INTERNATIONAL CODE OF ŒNOLOGICAL PRACTICES

ORGANISATION INTERNATIONALE DE LA VIGNE ET DU VIN

INTERNATIONAL ORGANISATION OF VINE AND WINE

INTERNATIONAL CODE OF ŒNOLOGICAL PRACTICES

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OIV – HÔTEL BOUCHU DIT D'ESTERNO, 1, RUE MONGE - 21000 DIJON
TEL : +33 (0) 1 44 94 80 80 – FAX : +33 (0) 1 42 66 90 63 – E-MAIL : CONTACT@OIV.INT - WWW.OIV.INT

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PREFACE

In application of the stipulations of the Agreement of 3 April 2001 establishing the International Organisation of Vine and Wine (OIV), the OIV Member Countries have approved[(1)] the following provisions regarding the definition of vitivinicultural products and oenological practices and treatments, accepted or otherwise.

This document constitutes a technical and legal reference document aimed at the standardisation of products from the vitivinicultural sector and which should be used as a foundation for establishing national or supranational regulations and be essential in international trade.

This Code, together with the *Compendium of International Methods of Wine and Must Analysis* and the *International Oenological Codex*, constitutes an integrated and coherent regulatory corpus that is regularly updated in line with technological innovations.

[(1)] *Legal basis: Agreement of 3 April 2001, Resolution AG 3/2004, Resolution 16/70.*

FOREWORD

The present edition of the *International Code of Oenological Practices* is a codification of agreements adopted by the different General Assemblies of the OIV since 1970.

After each definition, treatment or practice heading, the reference to the number of the corresponding resolution is given in brackets.

Part I of the *International Code of Oenological Practices* includes the different definitions of vitivinicultural products adopted by the OIV, which are grouped under several categories: Grapes; Musts; Wines; Special wines; Mistelles; Products derived from grapes, grape must or wine; Spirits, alcohols and spirit beverages of vitivinicultural origin.

Part II of the *International Code of Oenological Practices* comprises different oenological treatments and practices, accepted or otherwise by the OIV. These treatments are grouped according to the product type (Grapes, Musts, Wines) that applies to them. Each sheet specifies the

technological objective, as well as some prescriptions for the treatment in question. Additionally, each oenological treatment or practice should comply with the provisions of the *International Oenological Codex*, which establishes various specifications.

Part III contains good practice guides to supplement this *International Code of Oenological Practices*.

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PART I

DEFINITIONS

ANNEXE
MAXIMUM ACCEPTABLE LIMITS

NOTA BENE:

1) an asterisk (*) placed after a term indicates that the practice or the treatment that it designates is described in part II of the code.

2) two asterisks (**) placed after the word "code" in some sentences indicate that the production conditions are being studied and that their detailed description will feature in a supplement to the International Code of Oenological Practices that will appear later.

3) 🕨 to be referred to the specific files ; 🕩 to be referred to the general file

DISTINCTION BETWEEN ADDITIVES AND PROCESSING AIDS (OENO 567A-2016, OENO 682-2021, OIV-OENO 567B2-2022, OIV-OENO 567B4-2022, OIV-OENO 567C1-2022, OIV-OENO 723-2024)

FOOD ADDITIVE

This term means "any substance not normally consumed as a food by itself and not normally used as a typical ingredient of the food, whether or not it has nutritive value, the intentional addition of which to food for a technological (including organoleptic) purpose in the manufacture, processing, preparation, treatment, packaging, transport or holding of such food results, or may be reasonably expected to result (directly or indirectly) in it or its by-products becoming a component of or otherwise affecting the characteristics of such foods. The term does not include 'contaminants' or substances added to food for maintaining or improving nutritional qualities".

PROCESSING AID

This term means "any substance or material, not including apparatus or utensils, and not consumed as a food ingredient itself, intentionally used in the processing of raw materials, food or its ingredients, to fulfill a certain technological purpose during treatment or processing and which may result in the non-intentional but unavoidable presence of residues or derivatives in the final product".[1]

[1] *CODEX STAN 107-1981*

Compounds admitted by the OIV for treatment of grape, must and wines and their status as additives and processing aids and the use levels or residual limits

Substances	INS or CAS No.	Code of Oenological Practices		OIV Codex file reference	Additive	Processing aid	
		Grape/ Must	wine				
Acidity regulators							
Malic acid (D,L-; L-)	INS 296	File 2.1.3.1.1	File 3.1.1.1	COEI-1-ACIMAL	X		Maximum use level 4 g/L[2]
Lactic acid	INS 270	File 2.1.3.1.1	File 3.1.1.1	COEI-1-ACILAC	X		Maximum use level 4 g/L[2]
Tartaric acid L(+)	INS 334	File 2.1.3.1.1	File 3.1.1.1	COEI-1-LTARAC	X		Maximum use level 4 g/L[2]
Citric acid, monohydrate	INS 330		File 3.3.8; 3.3.1	COEI-1-CITACI	X		Maximum use level 4 g/L[2] Residual limit 1g/L
Potassium L(+) tartrate	INS 336	File 2.1.3.2.2	File 3.1.2.2	COEI-1-POTTAR		X	
Potassium hydrogen tartrate	INS 336i	File 2.1.3.2.2	File 3.1.2.2	COEI-1-POTBIT		X	
Calcium carbonate	INS 170	File 2.1.3.2.2	File 3.1.2.2	COEI-1-CALCAR		X	
Potassium hydrogen carbonate	INS 501ii	File 2.1.3.2.2	File 3.1.2.2	COEI-1-POTBIC		X	
Calcium tartrate	INS 354		File 3.3.12	COEI-1-CALTAR		X	Maximum use level 200 g/L
Potassium carbonate	INS 501i	File 2.1.3.2.5		COEI-1-POTCAR		X	
Calcium sulfate *(liqueur wines only)*	INS 516	File 2.1.3.1.1.1		Ongoing	X		Maximum use level 2 g/L
Preservatives							
Ascorbic acid	INS 300	File 1.11; 2.2.7	File 3.4.7	COEI-1-ASCACI	X		Maximum use level 0.25 g/L[3] Residual limit

[2] *Expressed as tartaric acid*

[3] *When the ascorbic acid has also been used on grape or must, the final concentration, in terms of ascorbic plus dehydroascorbic acid, shall not exceed 300 mg/l.*

Substances	INS or CAS No.	Code of Oenological Practices		OIV Codex file reference	Additive	Processing aid	
		Grape/ Must	wine				
							300 mg/L
Erythorbic acid	INS 315	File 1.11; 2.2.7	File 3.4.7	COEI-1-ASCACI	X		Maximum use level 0.25 g/L[3] Residual limit 300 mg/L
Sorbic acid	INS 200		File 3.4.5	COEI-1-SORACI	X		Maximum use level 0.2 g/L
Potassium sorbate	INS 202		File 3.4.5	COEI-1-POTSOR	X		Maximum use level 0.2 g/L
Lysozyme	INS 1105	File 2.2.6	File 3.4.12	COEI-1-LYSOZY	X	X	Maximum use level 0.5 g/L
Liquid sulphur dioxide	INS 220	File 1.12; 2.1.2	File 3.4.4	COEI-1-SOUDIO	X		Residual limit 150 mg/l for red wines, 200 mg/l for white and rosés wines, 300 mg/l: red wines, rosés and whites containing more than 4 g/l of reducing substances, 400 mg/l: exceptionally in certain sweet white wines
Potassium hydrogen sulphite	INS 228	File 2.1.2		COEI-1-POTBIS	X		
Ammonium hydrogen sulphite	CAS 10192-30-0	File 1.12; 2.1.2		COEI-1-AMMHYD	X		
Potassium anhydrous sulphite	INS 224	File 1.12		COEI-1-POTANH	X		
Antioxidant							
Glutathione	CAS 70-18-8	File 2.2.8	File 3.4.18	COEI-1-GLUTAT	X		Maximum use level 0.02 g/L
Sequestrant							
Oenological carbon	INS 153	File 2.1.9	File 3.5.9	COEI-1-CHARBO		X	Maximum use level 1 g/L
Selective vegetal fibres	-		File 3.4.20	COEI-1-FIBVEG		X	
Fermentation activators							
Ammonium chloride	INS 510		File 4.1.8	COEI-1-AMMCHL		X	

Substances	INS or CAS No.	Code of Oenological Practices		OIV Codex file reference	Additive	Processing aid	
		Grape/ Must	wine				
Ammonium sulphate	INS 517		File 4.1.7	COEI-1-AMMSUL		X	Maximum use level 0.3 g/L
Diammonium hydrogen phosphate	INS 342		File 4.1.7	COEI-1-PHODIA		X	Maximum use level 0.3 g/L
Thiamine hydrochloride	CAS 67-03-8	File 2.3.3	File 4.1.7	COEI-1-THIAMIN		X	Maximum use level 0.6 g/L
Cellulose food grade	INS 460	File 2.3.2		COEI-1-CELLUL		X	
Microcrystalline cellulose	INS 460	File 2.3.2	File 3.4.21	COEI-1-CELMIC		X	
Anti-foaming agent							
Fatty acid mono- and diglycerides	INS 471	File 2.3.2		COEI-1-ACIGRA		X	
Clarifying agents							
Protein of plant origin from peas		File 2.1.17	File 3.2.7	COEI-1-PROVEG		X	
Protein of plant origin from potatoes		File 2.1.17	File 3.2.7	COEI-1-PROVEG		X	
Isinglass			File 3.2.1	COEI-1-COLPOI		X	
Gelatin	CAS 9000-70-8	File 2.1.6	File 3.2.1	COEI-1-GELATI		X	
Egg (albumin)	CAS 9006-59-1		File 3.2.1	COEI-1-OEUALB		X	
Casein (calcium caseinate)	CAS 9005-43-0	File 2.1.16		COEI-1-CASEIN		X	
Potassium caseinate	CAS 68131-54-4	File 2.1.15	File 3.2.1	COEI-1-POTCAS		X	
Alginic acid	INS 400		File 3.2.1	COEI-1-ALGIAC		X	
Skim milk[4]			File 3.2.1	COEI-1-LAIECR		X	

[4] *Skimmed milk is a foodstuff used in enology as a processing aid.*

Substances	INS or CAS No.	Code of Oenological Practices		OIV Codex file reference	Additive	Processing aid	
		Grape/ Must	wine				
Potassium alginate	INS 402		File 4.1.8	COEI-1-POTALG		X	
Calcium alginate	INS 402		File 4.1.8	COEI-1-ALGIAC		X	
Cellulose	INS 460	File 2.1.11.1	File 3.2.2.1 3.2.2.2	COEI-1-CELLUL		X	
Chitin-glucan	CAS Chitin 1398-61-4 CAS Glucan 9041-22-9	File 2.1.23	File 3.2.1; 3.2.1.3 ; 3.4.17	COEI-1-CHITGL		X	
Chitosan	CAS 9012-76-4	File 2.1.22	File 3.2.1; 3.2.12; 3.4.16	COEI-1-CHITOS		X	
Diatomite	CAS 68855-54-9	File 2.1.11	File 3.2.2	COEI-1-DIATOM		X	
Kaolin	CAS 1332-58-7		File 3.2.1	COEI-1-KAOLIN		X	
Perlite	CAS 93763-70-3	File 2.1.11	File 3.2.2	COEI-1-PERLIT		X	
Colloidal silicon dioxide solution	INS 551	File 2.1.10	File 3.2.1; 3.2.4	COEI-1-DIOSIL		X	
Bentonites	INS 558	File 2.1.8	File 3.3.5	COEI-1-BENTON		X	
Polyvinylpolypyrrolidone (PVPP)	INS 1202		File 3.4.9	COEI-1-PVPP		X	Maximum use level 0.8 g/L
Yeast protein extracts		File 2.1.24; 2.1.25	File 3.2.14	COEI-1-EPLEV		X	
Stabilising agents							
Sodium Carboxymethylcellulose	INS 466		File 3.3.14	COEI-1-CMC	X		Maximum use level 0.2 g/L
Metatartaric acid	INS 353		File 3.3.7	COEI-1-METACI	X		Maximum use level 0.1 g/L
Yeast mannoproteins			File 3.3.13	COEI-1-MANPRO	X		

Substances	INS or CAS No.	Code of Oenological Practices		OIV Codex file reference	Additive	Processing aid	
		Grape/ Must	wine				
Dimethyl dicarbonate	SIN 242		File 3.4.13	COEI-1-DICDIM	See footnote e[5]	See footnote e[6]	
tartaric acid D,L-	CAS 133-37-9	File 2.1.21	File 3.4.15	COEI-1-DLTART		X	
Potassium D,L-tartrate			File 3.4.15	COEI-1-POTRAC		X	
Gum arabic	INS 414		File 3.3.6	COEI-1-GOMARA	X		Maximum use level 0.3 g/L
Copper sulphate, pentahydrate	CAS 7758-99-8		File 3.5.8	COEI-1-CUISUL		X	Maximum use level 0.01 g/L Residual limit 1 mg/L[7]
Copper citrate	CAS 866-82-0		File 3.5.14	COEI-1-CUICIT		X	Maximum use level 0.01 g/L Residual limit 1 mg/L[4]
Potassium hexacyanoferrate (II)	INS 536		File 3.3.1	COEI-1-POTFER		X	
Calcium phytate	CAS 3615-82-5		File 3.3.1	COEI-1-CALPHY		X	
PVI/PVP copolymer	CAS 87865-40-5	File 2.1.20	File 3.4.14	COEI-1-PVIPVP		X	Maximum use level <0.5 g/L Residual limit Vinylpyrrolidone ≤ 10 µg/L Vinylimidazole ≤ 10 µg/L Pyrrolidone ≤ 25 µg/L Imidazole ≤ 150 µg/L

[5] *According to the national laws of different countries, DMDC is considered as an additive in some countries whereas in other countries it is considered as a processing aid.*

[6] *According to the national laws of different countries, DMDC is considered as an additive in some countries whereas in other countries it is considered as a processing aid.*

[7] *2 mg/L for liqueur wines*

Substances	INS or CAS No.	Code of Oenological Practices		OIV Codex file reference	Additive	Processing aid	
		Grape/ Must	wine				
Potassium polyaspartate	CAS 64723-18-8		File 3.3.15	COEI-1-POTASP	X		Maximum use level 0.1 g/L
Enzymes							
Arabinanases	EC 3.2.1.99	File 2.1.4; 2.1.18	File 3.2.8; 3.2.11	COEI-1-ACTARA		X	
Beta-glucanases (β1-3, β1-6)	EC 3.2.1.6		File 3.5.7	COEI-1-ACTGLU		X	
Cellulases	EC 3.2.1.4	File 2.1.4; 2.1.18	File 3.2.8; 3.2.11	COEI-1-ACTCEL		X	
Glycosidases	EC 3.2.1.20	File 2.1.19	File 3.2.9	COEI-1-GLYCOS		X	
Glucosidases	EC 3.2.1.21	File 2.1.19	File 3.2.9			X	
Pectinlyases	EC 4.2.2.10	File 2.1.4; 2.1.18	File 3.2.8; 3.2.11	COEI-1-ACTPLY		X	
Pectinmethylesterases	EC 3.1.1.11	File 2.1.4; 2.1.18	File 3.2.8; 3.2.11	COEI-1-ACTPME		X	
Polygalacturonases	EC 3.2.1.15	File 2.1.4; 2.1.18	File 3.2.8; 3.2.11	COEI-1-ACTPGA		X	
Hemicellulases	EC 3.2.1.78	File 2.1.4; 2.1.18	File 3.2.8; 3.2.11	COEI-1-ACTGHE		X	
Urease	EC 3.5.1.5		File 3.4.11	COEI-1-UREASE		X	
Beta-glucanases	EC 3.2.1.58		File 3.2.10	COEI-1-BGLUCA		X	
Proteases		File 2.2.12	File 3.3.16	COEI-1-PROTEA		X	
Gases							
Oxygen	INS 948	File 2.1.1	File 3.5.5	COEI-1-OXYGEN		X	
Nitrogen	INS 941	File 2.2.5	File 3.2.3	COEI-1-AZOTE		X	
Argon	INS 938	File 2.2.5	File 3.2.3	COEI-1-ARGON		X	

Substances	INS or CAS No.	Code of Oenological Practices		OIV Codex file reference	Additive	Processing aid	
		Grape/ Must	wine				
Fermentation agents							
Active Dry Yeasts	INS 510		File 4.1.8	COEI-1-LESEAC		X	
Lactic acid bacteria	INS 342		File 4.1.7	COEI-1-BALACT		X	
Yeast autolysates	-	File 2.3.2		COEI-1-AUTLYS		X	
Yeast hulls	-	File 2.3.4		COEI-1-YEHULL		X	Maximum use level 0.4 g/L
Inactivated yeasts	-	File 2.3.2		COEI-1-INAYEA		X	
Inactivated yeasts with guaranteed glutathione levels	-	File 2.2.9	File 3.4.19	COEI-1-LEVGLU		X	Maximum use level (glutathione) 0.02 g/L
Others							
Caramel *(special wines only)*	INS 150a, 150b, 150c, 150d		File 4.3; 6.1	COEI-1-CARAMEL	X		
Dimethyl dicarbonate (DMDC)			File 3.4.13				
Silver Chloride			File 3.5.15				
Oenological tannins		File 2.1.7 File 2.1.17	File 3.2.6 File 3.3.1	COEI-1-TANINS		X	
Skim milk			File 3.2.1				
Grape sugar							
Rectified alcohol of agricultural origin			File 3.5.1				
Rectified alcohol of vitivinicultural origin			File 3.5.1				
Carbon dioxide	SIN 290			COEI-1-DIOCAR			

Substances	INS or CAS No.	Code of Oenological Practices		OIV Codex file reference	Additive	Processing aid	
		Grape/ Must	wine				
		File 1.7				X	
		File 2.2.3			X[8]		
		File 2.2.5				X	
		File 2.3.9				X	
			File 3.2.3			X	
			File 3.5.17		X		
			File 4.1.10			X	
			File 4.5		X		
			File 6.15		X		
Acidification by yeasts		File 2.1.3.1.2.1					
De-acidification by yeasts		File 2.1.3.2.3.1					
De-acidification by lactic acid bacteria		File 2.1.3.2.3.3					
Inoculation with yeasts		File 2.3.1					
Fumaric acid			File 3.4.2; 3.4.23		X		Recommanded doses of 300-600 mg/L

[8] *Carbon dioxide is considered an additive when it is added to the must. However to continue with the production phases, after storage, it is eliminated from the must, and therefore it can be considered a processing aid.*

Processes admitted by the OIV for thtreatment of grape, must and wines

Substances	Code of Oenological Practices		OIV Codex file reference	
	Grape/Must	wine		
Physical technics				
Filtration on filter bed	File 2.1.11.1	File 3.2.2.1		
Flotation	File 2.1.14			
Pasteurisation	File 2.2.4	File 3.4.3.1; File 3.4.3.2		
Interruption of alcoholic fermentation by physical procedures	File 2.3.6			
Warm post fermentation maceration of red grapes called warm final maceration	File 2.3.9			
Maceration of raisined grapes or their pomace in wine	File 2.3.10			
Sterilising filtration		File 3.2.2.2		
Cold stabilisation treatment		File 3.3.4		
Topping up		File 3.4.1		
Blending and mixing or preparation of the cuvee		File 3.5.3		
Hot bottling		File 3.5.4		
Fermentation in small capacity wooden containers	File 2.3.8			
Fermenting must or wines in contact with wood		File 3.5.12		
Ageing in small capacity wooden containers		File 3.5.12.1		
Usage of pieces of oak wood in winemaking		File 3.5.12.2		
Physical processes				

Substances	Code of Oenological Practices		OIV Codex file reference	
	Grape/Must	wine		
Electromenbrane				
Acidification by electromembrane treatment (Bipolar membrane electrodialysis	File 2.1.3.1.3	File 3.1.1.4		
De-acidification using an electromembrane process	File 2.1.3.2.4	File 3.1.2.3		
Elimination of sulfur dioxide by physical process	File 2.1.13			
Reverse osmosis				
Concentration of must by reverse osmosis	File 2.1.12.1			
Reduction of the sugar content in musts through membrane coupling	File 2.1.25.1			
Cryoconcentration				
Concentration of must or wine by cold	File 2.1.12.4	File 3.5.11.1		
Microfiltration				
Reduction of the sugar content in musts through membrane coupling (used with nanofiltration or reverse osmosis)	File 2.1.25.1	File 3.2.2		
Ultrafiltration				
Reduction of the sugar content in musts through membrane coupling (used with nanofiltration or reverse osmosis)	File 2.1.25.1			
Nanofiltration				
Reduction of the sugar content in musts	File 2.1.25.1			

Substances	Code of Oenological Practices		OIV Codex file reference	
	Grape/Must	wine		
through membrane coupling				
Cations exchangers				
Acidification by cation exchanger treatment	File 2.1.3.1.4	File 3.1.1.3 File 3.1.1.5		
Tartrate stabilisation by treatment with cation exchangers		File 3.1.1.3; File 3.3.3		
Filter plates containing zeolites y-faujasite				
Use of filter plates containing zeolites y-faujasite to adsorb haloanisoles		File 3.2.15		
Electrodialysis				
Tartrate stabilisation by electrodialysis		File 3.3.2		
Heat exchanger				
Pasteurisation	File 2.2.4	File 3.4.3.1		
Biological stabilisation		File 3.4.2		
Partial evaporation under atmospheric pressure				
to obtain the desired degree of concentration and caramelization of sugar	File 2.1.12.3			
Partial evaporation under vacuum process				
to concentrate musts	File 2.1.12.2			
Correction of the alcohol content in wines		File 3.5.13		
Dealcoholisation of wines		File 3.5.16		
Membrane techniques for alcohol reduction				

Substances	Code of Oenological Practices		OIV Codex file reference	
	Grape/Must	wine		
Correction of the alcohol content in wines		File 3.5.13		
Dealcoholisation of wines		File 3.5.16		
Distillation process				
Correction of the alcohol content in wines		File 3.5.13		
Dealcoholisation of wines		File 3.5.16		
Membrane contactor				
Management of dissolved gas in wine using membrane contactors		File 3.5.17		
Nanofiltration coupled with activated carbon column				
Treatment of wines using a membrane technology coupled with activated carbon to reduce excess 4-ethylphenol and 4-ethylguaiacol		File 3.5.18		
Ultrasounds				
Usage of ultrasound for a rapid extraction of grape compounds		File 1.17		
Discontinuous High Pressure Processes				
Process that consists in the reduction of indigenous organisms in grapes and musts by the use of discontinuous high pressure processes, with pressures higher than 150 MPa (1500 bar)	File 1.18; 2.1.26			
Pulsed electric fields (PEF)				

Substances	Code of Oenological Practices		OIV Codex file reference	
	Grape/Must	wine		
A process that consists on the application of sufficiently high pulsed electric fields (PEF) to destemmed and crushed grapes that causes the permeabilization of the cell membranes especially of the grape skins	File 2.1.27			
Treatment by continuous high pressure processes				
Operation for the elimination of wild microorganisms in musts and wine by high pressure processing (above 200 MPa or 2000 bar) in continuous. In UHPH, the pressure is usually ranging 300-400 MPa	File 1.18	File 2.2.10		
Treatment of musts using adsorbent styrene-divinylbenzene beads				
Physical process of reduction or elimination of organoleptic deviations characterised as “earthy-musty” by the appropriate and controlled percolation at a high flow rate through adsorbent styrene-divinylbenzene beads	File 2.2.11	File 3.4.22		
Traitements aux ultrasons				
Treatment of crushed grapes with ultrasound to promote the extraction of their compounds	Fiche 1.17			

PREVENTION OR MINIMISATION OF CONTAMINANTS (OENO 362-2011)

Definition of contaminant:
Contaminant, in the context of a vitivinicultural product, means any substance not intentionally present in the product as a result of the production, processing, treatment, packing, packaging, transport or holding of such product, or as a result of environmental contamination, the presence of which has an impact on the safety and/or quality of the product.

Objectives:
The techniques for prevention or minimisation of contaminants are aimed:

a) to minimise the food safety risks associated with consumption of the product.
b) to optimise the organoleptic quality of the product,

Prescriptions:

a) Preventative practices to avoid contamination in the first place should be favoured referred to the "Good Practices Guide" of the OIV and the specifications of oenological products of International Oenological Codex.
b) Oenological practices aimed at reducing contaminant levels are based principally on absorptive techniques, and must be in accordance with the OIV International Code of Oenological Practices.

GENERAL PRINCIPLES TO TAKE INTO ACCOUNT IN THE ASSESSMENT OF OENOLOGICAL PRACTICES AND SUBSTANCES COMPOSING OENOLOGICAL PRODUCTS (OIV-OENO 602-2022)

Oenological practices:

- Are safe biological, physical and chemical practices intended for the production and preservation of vitivinicultural products,
- Preserve the natural and essential characteristics and composition of wine,
- Should not cause consumer confusion or facilitate this.

(Wherever possible and reasonable, preference should be given to substances that are extracted from grapes/ substances of vitivinicultural origin).
Oenological practices and the use of oenological substances should not mask the effects of the use of defective raw materials, faulty raw materials or unhygienic practices[9].

Taking into consideration the OIV established a specific description of each oenological practice and any use of oenological substances, including its objectives, purposes and conditions of use. Onological practices and the use of oenological susbtances recommended and published by OIV shall only be used for the purposes described and, in the manner, described to provide a benchmark for good manufacturing practice.

Oenological practices and oenological substances are used:

- To prevent or eliminate wine defects (oxidation, bacterial contamination, tartaric precipitation, etc.),

[9] *"Hygiene", measn the measures and conditions necessary to control hazards and to ensure fitness for human consumption of wine, wine-based beverages, table grapes, raisin and other vine-based products taking into accounts its intended use.*

- To improve the process of winemaking (control the fermentations, improve the filtrability, improve clarification,…)
- To improve the storage capacity or stability of the vitivinicultural product and maintenance of its organoleptic qualities,
- As additives or processing aids, while the status of the substance depends on their use.

There is a sufficient technological need to justify the use of the oenological substance, or the treatment gives evident advantages, economically or technically compared to the present practices and consumers are not misled through the use of the oenological treatment agent; the oenological substance provides advantages to consumers and consequently fultils one or several objectives such as:

- Preservation of the nutritive quality of the vitivinicultural products,
- Improvement of the storage capacity or stability of the vitivinicultural product and maintenance of its organoleptic qualities.

The OIV establishes a specification for each oenological substance concerning the origin, purity and other necessary indications.

The OIV evaluates and develops new oenological practices or revises those that already exist, also taking into account environmental impact/ sustainability according to technological innovayions.

The OIV recommends that:

- The quantity of an oenological treatment agent added in the elaboration of a product shall be limited to the lowest possible level necessary to accomplish its desired effect,
- The quantity of the oenological treatment agent that as a result of its usetransforms to another product not intended to accomplish any physical or other technical effect in the

vitivinicultural product itself, is reduced to the extent reasonably possible.

The OIV recommends maximum numerical use levels for oenological substances with an acceptable daily intake (ADI) set by JECFA or other Food Safety Authorities, also taking account of the opinion of the OIV's "Food Safety" Group. The OIV also recommends numerical limits for best use of the technological function and/ or for quality purposes on the basis of experimental data analysed by its own experts. In the absence of fixed numerical limits from the OIV, the OIV recommends oenological substances shall be used at levels established for GMP, which are the lowest levels possible to provide a specific technological function.

PART I

DEFINITIONS

1. GRAPES

1.1 FRESH GRAPES (18/73)

The ripe fruit of the vine.

1. GRAPES

1.1.1 WINE GRAPE (18/73)

A fresh grape destined for vinification, basically because of its characteristics. It can be overripe or slightly raisined or suffering from noble rot, provided that it may be crushed or pressed using normal winery procedures and that it is capable of undergoing a spontaneous alcoholic fermentation.

1. GRAPES

1.1.2 TABLE GRAPE (18/73)

A fresh grape, produced from special vine varieties or vine varieties cultivated for this purpose and destined for consumption as such, basically because of its sensory and commercial characteristics.

1. GRAPES

1.2 DRIED GRAPES (RAISINS) (18/73)

Ripe fruit of the vine brought, once separated from the plant and using treatments and authorised processes, to a state of dehydration or desiccation such that it can neither be crushed by normal winery procedures, nor undergo spontaneous fermentation; destined, by its characteristics, to food use to the exclusion of use for the production of wine and grape juice, and produced from special vine varieties or vine varieties cultivated for this purpose.

2. MUSTS

2.1 GRAPE MUST (18/73)

Liquid product obtained from fresh grapes, whether spontaneously or by physical processes such as: crushing(*), removing stems from grape berries or crushed grapes (*), draining(*), pressing (*).

2. MUSTS

2.2 PRESERVED GRAPE MUST (16/70 & 5/88)

Fresh grape must whose alcoholic fermentation has been prevented by one of the following oenological procedures: sulphiting (*) or addition of carbon dioxide (carbonation of the must (*)) or by sorbic acid (*, not accepted).
A small quantity of endogenous ethanol is tolerated, with a limit of 1% vol.

2. MUSTS

2.3 CONCENTRATED GRAPE MUST (18/73)

Product neither fermented nor caramelised, obtained by the partial dehydration(*) of grape must or of preserved grape must according to procedures accepted by the OIV, such that its density at 20°C is not less than 1.24 g/ml.

2. MUSTS

2.4 CARAMELISED GRAPE MUST (18/73)

Non-fermented product, obtained by the partial dehydration by direct heat of grape must or of grape must preserved according to procedures accepted by OIV, such that its density at 20°C is not less than 1.3 g/ml.

3. WINES

3.1 BASIC DEFINITION (18/73)

Wine is the beverage resulting exclusively from the partial or complete alcoholic fermentation of fresh grapes, whether crushed or not, or of grape must. Its actual alcohol content shall not be less than 8.5% vol.

Nevertheless, taking into account climate, soil, vine variety, special qualitative factors or traditions specific to certain vineyards, the minimum total alcohol content may be able to be reduced to 7% vol. by legislation particular to the region considered.

3. WINES

3.2 COMPLEMENTARY DEFINITIONS RELATING TO SUGAR CONTENT[10] (18/73, ECO 3/1993, ECO 3/03, OENO 415-2011)

The wine is said to be :

- *Dry,* when the wine contains a maximum of either 4 g/l sugar or 9 g/l when the level of total acidity (expressed in grams of tartaric acid per litre) is no more than 2 g/l less than the sugar content.
- *Medium dry*, when the sugar content of the wine is higher than the sugar content indicated under the first bullet point and does not exceeds
    - 12 g/l or
    - 18 g/l, when the difference between the sugar content and the level of total acidity expressed in g/l of tartaric acid does not exceed 10g/lwhen the sugar content of the wine is more than that specified in the first bullet point, up to a maximum of either 12 g/l or 18 g/l when the content in total acidity is fixed according to the first bullet point above.
- *Semi-sweet*, when the sugar content of the wine is more than that specified in the second bullet point, up to a maximum of 45 g/l.
- *Sweet*, when the wine has a minimum sugar content of 45 g/l.

[10] sugar content is determined by the "glucose + fructose" method of analysis described in the International Compendium of Methods of Analysis

3. WINES

3.3 COMPLEMENTARY DEFINITIONS RELATING TO CARBON DIOXIDE CONTENT (18/73), (OENO 1/02)

The wine is said to be :

- *Still,* when the carbon dioxide concentration is less than 4 g/l at 20°C,

- *Semi-sparkling,* when this concentration is equal to or above 3 g/l and less than or equal to 5 g/l at 20°C.

If the carbon dioxide content of the product enables the indication of these two references, the wine maker or the importer shall only use one reference of his/her choosing.

4. SPECIAL WINES

4.1 BASIC DEFINITION (6/76)

Special wines are wines coming from fresh grapes, from musts or wines which have undergone certain treatments during or after their production and whose characteristics come not only from the grape itself, but also from the production technique used.

Special wines include[11]:

- Flor or film wines,
- Liqueur wines,
- Sparkling wines,
- Carbonated wines
- Sweet wines with residual sugar derived from grapes
- Icewine - eiswein

[11] List not restrictive

4. SPECIAL WINES

4.2 FLOR OR FILM WINES (6/76)

Wines whose principal characteristic is to be subjected to a period of biological ageing in contact with air by the development of a film of typical yeasts on the free surface of the wine, after complete alcoholic fermentation of the must. Wine spirit, neutral alcohol of agricultural origin or neutral alcohol of vitivinicultural origin may be added to the wine, in which case the actual alcohol content of the finished product must be equal to or greater than 15% vol.

Prescriptions :

The wine spirit, neutral alcohol of agricultural origin or neutral alcohol of vitivinicultural origin which may be added must comply with the conditions fixed for the production of these products in the present Code and with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

It is recommended that the neutral alcohol of agricultural origin used is exclusively of viticultural origin.

4. SPECIAL WINES

4.3 LIQUEUR WINE (ECO 2/2007) [12]

Liqueur wine is a product with acquired alcoholic strength above or equal to 15% and below or equal to 22%. A state can however, for its domestic market, apply a maximum acquired alcoholic strength of above 22% whilst remaining below or equal to 24%.

Liqueur wine is made from grape musts (including partially fermented grape musts) and/or wine, to which are added, alone or in a mixture, distillates, spirits and alcohol of vitivinicultural origin.

One or more of the following products can be added: concentrated or caramelised grape must, over ripened or raisined grapes, mistelles, caramel.

A State can, however, for its domestic market, allow the use of neutral alcohol of agricultural origin if this usage is already authorised in the regulations of this state at the time of the adoption of the present resolution, within a limited time period.

[12] *The group of experts "Law and consumer information", in its session of 13 March 2013, decided that it is required to implement the resolution ECO 2/2007 and remove both specific sheet of the Code concerning "spirituous wines" (sheet 4.3.1) and "Syrupy wines" (sheet 4.3.2).*

4. SPECIAL WINES

4.4 SPARKLING WINES (18/73 & 6/79)

Special wines produced from grapes, musts or wines processed according to techniques accepted by OIV, characterised on uncorking by the production of a more or less persistent effervescence resulting from the release of carbon dioxide of exclusively endogenous origin. The excess pressure of this gas in the bottle is at least 3.5 bars at 20°C. Nevertheless, for bottles of a capacity less than 0.25 l, the minimum excess pressure is 3 bars at 20°C.
According to the production technique, sparkling wines are said to be:

- Of secondary fermentation in bottle,
- Of secondary fermentation in closed tank.

The wine is said to be:

- Brut when it contains at the most 12 g/l of sugar with a tolerance of + 3 g/l;
- Extra-dry, when it contains at least 12 g/l and at most 17 g/l with a tolerance of + 3 g/l;
- Dry, when it contains at least 17 g/l and at most 32 g/l with a tolerance of +3 g/l;
- Demi-sec, when it contains 32 to 50 g/l;
- Sweet, when it contains more than 50 g/l.

4. SPECIAL WINES

4.5. CARBONATED WINES (18/73)

Special wines produced from wines treated according to techniques accepted by OIV, showing physical characteristics analogous to those of sparkling wines, but whose carbon dioxide is partially or totally of exogenous origin.

4. SPECIAL WINES

4.6. SWEET WINES WITH RESIDUAL SUGAR DERIVED FROM GRAPES (287/2010)

Sweet wine with residual sugar derived from grapes is a wine with a content of fermentation residual sugars, glucose plus fructose, above or equal to 45g/l, and resulting exclusively from partial alcoholic fermentation of grapes or grape must for which the sugar content was obtained naturally, during the grape maturation, or may be obtained in accordance with provisions in 1.10 "Mastering sugar content from the harvest", notably raisining, selective sorting of grapes and cryoselection.
The actual alcoholic strength by volume of the wine must not be less than 4,5% alc. vol.
The potential alcoholic strength of the grapes before fermentation must not be less than 15% alc. vol.

4. SPECIAL WINES

4.7. ICEWINE - EISWEIN (OENO 6/03)

Definition:

Wine made exclusively from the fermentation of fresh grapes having undergone cryoselection in the vineyard without recourse to physical procedures (see point d sheet Managing sugar contents in the wine harvest). The grapes used for the production of ice wine must be frozen during the harvest and be pressed in this state.

Prescriptions:

a) Harvesting and pressing should be performed at a recommended temperature lower or equal to –7°C.

b) The potential alcohol strength by volume for musts cannot be increased and should be as a minimum 15% volume (corresponding 110° Oechsle or 25.3 Brix).

c) The minimal alcoholic strength acquired should be 5.5% by volume.

d) The maximum limit of volatile acidity should be 35 milli-equivalents (2.1 g/l expressed in acetic acid).

e) All grapes used in ice wine should come from the same region.

4. SPECIAL WINES

4.8. WINE WITH AN ALCOHOL CONTENT MODIFIED BY DEALCOHOLISATION (ECO 523-2016)

Wine with an alcohol content modified by dealcoholisation is a beverage:

- obtained exclusively from wine or special wine as described in the *International Code of Oenological Practices*,
- which has undergone a dealcoholisation treatment in accordance with *the International Code of Oenological Practices* that has reduced the initial actual alcohol content by volume of the wine or special wine by a proportion of more than 20%,
- and which has an actual alcohol content equal to or greater than the relevant minimum actual alcohol content for wine or special wine specified in the *International Code of Oenological Practices*.

4. SPECIAL WINES

4.9. WHITE WINE WITH MACERATION (ECO 647-2020)

Definition:

White wine derived from alcoholic fermentation of a must with prolonged contact with grape pomace[13], including skins, pulp, seeds and eventually stems.

Prescriptions:

a) Winemaking is conducted exclusively using white grapes varieties;
b) the maceration is carried out in contact with grape pomace;
c) the minimum duration of the maceration phase is 1 month;
d) "White wine with maceration" can be characterised by an orange-amber colour and a tannic taste.

[13] The term grape pomace includes skins and also seeds

5. MISTELLES (6/76)

Mistelles are products produced from unfermented fresh grapes or grape musts (1% vol. actual alcohol is tolerated) and rendered non-fermentable by addition of wine spirit, neutral alcohol of agricultural origin or neutral alcohol of vitivinicultural origin. Mistelles are categorised as:

- Mistelles destined for further processing,
- Mistelles destined to be consumed as such and that are similar to fortified wines.

In the case of mistelles destined for further processing, the grape must used shall have a total natural alcohol content of at least 8.5% vol. The actual alcohol content of the finished product shall be 12 to 15% vol.

For the mistelles destined for direct consumption, the grape must used shall have a total natural alcohol content of at least 12% vol. The actual alcohol content of the finished product shall be not less than 15% vol. and not greater than 22% vol.

Prescriptions :

The wine spirit, neutral alcohol of agricultural origin or neutral alcohol of vitivinicultural origin which are added must comply with the conditions fixed for the production of these products in the present Code and with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

It is recommended that the neutral alcohol of agricultural origin used is exclusively of viticultural origin.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1 WINES FOR DISTILLATION (18/73)

Wines for distillation are dry wines fortified exclusively with wine spirit, having a minimum alcohol content of 18% vol. and a maximum of 24% vol., not included in the preceding categories and destined exclusively for distillation.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.2 GRAPE SUGAR (4/87 - CODEX)

Grape sugar is the syrupy, milky white or slightly yellowish product, of neutral flavour, obtained exclusively from grape must and that corresponds to the analytical prescriptions of the *International Oenological Codex .*

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.3 GRAPE JUICE (18/73)

Grape must which has undergone authorised practices and treatments, ready to be used, unfermented, in the diet, to the exclusion of all oenological usage.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.4 CONCENTRATED GRAPE JUICE (18/73)

Product neither fermented nor caramelised, obtained by partial dehydration of grape must or juice, which has undergone authorised practices and treatments, such that its density at 20°C is not less than 1.24 g/ml.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.5 LIGHTLY SPARKLING GRAPE DRINK (18/73)

Drink derived from the grape or grape must, containing carbon dioxide as a result of its partial fermentation, which may have undergone solely physical practices and treatments authorised by the present Code, and destined to be used in the diet, to the exclusion of all oenological use.

The alcohol of the finished product shall be of exclusively endogenous origin and the alcohol content shall not exceed 3% vol.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.6 BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS (288/2010)

A beverage based on vitivinicultural products is a beverage:

- obtained from at least 50% by volume of wine, and/or special wine and/or must as defined in the International Code of Oenological Practices of the OIV,
- which could have undergone the following treatments:
  - sweetening
  - colouring addition of aromatising substances or preparations
  - addition of food-related products or non alcoholic products or beverages including water
- for which the actual alcoholic strength by volume is equal to or above 1.2% vol. and below 14.5% vol.
- and for which the alcoholic component derives exclusively from the wine or special wine used, except for doses used only to dilute aromatic substances, or colorants, or any other authorised substance.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.7 WINE BASED BEVERAGES (288/2010)

A wine-based beverage is a beverage:

- obtained from at least 50% by volume of wine, and/or special wine as defined in the International Code of Oenological Practices of the OIV,
- which could have undergone the following treatments:
  - sweetening
  - colouring
  - addition of aromatising substances or preparations
  - addition of food-related products, such as must or non alcoholic products or beverages including water
- for which the actual alcoholic strength by volume is equal to or above 3.5% vol. and below 14.5% vol.
- and for which the alcoholic component derives exclusively from the wine or special wine used, except for doses used only to dilute aromatic substances, or colorants, or any other authorised substance.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.8 AROMATISED WINES (OENO 395-2011)

Aromatised wine is a beverage:

- obtained from at least 75% by volume of wine and/or special wine, as defined in the International Code of Oenological Practices of the OIV, and which has undergone an aromatisation process;
- to which ethyl alcohol of viticultural origin and/or a wine distillate and/or alcohol of agricultural origin could have been added;
- which could have undergone a sweetening;
- which could have undergone a colouring;
- which could have undergone one or more of other specific oenological practices applicable to this beverage;

with an actual alcoholic strength by volume varying between 14.5% minimum and 22%.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.9 BEVERAGE OBTAINED BY DEALCOHOLISATION OF WINE (OENO 432-2012)

Beverage obtained by dealcoholisation of wine is a beverage:

- obtained exclusively from wine or special wine as described in the International Code of oenological practices of the OIV;
- which has undergone exclusively specific for this type of products treatments in accordance with the OIV International Code of Oenological practices, in particular a dealcoholisation;
- and with an alcoholic strength by volume below 0,5% vol..

*NOTE

This definition does not preclude the denomination "dealcoholised wine" to be used in case the legislation of Member States allows it.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.10 BEVERAGE OBTAINED BY PARTIAL DEALCOHOLISATION OF WINE (OENO 433-2012)

Beverage obtained by partial dealcoholisation of wine is a beverage:

- obtained exclusively from wine or special wine as described in the International Code of oenological practices of the OIV;
- which has undergone exclusively specific for this type of products treatments in accordance with the OIV International Code of Oenological practices, in particular a dealcoholisation;
- and with an alcoholic strength by volume equal or above 0,5% vol. and less than the applicable minimum alcoholic strength of wine or special wine.

*NOTE
This definition does not preclude the denomination "partially dealcoholised wine" to be used in case the legislation of Member States allows it

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.11 WINE VINEGAR (ECO 401-2012)

Wine vinegar is a product suitable for human consumption, produced exclusively by the acetic fermentation of wine with a minimum acidity of 60 g/L expressed as acetic acid and with a maximum ethanol content of 4% vol.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.12 GRAPE NECTAR (OIV-VITI 678A-2022)

Grape nectar is an unfermented beverages (clarified or with pulp) for direct consumption[14] obtained by adding potable water and/ or sugars*, and/or honey**, and/or syrups***, and/or sweeteners**** (up to 20% of the total weight of the finished products), and/ or vitamins and minerals to the following grapevine products: grape juice[15], concentrated grape juice[16], dehydrated grape juice[17], water extracted grape juice[18], grape puree[19], concentrated grape puree[20] or a mixture of these products. Aromatic substances, exclusively recovered from grape and obtained by suitable physical means can be added.

Gape nectar must contain a minimum amount (% volume of finished product) of 50% of grape juice and/ or grape puree.

For grape nectar the potable water used for reconstitution must, as a minimum, comply with the latest edition of the Guidelines for drinking water quality of the World Health Organisation

[14] *Not used for the winemaking process*
[15] *According to OIV resolution AG 18/73-OEN*
[16] *According to OIV resolution AG 18/73-OEN*
[17] *According to the definitions of CODEX STAN 247-2005*
[18] *According to the definitions of CODEX STAN 247-2005*
[19] *According to the definitions of CODEX STAN 247-2005*
[20] *According to the definitions of CODEX STAN 247-2005*

*Sugars: Sugars must comply with the ones listed in the CODEX STAN 247-2005: sucrose, dextrose anhydrous, glucpse, fructose.
** Honey: according to CODEX STAN 12-1981
*** Syrups: syrups as defined in the CODEX Standard for Sugars, must comply with ones listed at the CODX STAN 247-2005: liquid sucrose, invert sugar soluton, invert sugar syrup, liquid cane sugar, isoglucose, high fructose syrup.
**** Sweeteners: as listed in the General Standard for Food Additives. Includes products that are preparations of high-intensity sweeteners (e.g. acesulfame potassium) and/ or of polyols (e.g. sorbitol) which may contain other additives and/or nutritive ingredients, such as carbohydrates. Thse products, which are sold to the final consumer, may be in powder, solid (e.g. tablets or cubes), or liquid form.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.13 CARBONATED GRAPE NECTAR (OIV-VITI 678A-2022)

Carbonated Grape nectar is an unfermented beverages for direct consumption produced according to the definition of Grape nectar in which carbon dioxide is added.

7. Spirits, alcohols and spirit beverages of vitivinicultural origin (Oeno 2/2000)

7.1 DISTILLATTE OF VITIVINICULTURAL ORIGIN (OENO 1/2005)

Alcoholic liquid is obtained:

- by direct distillation of wine, fortified wine, wine lees, or
- after alcoholic fermentation of grape marcs, raisins or fresh grapes by the distillation of these fermented musts, or
- by re-distillation of the distillate of vitivinicultural origin or wine spirits,

The distillate of vitivinicultural origin, contrary to neutral alcohol of vitivinicultural origin, must have the aroma and taste of the above-mentioned raw materials.

7. SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN (OENO 2/2000)

7.2 WINE DISTILLATE (OENO 2/2005)

Alcoholic liquid produced

- by direct distillation of wine and possibly wine distillate added or,
- by re-distillation of a wine distillate.

The wine distillate, contrary to neutral alcohol of vitivinicultural origin, must have the aroma and taste from the above-mentioned raw materials.

7. SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN (OENO 2/2000)

7.3 NEUTRAL ALCOHOL OF AGRICULTURAL ORIGIN (ECO 1/08)

Ethyl alcohol obtained by distillation and rectification, with a minimum alcoholic strength of 96% volume, either after alcoholic fermentation, agricultural products such as beets, molasses, potatoes, grains, grape musts, grapes or other fruits, or agricultural origin spirits including wine and which do not have a detectable taste.

A member state can however accept a minimum alcoholic strength of 95% vol. for its domestic market if this corresponds to a national law foregoing the approval of this Resolution.

7. SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN (OENO 2/2000)

7.4 NEUTRAL ALCOHOL OF VITIVINICULTURAL ORIGIN (ECO 2/08)

Ethyl alcohol obtained by distillation and rectification, with a minimum alcoholic strength of 96% volume, either after alcoholic fermentation, products of viticultural origin such as grape must, grapes or raisins, grape marcs of wine, wine with the addition of wine distillate, wine lees which present no detectable taste.

A member state can however accept a minimum alcoholic strength of 95% vol. for its domestic market if this corresponds to a national law foregoing the approval of this Resolution.

7. SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN (OENO 2/2000)

7.5 WINE SPIRITS (ECO 3/08)

A spirit beverage obtained exclusively by the distillation of wine, fortified wine, wine possibly with the addition of wine distillate or by re-distillation of a wine distillate with the result that the product retains the taste and aroma of the above-mentioned raw materials.

Alcoholic strength of the end product must not be less than 37.5% volume.

A member state can however accept a minimum alcoholic strength of 36% vol. for its domestic market if this corresponds to a national law foregoing the approval of this Resolution.

7. SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN (OENO 2/2000)

7.6 BRANDY/WEINBRAND (ECO 4/08)

A spirit beverage obtained exclusively by the distillation of wine, fortified wine, wine possibly with the addition of wine distillate or by re-distillation of a wine distillate with the result that the product retains the taste and aroma of the above-mentioned raw materials. A certain period of aging in oak wood containers is obligatory before marketing.

Alcoholic strength of the end product must not be less than 36% volume.

7. SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN (OENO 2/2000)

7.7 GRAPE MARC SPIRITS (ECO 5/08)

A spirit beverage obtained by the distillation of fermented grape marcs to which lees can be added whenever provided by the legislation of the State and in due proportion to the level authorised by the State with the result that the product retains a preponderant taste and aroma of the marc.

Alcoholic strength of the end product must not be less than 37.5% volume.

A member state can however accept a minimum alcoholic strength of 36% vol. for its domestic market if this corresponds to a national law foregoing the approval of this Resolution.

7. SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN (OENO 2/2000)

7.8 WINE LEES SPIRITS (ECO 6/08)

A spirit beverage obtained by the distillation of fresh wine lees with the result that the product retains the taste and aroma of the above-mentioned raw materials.

The minimum alcoholic strength of the end product must not be less than 38% volume.

A member state can however accept a minimum alcoholic strength of 36% vol. for its domestic market if this corresponds to a national law foregoing the approval of this resolution.

7. SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN (OENO 2/2000)

7.9 GRAPE SPIRITS (ECO 7/08)

A spirit beverage obtained by the distillation of fresh fermented grapes with the result that the distillate retains the taste and aroma of the above-mentioned raw materials.

Alcoholic strength of the end product must not be less than 37.5% volume.

7. SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN (OENO 2/2000)

7.10 RAISIN SPIRITS (ECO 8/08)

A spirit beverage obtained by the distillation of fermented raisin extracts with the result that the distillate retains the taste and aroma of the above-mentioned raw materials.

Alcoholic strength of the end product must not be less than 37.5% volume.

A member state can however accept a minimum alcoholic strength of 36% vol. for its domestic market if this corresponds to a national law foregoing the approval of this resolution

PART II

OENOLOGICAL PRATICES AND TREATMENTS

1. GRAPES

1.1 SORTING (16/70)

Definition :

Choice of healthy bunches and separation of green, deteriorated or rotted berries. If need be, classification of bunches according to their degree of maturity.

Objective :

Operation aiming to preserve for sale as such or for further processing only good quality fruit suited for the intended use.
Indispensable operation for quality products.

Prescription :

No particular prescription.

Recommendation of the OIV :

Accepted

1. GRAPES

1.2 CRUSHING (16/70)

Definition :

Operation that consists of breaking the skin of berries and crushing them to liberate the must.

Objectives :

a) To ensure good diffusion of the soluble elements of the marc into the must, in the case of wines produced according to traditional maceration.
b) To facilitate the multiplication of yeasts by bringing the juice released into contact with indigenous yeasts on the surface of grapes and on the wine making equipment.

Prescriptions :

a) Crushing must take place immediately when grapes arrive at the winery.
b) It is necessary to take care to avoid:
- Crushing the seeds and stems,
- The use of devices which increase the level of solids,
- Excessive contact of the must with the solid parts of the grape in the vinification of white wine, except in the case of maceration on skins (**).

Recommendation of OIV:

Accepted.

1. GRAPES

1.3 REMOVING STEMS FROM EITHER GRAPE BERRIES OR CRUSHED GRAPES (16/70)

Definition :

Separation of berries from their stems, or more generally removal of stems from the harvested grapes before the start of fermentation.

Objective :

To reduce the loss of colour and alcohol from red wines and to render them lower in tannin and less astringent. Reduces the herbaceous character due to non-lignified stems.

Prescription :

No particular prescription.

Recommendation of the OIV:

Accepted.

1. GRAPES

1.4 DRAINING (16/70)

Definition :

Operation consisting of leaving the juice of the crushed, harvested grapes to flow, before pressing.

Objective :

To obtain a must including little of the substances contained in the stalks, skins, seeds, etc.

Prescriptions :

There are two distinct draining techniques: static and dynamic:
- The first should be as rapid as possible,
- The second should avoid abrasion which produces musts with a high solids content.

Recommendation of OIV :

Accepted.

1. GRAPES

1.5 PRESSING (16/70)

Definition :

Operation consisting of pressing the harvested grapes or the marc so as to extract the liquid part.

Objectives :

a) To extract must either for the preparation of grape juice or for fermentation in the absence of grape solids (fermentation off skins).
To separate the press wine from the marc after fermentation in the presence of grape solids (fermentation on skins).

Prescriptions :

a) Pressing should be undertaken as soon as possible after harvest for freshly harvested grapes, or after crushing for crushed grapes.
b) Pressing should be slow and progressive and the equipment used should compress the marc without breaking or crushing tissues in the solid parts of the harvested grapes.
c) Pressing should be performed with caution and not to excess

Recommendation of OIV :

Accepted

1. GRAPES

1.6 MACERATION ACCORDING TO THE TRADITIONAL TECHNIQUE OF FERMENTATION ON SKINS (16/70)

Definition :

Process consisting, after crushing and possible de-stemming of the harvested grapes, of leaving the solid and liquids parts in contact for a more or less prolonged period of time.

Maceration and fermentation are accomplished simultaneously.

Objective :

Extraction of substances contained in the skin of grapes, notably polyphenolic and flavour substances, etc.

Prescriptions :

To achieve the objectives of the process more rapidly, various mechanical processes can be used : pumping over, irrigation of the cap, use of tanks with automatic irrigation, or of devices to re-circulate the wine through the marc.

Recommendation of OIV:

Accepted

1. GRAPES

1.7 CARBONIC MACERATION (16/70)

Definition :

Process in which whole grapes are placed for a few days in a closed tank whose atmosphere comprises carbon dioxide. This gas results either from an external source, or from the respiration of grapes and the fermentation of a part of the crushed berries, or from both.

Objective :

Production of red wine or rosé which is more supple, less acidic, fresher and with a better expression of varietal aromas.

Prescriptions :

a) A device for venting the gas formed should be provided so that the internal pressure does not exceed atmospheric pressure.
b) The grapes, once removed from the tank, are crushed and pressed, and the separated must is fermented in the absence of solid matter.

Recommendation of OIV :

Accepted

1. GRAPES

1.8 MACERATION AFTER HEATING THE HARVESTED GRAPES (16/70)

Definition :

Process of heating whole, crushed or de-stemmed grapes, before the start of fermentation, to temperatures chosen according to the desired goal, and maintaining them at these temperatures for a certain period of time.

Objectives :

a) More rapid and more complete extraction of colour and other substances contained in skins.
B) Prevention of enzymatic processes.

Prescriptions :

a) The must may ferment either in contact with or in the absence of solids.
b) The process must not lead either to a concentration, or to a dilution. Consequently:

- Excess heating is to be avoided,
- Heating by injection of steam is forbidden.

Recommendation of OIV :

Accepted

1. GRAPES

1.9 CONTROL OF THE SUGAR CONTENT OF GRAPES (OENO 2/93)

Definition :

An increase in the natural sugar content of grape berries by viticultural techniques.

Objective :

To achieve an optimal composition of the crop by moderating yield and controlling vigour.

Prescriptions :

The objective can be reached by a choice of different factors such as:

a) Soil and climate,
b) Varieties, clones and rootstocks,
c) Optimum planting density and vineyard management,

and by the application of the following viticultural practices:

- Balanced loading of buds on the vine,
- Maintenance and moderate fertilisation of the soil,
- Performing the operations of the annual vegetative period of the vine at an opportune time, without excessive trimming,
- Supplementary irrigation in dry zones,
- Occasional thinning of bunches,
- Reasonable use of pesticides,
- Harvest at optimal maturity,
- Natural raisining on the vine, late harvesting.

Recommendation of OIV :

Accepted

1. GRAPES

1.10 CONTROL OF THE SUGAR CONTENT OF THE HARVESTED GRAPES (OENO 2/93) (OENO 2/02)

Definition :
Increase of the sugar content in the grape crop, that is to say in the harvested grapes.

Objective :
To increase the sugar content of the raw materials used.

Prescriptions :
The objective can be achieved by the use of one or more of the following practices:

a) Natural raisining: Operation consisting of exposing grape bunches on straw, racks and other supports or suspending them for the appropriate time to reach the desired sugar content:
- In the sun
- In the open or a naturally ventilated enclosure.

b) Raisining by physical treatment (**): Operation involving a forced artificial ventilation of grapes at 35°-40°C for the appropriate time to reach the desired sugar content.

c) Selective sorting of grapes: Operation consisting of selecting the most ripe bunches, parts of bunches and grape berries to obtain the must from them: manual sorting during or after the harvest.

d) Cryoselection in the vineyard without recourse to physical procedures: Prescription consisting of letting grapes partially freeze on the vine, then pressing them at low temperatures to produce a must with a higher sugar content.

e) Cryoselection by physical procedures Prescription consisting of partially freezing grapes in a cold room, then pressing at a low temperature in order to produce a must with a higher sugar content

Recommendation of OIV :

Accepted

1. GRAPES

1.10.1 NATURAL RAISINING (**)

1.10.2 RAISINING BY PHYSICAL TREATMENT (OENO 5/98)

Definition:

Process consisting in prolonging the ripening of grapes in a climatic chamber regulated by dehydrated air which may be heated.

Objectives:

To complete grape ripening when climatic conditions are unfavorable and to obtain an enrichment of sugar and all elements aside from malic acid.

Prescriptions:

a) The harvest must be done by hand and the grapes transported in small, perforated crates;

b) The distribution of air within the climatic chamber must be as homogeneous as possible;

c) The internal temperature of the berry should not exceed 30°C;

d) The concentration cannot lead to a reduction of more than 20% of initial volume nor increase more than 2% of the initial potential alcoholic strength, with an exception being made for certain special wines;

Recommendation of the OIV:

Accepted.

1.10.3 SELECTING SORTING OF GRAPES (**)

1.10.4 CRYOEXTRACTION (**)

1. GRAPES

1.11. TREATMENT WITH ASCORBIC ACID (OENO 10/01)

Classification:

Ascorbic acid: additive
Erythorbic acid: additive

Definition:

Addition of ascorbic acid to grapes.

Objective:

Protect the aromatic substances of the grape, through the antioxidant properties of the product, against the influence of oxygen in the air.

Prescriptions:

a) It is recommended to add ascorbic acid before the grape's crushing,
b) The dose used must not exceed 250 mg/kg,
c) It is advisable to use ascorbic acid with sulfur dioxide.
d) The ascorbic acid must comply with the prescriptions of the International Oenological Codex.

Recommendation of OIV:

Accepted.

1. GRAPES

1.12. SULFITING (OENO 3/04)

Classification :
Sulphur dioxide additive
Potassium hydrogen sulphite : additive
Ammonium sulphite: additive
Ammonium hydrogen sulphite: additive
Potassium anhydrous sulphite: additive

Definition:

Addition of, solution of sulphur dioxide, or potassium hydrogen sulphite, potassium anhydrous sulphite, ammonium sulphite or ammonium hydrogen sulphite to grapes.

Objectives:

Obtain microbiological control of grapes by limiting and/or preventing the propagation of yeasts and bacteria and technologically undesirable microorganisms.
Implement an antioxidant.

Prescriptions:

a) The addition of sulfur dioxide prior to alcoholic fermentation should be limited as much as possible because the combining with acetaldehyde will render the solution with no antiseptic or antioxidant effects in resulting wine.
b) The total sulfur dioxide contents when marketed must at least comply with the limits set by Annex C of the Compendium of International Methods of Analysis of wine and musts.

c) The products used must comply with the prescriptions of the International Oenological Codex.

Recommendation of OIV:

Accepted.

1. GRAPES

1.13. USE OF ENZYMES TO IMPROVE THE GRAPE MACERATION PROCESS, THE EXTRACTION OF JUICE AND OTHER GRAPE COMPOUNDS (OENO 13/04, OENO 498-2013, OENO 682-2021)

Definition:

Addition to grapes of enzymatic preparations containing activities catalysing the degradation of structural macromolecules of the cell wall of the grape, such as cellulose, pectins with their side chains, hemicellulose, glycoproteins, and various protein fractions.
Enzyme activities involved in the maceration of grapes notably include polygalacturonases, pectin lyases, pectinmethylesterases, arabinanases, rhamnogalacturonases, cellulases and hemicellulases.

Objectives:

a. To facilitate operations for obtaining musts such as draining and pressing.
b. To facilitate racking operations.
c. To facilitate the extraction of colouring matter and polyphenols.
d. To facilitate the extraction of aromas and aromatic precursors from grape berry skin.

Prescription:

The enzymes must comply with the prescriptions of the International Oenological Codex.

Recommendation of OIV:

Accepted.

1. GRAPES

1.14. PREFERMENTATIVE COLD MACERATION FOR MAKING WHITE WINES (OENO 11/05)

Definition:

Procedure involving the cold maturation of white grapes, destemmed or crushed and whole clusters. The mixture is held at a temperature for a period of time adapted to the sought after objective prior to pressing and fermentation.

Objective

To promote the release of skin compounds, notably aroma precursors using a diffusional and enzymatic procedure in order to increase the aromatic and gustatory complexity of wine

Prescriptions

a) Evaluate the health condition and maturity of grapes in order to determine the technique or diffusional, enzymatic or biochemical procedure sought after,
b) Manage oxidative phenomena through appropriate means,
c) Prevent a significant extraction of phenolic compounds from excessive sulphiting at too high of a temperature or for a too lengthy maceration period,
d) Prevent microbial activity through appropriate hygiene and at an adapted controlled temperature,
e) Determine length of maceration time based on grape characteristics and the sought after wine type.

Recommendation of the OIV

Admitted

1. GRAPES

1.15. PREFERMENTATIVE COLD MACERATION FOR MAKING RED WINES (OENO 12/05)

Definition:

Procedure involving the cold maturation of red grapes, destemmed and/or crushed whole clusters at a temperature for a period of time adapted to the sought after objective prior to onset of fermentation.

Objectives

Promote the release of skin compounds using a diffusional and enzymatic procedure in order to increase the aromatic and gustatory complexity of wine and to improve the colour characteristics.

Prescriptions

a) Evaluate the health condition and maturity of grapes in order to determine the interest of the technique,
b) Manage oxidative phenomena through adapted dispositions,
c) Prevent microbial activity through appropriate hygiene and controlled temperature, and an adapted maceration time,
d) Determine length of maceration based on grape characteristics and sought after wine type.

Recommendation of the OIV

Admitted

1. GRAPES

1.16. MACERATION (GENERAL SHEET) (OENO 196-2009)

Definition:

Process consisting of leaving the solid and liquid parts of harvested grapes in contact for a more or less extended period of time. Maceration takes place before, simultaneously with or after fermentation.

Objective

Dissolution of substances contained within grapes, notably phenolic compounds, aromas and their precursors.

Prescriptions

The objective may be achieved by:
a) Maceration according to the traditional technique of fermentation on skins (II 1.6)
b) Carbonic maceration (II 1.7)
c) Maceration after heating the harvested grapes (II 1.8)
d) Prefermentative cold maceration for making white wine (II 1.14)
e) Prefermentative cold maceration for making red wine (II 1.15)
f) Warm post-fermentation of red grapes, known as warm final maceration (II 2.3.9)
g) Maceration of raisined grapes or their pomace in wine (II 2.3.10)

Recommendation of OIV

Refer to the practices and treatments indicated above

1. GRAPES

1.17. TREATMENT OF CRUSHED GRAPES WITH ULTRASOUND TO PROMOTE THE EXTRACTION OF THEIR COMPOUNDS (OENO 616-2019)

Definition:

Usage of ultrasound for a rapid extraction of grape compounds.

Objective

To stimulate extraction of grape compounds during pre-fermentation maceration, after destemming and crushing, by using of ultrasound, with the following aims:

- To obtain a must with a higher concentration of phenolic compounds and other grape compounds
- To obtain wines with an adequate and stable phenolic composition, reducing the maceration time compared to a traditional process
- To limit the release of tannins present in the seeds (since maceration time is decreased), mainly when the treated grapes have a low phenolic maturation
- To accelerate the grape processing

Prescriptions

a) The treatment must be carried out on destemmed and crushed grapes in order to increase the performance of the treatment
b) In order to avoid a temperature increase in the bulk of crushed grapes this treatment should be done with the bulk in movement
c) To boost an efficient cavitation process, the solid/liquid proportion in the bulk of crushed grapes must be adequate.

Recommendation of OIV

Accepted

1. GRAPES

1.18. TREATMENT BY DISCONTINUOUS HIGH PRESSURE PROCESSES (OENO 594A-2019)

Definition:

Process that consists in the reduction of indigenous organisms in grapes by the use of discontinuous high pressure processes, with pressures higher than 150 MPa (1500 bar).

Objective

a) To reduce the microbial loads of indigenous microorganisms, especially yeasts,
b) To reduce SO2 levels used in winemaking,
c) To accelerate maceration in red winemaking.

Prescriptions

a) The high hydrostatic pressure (HHP) technique relates to the use of pressure levels of higher than 150 MPa (1500 bar) during a discontinuous process.
b) The elimination of yeasts in grapes and musts requires pressure levels of 200-400 MPa.
c) The elimination of bacterial cells needs pressure levels of 500-600 MPa.
d) The treatment time range is 2-10 minutes.
e) If necessary, the increase in temperature may be controlled by supplementary refrigeration.
f) The increase in temperature and the techniques used should not entail any alteration in the appearance, colour, flavour or taste of the wine.

Recommendation of OIV

Accepted

2. MUSTS

2.0. SEPARATIVE TECHNIQUES USED IN THE TREATMENTS OF MUSTS AND WINES* (OENO 372/2010)

Definition:

Physical processes consisting in separating must or wine into several fractions having different chemical composition.

Objectives:

a) Optimise the organoleptic characteristics of wine subject to the treatment
b) Increase effectiveness of other practices regarding must or wine that undergoes the treatment
c) Complete or partial separation of the fraction
d) Complete or partial recombination of the separated and possibly treated fractions

Prescriptions:

a) The objectives can be achieved by different techniques alone or in combination
   - Membrane techniques
   - Evaporative techniques (such as distillation and vacuum distillation)
   - Other separative techniques

* *This file is general and the techniques will be described in detail into specific files*

b) The wine or must to be treated must comply with OIV's definitions and limits.

c) These techniques cannot be used to cover fraudulent acts

d) Fractions, untreated or treated by oenological practices approved by the OIV must be blended exclusively with must or wine fractions, obtained by separative techniques, derived from the same original product. Fractions used as wine based products as defined in the International Code of Oenological Practices are the only exception.

e) Recombination must occur within the shortest possible time and in the same place when it is possible.

f) The techniques, membranes and equipment used, and the practices implemented in the additional procedures must comply with the provisions stated in the OIV International Code of oenological practices

g) Treatments of the fractions must comply with the OIV International Code of oenological practices

2. MUSTS

2.0.1. APPLICATION OF MEMBRANE TECHNIQUES* (OENO 373A/2010)

Definition:

Treatment of musts using membrane techniques enabling the selective holding back or passing of some compounds in musts.

Objectives:

a) Enabling the development of more balanced wine or other vitivinicultural products in terms of organoleptic or technological characteristics
b) To compensate effects of adverse weather conditions and climate change, and to resolve certain organoleptic issues,
c) To expand the techniques available for development of products more adapted to consumer expectations

Prescriptions:

a) See the general sheet on treatments of musts and wines with separative techniques used in the treatment of wine and must

b) The above-mentioned objectives can be reached by applying these techniques, for example, for:
   1. the partial deshydratation of must
   2. the reduction of sugar concentration,

* *This file is general and the techniques will be described in detail into specific files*

3. the adjustment of acidity or pH of musts
4. the reduction of the concentration of certain organic acids.

c) There are different types of membrane techniques, alone or in combination, depending on the sought after objectives including:
   1. microfiltration,
   2. ultrafiltration,**
   3. nanofiltration,**
   4. membrane contactor**
   5. reverse osmosis,
   6. electromembranes
   7. other membrane techniques.**

d) The use of membrane techniques to obtain opposite features is not allowed.

e) This practice must be carried out by an oenologist or a qualified technician.

f) The membranes and material, in addition to techniques used in complementary procedures, as stated in point C, shall be consistent with the provisions of the International Code of Oenological Practices and the International Oenological Codex.

2.1 PREPARATION OF MUSTS FOR EITHER PRESERVATION OR ALCOHOLIC FERMENTATION

2.1.1 OXYGENATION (OENO 545A/2016)

Classification :

Oxygen: processing aid

Definition:

Addition of oxygen or air to must

Objectives:

a) To accelerate the oxidation process in musts in white or rosé winemaking with the aim of provoking browning reactions in phenolic compounds, which are formed by polymerisation, then precipitate and are removed during clarification of musts, to improve the stability of wines in relation to oxidation. This practice, which provides for the addition of high levels of oxygen to musts, equivalent to several saturations, is called "hyperoxygenation";

b) to contribute to the reduction of aromas compounds related to vegetal sensory character and the disappearance of reductive aromas;

c) to ensure alcoholic fermentation occurs smoothly and to avoid stuck fermentations.

Prescriptions:

a) In the case of reduction of the level of phenolic compounds involved in browning phenomena, oxygen should be added before clarification of must;

b) in the case of management of fermentation kinetics, the addition of oxygen at the recommended dose of 5-10 $mg \cdot L^{-1}$ is sufficient provided that this is carried out at the end of the yeast growth phase, namely after the reduction of the sugar concentration of the must by around 50 $g \cdot L^{-1}$;

c) the aim of oxygenation should not be a reduction in sulphite of musts containing excess sulphur dioxide.

Recommendation of OIV:

Accepted.

2. MUSTS

2.1.2 SULPHITING (5/87)

Classification :

Sulphur dioxide: additive
Ammonium hydrogen sulphite: additive
Potassium anhydrous sulphite: additive

Definition :

Addition to crushed grapes or to must of gaseous sulphur dioxide, aqueous sulphur dioxide solution, or potassium disulphite*, ammonium sulphite or ammonium disulphite.

Objectives :

a) Put into action:
   - An antiseptic against problems due to the growth of microorganisms,
   - An antioxidant,
   - A selective factor for yeasts,
   - A product facilitating settling,
   - A product favouring the extraction of anthocyanins.

b) To regulate and control the fermentation.
c) To produce preserved musts.

Prescriptions :

a) Sulphiting should take place during crushing or immediately after.

* Potassium disulphite is synonymous with potassium metabisulphite

b) Distribute the product evenly in the crushed grapes or the must.
c) Ammonium sulphite and disulphite also introduce in the must ammonium ions that constitute growth activators for yeasts (see *Activation of alcoholic fermentation*).
d) Products used shall comply with the prescriptions of the *International Oenological Codex .*

Recommendation of OIV :

Accepted.

2. MUSTS

2.1.3 ADJUSTMENT OF ACIDITY OF MUST

2.1.3.1 ACIDIFICATION (6/79, OENO 4/03, OENO 360/2010)

Definition :

Increase of the titratable acidity and the actual acidity (decrease of the pH).

Objectives :

a) Production of balanced wines from a sensory point of view
b) To promote good biological characteristics and good keeping quality of the wine.

Prescriptions :

The objective can be reached :

a) By blending (**) with musts of elevated acidity;
b) With the help of strong cation exchangers in the free form (**).
c) By the use of chemical procedures (see *Chemical acidification);*
d) By microbiological acidification
e) by electromembrane treatment, see Acidification by Electromembrane treatment (bipolar membrane electrodialysis)

Recommendation of OIV:

Refer to the practices and procedures mentioned above.

2. MUSTS

2.1.3.1.1 CHEMICAL ACIDIFICATION (OENO 3/99, OENO 13/01)

Classification:

Malic acid (D,L-, L-): additive
Lactic acid: additive
Tartaric acid: additive

Definition:

Increasing the titration acidity and the actual acidity (decreasing pH) by adding organic acids.

Objectives:

a) Produce balanced wines from the gustatory point of view;
b) Favor a good biological evolution and good maturation of wine;
c) Remedy insufficient natural acidity caused by:
   - climatic conditions in the viticultural region, or
   - oenological practices which lead to a decrease in natural acidity

Prescriptions:

a) Lactic acid, L(-) or DL malic acid and L(+) tartaric acid are the only acids that can be used;
b) The addition of acids should not be done to conceal fraud;
c) The addition of mineral acids is forbidden;
d) Chemical acidification and chemical de-acidification are mutually exclusive;
e) The acids used must conform to the *International Oenological Codex* standards

f) Acids can be only be added to musts under condition that the initial acidity content is not raised by more than 54 meq/l (i.e. 4 g/l expressed in tartaric acid),

When must and wine are acidified, the net cumulative increase must not exceed 54 meq/l (or 4 g/l expressed in tartaric acid),

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.3.1.1.1 CALCIUM SULFATE (OENO 583/2017)

Classification:

Calcium sulphate: additive

Definition:

Addition of calcium sulphate ($CaSO_4.2H_20$) to the must prior to fermentation in combination with tartaric acid for the elaboration of liqueur wines.

Objective:

d) Produce balanced liqueur wines from the gustatory point of view;
e) Favour a good biological evolution and good storage of liqueur wine;
f) Remedy insufficient natural acidity of liqueur wines caused by:
   - climatic conditions in the viticulture region,
   - oenological practices which lead to a decrease in natural acidity

Prescriptions:

a) The use of calcium sulfate is used in combination with lower tartaric acid level
b) It is suggested to make laboratory preliminary tests to calculate the doses of calcium sulfate and tartaric acid needed to reduce the pH required;
c) The dose must not exceed 2 g/L of calcium sulfate because it allows to reach the adequate pH 3.2 in the winemaking of these

musts and to obtain equilibrated wines even in years of adverse weather conditions;

d) The residual level of sulfates in wines must not exceed the OIV limit;
e) The practice should not be done to conceal fraud;
f) Chemical acidification and chemical de-acidification are mutually exclusive;
g) Calcium sulfate used must comply with the prescription of the International Oenological Codex standards.

Recommendation of the OIV:

Accepted only for liqueur wines

2. MUSTS

2.1.3.1.2 MICROBIOLOGICAL ACIDIFICATION (OENO 5/03) (OENO 546/2016)

Definition:

Increase of titratable acidity and real acidity (decrease in pH) by using yeasts.

Objective:

a) see general sheet "acidification" (2.1.3.1)

Prescriptions:

In order to achieve this objective, microbiological acidification by yeasts may be carried out by inoculation of selected strains.

Recommendation of the OIV.:

See sheet: acidification by yeasts (*Saccharomyces* and *non-Saccharomyces*)

2. MUSTS

2.1.3.1.2.1 ACIDIFICATION BY YEASTS (OENO 4/02) (OENO 546/2016)

Definition:

Increase of titration acidity and real acidity (decrease in pH) during alcoholic fermentation with yeasts (*Saccharomyces* and non-*Saccharomyces*)".

Objectives:

a) To make balanced wine from a sensory point of view;
b) To obtain a production of D or L-malic acid and/or D or L-lactic and/or succinic acid during alcoholic fermentation.

Prescriptions:

Acidification by musts can operate:

a) on musts (see file 2.1.3.1);
b) with pure strains or successive fermentations using yeast strains capable of producing D or L-malic acid and/or D or L-lactic and/or succinic;
c) the yeast must comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV.:
Admitted.

2. MUSTS

2.1.3.1.3 ACIDIFICATION BY ELECTROMEMBRANE TREATMENT (BIPOLAR MEMBRANE ELECTRODIALYSIS) (OENO 360/2010)

Definition:

Physical ionic must extraction method under action of electric field using permeable cation membranes and bipolar membrane giving rise to increased titratable acidity and actual acidity (decrease in pH).

Objectives:

a) Increase titration acidity and actual acidity (decrease in pH).
b) Promote good biological characteristics and favour good vinification.
c) Favour good maturation of wine.
d) Remedy insufficient natural acidity caused by:
   - climatic conditions in the viticulture region, or
   - oenological practices which lead to a decrease in natural acidity.

Prescriptions:

a) See the general sheet on separative techniques used in the treatment of musts and wines and the sheet concerning the use of membrane techniques applied to musts.

b) Acidification by electro-membrane treatment should not be done to conceal fraud.

c) Cationic membranes shall be made in a way so as to only enable them to be adapted to the extraction of cations only and in particular cations: K+.

d) Bipolar membranes are impermeable to anions and cations of musts.

e) Acidification by bipolar electrodialysis must only be carried out provided that initial must acidity is not increased more than 54 meq/l (that being 4 g/l expressed in tartaric acid).
When musts and wine are acidified, the net accumulated increase must not be over 54 meq/l (that being 4 g/l expressed in tartaric acid).

f) The implementation of the process will be under the responsibility of an oenologist or a qualified technician.

g) The membranes shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.3.1.4 ACIDIFICATION BY CATION EXCHANGER TREATMENT (OENO 442/2012)

Definition:

Physical partial extraction of cations of the musts to increase titration acidity and actual acidity (decrease in pH). through a cation exchanger.

Objectives:

a) Increase titration acidity and actual acidity (decrease in pH)

b) Refer to the objectives in the general file 2.1.3.1. Acidification

Prescriptions:

a) The treatment will be performed using cation exchange resins regenerated in the acid cycle.

b) The treatment must be limited to the elimination of excess cations

c) To avoid the production of fractions of must, the treatment will be performed continuously, with in-line incorporation of the treated must into the original must.

d) As an alternative, the resin could be directly introduced into the tank of must, in the quantities required, then separated by all appropriate technical methods.

e) The acidification must be carried under condition that the initial acidity is not raised by more than 54 meq/L. When must and wine are acidified, the cumulative net increase must not exceed 54 meq/L

f) All operations will be placed under the responsibility of an oenologist or qualified technician

g) The resins shall comply with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.3.2 DE-ACIDIFICATION (6/79) (OENO 442-2012, OENO 483-2012, OENO 611-2019)

Definition :

Reduction of the total acidity and the actual acidity (increase of the pH).

Objective :

Production of balanced wines from a sensory point of view.

Prescriptions :

The objective can be achieved :

a) Spontaneously by precipitation of tartaric acid in the form of potassium bitartrate (see *Physical de-acidification),*
b) By blending with less acidic musts (see *Blending*),
c) By the use of physical procedures (see *Physical de-acidification* and *Cold treatment(**)*),
d) By microbiological degradation of malic acid (see *Microbiological de-acidification*),
e) By the use of chemical processes (see *Chemical de-acidification*)
f) With the help of anion exchangers (**)
g) using an electromembrane process. See: de-acidification using an electromembrane process (electrodialysis with bipolar and anionic membranes)

Recommendation of the OIV:

Refer to the practices and procedures mentioned above.

2. MUSTS

2.1.3.2.1 PHYSICAL DE-ACIDIFICATION (6/79, OENO 611-2019) ♎

Definition :

Reduction of the total acidity by the application of physical procedures.

Objectives :

To produce wines :

a) See 2.1.3.2.
b) Stable with regard to precipitation of excess potassium bitartrate and calcium tartrate.

Prescriptions :

The potassium bitartrate and calcium tartrate precipitation occurs:

a) Either spontaneously during storage of the must at low temperature, or
b) As the result of chilling the must (see C*old treatment(**)*)

Recommendation of the OIV :

Accepted.

2. MUSTS

2.1.3.2.2 CHEMICAL DE-ACIDIFICATION (6/79)

Classification :

Potassium L(+) tartrate: processing aid
Calcium carbonate: processing aid
Potassium hydrogen carbonate: processing aid

Definition :

Decrease of the acidity and the actual acidity (increase of the pH) by addition of neutral potassium tartrate, potassium hydrogen carbonate or calcium carbonate containing possibly small quantities of the calcium double salt of L(+) tartaric and L(-) malic acids.

Objectives :

a) See 2.1.3.2 .
b) To favour biological de-acidification.

Prescriptions :

a) The wine produced from a de-acidified must shall contain at least 1 g/l tartaric acid;
b) The process of the formation of the double salt (neutral calcium salts of tartaric and malic acids) should be applied in the case of musts very rich in malic acid for which precipitation of the tartaric acid alone does not provide a satisfactory reduction of the titratable acidity,
c) The aim of chemical de-acidification shall not be to conceal fraud,
d) Chemical de-acidification and chemical acidification are mutually exclusive.

e) The products added shall comply with the prescriptions of the *International Oenological Codex*.

Recommendation of OIV:

Accepted.

2. MUSTS

2.1.3.2.3 MICROBIOLOGICAL DE-ACIDIFICATION (OENO 3/03, OENO 546/2016, OENO 611/2019) ◊◊

Definition:

Lowering of total acidity and real acidity (increase in pH) by using yeasts or lactic acid bacteria.

Objective:

See sheet 2.1.3.2 'De-acidification'

Prescriptions:

In order to achieve this objective, microbiological de-acidification by microorganisms is carried out by inoculation of selected strains.

Recommendation of the OIV.:

See sheets:
2.1.3.2.3.1 'De-acidification by yeasts (Saccharomyces and non-Saccharomyces)' and / or
2.1.3.2.3.2 'De-acidification by lactic acid bacteria'.

2. MUSTS

2.1.3.2.3.1 DE-ACIDIFICATION BY YEASTS (*OENO 5/02*) (OENO 546/2016, OENO 611-2019)

Definition:

Lowering of total acidity and real acidity (increase in pH) by using selected yeasts (*Saccharomyces* and non-*Saccharomyces*)

Objectives:

a) To make balanced wine from a gustatory sensation point of view;

b) To obtain a partial *or total* breakdown of malic acid by a biological pathway

Prescriptions:

Biological decrease of malic acid by yeasts can operate :

a) On musts (see file 2.1.3.2.3.);

b) The objective under b) can be achieved during alcoholic fermentation using selected Saccharomyces or non-Saccharomyces strains. Strains of Saccharomyces genus are known for their partial breakdown capabilities. Strains of Schizosaccharomyces pombe are known for their total malic acid breakdown capabilities;

c) The use of Schizosaccharomyces yeasts has shown its efficiency for obtaining a rapid breakdown, whether partial or complete, of L-malic acid in musts and wines. Due to the great decrease of titratable acidity and the concentration of hydrogen ions, induced by the activity of these yeasts, their

development can be undesirable for certain wines. So precautions should be taken to avoid contamination of the vats for which the development of these yeasts is undesirable.

d) Yeasts must comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV.:

Admitted.

2. MUSTS

2.1.3.2.3.2 DE-ACIDIFICATION BY LACTIC ACID BACTERIA (OENO 611-2019)

Definition:
Reduction of the total acidity and real acidity (increase in pH) through the use of lactic acid bacteria of the Lactobacillus, Leuconostoc, Pediococcus and Oenococcus genera.

Objectives:
a) To develop balanced wines in terms of taste sensations;
b) to obtain the total or partial degradation of malic acid by biological means.

Prescriptions:
a) To achieve the objective, de-acidification by lactic acid bacteria is conducted by addition of at least 10^6 CFU/mL of selected strains of lactic acid bacteria to must, which may or may not be in the process of alcoholic fermentation.
b) the selected strains must comply with the prescriptions of the International Oenological Codex.

OIV recommendation:

Accepted.

2. MUSTS

2.1.3.2.4 DE-ACIDIFICATION USING AN ELECTROMEMBRANE PROCESS (OENO 483-2012) ♦

Definition:

Physical method of ionic extraction from the must under the action of an electric field using permeable membranes with anions on the one part and bipolar membranes on the other. The combination of permeable membranes with anions and bipolar membranes is used to manage a reduction in titratable acidity and the actual acidity (increase in the pH)

Objectives:

a) Correct excess natural acidity caused by climate conditions in the wine region by reducing titratable acidity and actual acidity (increase in the pH)
b) Develop balanced wines in terms of taste
c) Promote a smooth wine maturing operation

Prescriptions:

a) Refer to the general file on separative techniques used in the processing of musts and wines and the file on the application of membrane techniques to musts.
b) De-acidification using an electromembrane process should not be intended to hide a fault.
c) The anionic membranes must be composed in such a way that they only allow the extraction of anions and in particular the organic acids from the must.

d) The bipolar membranes are impermeable to anions and cations in the must.
e) The wine from a de-acidified must should contain at least 1g/L^{-1} of tartaric acid.
f) De-acidification by membrane process and acidification are mutually exclusive;
g) An oenologist or qualified technician will be responsible for implementing the process.
h) The membranes used must comply with the prescriptions contained in the *"International Oenological Codex"*

OIV recommendation:

Accepted.

2. MUSTS

2.1.3.2.5 TREATMENT WITH POTASSIUM CARBONATE (OENO 580-2017) ♁

Classification:
Potassium L(+) tartrate: processing aid
Potassium carbonate: processing aids
Potassium hydrogen carbonate: processing aid
Calcium carbonate: processing aid

Definition:

Decrease of the acidity and the actual acidity (increase of the pH) by addition of neutral potassium tartrate, potassium hydrogen carbonate, potassium carbonate or calcium carbonate containing possibly small quantities of the calcium double salt of L(+) tartaric and L(-) malic acids.

Objective:

a) See 2.1.3.2
b) For de-acidification of must.

Prescriptions:

a) The wine produced from a de-acidified must should contain at least 1 g/l tartaric acid for wine quality reasons;
b) The process of the formation of the double salt (neutral calcium salts of tartaric and malic acids) should be applied in the case of musts very rich in malic acid for which precipitation of the tartaric acid alone does not provide a satisfactory reduction of the titratable acidity;
c) The aim of chemical de-acidification shall not be to conceal fraud;

d) Chemical de-acidification and chemical acidification are mutually exclusive;
e) The products added shall comply with the prescriptions of the International Oenological Codex.

Recommendation of OIV:
Accepted.

2. MUSTS

2.1.4 USE OF ENZYMES FOR THE CLARIFICATION (OENO 11/04, OENO 498-2013, OENO 682-2021)

Classification :

Arabinanases : processing aid
Cellulases : processing aid
Pectinlyases : processing aid
Pectinemethylesterase : processing aid
Polygalacturonases : processing aid
Hemicellulases : processing aid

Definition :

Addition to must of enzymatic preparations containing activities catalysing the degradation of grape macromolecules which went into the must during the juice extraction operations, as well as beta-glucans produced by the fungus *Botrytis cinerea*.
Enzyme activities involved in the clarification of musts notably include polygalacturonases, pectinlyases, pectinmethylesterases, and to a lesser extent arabinanases, rhamnogalacturonases, cellulases and hemicellulases as well as β-glucanases if the musts come from botrytised grapes.

Objective:

To facilitate the clarification of musts.

Prescription:

The enzymes used must comply with the prescriptions of the *International Oenological Codex*.

Recommendation of OIV :

Accepted.

2. MUSTS

2.1.5 SETTLING (16/70) (2/89)

Definition :

Separation, before fermentation, of the more or less clear liquid from the solid matter suspended in the must.

Objectives :

a) To eliminate soil particles.
b) To eliminate organic particles so as to reduce phenoloxidase activity.
c) To reduce the indigenous microbial flora.
d) To reduce colloid content and turbidity.

Prescriptions :

a) To achieve these objectives, one can use :
- Static settling, either spontaneously or facilitated by the use of appropriate additives, consisting of leaving the must for a few hours in a tank, then separating the deposit by decanting.
- Dynamic settling by centrifugation or filtration.

b) To avoid the commencement of fermentation, the must may be initially cooled and/or sulphited.

Recommendation of OIV:

Accepted

2. MUSTS

2.1.6 GELATIN TREATMENT (OENO 5/97)

Classification

Gelatin: processing aid

Definition:

Addition of gelatin to the must

Objectives:

a) Reduction of polyphenolic compounds in the must, in order to decrease must astringency before fermentation.

b) Reduction of the particles which are insoluble in the must.

Prescription:

This gelatin must conform to the prescriptions of the *International oenological codex*.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.7 TANNIN ADDITION (16/70; OENO 612-2019)

Definition :

Addition of tannin to must.

Objectives :

a) To facilitate the subsequent stabilisation of wines by partial precipitation of excess proteinaceous matter in musts;
b) to facilitate the fining of musts in conjunction with protein-type fining agents and prevent over-fining;
c) to contribute to the antioxidant and antioxidasic protection of compounds of the must;
d) to promote the expression of colour in red wines obtained from musts to which tannins have been added.

Prescription :

a) To facilitate rapid incorporation into must, tannins may be added immediately after harvesting;
b) the tannins used should comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.8 TREATMENT WITH BENTONITES (16/70)

Classification :

Bentonites : processing aid

Definition :

Addition of bentonites to must.

Objective :

Preventive treatment for protein and copper hazes.

Prescription :

The substances used shall comply with the prescriptions of the *International Oenological Codex .*

Recommendation of OIV:

Accepted.

2. MUSTS

2.1.9 TREATMENT WITH CARBON (16/70), (OENO 3/02)

Classification:

Oenological carbon: processing aid

Definition :

Addition of carbon to musts.

Objectives :

a) To correct organoleptic characteristics of wine coming from musts affected by fungi such as grey rot or oidium;
b) To eliminate possible contaminants;
c) To correct the colour :
- white musts derived from the white juice of red grapes,
- very yellow musts derived from white grape varieties,
- oxidized musts.

Prescriptions :

a) The quantity of dry carbon used shall be less than 100 g/hl of must.
b) The carbon added shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of OIV:

Accepted.

2. MUSTS

2.1.10 TREATMENT WITH SILICON DIOXIDE (1/91)

Classification
colloidal solution of silicon dioxide: Processing aid

Definition :

Addition to must of a colloidal solution of silicon dioxide coupled with the addition of a gelatin solution.

Objective :

To achieve the flocculation of the gelatin with a view to clarification.

Prescriptions :

a) The product is added to the must.
b) Preliminary tests are necessary to determine optimal doses of colloidal silicon dioxide and of gelatin.
c) The products added shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of OIV:

Accepted.

2. MUSTS

2.1.11 FILTRATION (16/70)

Definition :

Physical process by which must is passed through appropriate filters that retain particles in suspension.

Objective :

Clarification of the must.

Prescriptions :

a) Filtration is practised with or without additives.
b) Additives used, such as diatomaceous earth and cellulose paste and powder, shall comply with the prescriptions of the *International Oenological Codex*

Recommendation of OIV:

Refer to the practices and treatments mentioned above.

2. MUSTS

2.1.11.1 FILTRATION ON A FILTER BED (1/90)

Classification :
Diatomite : processing aid
Perlite : processing aid

Definition :

Filtration of the must through a bed of auxiliary filter material.

Objective :

See 2.1.11

Prescriptions :

The filtration can be undertaken :

a) By continuous deposition of the bed on appropriate supports;
b) On a filter bed formed on a rotary drum under vacuum with continuous elimination of the external skin containing the filtered particles.

Auxiliary filter materials, such as diatomaceous earth, perlite and cellulose, are chosen as a function of the degree of clarification desired. They shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.12 PARTIAL DEHYDRATATION OF MUSTS (OENO 2/98)

Definition:

Process consisting in the elimination of a certain quantity of water in grape must.

Objectives:

a) To increase the sugar level of a must intended to be fermented;
b) To produce caramelized musts;
c) To produce concentrated musts;
d) To prepare grape sugar.

Prescritions:

a) The objectives can be reached by various techniques called subtractive richness techniques:
- cold concentration;
- Inverse osmosis
- Partial evaporation by vacuum;
- Partial evaporation by atmospheric pressure;

b) For objective under a), concentration cannot lead to a reduction of more than 20% of initial volume nor increase more than 2% of the initial, potential alcoholic strength of the must.
c) The elimination of water in the must cannot be cumulated with the elimination of water in the corresponding wine (only for objective a).

Recommendations of the OIV:
To refer to the sheets concerning the above-mentioned practices and treatments.

2. MUSTS

2.1.12.1 CONCENTRATION OF MUST BY REVERSE OSMOSIS (OENO 1/93)

Definition :

Process consisting of concentrating must by elimination of part of the water through specific membranes under the action of a pressure greater than the osmotic pressure of the must.

Objective :

To obtain an enrichment of the must, especially in sugars.

Prescriptions :

a) The concentration can be performed on all or part of the must.
b) The concentration shall not be undertaken to reduce the initial volume of the must by more than 20% nor to increase the initial potential alcohol content of the must by more than 2% (vol.).
c) Since this procedure entails a concentration of all must constituents, its application shall be limited to musts where its use is justified. It should not be used to modify the type of wine produced.
d) The procedure shall be conducted under the responsibility of an oenologist or a specialist technician.
e) The membranes used shall comply with the prescriptions of the *International Oenological Codex*.

Recommendation of OIV

Accepted.

2. MUSTS

2.1.12.2 PARTIAL EVAPORATION UNDER VACUUM (OENO 1/01)

Definition:

Prescriptions to concentrate musts at a moderate temperature by evaporation of a portion of the water in the thermal exchanger under a high vacuum.

Objective:

See the sheet on "Partial dehydration of musts".

Prescriptions:

a) Select a continuous, rather than a re-circulating, unit;
b) The prescription concentrates all ingredients and should thus be limited to must justifying this technique and should not modify the type of wine produced;
c) This prescription is not recommended for musts from grape varieties with significant free varieties of odour;
d) A volume counter will measure the amount of water eliminated.

Recommendation of OIV:

Accepted.

2. MUSTS

2.1.12.3 PARTIAL EVAPORATION UNDER ATMOSPHERIC PRESSURE (OENO 3/98) ♦

Definition:

Process consisting in eliminating a certain quantity of water from grape must in an evaporational system under atmospheric pressure.

Objectives:

See 2.1.12. b, c, and d.

Prescriptions:

a) evaporation may be done in open cauldrons, with or without stirring, heated:
- by direct fire, or
- by steam sleeves or in another calorific fluid

b) These processes must be conducted in such a way as to obtain the desired degree of concentration and caramelization of sugar without obtaining undesirable changes in taste.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.12.4 CONCENTRATION OF MUST BY COLD (CRYOCONCENTRATION) (OENO 4/98)

Definition:

Process consisting in concentrating must by partial freezing and elimination of the ice thus formed.

Objective:

See 2.1.12 a and c.

Prescriptions:

A light sulfiting of the must before freezing is recommended.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.13 DESULPHITING (6/76)

Definition :

Operation designed to remove from the must, completely or partially, the sulphur dioxide that had been introduced by sulphiting .

Objectives :

a) To render the must suitable for the production of different products, notably concentrated must, grape juice and special wines.
b) To render fermentable a must preserved with sulphur dioxide.

Prescription :

Only physical processes may be employed.

Recommendation of OIV:

Accepted.

2. Mmusts

2.1.14 Flotation (Oeno 2/99, OIV-OENO 708-2022)

Definition:

An operation consisting of injecting gas into a must in such a way as to cause particles or microorganisms to rise to its surface.

Objectives:

a) Obtain rapid clarification with or without adding clarifying agents;
b) Reduce the indigenous population of microorganisms prior to alcoholic fermentation for the subsequent use of selected yeasts;
c) To continuously clarify in order to regularize the quantity of items to eliminate;
d) And possibly, enhance oxygenation during clarification.

Prescriptions:

Clarification can be done:

a) Protected from air by using nitrogen or argon, or with compressed air to encourage the oxidation compounds and render the color of the wine more stable;
b) At ambient temperature, after chilling or by using continuous systems which allow real-time control of clarifying agents and clarification speed;
c) Or in a static manner using appropriate containers
d) The products used must conform to the *International Oenological Codex* standards

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.15 TREATMENT WITH POTASSIUM CASEINATE (OENO 4/04)

Classification :

Potassium caseinate: processing aid

Definition:

Addition of potassium caseinate to musts in the form of a colloidal suspension or in association with other fining agents.

Objective:

Eliminate oxidized polyphenolic compounds or those compounds likely to oxidize

Prescription:

Potassium caseinate must comply with prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.16 TREATMENT WITH CASEIN (OENO 5/04)

Classification :

Casein (calcium caseinate): processing aid

Definition:

Addition of casein to musts in the form of a colloidal suspension or in association with other fining products.

Objective:

Elimination of polyphenolic compounds or those susceptible to oxidation

Prescription:

The casein used must comply with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.17 FINING USING PROTEINS OF PLANT ORIGIN (OENO 7/04)

Objectives

Use of protein matter of plant origin for the fining of musts in order to improve their clarity, stability and taste.

Prescriptions:

1. The dose to be used is determined after a preliminary test trial. The maximum usage dose should be less than 50 g/hl. The dose retained corresponds to the sample which produces the sought after clarity and gives a better result for tasting.

2. Protein matter of plant origin can be used with other admitted products such as tannins, bentonite, silica gel…

3. Protein matter of plant origin must comply with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.18 USE OF ENZYMES FOR IMPROVING THE FILTERABILITY (OENO 14/04, OENO 499-2013, OENO 682-2021)

Classification :

Arabinanases : processing aid
Cellulases : processing aid
Pectinlyases : processing aid
Pectinemethylesterase : processing aid
Polygalacturonases : processing aid
Hemicellulases : processing aid

Definition:

Addition to must of enzymatic preparations containing activities catalysing the degradation of plugging macromolecules of grapes which went into the must during the juice extraction operations.
Enzyme activities involved in improving the filterability of musts notably include polygalacturonases, pectin lyases, pectinmethylesterases, and to a lesser extent arabinanases, rhamnogalacturonases, cellulases, hemicellulases, as well as β-glucanases if the musts come from botrytised grapes.

Objective:

To improve the filterability of musts by specific hydrolysis of colloids.

Prescription:

The enzymes used must comply with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.19 USE OF ENZYMES FOR THE RELEASE OF FLAVOURING SUBSTANCES (OENO 16/04, OENO 498-2013)

Classification :

Glycosidases: processing aid
Glucosidases: processing aid

Definition:

Addition to must of enzymatic preparations containing activities catalysing the hydrolysis of the saccharide portion of the glycosylated aromatic substances (flavour precursors) of the grape, such as glycosylated terpenes.
Enzyme activities involved in the release of flavouring substances are glycosidases and glucosidases. Depending on the degree of inhibition by glucose, these enzymes may become active only after the fermentation has concluded.

Objective:

to enhance the aromatic potential of the must.

Prescription:

The enzymes used must comply with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.1.20 ADSORBANT COPOLYMER TREATMENT PVI/PVP (OENO 1/07, OENO 262-2014)

Classification :

PVI/PVP copolymer: processing aid

Definition:

The addition of polyvinylimidazole – polyvinylpyrrolidone copolymers (PVI/PVP) in order to reduce copper, iron and heavy metal contents.

Objectives:
a) To prevent defects caused by too high metal contents (for example ferric casse).
b) To reduce undesirable high concentration of metals due to:
- Must contaminated by metal cations (for example by residues from phytosanitary products containing copper),
- Metal cation contamination during must treatment from winemaking equipment.

Prescriptions:
a) The amount used should be less than 500 mg/l.
b) When musts and wine are treated with PVI/PVP copolymers, the accumulated dosage should be less than 500 mg/l.
c) The copolymers should be eliminated by filtration no later than two days after the addition taking into account the precautionary principle. In the case of cloudy musts, the copolymer must be added no earlier than a maximum of two days before filtration.
d) The adsorbant copolymers used should comply with the prescriptions of the International Oenological Codex and in particular monomers limits.
e) The implementation of the procedure shall be placed under the responsibility of an oenologist or a specialised technician.

Recommendation of the OIV:
Admitted

2. MUSTS

2.1.21 TREATMENT WITH D,L-TARTARIC ACID (OENO 3/08)

Classification:

D,L-tartaric acid: processing aid

Definition:

Addition of D,L-tartaric acid or the potassium-salts of D,L-tartaric acid in must

Objectives:

Reduction of excessive levels of calcium

Prescriptions:

a) The treatment yields particularly insoluble salts. The use of D,L-tartaric acid is subject to certain regulations.
b) The treatment will be placed under the responsibility of an oenologist or a specialist technician.
c) The products added shall comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV:

Admitted

2. Mmusts

2.1.22 Fining using chitosan (Oeno 336A-2009)

Classification:
Chitosan: processing aid

Definition:

Addition of chitosan of fungal origin for the purpose of fining musts

Objectives:

To facilitate settling and clarification
To carry out a treatment to prevent protein haze

Prescriptions:

a) The doses to be used are determined after preliminary testing. The recommended dose used should be less than or equal to 100 g/hl.
b) Chitosan must comply with the requirements of the International Oenological Codex.

Recommendation of the OIV

Accepted

2. MUSTS

2.1.23 FINING USING CHITIN-GLUCAN (OENO 336B-2009)

Classification:
chitin-glucan: processing aid

Definition:

Addition of chitin-glucan of fungal origin for the purpose of fining musts

Objectives:

a) To facilitate settling and clarification
b) To carry out a treatment to prevent protein haze

Prescriptions:

a) The doses to be used are determined after preliminary testing. The recommended dose used should be less than or equal to 100 g/hl.
b) Chitin-glucan complex must comply with the requirements of the International Oenological Codex.

Recommendation of the OIV

Accepted

2. MUSTS

2.1.24 FINING USING YEAST PROTEIN EXTRACTS (OENO 416-2011)

Classification :
Yeast protein extracts: processing aid

Definition:

Addition of yeast protein extracts for fining musts

Objectives:

a) Facilitate racking of musts
b) Reduce turbidity of musts by precipitating suspended particles
c) Reduce quantity of tannin
d) Improve filtrability of wine derived from fined musts

Prescriptions:

a) The doses used are determined beforehand by laboratory trials (fining point)
b) Maximum dose to be used, determined by a test of efficiency in laboratory must not exceed 30 g/hl
c) The yeast protein extracts can be used alone or associated with other authorised fining products
d) The deposits from the fining of musts are eliminated from the musts by physical processes
e) The yeast protein extracts must comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV:

Admitted

2. MUSTS

2.1.25 REDUCTION OF THE SUGAR CONTENT IN MUSTS FINING USING YEAST PROTEIN EXTRACTS (OENO 450A-2012)

Classification :

Yeast protein extracts: processing aid

Definition:

Operation that consists in extracting a certain quantity of sugar from grape must.

Objectives:

a) Produce musts with lowered sugar content
b) Develop a wine with reduced ethanol content by decreasing the sugar content of the must.

Prescriptions:

a) Refer to the general sheet concerning must and wine treatments with separation techniques used in the treatment of musts (sheet 2.0) and the sheet concerning the application of membrane techniques used for musts (sheet 2.0.0),

b) The objectives may be met with various techniques:
   - membrane coupling

- other methods**[*]

c) The process entails a reduction in volume dependant on the quantity and sugar content of the sugar solution extracted from the initial must.

d) The processes must enable to preserve the contents in must components other than sugar.

e) The reduction of the sugar content in musts excludes the dealcoholisation of the wines from which they originate

f) This practice must not be used in conjunction with the enrichment techniques for musts and wines

g) The reduction of the sugar content is limited because of the significant reduction of volume and the results of the separation techniques used.

h) For objective b) the end product must comply with the definition of wine.

OIV's recommendation:

Refer to the sheets concerning the practices and treatments mentioned above.

[*] *To be described subsequently if required*

2. MUSTS

2.1.25.1 REDUCTION OF THE SUGAR CONTENT IN MUSTS THROUGH MEMBRANE COUPLING (OENO 450B-2012)

Definition:

Process that consists in extracting the sugar from musts, by using membrane coupling combining microfiltration or ultrafiltration with nanofiltration or inverted osmosis.

Objectives:

a) Reducing the sugar content of musts destined for fermentation, with the purpose of obtaining a wine with reduced ethanol content;

Prescriptions:

a) Refer to the general sheet concerning the reduction of sugar content in musts (sheet 2.1.25)

b) The treatment is carried out on a volume of must that is determined according to the required result in terms of sugar content reduction.

c) The objective of the first step is to prepare the must for the second concentration step and to filter out all the macromolecules smaller than the membrane's cut-off size. This step may be done by ultrafiltration.

d) The ultrafiltrate obtained during the first step of the treatment is then concentrated by nanofiltration or inverted osmosis.
The water and the organic acids filtered out by the nanofiltration process can be reintroduced into the treated must

e) The treatment is to be conducted under the responsibility of an oenologist or of a qualified technician

f) The membranes used must comply with the prescriptions contained in the "International Oenological Codex"

OIV's recommendation:
Accepted.

2. MUSTS

2.1.26. TREATMENT BY DISCONTINUOUS HIGH PRESSURE PROCESSES (OENO 594A-2019)

Definition:

Process that consists in the reduction of indigenous organisms in musts by the use of discontinuous high pressure processes, with pressures higher than 150 MPa (1500 bar).

Objective

a) To reduce the microbial loads of indigenous microorganisms, especially yeasts,
b) To reduce SO2 levels used in winemaking,
c) To accelerate maceration in red winemaking.

Prescriptions

a) The high hydrostatic pressure (HHP) technique relates to the use of pressure levels of higher than 150 MPa (1500 bar) during a discontinuous process.
b) The elimination of yeasts in grapes and musts requires pressure levels of 200-400 MPa.
c) The elimination of bacterial cells needs pressure levels of 500-600 MPa.
d) The treatment time range is 2-10 minutes.
e) If necessary, the increase in temperature may be controlled by supplementary refrigeration.
f) The increase in temperature and the techniques used should not entail any alteration in the appearance, colour, flavour or taste of the wine.

Recommendation of OIV

Accepted

2. MUSTS

2.1.27. TREATMENT OF GRAPES BY PULSED ELECTRIC FIELDS (PEF) (OENO 634-2020)

Definition:

A process that consists on the application of sufficiently high pulsed electric fields (PEF) to destemmed and crushed grapes that causes the permeabilization of the cell membranes especially of the grape skins.

Objective

a) Treatment of red grapes destemmed and crushed by PEF in order to
- Facilitate and increase the extraction of valuable substances such as polyphenols, yeast available nitrogen, aroma compounds including precursors, and other substances located inside the grape cells
- Reduce maceration time

b) Treatment of white grapes destemmed and crushed by PEF in order to
- Facilitate and increase the extraction of valuable substances such as yeast available nitrogen, aroma compounds including precursors, and other substances located inside the grape cells.

Prescriptions

The technique consists on the application of pulsed electric fields in the range of nanoseconds to milliseconds which are sufficiently high to permeabilize the cell membranes. The destemmed and

crushed grapes are treated in at least one treatment chamber with at least one pair of electrodes.

Recommendation of OIV
Admitted

2. MUSTS

2.1.28. USE OF SELECTIVE PLANT FIBRES IN MUST (OIV-OENO 684B-2022)

Definition:

Use in musts of a selective absorbent composed of plant fibres.

Objective

a) To reduce the ochratoxin A levels in musts;
b) To reduce the number and levels of phytosanitary product residues in musts.

Prescriptions

a) Selectivee plant fibres are to be incorporated into must, or during fermentation;
b) The dose to be used is to be determined depending on the must and levels of molecules to be adsorbed, and should not exceed 200 g/hL;
c) Selective plant fibres are to be removed by racking after sedimentation, by centrifugation or by filtration;
d) Selective plant fibres are to be used in musts in compliance with the applicable authorisations and limits for phytosanitary product residues;
e) Selectivee plant fibres shoul comply with the prescriptions of the International Oenological Codex

Recommendation of OIV
Admitted

2. MUSTS

2.2 PRESERVATION OF MUSTS

2.2.1 TREATMENT WITH SORBIC ACID (5/88)

Definition:

Addition of sorbic acid or potassium sorbate to must.

Objective:

To prevent the alcoholic fermentation of the must.

Recommendation of OIV:

Not accepted.

2. MUSTS

2.2.2 PRESERVATION WITH ALCOHOL BEFORE OR DURING FERMENTATION (1/91)

Definition :

Addition of rectified alcohol of viticultural origin, wine spirit, alcohol of viticultural origin or rectified food alcohol to the must before or during alcoholic fermentation.

Objectives :

a) To prevent alcoholic fermentation of a must with a view to producing either a mistelle (see Part I, chap. 5 Mistelles), or a must preserved with alcohol
b) To stop alcoholic fermentation with a view to obtaining a fortified wine (see Part I, chap. 4.3 Fortified wines).

Prescriptions :

a) Spirits of viticultural origin shall comply with the prescriptions of the *International Oenological Codex* and shall conform to the production conditions for these products specified in the present Code.
b) The nature of the alcohols and spirits added depends on the final product to be produced (see the sections corresponding to the different products).

Recommendation of OIV:

Accepted.

2. MUSTS

2.2.3 PRESERVATION BY ADDITION OF CARBON DIOXIDE TO MUST OR CARBONATION OF MUST (16/70)

Definition :

Addition of carbon dioxide under pressure to must, so as to hinder its fermentation.

Objectives :

a) Preservation of must destined for the manufacture of juice.
b) Slowing or stopping fermentation without other intervention.

Prescription :

The gas used shall comply with the prescriptions of the *International Oenological Codex .*

Recommendation of OIV:

Accepted.

2. Mmusts

2.2.4 Pasteurisation (5/88)

Definition :

Heating must to a specified temperature for a given time.

Objectives :

a) To inhibit the activity of microorganisms present in the must at the moment of treatment.
b) To inactivate enzymes present in the must.

Prescriptions :

a) Pasteurisation is performed in bulk by passing the must through a heat exchanger followed by rapid cooling.
b) The increase in temperature and the techniques used shall cause no alteration in the appearance, colour, odour or taste of the must.

Recommendation of OIV :

Accepted

2. MUSTS

2.2.5 PROTECTION UNDER INERT ATMOSPHERE (16/70)

Classification :

Nitrogen : processing aid
Argon : processing aid

Definition :

Operation consistent with creating an inert atmosphere using nitrogen, carbon dioxide and/or argon.

Objective :

To keep the must protected from air to avoid oxidation and the growth of aerobic organisms.

Prescriptions :

The nitrogen, carbon dioxide and argon shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of OIV:

Accepted.

2. MUSTS

2.2.6 LYSOZYME TREATMENT (OENO 6/97)

Classification
Lysozyme: Processing aid

Definition:

Addition of lysozyme to the must.

Objectives:

a) Control of the growth and activity of the bacteria responsible for malolactic fermentation of the must.

b) Reduction of the rate of sulphur dioxide.

Prescriptions:

a) According to experiments, the maximum dose of 500 mg/l appears to be sufficient to control the growth and the activity of the bacteria responsible for malolactic fermentation during alcoholic fermentation.

b) Lysozyme cannot totally substitute itself to SO_2 which possesses antioxidant properties. A SO_2 + lysozyme association provides more stable wines.

c) When must and wine are treated with lysozyme, the accumulated dose must not exceed 500mg/l.

d) The product must conform to the prescriptions of the *International oenological codex.*

Recommendation of the OIV:

Accepted.

2. MUSTS

2.2.7. TREATMENT WITH ASCORBIC ACID (OENO 11/01)

Classification:

Ascorbic acid: additive
Erythorbic acid: additive

Definition:

Addition of ascorbic acid to must.

Objectives:

1) Protect the aromatic substances of the grape, through the antioxidant properties of the product, against the influence of oxygen in the air.
2) Limit the formation of ethanal during alcoholic fermentation, through the combination with sulphur dioxide.
3) Limit the formation of hydrogen sulphide and volatile thiols of fermentation origin.

Prescriptions:

a) It is recommended to add ascorbic acid immediately after the grape's crushing.
b) The dose used, cumulated if necessary, with that used on the grapes, shall not exceed 250 mg/l.
c) It is advisable to use ascorbic acid with sulphur dioxide.
d) The ascorbic acid shall comply with the prescriptions of the *International Oenological Codex*.

Recommendation of OIV:
Accepted.

2. MUSTS

2.2.8. TREATMENT OF MUST WITH GLUTATHIONE (OENO 445/2015)

Classification:
Glutathione: additive

Definition:

Addition of glutathione to musts.

Objective:

To limit the intensity of oxidation phenomena in musts, thanks to the ability of glutathione to trap quinones and reduce their oxidative activity.

Prescriptions:

a) It is advised to add the glutathione while obtaining the musts or at the start of alcoholic fermentation, ensuring that, prior to and during alcoholic fermentation, the assimilable nitrogen level is sufficient to avoid the metabolism of glutathione by the yeast;
b) the dose used should not exceed 20 mg/L;
c) the glutathione must be in a reduced form and comply with the prescriptions of the *International Oenological Codex*.

OIV recommendation:

Accepted.

2. MUSTS

2.2.9. TREATMENT USING INACTIVATED YEASTS WITH GUARANTEED GLUTATHIONE LEVELS (OENO 532/2017)

Classification:
inactivated yeasts with guaranteed glutathione levels: processing aids

Definition:
Addition of inactivated yeasts whose cells have guaranteed reduced-glutathione levels.

Objectives:
a) To limit the oxidation of certain varietal aromatic compounds revealed by the metabolism of yeasts (particularly thiols);

b) to promote yeast metabolism through the provision of naturally-occurring nutritional compounds.

Prescriptions:
a) The addition of inactivated yeasts with guaranteed glutathione levels at the start or during the alcoholic fermentation is recommended, ensuring that the assimilable nitrogen level is sufficient to avoid the use of glutathione by the fermentative yeasts;

b) the dose used of glutathione, supplied directly or via yeasts with guaranteed glutathione levels, should not exceed 20 mg/L, in order to avoid any risk of reduction and the emergence of a yeast taste;

c) the inactivated yeasts with guaranteed glutathione levels should contain a reduced form of glutathione; this may be

accompanied by the presence of its precursors (cysteine and particularly gamma-glutamylcysteine);

d) the inactivated yeasts with guaranteed glutathione levels should comply with the prescriptions of the *International Oenological Codex.*

Recommendation of the OIV:
Admitted

2. MUSTS

2.2.10. TREATMENT BY CONTINUOUS HIGH PRESSURE PROCESSES (OENO 594B-2020)

Definition:
Operation for the elimination of wild microorganisms in musts by high pressure processing (above 200 MPa or 2000 bar) in continuous. In UHPH, the pressure is usually ranging 300-400 MPa.

Objectives:
- To reduce or eliminate the load of wild microorganisms, mainly yeasts, preserving the organoleptic quality.
- To reduce the amount of SO2 used in winemaking.
- To reduce or inactivate the activity of oxidative enzymes.
- To get grape must stable from the microbiological point of view.
- To obtain partially fermented musts.

Prescriptions:
a) The ultra high pressure homogenization technique (UHPH) consists in the application of pressures higher than 200 Mpa (2000 bar) by continuous pumping.
   - UHPH: continuous process that could be better integrated in the pretreatment of musts.
b) To eliminate the yeasts of the musts, pressures of 200-400 Mpa are needed.
c) To eliminate bacteria, pressures of 200-400 Mpa are needed.
d) The treatment speed can range from 40 L / h to 40,000 L / h.
e) If necessary, the increase in temperature can be controlled with additional refrigeration.

f) Neither the increase in temperature nor the techniques used should produce significant alterations in the appearance, color, smell or taste of the wine.
g) The procedures must conform to the specifications of the International Oenological Codex.

Recommendation of the OIV:
Admitted

2. MUSTS

2.2.11. TREATMENT OF MUSTS USING ADSORBENT STYRENE-DIVINYLBENZENE BEADS (OENO 614A-2020)

Definition:
Physical process of reduction or elimination of organoleptic deviations characterised as "earthy-musty" by the appropriate and controlled percolation of musts at a high flow rate through adsorbent styrene-divinylbenzene beads.

Objectives:
a) To eliminate the perception of organoleptic deviations characterised as "earthy-musty" by the reduction in concentration or elimination of one of the main molecules responsible, geosmine.

Prescriptions:
a) Treatment should be carried out on clarified musts with turbidities of less than 30 NTU (nephelometric turbidity units). With regard to red grapes, a preliminary treatment separating the liquid phase from the solid parts should be envisaged.
b) The quantity of adsorbent beads to be used in the column and the must flow rate are to be determined based on the initial geosmine content.
c) The adsorbent beads are placed in a column that is compliant with standards for food contact materials.
d) The adsorbent beads implanted and the condition of their use should comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV:
Admitted

2. MUSTS

2.2.12. USE OF ASPERGILLOPEPSIN I TO REMOVE HAZE-FORMING PROTEINS (OENO 541A-2021)

Definition:
The addition to grape must of Aspergillopepsin I from Aspergillus spp. to remove haze-forming proteins.

Objectives:
To prevent protein haze in still white, rosé wines and sparkling wines.

Prescriptions:

a) Addition of Aspergillopepsin I preparation to must prior to initiation of fermentation
b) After addition of Aspergillopepsin I preparation, one short-term must heating must be applied as it contributes to the unfolding of haze-forming proteins and facilitates their enzymatic degradation by proteases, as well as leads to a denaturation of the protease itself.

This single heat treatment must take into account:

- the activity of Aspergillopepsin I preparation as regards the temperature
- the quantity of Aspergillopepsin I used
- The minimum temperature of treatment should be at or above the denaturation temperature of the proteins, generally comprised between 60 and 75 °C.
- the heating time, generally around 1 minute. Too long heating time could induce negative organoleptic impact.

This loss of three-dimensional conformation of TLPs (Thaumatin Like Proteins) is reversible, so the heating has to be simultaneous to the addition of enzymes for optimal efficiency.

c) The must is cooled to an appropriate temperature prior to yeast inoculation.
d) A filtration must be performed to remove the residual proteins (including added proteases and other proteins).
e) The enzymes used must comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV:
Admitted

2. MUSTS

2.3 ALCOHOLIC FERMENTATION (5/88)

Definition :

Transformation of grape sugars into ethanol, carbon dioxide and secondary products.

Objective :

Production of wine.

Prescriptions :

a) Fermentation can take place:
- Spontaneously by means of yeasts naturally present on the skins of the grapes, in the musts and in cellars ;
- By inoculation of must or of crushed grapes with selected yeasts, before or during the fermentation (see *Inoculation with yeasts*).

b) The progress of the alcoholic fermentation can be influenced:
- By addition of activator substances (see Activation of alcoholic fermentation and Treatment with yeast ghosts):
- By aeration of the crushed grapes or of the fermenting must (see Aeration);
- By control of the fermentation temperature as a function of the type of wine desired (see Interruption of alcoholic fermentation by physical processes);
- By all other acceptable interventions aiming to favour alcoholic fermentation, to restrain it or to stop it.

Recommendation of OIV:

Accepted

2. MUSTS

2.3.1 INOCULATION WITH YEASTS (16/70, ECO 3/03) (OENO 546/2016) ♁

Definition :

Inoculation of a must, before or during its fermentation, with the help of a starter inoculum prepared either from indigenous yeasts or from selected yeasts.

Objectives :

a) To initiate, regulate and accelerate fermentation, especially in the case of vinifications, which are proceeding too slowly.
b) To re-activate an interrupted fermentation.
c) To facilitate the depletion of glucose and fructose.
d) To change the wine acidity by synthesis or breakdown of organic acids.
e) To produce less volatile acidity, especially in the case of musts with high sugar levels.
f) To impact on the wine's sensorial properties (aromas, mouthfeel).

Prescriptions :

a) Use the yeast or mixture of yeasts appropriate for the objective pursued. Use the yeast appropriate to the objective pursued.
b) In the case of non-Saccharomyces, the addition occurs before or at the same time as for the Saccharomyces.
c) The commercial starters added may be pure cultures or blends of Saccharomyces strains and non-Saccharomyces strains.

d) Where active, selected yeasts (Saccharomyces and non-Saccharomyces) are used, these shall comply with the prescriptions of the International Oenological Codex.

Recommendation of OIV:

Accepted.

2. MUSTS

2.3.2 FERMENTATION ACTIVATORS (OENO 7/97; 14/05, OENO 633-2019) ♎

Classification:

Yeast auto lysates*:* processing aid
Microcrystalline Cellulose: processing aid
food-grade cellulose: processing aid
Inactivated yeasts: processing aid
Fatty acid mono- and diglycerides: processing aid

Definition:

Addition to the harvest or the must, before or during the alcoholic fermentation, of fermentation activators.

Objective:

Favour the beginning or the completion of alcoholic fermentation;

a) By enriching the environment with nutritive elements (ammoniacal nitrogen, aminated and peptidic nitrogen) and growth factors (thiamine, long chain fat acids),

b) In detoxifying the environment by rapid release of carbon dioxide at the start of alcoholic fermentation and/or by adsorption of yeast inhibitors such as medium chain fat acids (supporting role of inactivated yeasts, food-grade cellulose).

Prescriptions :

a) The activators can be microcrystalline cellulose, food-grade cellulose, ammoniacal salts, thiamine or products coming from

the degradation of yeasts (autolysates, cell skins, inactivated yeasts).

b) Fermentation activators must conform to the prescription of the International oenological codex.

Recommendation of the OIV:

Accepted.

2. MUSTS

2.3.3 TREATMENT WITH THIAMIN (6/76)

Classification :

Thiamine hydrochloride: processing aid

Definition :

Addition of thiamin to must.

Objectives :

a) To accelerate the alcoholic fermentation.
b) To reduce the formation, during the alcoholic fermentation, of substances capable of combining with sulphur dioxide and also to allow a reduction in the dose.

Prescriptions :

a) According to experiments conducted to date, a dose of 60 mg/hl proves sufficient.
b) The product shall comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV :

Accepted.

2. MUSTS

2.3.4 TREATMENT WITH YEAST GHOSTS (5/88)

Classification :

Yeast hulls: processing aid

Definition :

Addition to the must, to the fermenting must or to the wine of a preparation of yeast ghosts.

Objectives :

a) To prevent sticking of the alcoholic fermentation
b) To facilitate the completion of slow fermentations.
c) To treat "stuck" fermentations.

Prescriptions :

a) Yeast ghosts are added before or at the start of fermentation for objective (a); at the end of the fermentation for objective (b); before the yeast inoculation for objective (c).
b) The doses used shall not be greater than 40 g/hl.
c) The yeast ghosts shall comply with the prescriptions of the International Oenological Codex

Recommendation :

Accepted.

2. MUSTS

2.3.6 INTERRUPTION OF ALCOHOLIC FERMENTATION BY PHYSICAL PROCEDURES (5/88)

Definition :

Arresting the alcoholic fermentation.

Objective :

To obtain a product containing endogenous sugar.

Prescriptions :

a) Only the physical techniques: heat, cold, filtration and centrifugation may be used.
b) The product obtained shall remain fermentable.

Recommendation of OIV:

Accepted.

2. MUSTS

2.3.7 PROCEDURES TO LIMIT THE FORMATION OF FOAM (OENO 1/93)

Definition :

Prevention of foam formation during the alcoholic fermentation.

Objective :

To control the formation of foam during alcoholic fermentation of must with a view to avoiding losses by overflow and to allow a better use of the capacity of the fermentation cellar.

Prescriptions :

A. PREVENTIVE PROCEDURES:

a) Utilisation of yeast strains selected for their low formation of foam.
b) Performing the fermentation using physical procedures (equipment, temperature...) likely to minimise the formation of foam.
c) Reduction of the must's ability to form foam by treatment with one of the products accepted for fining; particularly silicon dioxide and bentonite (see Fining)

B. REMEDIAL PROCEDURE

Addition of a surfactant: a mixture of mono- and di-glycerides of oleic acid ;
The substances used shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of OIV :

Accepted.

2. MUSTS

2.3.8. FERMENTATION IN SMALL CAPACITY WOODEN CONTAINERS (OENO 7/01)

Definition:

Carrying out alcoholic fermentation and, possibly, malolactic fermentation of wines in small capacity wooden containers.

Objectives:

a) To favour natural physical and chemical mechanisms leading to the enriching of wine through substances released by wood when containers have a maximum capacity of 600 litres;
b) Allow the transformation by micro-organisms of substances released by wood;
c) To obtain the closest possible contact between lees and wine, in order to favour the migration of wine yeast compounds into wine, through autolysis.

Prescriptions:

a) It is recommended to use partially clarified must at an appropriate temperature;
b) It is recommended, for the process to be efficient and to favour the maximum dissipation of fermentation heat, that the volume/wood surface ratio be optimised, in accordance with the product to be made;
c) The recipient will be made of wood that keeps its natural structure. Cooperage techniques as defined for the construction of new casks could be used to optimise the objectives. The traceability of wood is recommended, and at the very least, the manufacture date should be visibly engraved;

d) The inside surface of the recipient could be regenerated by usual cooperage methods. In this case, the date should be visibly engraved.

Recommendation of OIV:

Accepted.

2. MUSTS

2.3.9. WARM POST FERMENTATION MACERATION OF RED GRAPES CALLED WARM FINAL MACERATION (OENO 13/05)

Definition:

Procedure involving the prolonging of fermentative maceration using a warm post-fermentation maceration.

Objectives

a) Complete the release of skin compounds carried out by pre-fermentative and fermentative maceration.
b) Improve the polyphenolic structure of wine and colour characteristics.

Prescriptions

a) Advise against using this technique during harvests with deficiencies in health status,
b) Ensure that alcoholic fermentation is completely finished
c) Protect oxidative phenomenon, notably during the wine heating phase by carbon dioxide,
d) Bring the temperature of blends of wine to 40 to 45°C
e) Determine length of warm maceration according to grape characteristics and sought after wine type
f) Cool blends of wine prior to devatting and pressing

Recommendation of the OIV

Admitted

2. MUSTS

2.3.10. MACERATION OF RAISINED GRAPES OR THEIR POMACE IN WINE (OENO 278-2009)

Definition:

Procedure which involves the maceration in wine of raisined grapes or grapes affected by noble rot or their pomace following fermentation.

Objectives:

a) To increase content of:
* sugar in wine,
* phenolic compounds in wine,
* aromatic compounds in wine.

Prescriptions:

a) The length of maceration depends on the characteristics of the wine, the grape variety and the style of wine desired.
b) Avoid excessive extraction of phenolic compounds brought on by a too lengthy maceration.
c) The wine, raisined grapes and pomace obtained following fermentation must all be from the same vintage.

Recommendation of the OIV

Admitted

3. WINES

3.0. SEPARATIVE TECHNIQUES USED IN THE TREATMENTS OF MUSTS AND WINES[25] (OENO 372/2010)

Definition:

Physical processes consisting in separating must or wine into several fractions having different chemical composition.

Objectives:

a) Optimise the organoleptic characteristics of wine subject to the treatment
b) Increase effectiveness of other practices regarding must or wine that undergoes the treatment
c) Complete or partial separation of the fraction
d) Complete or partial recombination of the separated and possibly treated fractions

Prescriptions:

a) The objectives can be achieved by different techniques alone or in combination
   - Membrane techniques
   - Evaporative techniques (such as distillation and vacuum distillation)
   - Other separative techniques

[25] *This file is general and the techniques will be described in detail into specific files*

b) The wine or must to be treated must comply with OIV's definitions and limits.

c) These techniques cannot be used to cover fraudulent acts

d) Fractions, untreated or treated by oenological practices approved by the OIV must be blended exclusively with must or wine fractions, obtained by separative techniques, derived from the same original product. Fractions used as wine based products as defined in the International Code of Oenological Practices are the only exception.

e) Recombination must occur within the shortest possible time and in the same place when it is possible.

f) The techniques, membranes and equipment used, and the practices implemented in the additional procedures must comply with the provisions stated in the OIV International Code of oenological practices

g) Treatments of the fractions must comply with the OIV International Code of oenological practices

3. WINES

3.0.1. APPLICATION OF MEMBRANE TECHNIQUES[26] (OENO 373B/2010)

Definition:

Treatment of wine using membrane techniques enabling the selective holding back or passing of some compounds in wine.

Objectives:

a) To elaborate more balanced wine in terms of organoleptic characteristics,
b) To compensate effects of adverse weather conditions and climate change, and to resolve certain organoleptic issues
c) To expand the techniques available for development of products more adapted to consumer expectations.

Prescriptions:

a) See the general sheet on treatments of musts and wines with separative techniques used for the treatment of wines and musts

b) The above-mentioned objectives can be reached by applying these techniques, for example, for:
    1. the tartaric stabilisation
    2. the partial dehydratation
    3. the partial dealcoholisation of wine,

[26] *This file is general and the techniques will be described in detail into specific files*

4. the adjustment of acidity and pH,
5. the reduction of the concentration of certain organic acids
6. the reduction of the volatile acidity of wines qualified to be released o the market.
7. Management of dissolved gas

c) There are different types of membrane techniques alone or in combination depending on the sought after objectives, including:
   1. microfiltration,
   2. ultrafiltration**,
   3. nanofiltration**,
   4. membrane contactor**
   5. reverse osmosis,
   6. electromembranes processes,
   7. other membrane techniques**.

d) The use of membranes to obtain opposite features are not allowed

e) This practice shall be carried out by an oenologist or a qualified technician.

f) The membranes and material, in addition to techniques used in complementary procedures, shall be consistent with the provisions of the International Code of Oenological Practices and the *International Oenological Codex*.

3. WINES

3.1 ADJUSTMENT OF ACIDITY OF WINE

3.1.1 ACIDIFICATION (6/79, OENO 361/2010)

Classification:

Malic acid (D,L-, L-): additive
Lactic acid: additive
Tartaric acid: additive
Citric acid, monohydrate: additive

Definition :

Increase of the titratable acidity and the actual acidity (decrease of the pH).

Objectives :

a) Production of wines with good sensory balance
b) To promote good biological characteristics and good keeping quality of the wine.

Prescriptions :

The objectives can be achieved :

a) By blending with wines of elevated acidity;
b) With the help of strong cation exchangers in the free form (**)
c) By the use of chemical procedures (see *Chemical acidification*)

d) by electromembrane treatment, see Acidification by Electromembrane treatment (bipolar membrane electrodialysis)

Recommendation of OIV:
Refer to the practices and procedures mentioned above.

3. WINES

3.1.1.1 CHEMICAL ACIDIFICATION (OENO 4/99, OENO 14/01, OIV-OENO 581B-2024)

Classification:
Lactic acids, L(-): Additive
D,L malic acid: Additive
L(+) tartaric acid: Additive
Fumaric acid: Additive
Citric acid: Additive

Definition:

Increasing the titration acidity and the actual acidity (decreasing pH) by adding organic acids.

Objectives:

a) Produce balanced wines from the gustatory point of view;
b) Favor a good biological evolution and good maturation of wine
c) Remedy insufficient natural acidity caused by:
- climatic conditions in the viticulture region, or
- oenological practices which lead to a decrease in natural acidity

Prescriptions:

a) Lactic acids, L(-) or DL malic acid, L(+) tartaric acid, fumaric acid and citric acid are the only acids that can be used;
b) Citric acid content in wine after this procedure should not exceed the limit established in Annex C of the *International Collection of Methods for Wine and Must Analysis*
c) The addition of acids should not be done to conceal fraud;
d) The addition of mineral acids is forbidden;

e) Chemical acidification and chemical de-acidification are mutually exclusive;
f) The acids used must conform to the *International Oenological Codex* standards
g) Acids can be only be added to wine under condition that the initial acidity is not increased by more than 54 meq/l (i.e. 4 g/l expressed as tartaric acid),

When musts and wine are acidified, the cumulated dose must not exceed a net cumulative increase of 54 meq/l (or 4 g/l expressed as tartaric acid),

Recommendation of the OIV:

Accepted.

3. WINES

3.1.1.2 TREATMENT WITH CALCIUM SULPHATE (PLASTERING)[27] (3/85)

Definition :

Addition of calcium sulphate to wine.

Objective :

To lower the pH of the wine.

Recommendation of the OIV:

Not accepted.

[27] this section concerns only wines stricto sensu as defined in the present code (part I, chap.3, "Wine")

3. WINES

3.1.1.3 TREATMENT WITH ION EXCHANGERS (6/76) (OENO 443-2012)

Definition:

Operation consisting of passing the wine through a column of polymerised resin that acts as an insoluble polyelectrolyte whose ions are able to be exchanged with ions of the wine. According to their polar groupings, ion exchange resins are categorised as cation exchangers and anion exchangers.

Objectives :

a) Treatment with cation exchangers:
1. To stabilise the wine with regard to tartrate precipitation (see *Tartrate stabilisation by treatment with cation exchangers*),
2. To lower the pH of wines of low fixed acidity and high in cations,
3. To avoid metallic hazes.

b) Treatment with anion exchangers:
1. To reduce the titratable acidity,
2. To de-sulphite wines,
3. To reduce the sulphate content.

Recommendation of OIV :

For objective a)1 and a)2 : Accepted
For the other objectives: Not accepted

3. WINES

3.1.1.4 ACIDIFICATION BY ELECTROMEMBRANE TREATMENT (BIPOLAR MEMBRANE ELECTRODIALYSIS) (OENO 361/2010)

Definition:

Physical method for ionic extraction in wine under the action of an electric field using membranes permeable only to cations on the one hand, and bipolar membranes on the other hand, and enabling an increase of titratable acidity and actual acidity (decrease of the pH).

Objectives:

a) increase of titratable acidity and actual acidity (decrease of the pH).
b) Obtaining wines with balanced taste characteristics.
c) Promote a good biological evolution and proper storage of the wine.
d) Remedy insufficient natural acidity caused by:
- climatic conditions in the viticulture region, or
- oenological practices which lead to a decrease in natural acidity.

Prescriptions:

a) See the general sheet pertaining to separative techniques used in the treatment of wines and musts and the sheet pertaining to the use of membrane techniques applied to musts.

b) Acidification by electro-membrane treatment should not be done to conceal fraud.

c) Cationic membranes shall be made in such a way so as to be only adapted to the extraction of cations only and in particular cations: K^+.

d) Bipolar membranes are impermeable to anions and to wine cations.

e) The acidification by bipolar electrodialysis can only be carried out if initial must acidity has not been increased more than 54 meq/l
When must and wine are acidified, the total increased acidity must not exceed 54 meq/l.

f) The implementation of the process will be under the responsibility of an oenologist or a qualified technician.

g) The membranes shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of the OIV:

Accepted.

3. WINES

3.1.1.5 ACIDIFICATION BY CATION EXCHANGER TREATMENT (OENO 443-2012)

Definition:

Physical partial extraction of cations from the wine to increase titration acidity and actual acidity (decrease in pH) through cation exchanger

Objectives:

a) Increase titration acidity and actual acidity (decrease in pH)
b) Refer to objectives in the general file *3.1.1. Acidification*

Prescriptions:

a) The treatment will be performed using cation exchange resins regenerated in the acid cycle.
b) The treatment must be limited to the elimination of excess cations.
c) To avoid the production of fractions of wine, the treatment will be performed continuously, with in-line incorporation of the treated wine into the original wine.
d) As an alternative, the resin could be directly introduced into the tank of must, in the quantities required, then separated by all appropriate technical methods
e) The acidification must be carried under condition that the initial acidity is not raised by more than 54 meq/L. When

must and wine are acidified, the cumulative net increase must not exceed 54 meq/L.

f) All operations will be placed under the responsibility of an oenologist or qualified technician.

g) The resins shall comply with the prescriptions of the *International Oenological Codex*.[28]

Recommendation of the OIV:
Accepted.

[28] - The treatment must not decrease the concentration of metallic cations in the wine below 300 mg/l.
- The treatment must not lower the wine's pH below 3.0. The decrease in pH should not exceed 0.3 pH units.

3. WINES

3.1.2 DE-ACIDIFICATION (6/79)

Definition :

Reduction of the titratable acidity and the actual acidity (increase of the pH).

Objective :

Production of wines of better sensory balance

Prescriptions :

The objective can be achieved :

a) Spontaneously, whether by precipitation of the tartaric acid in the form of potassium bitartrate [see *Physical de-acidification; Prescriptions* (b)], or by degradation of malic acid (see *Microbiological de-acidification by lactic bacteria*)
b) By blending with less acidic wines (see *Blending*)
c) By the use of physical procedures [see *Physical de-acidification: Prescription* (b) and C*old Treatment: Objective* (a), and prescriptions corresponding to this objective (a)] and/or physico-chemical procedures [see *Treatment with ion exchangers;* objective b]
d) By the use of chemical procedures (see *Chemical de-acidification*),
e) By the use of microbiological procedures (see *Microbiological De-acidification by lactic acid bacteria*).

Recommendation of the OIV :

Refer to the practices and treatments mentioned above.

3. WINES

3.1.2.1 PHYSICAL DE-ACIDIFICATION (6/79) ♎

Definition :

Reduction of the titratable acidity by use of physical procedures.

Objective :

To produce wines :

a) See 3.1.2
b) Stable with regard to precipitation of excess potassium bitartrate and calcium tartrate.

Prescriptions :

The precipitation of potassium bitartrate and calcium tartrate occurs:

a) Either spontaneously during storage of the wine at low temperature, or
b) As the result of chilling the wine (see Cold Treatment)

Recommendation of the OIV:

Accepted

3. WINES

3.1.2.2 CHEMICAL DE-ACIDIFICATION (6/79)

Classification :

Potassium L(+) tartrate: processing aid
Potassium hydrogen tartrate: processing aid
Calcium carbonate: processing aid
Potassium hydrogen carbonate: processing aid

Definition :

Reduction of the acidity and the actual acidity (increase of the pH) by addition of neutral potassium tartrate, potassium hydrogen carbonate or calcium carbonate possibly containing a small quantity of the calcium double salt of L(+) tartaric and L(-) malic acids

Objectives :

a) See 3.1.2.
b) To favour biological de-acidification.

Prescriptions :

a) The de-acidified wine shall contain at least 1 g/l tartaric acid .
b) The process of the formation of double salt (neutral calcium salt of tartaric and malic acids) is intended to produce a greater reduction in titratable acidity, when the wine has a high malic acid content and the precipitation of tartaric acid alone does not prove sufficient.
c) Chemical de-acidification should be performed in such a way that the wines obtained do not lack acidity, taking account of a possible subsequent malolactic fermentation.

d) The aim of chemical de-acidification shall not be to conceal fraud.
e) The elimination of excess carbon dioxide can be achieved, if necessary, by flushing with nitrogen.
f) Chemical acidification and chemical de-acidification are mutually exclusive
g) The products used shall comply with the prescriptions of the International Oenological Codex.

Recommendation of OIV :

Accepted.

3. WINES

3.1.2.3 MICROBIOLOGICAL DE-ACIDIFICATION BY LACTIC ACID BACTERIA (4/80)

Definition :

Reduction of the titratable acidity and the actual acidity (increase of the pH) by malolactic fermentation.

Objective :

To produce wines :

a) See 3.1.2.
b) Biologically more stable.

Prescriptions :

To achieve the objectives, the microbiological de-acidification by lactic acid bacteria can be performed either in a spontaneous manner or by inoculation of selected strains.

a) The sulphur dioxide content should be limited, lactic acid bacteria being very sensitive to the presence of this compound,
b) It is desirable that malolactic fermentation takes place at the end of the alcoholic fermentation, to avoid bacterial degradation of sugars,
c) The wine in which malolactic fermentation is to occur should be maintained at a temperature of approximately 18°C.
d) Where selected cultures of lactic acid bacteria are used, these shall comply with the prescriptions of the International Oenological Codex

Recommendation of OIV :

Accepted.

3. WINES

3.1.2.4 DE-ACIDIFICATION USING AN ELECTROMEMBRANE PROCESS (OENO 484-2012)

Definition:

Physical method of ionic extraction from the wine under the action of an electric field using permeable membranes with anions on the one part and bipolar membranes on the other. The combination of permeable membranes with anions and biopolar membranes is used to manage a reduction in titratable acidity and the actual acidity (increase in the pH)

Objectives:

a) Correct excess natural acidity caused by climate conditions in the wine region by reducing titratable acidity and actual acidity (increase in the pH)
b) Develop balanced wines in terms of taste

Prescriptions:

a) Refer to the general file on separative techniques used in the processing of musts and wines and the file on the application of membrane techniques to wines.
b) De-acidification using an electromembrane process should not be intended to hide a fault.
c) The anionic membranes must be placed in such a way that they only allow the extraction of anions and in particular the organic acids from the wine.
d) The bipolar membranes are impermeable to anions and cations in the wine.

e) The wine from a de-acidified wine should contain at least 1g/L of tartaric acid.
f) De-acidification by membrane process and acidification are mutually exclusive;

g) An oenologist or qualified technician will be responsible for implementing the process.
h) The membranes used must comply with the prescriptions contained in the "International Oenological Codex"

OIV recommendation:

Accepted.

3. WINES

3.2 CLARIFICATION OF WINE

3.2.1 FINING (OENO 7/99), (OENO 6/04), (OENO 9/04) (OENO 339A-2009), (OENO 339B-2009, OENO 417-2011)

Classification :

Alginic acid : processing aid
Chitin-glucan : processing aid
Chitosan : processing aid
Isinglass : processing aid
Kaolin : processing aid
Gelatin : processing aid
Egg (albumin) : processing aid
Colloidal silicon dioxide solution: processing aid

Definition :

Clarification of wine by addition of substances that precipitate particles in suspension :
- Whether by promoting the natural sedimentation of the former, or
- By coagulating around the particles to be eliminated and by entraining them in sediments.

Objectives :

a) To complete spontaneous clarification on those occasions when it is unsatisfactory.
b) To soften red wines by removing from them some of the tannins and polyphenols.
c) To clarify wines with haze problems, stirred up lees, insoluble coloured matter, etc.

Prescriptions :

a) For clarifying agents promoting simply the sedimentation of particles, refer to Treatment with bentonites[29]
b) For the coagulating clarifying agents, only the following products are admissible: gelatin, albumin and white of egg, isinglass, skim milk, casein, alginates, colloidal solution of silicon dioxide, kaolin, potassium caseinate, proteins of plant origin, chitosan, chitin-glucan, yeast protein extracts.
c) The substances used shall to comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV :
Accepted.

[29] This definition applies solely to wines stricto sensu such as defined in the Part I, chap.3 "Wines" of the present Code.

3. WINES

3.2.2 FILTRATION (2/89)

Classification :

Diatomite : processing aid
Perlite : processing aid

Definition :

Physical process consisting of passing the wine through appropriate filters that retain particles in suspension.

Objectives :

a) Clarifying the wine, if necessary by successive stages (clarifying filtration) .
b) Obtaining biological stability of the wine by elimination of microorganisms (sterilising filtration).

Prescriptions :

Filtration can be undertaken :

a) By continuous deposition, using appropriate additives such as diatomaceous earth, perlite, cellulose…,
b) On pads of cellulose or other appropriate materials,
c) On mineral or organic membranes of a porosity greater than or equal to 0.2 μm (microfiltration).

The filter materials used shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of OIV:
Refer to the practices and treatments mentioned hereafter.

3. WINES

3.2.2.1 FILTRATION BY CONTINUOUS DEPOSITION (1/90)

Definition :

Filtration of the wine, after formation of a filter bed, which is then fed constantly by a continuous addition of filter material into the wine to be clarified.

Objective :

To obtain a suitable level of clarity, to a given technological stage, by the elimination of substances in suspension in the wine.

Prescriptions :

a) The nature of the filter material (such as diatomaceous earth, perlite and cellulose) and the necessary dose are determined by the turbidity of the wine and the clarification sought.
b) The filter materials used shall comply with the prescriptions of the *International Oenological Codex*.

Recommendation of OIV:

Accepted.

3. WINES

3.2.2.2 STERILISING FILTRATION (1/90)

Definition :

Filtration of wines on materials allowing the elimination of microorganisms.

Objective :

To obtain biologically stable wines for bottling.

Prescriptions :

a) The objective can be achieved by the use of the following, having regard to conditions of pressure, flow and recommended duration:
- Special prefabricated pads of cellulose or other materials ;
- Membranes having a maximum average pore diameter of 0.65 µm.

b) The filtration equipment must be sterilised beforehand by passing hot water or steam through them.
c) The materials used shall comply with the prescriptions of the *International Oenological Codex*.

Recommendation of OIV :

Accepted.

3. WINES

3.2.3 RACKING (16/70), (OENO 6/02)

Classification :

Nitrogen : processing aid
Argon : processing aid

Definition :

Operation involving the transfer of wine from one wine container to another by allowing the separation of solid deposits from the liquid.

Objectives:

a) Separate wine from the lees, and/or the deposits resulting from the addition of clarifying agents, deposited at the bottom of the container

b) Separate the wine from the micro-organisms at the end of the alcoholic and/or malolactic fermentation, or the bacterial or yeast sediment

c) Enable the carrying out of all wine making operations, treatment or transportation of wines.

d) Enable the tartaric stabilization by cooling and the separation of tartrate crystals (potassium bitartrate and calcium tartrate).

Prescriptions :

Racking can occur:

a) Either in the absence of air to avoid oxidation,

b) Or with aeration to eliminate hydrogen sulfide or to reduce carbon dioxide or to create controlled oxidation,

c) Or at room temperature, or after cooling to avoid possible carbonic gas loss,

d) Or using the law of interconnected vessels, either with pumps or hand containers

e) In the case of racking in the absence of air, the container to be filled must be rendered inert with carbon dioxide, nitrogen or with argon. These gases must comply with International Oenological Codex prescriptions.

Recommendation of OIV :

Accepted.

3. WINES

3.2.4 TREATMENT WITH SILICON DIOXIDE (1/91)

Classification :

Colloidal silicon dioxide solution: processing aid

Definition :

Addition to wine of a colloidal solution (gel) of silicon dioxide coupled with the addition of a gelatin solution or, possibly, with other proteinaceous finings.

Objective :

To achieve the flocculation of the gelatin and possibly other proteinaceous finings, with a view to clarification.

Prescriptions :

a) The product is added to young white wines and rosés and occasionally to red wines.
b) Preliminary tests are necessary to determine optimal doses of the colloidal solutions of silicon dioxide and gelatin or possibly, of other proteinaceous finings.
c) The products shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of OIV:

Accepted

3. WINES

3.2.5 DECANTING (RACKING) (5/88), (OENO 1/04)

Definition :

Operation consisting of transferring from one wine tank to another:
- A still wine at normal pressure,

Objectives :

a) To separate wines from their lees, deposited on the bottom of the container.
b) To prepare for mixing or blending operations.
c) To prepare for physical clarification by filtration, centrifugation, etc.
d) To achieve bulk transportation of the wine.

Prescriptions :

Decanting can be performed:

a) Either under protection from air so as to avoid all oxidation, or
b) With aeration, to eliminate hydrogen sulphide or to reduce the carbon dioxide or to create a managed oxidation.

Recommendation of OIV:

Accepted.

3. WINES

3.2.6 TANNIN ADDITION (16/70, OENO 613-2019)

Definition:

Addition of tannins to wine.

Objectives:

a) To facilitate the stabilisation of wines by partial precipitation of excess proteinaceous matter;
b) to facilitate the fining of wines in conjunction with protein-type fining agents and prevent over-fining;
c) to contribute to the antioxidant and antioxidasic protection of compounds of the wine;
d) to promote the expression, stabilisation and preservation of colour in red wines.

Prescription:

The tannins used should comply with the prescriptions of the *International Oenological Codex .*

Recommendation of OIV:

Accepted.

3. WINES

3.2.7 FINING USING PROTEINS OF PLANT ORIGIN (OENO 8/04, OIV-OENO 740-2024)

Classification :

Protein of plant origin from peas: processing aid
Protein of plant origin from potatoes: processing aid

Objectives :

Use of protein matter of plant origin for the fining of wines in order to improve their clarity, stability and gustatory properties.

Prescriptions:

1. The doses to be used are determined after a preliminary test trial. The maximum usage dose should be less than 50 g/hl. After racking, the wines are analysed (turbidity, colour, absorbance at 280nm) and tasted. The dose retained corresponds to the sample which clarifies the wine without excess and gives a better result for tasting.

2. Proteins of plant origin can be used with other admitted products such as tannins, bentonite, silica gel

3. Proteins of plant origin must comply with the prescriptions of the *International Oenological Codex* .

Recommendation of OIV:

Accepted.

3. WINES

3.2.8 USE OF ENZYMES FOR IMPROVING FILTERABILITY OF WINES (OENO 15/04, OENO 498-2013, OENO 682-2021)

Classification :

Arabinanases : processing aid
Cellulases : processing aid
Pectinlyases : processing aid
Pectinemethylesterase : processing aid
Polygalacturonases : processing aid
Hemicellulases : processing aid

Definition:

Addition to wine of enzymatic preparations containing activities catalysing the degradation of plugging macromolecules of grapes which went into the must and in wine during the vinification process, as well as plugging macromolecules of bacterial or fungal origin.
Enzyme activities involved in improving the filterability of wines notably include arabinanases, rhamnogalacturonases, and hemicellulases, and to a lesser extent polygalacturonases, pectin lyases and pectinmethylesterases, as well as β-glucanases if wines come from botrytised grapes or have a high glucans content from yeast cell walls

Objective:

To improve the filterability of wines by specific hydrolysis of colloids.

Prescription:

The enzymes used must comply with the prescriptions of the *International Oenological Codex*.

Recommendation of OIV:

Accepted.

3. WINES

3.2.9 USE OF ENZYMES FOR THE RELEASE OF FLAVOURING COMPOUNDS FROM GLYCOSYLATED PRECURSORS (OENO 17/04, OENO 498-2013)

Classification :
Glycosidases: processing aid
Glucosidases: processing aid

Definition:

Addition to wine of enzymatic preparations containing activities catalysing the hydrolysis of the saccharide portion of the glycosylated aromatic substances (flavour precursors) of grapes which went into the must and the wine during the vinification process.
The enzymatic activities involved in the release of flavouring substances are glycosidases and glucosidases.

Objective:

to enhance the aromatic potential of wine

Prescription:

The enzymes used must comply with the prescriptions of the *International Oenological Codex*.

Recommendation of OIV:

Accepted.

3. WINES

3.2.10 USE OF ENZYMES FOR IMPROVING THE SOLUBILISATION OF YEAST COMPOUNDS (OENO 18/04)

Classification :

Beta-glucanases : processing aid

Definition:

The addition to wine during winemaking on lees of enzymatic preparations notably with β-glucanase activities that catalyse the degradation of yeast cell walls.

Objectives:

a) To facilitate the release of yeast-soluble constituents into wine.
b) To improve the colloidal stability of wines.

Prescription:

The enzymes used must comply with the prescriptions of the *International Oenological Codex*.

Recommendation of OIV:

Accepted.

3. WINES

3.2.11 USE OF ENZYMES FOR THE CLARIFICATION OF WINES (OENO 12/04, OENO 498-2013, OENO 682-2021)

Classification :

Arabinanases : processing aid
Cellulases : processing aid
Pectinlyases : processing aid
Pectinemethylesterase : processing aid
Polygalacturonases : processing aid
Hemicellulases : processing aid
β-glucanases : processing aid

Definition:

Addition to wine of enzymatic preparations containing activities catalysing the degradation of grape macromolecules which went into the must and wine, as well as macromolecules of bacterial or fungal origin.
Enzyme activities involved in the clarification of wines notably include polygalacturonases, pectin lyases, pectinmethylesterases, and to a lesser extent arabinanases, rhamnogalacturonases, cellulases and hemicellulases, as well as β-glucanases if wines come from botrytised grapes

Objective:

To facilitate the clarification of wines.

Prescription:

The enzymes used must comply with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV

Admitted

3. WINES

3.2.12 FINING USING CHITOSAN (OENO 337A-2009)

Classification :
Chitosan : processing aid

Definition:

Addition of chitosan of fungal origin for the purpose of fining wines

Objectives:

a) To reduce turbidity by precipitating particles in suspension.
b) To carry out a treatment to prevent protein haze by the partial precipitation of excess proteinaceous matter.

Prescriptions:

a) The doses to be used are determined after preliminary testing. The maximum dose used must not exceed 100 g/hl.
b) Sediments are eliminated by physical procedures.
c) Chitosan of fungal origin may be used alone or together with other admitted products.
d) Chitosan must comply with the requirements of the International Oenological Codex.

Recommendation of the OIV
Admitted

3. WINES

3.2.13 FINING USING CHITIN-GLUCAN (OENO 337B-2009)

Classification:
chitin-glucan: Processing aid

Definition:

Addition of chitin-glucan of fungal origin for the purpose of fining wines

Objectives:

a) To reduce turbidity by precipitating particles in suspension
b) To carry out a treatment to prevent protein haze by the partial precipitation of excess proteinaceous matter.

Prescriptions:

a) The doses to be used are determined after preliminary testing. The maximum dose used must not exceed 100 g/hl.
b) Sediments are eliminated by physical procedures.
c) Chitin-glucan of fungal origin may be used alone or together with other admitted products.
d) Chitin-glucan must comply with the requirements of the International Oenological Codex.

Recommendation of the OIV

Admitted

3. WINES

3.2.14 FINING USING YEAST PROTEIN EXTRACTS (OENO 417-2011)

Classification :
Yeast protein extracts: processing aid

Definition:

Addition of yeast protein extracts for fining wines

Objectives:

a) Reduce turbidity of wines by precipitating suspended particles
b) Preserve chromatic characteristics of wines
c) Eliminate excess tannin
d) Improve wine filterability

Prescriptions:

a) The doses used are determined beforehand by laboratory trials (fining point)
b) Maximum dose to be used as determined by an efficiency test conducted in laboratory must not exceed 60 g/hl for red wine and 30 g/hl for white and rosé wine
c) The yeast protein extracts can be used alone or associated with other authorised fining products
d) The deposits from the fining are to be eliminated from wine by physical procedures
e) The yeast protein extracts must comply with the prescriptions of the International Oenological Codex

Recommendation of the OIV:

Admitted.

3. WINES

3.2.15 USE OF FILTER PLATES CONTAINING ZEOLITES Y-FAUJASITE TO ADSORB HALOANISOLES (OENO 444-2016)

Definition

Treatment using a filter plate containing zeolites Y-faujasite applied during filtration.

Objectives

a) To reduce the concentration of haloanisoles responsible for off-flavour in wines, below their sensory perception threshold.

Prescriptions

a) the treatment should be carried out on clarified wines;
b) the filter plates should be cleaned and disinfected before filtration;
c) the application of zeolites Y-faujasite should comply with the prescriptions in the International Oenological Codex.

OIV Recommendation:

Admitted

3. WINES

3.3 PHYSICO-CHEMICAL STABILISATION OF WINE

3.3.1 REMOVAL OF IRON (16/70)

Classification :

Potassium hexacyanoferrate (II): processing aid
Calcium phytate : processing aid

Definition :

Treatment designed to eliminate excess iron in wine.

Objective :

Prevention of iron hazes.

Prescription :

One of the following treatments is used, with or without a combined oxygenation:

- Tannin addition and fining,
- Addition of calcium phytate,
- Use of potassium ferrocyanide,
- Use of iron-removing carbon (not accepted),
- Use of citric acid.

Recommendation of the OIV:

Refer to the treatments and practices mentioned above.

3. WINES

3.3.2 TARTRATE STABILISATION BY ELECTRODIALYSIS (OENO 1/93)

Definition :

Physical method for the extraction of ions in super-saturation in the wine under the action of an electric field with the help of membranes permeable only to anions on the one hand, and membranes permeable only to cations on the other hand.

Objective :

To obtain a tartrate-stable wine :
- With respect to potassium hydrogen tartrate
- With respect to calcium tartrate (and other salts of calcium).

Prescriptions :

a) The membranes are flat and arranged alternately in a system typical of a filter-press, that establishes compartments of processing (wine) and concentration (reject water).
b) Cation exchange membranes shall be adapted to the extraction of only cations and in particular: K^+, Ca^{++}.
c) Anion exchange membranes shall be adapted to the extraction of only anions and especially of tartrate anions.
d) The equipment used will be operated under a control system that takes into account the instability of each wine in such a way that only the super-saturation in potassium hydrogen tartrate and in salts of calcium is eliminated.
e) The implementation of the process will be under the responsibility of an oenologist or specialist technician.
f) The membranes shall comply with the prescriptions of the *International Oenological Codex* and shall not to lead to

excessive modifications of the physico-chemical composition and sensory characteristics of the wine.

Recommendation of OIV

Accepted.

3. WINES

3.3.3 TARTRATE STABILISATION BY TREATMENT WITH CATION EXCHANGERS (OENO 1/93, OENO 447-2011)

Definition :

Operation consisting of passing the wine through a column of polymerised resin that reacts as an insoluble polyelectrolyte whose cations are able to be exchanged with cations of the surrounding medium.

Objective :

To obtain a tartrate-stable wine:

- With respect to potassium hydrogen tartrate
- With respect to calcium tartrate (and other salts of calcium).

Prescriptions :

a) The treatment must be limited to the elimination of excess cations.
- The wine may be initially cold treated.
- Only the minimum fraction of a wine necessary for obtaining stability will be treated with cation exchangers.

b) The treatment will be performed using cation exchange resins regenerated in the acid cycle.
c) The whole process will be placed under the responsibility of a oenologist or specialist technician.
d) The resins shall comply with the prescriptions of the *International Oenological Codex* and shall not lead to excessive modifications of the physico-chemical composition and sensory characteristics of the wine.

Recommendation of OIV

Accepted.

3. WINES

3.3.4 COLD STABILISATION TREATMENT (5/88), (OENO 2/04)

Definition :

Operation that consists of chilling the wine.

Objectives :

a) To promote the crystallisation and precipitation of potassium and calcium tartrates, the precipitation of colloids and also to improve the stability of wine.

Prescriptions :

- For objective (a), the treatment is performed using mechanical refrigeration or natural cold sources, with or without addition of potassium bitartrate crystals followed by the separation by physical techniques of the crystals and colloids precipitated.

Recommendation of OIV :

Accepted.

3. WINES

3.3.5 TREATMENT WITH BENTONITES(16/70)

Classification :

Bentonites : processing aid

Definition

Addition of bentonites to wine.

Objective :

To prevent protein and copper hazes.

Prescription :

The substances used shall comply with the prescriptions of the *International Oenological Codex*

Recommendation of the OIV:

Accepted.

3. WINES

3.3.6 TREATMENT WITH GUM ARABIC (AG 12/72-OEN, OIV-OENO 689-2022)

Classification :

Arabic gum : additive

Definition :

Addition of gum arabic to wine.

Objectives :

a) To avoid copper haze.
b) To protect wine against light iron haze.
c) To prevent the precipitation of substances such as pigments that, in the wine, are in the colloidal state.

Prescriptions :

a) The product should be added to the wine after the last filtration, or just before bottling.
b) The dose used shall not exceed 0.8 g/L for red liqueur wines and 0.3 g/L for other wines.
c) The gum arabic shall comply with the prescriptions of the International Oenological Codex

Recommendation of OIV :

Accepted.

3. WINES

3.3.7 TREATMENT WITH METATARTARIC ACID (16/70)

Classification :

Metartaric acid: additive

Definition :

Addition of metatartaric acid to wine.

Objective :

To prevent the precipitation of potassium hydrogen tartrate and calcium tartrate.

Prescriptions :

a) The addition should take place only at the last moment, before bottling.
b) The dose used shall be less than or equal to 10 g/hl.
c) The duration of protection depends on the storage temperature of the wine, because the acid in question hydrolyses slowly in the cold, but rapidly under hot conditions.
d) The metatartaric acid shall comply with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

Accepted.

3. WINES

3.3.8 TREATMENT WITH CITRIC ACID (16/70)

Classification :

Citric acid, monohydrate : additive

Definition :

Addition of citric acid to wine.

Objective :

To bind ferric ions in a soluble complex anion and thus to lessen the tendency to form iron hazes.

Prescriptions :

a) The maximum citric acid content of the wine at the point of consumption shall be 1 g/l.
b) The citric acid used shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of the OIV:

Accepted.

3. WINES

3.3.9 TREATMENT WITH IRON-REMOVING CARBON (6/76)

Definition :

Addition to wine of carbon specially prepared for the removal of iron from wines.

Objective :

To prevent iron hazes.

Recommendation of OIV:

Not accepted.

3. WINES

3.3.10 TREATMENT WITH POTASSIUM FERROCYANIDE (16/70)

Classification:
potassium ferrocyanide: Processing aid

Definition :

Addition of potassium ferrocyanide to wine.

Objective :

To lessen the wine's content:
- Of iron to avoid iron hazes,
- Of copper to avoid copper hazes,
- And more generally of heavy metals.

Prescriptions :

a) This procedure can be executed only by a responsible and qualified technician.
b) The main operation must be preceded by trials to determine the amount of product to add.
c) The main operation should be followed by an examination of the treated wine, to determine the absence of an excess of ferrocyanide or its derivatives.
d) The potassium ferrocyanide used shall comply with the prescriptions of the *International Oenological Codex .*

Recommendation of OIV:

Accepted.

3. WINES

3.3.11 TREATMENT WITH CALCIUM PHYTATE (12/72)

Classification:
calcium phytate: Processing aid

Definition :

Addition to wine of calcium phytate (or the calcium salt of the hexaphosphoric ester of inositol) .

Objective :

To prevent iron hazes in the case of wines high in iron, but having no excess copper.

Prescriptions :

a) It is necessary to perform preliminary tests and performance trials, given that the treatment gives uncertain results.
b) The use of hydrochloric acid to dissolve calcium phytate before its addition to the wine is positively forbidden.
c) The calcium phytate used shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of the OIV:

Accepted.

3. WINES

3.3.12 CALCIUM TARTRATE TREATMENT (OENO 8/97)

Classification:

Calcium tartrate: processing aid

Definition:

Addition of calcium tartrate to wine.

Objective:

to contribute to the tartaric stabilisation of wine by decreasing the content of potassium hydrogenotartrate and calcium tartrate.

Prescriptions:

a) The dose used must be inferior to 200g/hl.

b) The treatment is carried out by calcium tartrate addition, stirring and artificial cooling of the wine followed by the separation with crystals formed by physical means.

c) Calcium tartrate must conform to the prescriptions of the *International oenological codex.*

Recommendation of the OIV:

Accepted.

3. WINES

3.3.13. TREATMENT OF WINES WITH YEAST MANNOPROTEINS (OENO 4/01; 15/05)

Classification :

Yeast mannoproteins : additive

Definition:

Treatment of wines by using mannoproteins from yeast wall degradation.

Objective:

Improve stability of wine only with regards to tartaric salts and/or its proteins in the case of white or rosé wines

Prescriptions:

a) The doses that should be used will be established by the person in charge of the treatment;
b) for certain young red and rosé wines the person in charge of the treatment should consider a pre-treatment using yeast cell walls if the mannoproteins alone do not present the sought after efficiency;
c) Mannoproteins must comply with the provisions of the International Oenological Codex.

Recommendation of OIV:
Accepted.

3. WINES

3.3.14. TREATMENT WITH CELLULOSE GUMS (CARBOXYMETHYLCELLULOSE) (OENO 2/08, OENO 586-2019, OENO 659-2020)

Classification :
Sodium Carboxymethylcellulose: additive

Definition:
Addition of cellulose gums to white, rosé and sparkling wines

Objective:
Contribute to the tartaric stabilisation of white wine and sparkling wine

Prescriptions:
a) The dose of carboxymethylcellulose to be used should be below 200 mg/L
b) For questions of incorporation, it is preferable to use products in granulated form or less viscous products.
c) Carboxymethylcellulose may cause instability in the presence of proteins and polyphenols
d) Cellulose gums used must be in accordance with the provisions of the International Oenological Codex.

Recommendation of the OIV:
Admitted.

3. WINES

3.3.15. TREATMENT WITH POTASSIUM POLYASPARTATE (OENO 543/2016)

Classification:
Potassium polyaspartate : *additive*

Definition:

Addition of potassium polyaspartate to wines

Objective:

Contribute to the tartaric stabilization of wines

Prescription:

a) The optimum dose of potassium polyaspartate used to stabilize wines, also those with a high degree of tartaric instability, must not exceed 10 g/hL. At higher doses, the potassium polyaspartate's (KPA) stabilizing performance is not improved and, in some cases, an increase of wine turbidity could be induced;
b) for red wines with high colloidal instability, prior treatment with bentonite is recommended;
c) the application of potassium polyaspartate must be in accordance with the prescriptions of the International Oenological Codex.

Recommendation:

Accepted.

3. WINES

3.3.16. USE OF ASPERGILLOPEPSIN I TO REMOVE HAZE-FORMING PROTEINS (OENO 541B/2021)

Definition:
The addition to wine of Aspergillopepsin I from *Aspergillus spp*. to remove haze-forming proteins

Objective:
To prevent protein haze in still white and rosé wines and sparkling wines.

Prescription:

a) After addition of Aspergillopepsin I preparation, one short-term wine heating must be applied as it contributes to the unfolding of haze-forming proteins and facilitates their enzymatic degradation by proteases, as well as leads to a denaturation of the protease itself.

This single heat treatment must take into account:

- the activity of the Aspergillopepsin I preparation as regards temperature
- the quantity of Aspergillopepsin I used
- The minimum temperature of treatment should be at or above the denaturation temperature of the proteins, generally comprised between 60 and 75 °C.
- the heating time, generally around 1 minute. Too long heating time could induce negative organoleptic impact.

This loss of three-dimensional conformation of TLPs (Thaumatin Like Proteins) is reversible, so the heating has to be simultaneous to the addition of enzymes for optimal efficiency.

b) The wine is immediately cooled to an appropriate temperature.
c) A filtration must be performed to remove the residual proteins (including added proteases and other proteins).
d) The enzymes used must comply with the prescriptions of the International Oenological Codex.

Recommendation:
Admited.

3. WINES

3.3.17. TREATMENT WITH FUNCTIONALISED MESOPOROUS SILICA (FMS) (OIV-OENO 672B-2024)

Classification:
Functionalised mesoporous silica: processing aid

Definition:
Addition of functionalised mesoporous silica to wine to remove unstable proteins from wines.

Objective:
To selectively absorb and eliminate unstable proteins present in wine.

Prescription:
a) Treatment with FMS may be carried out discontinuously in the tank (static clarification) or by passing the wine over a layer of FMS within a continuous system (percolation); the regeneration of FMS allows it to be re-used;
b) The dose to be used, determined by a pre-test, at approx. 10-150 g/hL;
c) FMS is a product that does not require any preparation steps (such as, for example, rehydration), and in the case of discontinuous treatment, can be added directly to wine while mixing the mass by pumping-over;
d) after treatment with functionalised mesoporous silica, the wine should be filtered through a filtering medium with a pore diameter no larger than 0.45 µm;
e) The FMS should comply with the prescriptions of the International Oenological Codex

OIV Recommendation:
Admited.

3. WINES

3.4 PROTECTION AND PRESERVATION OF WINE

3.4.1 TOPPING UP (5/88)

Definition :

Operation consisting of the addition of wine to a wine container in order always to keep it full and to compensate for normal storage losses.

Objective :

To avoid all contact of the wine with air which could lead to oxidation or aerobic microbial growth.

Prescription :

The wine used for topping up should be the same wine or to have similar characteristics to those of the wine to which it is added so as not to modify its quality.

Recommendation of OIV :

Accepted.

3. WINES

3.4.2 BIOLOGICAL STABILISATION (1/91, OENO 581A-2021)

Definition :

Processing designed to eliminate undesirable microorganisms or to inhibit their development.

Objective :

To obtain biological stability of the wine.

Prescriptions :

To achieve the objective, the following procedures may be used:

a) Heat Treatment
   - Pasteurisation,
   - Hot bottling

b) Sterilising filtration.

c) The application of microbial inhibitors, such as sulphite, sorbic acid, fumaric acid, dimethyl dicarbonate (**) and diethyl dicarbonate (not accepted).

d) Depletion of the must in undesirable microorganisms (filtration, centrifugation) and in nutritional elements by development of successive generations of microorganisms followed by their elimination.

Recommendation of OIV:

Refer to the practices and treatments mentioned above.

3. WINES

3.4.3 PASTEURISATION (5/88)

Definition :

Heating wine to a specified temperature for a given time.

Objectives :

a) To inhibit the activity of microorganisms present in the must at the time of treatment.
b) To inactivate enzymes present in the wine.

Prescriptions :

a) Pasteurisation can be performed :
- In bulk (see Bulk pasteurisation);
- In bottle (see In-bottle pasteurisation).

b) Pasteurisation can be achieved using different techniques.
- By passage of the wine through a heat exchanger followed by rapid cooling.
- By bottling and corking the wine hot, followed by natural cooling (see Hot bottling)
- By heating the wine in bottles, followed by cooling.

c) The increase in temperature and the techniques used shall cause no alteration in the appearance, colour, odour or taste of the wine.

Recommendation of OIV:

Refer to the practices and treatments mentioned above.

3. WINES

3.4.3.1 BULK PASTEURISATION (1/90)

Classification :

Liquide sulphur dioxide: additive

Definition :

Heating wine to a specified temperature for a given time.

Objectives :

a) See 3.4.3.
b) To inactivate oxidative enzymes when they are present in the wine.

Prescriptions :

a) Bulk pasteurisation is performed by passing the wine through a heat exchanger followed by cooling. It can take two forms:
    - Simple pasteurisation,
    - Flash pasteurisation.

   Flash pasteurisation is distinguished from simple pasteurisation by rapid heating, to a higher temperature, for a very short time, followed by rapid cooling.
b) The treatment should not produce any alteration in the clarity, colour, odour or taste of the wine.

Recommendation OIV:

Accepted.

3. WINES

3.4.4 SULPHITING (OENO 7/03)

Classification:

Sorbic acid: additive
Potassium sorbate: additive

Definition:

The addition of gaseous sulphur dioxide, sulphuric solutions or potassium metabisulphite solutions to wine.

Objectives:

a) To obtain the microbiological stabilisation of wine by limiting and/or preventing the growth of yeast and technologically unwanted bacteria,

b) To use its reducing and antioxidant properties,

c) To combine certain molecules that give undesirable odours,

d) To inhibit possible oxidasic activities.

Prescriptions:

a) The total sulphur dioxide contents when marketed must at least comply with the limits set by *Annex C of the Compendium of International Methods of Analysis of Wine and Musts.*

b) The addition of sulphur dioxide can be carried out by:
- the direct addition to wine during the wine making process,

- the direct addition to the wine prior to bottling,
- the direct injection to the wine prior to filling,
- the direct injection in the empty bottle prior to filling.

c) The products used must comply with the prescriptions of the *International Oenological Codex.*

OIV Recommendation:

Admitted.

3. WINES

3.4.5 TREATMENT WITH SORBIC ACID (5/88)

Classification:
Sorbic acid: Additive

Definition :

Addition to wine of sorbic acid or potassium sorbate.

Objectives :

a) See 3.4.2 .
b) To prevent the re-fermentation of wines containing fermentable sugars.
c) To prevent the development of undesirable yeasts.

Prescriptions :

a) The addition should take place only a shortly before bottling.
b) The dose used shall not exceed 200 mg/l expressed as sorbic acid.
c) The sorbic acid and potassium sorbate shall comply with the prescriptions of the International Oenological Codex

Recommendation of the OIV:

Accepted.

3. WINES

3.4.6 TREATMENT WITH OILS (5/88)

Definition :

Use of mineral oils.

Objective :

To eliminate accidental taints in wine by intimate mixing of the oil and the wine.

Recommendation of the OIV:

Not accepted.

3. WINES

3.4.7 TREATMENT WITH ASCORBIC ACID (OENO 12/01)

Classification:

Ascorbic acid: additive
Erythorbic acid: additive

Definition:
Addition of ascorbic acid[30] to wine.

Objective:
Protect the wine through the antioxidant properties of the product, against the influence of oxygen in the air, which modifies its colour and flavour.

Prescriptions:
a) It is recommended to add ascorbic acid during bottling, otherwise it oxidises in the presence of air and the oxidation product causes far more significant oxidative alterations in the wine than those resulting from oxygen in the air in the absence of ascorbic acid.
b) The dose used shall not exceed 250 mg/l.

[30] *Isoascorbic acid, or D-ascorbic acid or erythorbic acid has the same antioxidant power as ascorbic acid and can be used for the same oenological purpose.*
This acid exhibits the same appearance and the same solubility properties as ascorbic acid.
With the exception of rotatory power, this acid should exhibit the same properties as ascorbic acid, respond in the same way to the identifying reactions, pass the same tests and responds to the same quantitative analysis. (Cf Codex sheet COEI-1-ASCACI : 2007)

c) When the ascorbic acid has also been used on grape or must, the final concentration, in terms of ascorbic plus dehydroascorbic acid, shall not exceed 300 mg/l.
d) The ascorbic acid shall comply with the prescriptions of the International Oenological Codex.

Recommendation of OIV:
Accepted.

3. WINES

3.4.8 TREATMENT WITH DIETHYL DICARBONATE (16/70) (7/77)

Definition :

Addition of diethyl dicarbonate to wine.

Objective :

To stabilise wine from a biological point of view by chemical treatment.

Recommendation of OIV :

Not accepted.

3. WINES

3.4.9 TREATMENT WITH POLYVINYLPOLYPYRROLIDONE (PVPP) (5/87)

Classification:

Polyvinylpolypyrrolidone: processing aid

Definition:

Addition to wine of polyvinylpolypyrrolidone (PVPP).

Objectives :

To reduce the content of tannin and other polyphenols in the wine with a view:
- To overcoming the tendency to brown,
- To reducing the astringency,
- To correcting the colour of slightly discoloured white wine.

Prescriptions :

a) The dose of PVPP used shall not exceed 80 g/hl.
b) The PVPP used shall comply with the prescriptions of the International Oenological Codex .

Recommendation of OIV :

Accepted.

3. WINES

3.4.10 TREATMENT WITH POLYAMIDES (12/72)

Definition :

Addition to wine of a powder or paste of polyamide.

Objectives :

a) To reduce the content of tannin and other polyphenols in wine.
b) To combat the tendency to browning.

Recommendation of OIV:

Not accepted.

3. WINES

3.4.11 TREATMENT OF WINES WITH UREASE (OENO 2/95)

Classification :

Urease: processing aid

Definition :

Addition to wine of an active acid urease, produced from *Lactobacillus fermentum*.

Objective :

To reduce the level of urea in wines, when this is excessive, in order to avoid the formation of ethyl carbamate during ageing. The enzyme transforms urea into ammonia and carbon dioxide.

Prescriptions :

a) It is preferable to add the urease to wine already clarified by spontaneous sedimentation of the lees.
b) A knowledge of the level of urea in the wine will allow assessment of the dose of urease to be added.
c) The urease will be eliminated during the filtration of the wine.
d) The urease shall comply with the prescriptions of *the International Oenological Codex* .

Recommendation of OIV :

Accepted.

3. WINES

3.4.12 LYSOZYME TREATMENT (OENO 10/97)

Classification :

Lysozyme : additive

Definition:

Addition of lysozyme to the wine.

Objectives:

a) Control of the growth and activity of the bacteria responsible for malolactic fermentation of the wine.

b) Reduction of the rate of sulphur dioxide.

Prescriptions:

a) According to experiments, the maximum dose of 500 mg/l appears to be sufficient to control the growth and the activity of the bacteria responsible for malolactic fermentation.

b) Lysozyme cannot totally substitute itself to SO_2 which possesses antioxidant properties. A SO_2 + lysozyme association provides more stable wines.

c) When must and wine are treated with lysozyme, the cumulative dose must not exceed 500 mg/l.

d) The product must conform to the prescriptions of the *International oenological codex.*

Recommendation of the OIV:

Accepted.

3. WINES

3.4.13. TREATMENT WITH DIMETHYL DICARBONATE (DMDC) (OENO 5/01, OENO 421-2011)

Definition:
Addition of dimethyl dicarbonate to wine.

Objectives:

a) Obtain microbiological stability of bottled wine containing fermentable sugars;
b) Prevent the development of unwanted yeast and lactic bacteria.
c) Block fermentation of sweet, medium sweet, and medium dry wines

Prescriptions:

a) For objective a), should only be added shortly before bottling;
b) The dosage should be no more than 200 mg/l expressed as dimethyl dicarbonate;
c) The addition of dimethyl dicarbonate must not lead to surpassing the maximum content level for methanol in wine, as recommended by the OIV.
d) The wine should not be placed on the market as long as dimethyl dicarbonate is detectable.
e) The dimethyl dicarbonate used, must comply with the provisions of the International Oenological Codex.

OIV Recommendation:
Accepted.

3. WINES

3.4.14. ADSORBANT COPOLYMER TREATMENT (PVI/PVP) (OENO 2/07, OENO 262-2014)

Classification:

PVI/PVP copolymer: processing aid

Definition:
The addition of polyvinylimidazole – polyvinylpyrrolidone copolymers (PVI/PVP) in order to reduce copper, iron and heavy metal contents.

Objectives:
a) To prevent defects caused by too high metal contents (for example ferric casse).
b) To reduce undesirable, high concentration of metals due to:
   - Must contaminated by metal cations
   - Metal cation contamination during must or wine treatment from winemaking equipment
   - Enrichment in copper following the treatment of wines by copper sulphate.

Prescriptions:
a) The amount used should be less than 500 mg/l.
b) When musts and wine are treated with PVI/PVP polymers, the accumulated dosage should be less than 500 mg/l.
c) The copolymers should be eliminated after no more than 2 days after the addition taking into account the precautionary principle and separated from the wine by filtering before bottling
d) The adsorbant copolymers used should comply with the prescriptions of the International Oenological Codex and in particular monomers limits.

e) The implementation of the procedure shall be placed under the responsibility of an oenologist or a specialised technician.

Recommendation of the OIV:
Admitted.

3. WINES

3.4.15. TREATMENT WITH D,L-TARTARIC ACID (OENO 4/08)

Classification:

D,L-tartaric acid: processing aid
Potassium D,L-tartrate: processing aid

Definition:

Addition of D,L-tartaric acid or the potassium-salts of D,L-tartaric acid in wine

Objectives:

Reduction of excessive levels of calcium

Prescriptions:

a) The treatment yields particularly insoluble salts. The use of D,L-tartaric acid is subject to certain regulations.
b) The treatment will be placed under the responsibility of an oenologist or a specialist technician.
c) The products added shall comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV:

Admitted

3. WINES

3.4.16. TREATMENT USING CHITOSAN (OENO 338A/2009)

Classification :

Chitosan : processing aid

Definition:

Addition of chitosan of fungal origin to wines

Objectives:

a) To reduce heavy metal content, notably iron, lead, cadmium, copper,
b) To prevent iron haze, copper haze,
c) To reduce possible contaminants, especially ochratoxin A,
d) To reduce undesirable micro-organisms, notably *Brettanomyces*.

Prescriptions:

a) The doses to be used are determined after preliminary testing. The maximum dose used must not exceed :
   - 100 g/hl for the objectives a) and b)
   - 500 g/hl for the objective c)
   - 10 g/hl for the objective d)
b) Sediments are eliminated by physical procedures.
c) Chitosan of fungal origin may be used alone or together with other admitted products.
d) Chitosan must comply with the requirements of the International Oenological Codex.

Recommendation of the OIV:

Admitted

3. WINES

3.4.17. TREATMENT USING CHITIN-GLUCAN (OENO 338B/2009)

Classification :
Chitin-Glucan : processing aid

Definition:

Addition of chitin-glucan of fungal origin to wines

Objectives:

a) To reduce heavy metal content, notably iron, lead, cadmium, copper,
b) To prevent iron haze, copper haze,
c) To reduce possible contaminants, especially ochratoxin A.

Prescriptions:

a) The doses to be used are determined after preliminary testing. The maximum dose used must not exceed :
   - 100 g/hl for the objectives a) and b)
   - 500 g/hl for the objective c)
b) Sediments are eliminated by physical procedures.
c) Chitin-glucan complex of fungal origin may be used alone or together with other admitted products.
d) Chitin-glucan complex must comply with the requirements of the International Oenological Codex.

Recommendation of the OIV:

Admitted

3. WINES

3.4.18. TREATMENT WITH GLUTATHIONE (OENO 446-2015)

Classification:
Glutathione: Additive

Definition:

Addition of glutathione to wine.

Objectives:
a) To protect aromatic substances present in wines (and particularly those of the thiol family) from oxidation, thanks to the antioxidant properties of the product;
b) to limit the formation of compounds responsible for ageing defects resulting from oxidation;

Prescriptions:
a) The addition of glutathione on storage and/or packaging, including the bottling of wine, is recommended;
b) the dose used should not exceed 20 mg/L;
c) the glutathione must be in a reduced form and comply with the prescriptions of the International Oenological Codex.

OIV recommendation:
Accepted.

3. WINES

3.4.19. TREATMENT OF WINES USING INACTIVATED YEASTS WITH GUARANTEED GLUTATHIONE LEVELS (OENO 533-2017)

Classification
Inactivated yeasts with guaranteed glutathione levels: Processing aid

Definition:
Addition of inactivated yeasts whose cells have guaranteed reduced-glutathione levels.

Objectives:
d) To limit the oxidation in wines of certain varietal aromatic compounds revealed by the metabolism of yeasts (particularly thiols).

Prescriptions:
a) The addition of inactivated yeasts with guaranteed glutathione levels at the start of maturing or during storage of wines is recommended;

b) the dose used of glutathione, supplied directly or via yeasts with guaranteed glutathione levels, should not exceed 20 mg/L, in order to avoid any risk of reduction and the emergence of a yeast taste;

c) the inactivated yeasts with guaranteed glutathione levels should contain a reduced form of glutathione; this may be accompanied by the presence of its precursors (cysteine and particularly gamma-glutamylcysteine);

d) the inactivated yeasts with guaranteed glutathione levels should comply with the prescriptions of the *International Oenological Codex.*

Recommendation of the OIV:
Accepted.

3. WINES

3.4.20. USE OF SELECTIVE VEGETAL FIBRES (OENO 582-2017, OIV-OENO 684A-2022)

Definition:

Use in wines of a selective adsorbent composed of plant fibres.

Objectives:

a) To reduce the ochratoxin A levels in wines;

b) to reduce the number and levels of phytosanitary products residues in wines.

Prescriptions:

a) Selective plant fibres are to be used as processing aids and incorporated either into wine or during filtration with continuous deposition, during cross-flow filtration, or as a constituent of a filter sheet;

b) the recommended dosage is determined according to the filtration technique used, without exceeding 1.5 kg/m^2 of the filter sheet surface area or 200 g/hL in wine;

c) selective plant fibres used in wines are to be removed by racking after sedimentation, centrifugation, or filtration;

d) selective plant fibres are to be used in wines in compliance with the regulatory requirements, particularly the permitted limits for phytosanitary product residues;

e) selective plant fibres should comply with the prescriptions of the International Oenological Codex

Recommendation of OIV:
Admitted.

3. WINES

3.4.21. MALOLACTIC FERMENTATION ACTIVATORS (OENO 531-2015)

Definition:
Addition of malolactic fermentation activators at the end or after the alcoholic fermentation to facilitate malolactic fermentation.

Objective:
Promote the initiation, kinetics or completion of malolactic fermentation:
- by enriching the environment with nutrients and growth factors for acid lactic bacterias,
- by the adsorption of some bacteria inhibitors.

Prescriptions:

a. Activators are microcrystalline cellulose or products derived from the degradation of yeasts (autolysates, inactivated yeasts, yeast walls);
b. activators can be added to wine or fermenting wine before or during malolactic fermentation;
c. the activators do not have to induce to organoleptic deviations in wine
d. Malolactic fermentation activators must comply with the prescriptions contained in the International Oenological Codex.

Note: The use of malolactic fermentation activators might foster the growth of undesirable microorganisms with the production of undesirable compounds.

OIV recommendation:
Admitted

3. WINES

3.4.22. TREATMENT OF MUSTS USING ADSORBENT STYRENE-DIVINYLBENZENE BEADS (OENO 614B-2020)

Definition:

Physical process of reduction or elimination of organoleptic deviations characterised as "earthy-musty" by the appropriate and controlled percolation of wines at a high flow rate through adsorbent styrene-divinylbenzene beads.

Objective:

a) To eliminate the perception of organoleptic deviations characterised as "earthy-musty" by the reduction in concentration or elimination of one of the main molecules responsible, geosmine.

Prescriptions:

a) Treatment should be carried out on clarified wines with turbidities of less than 30 NTU (nephelometric turbidity units);
b) the quantity of adsorbent beads to be used in the column and the wine flow rate are to be determined based on the initial geosmine content;
c) the adsorbent beads are placed in a column that is compliant with standards for food contact materials;
d) the adsorbent beads implanted and the conditions of their use should comply with the prescriptions of the International Oenological Codex.

OIV recommendation:
Admitted

3. WINES

3.4.23. TREATMENT WITH FUMARIC ACID TO INHIBIT MALOLACTIC FERMENTATION (OENO 581A-2021)

Classification: Fumaric acid : Additive

Definition:
Addition of fumaric acid to wine.

Objective:
1) Control of the growth and activity of the lactic acid bacteria responsible of the malolactic fermentation of wine;
2) reduction of the dose of sulphur dioxide;
3) preserve malic acidity.

Prescriptions:
1) Doses of 300-600 mg/L to control malolactic fermentation, even in the presence of high quantities of inoculum and during tumultuous fermentation;
2) fumaric acid must comply with the prescriptions of the International Enological Codex.

OIV recommendation:
Admitted

3. WINES

3.5 PREPARATION FOR PACKAGING AND PACKAGING

3.5.1 FORTIFICATION (5/82)

Definition :

Addition to wines of wine spirit, rectified alcohol of viticultural origin or rectified food alcohol.

Objectives :

a) Increase the actual alcohol content of the wine,
b) Production of special wines (flor or film wines, fortified wines), mistelles and beverages based on must and/or wine.

Prescription :

The rectified food alcohol, rectified alcohol of viticultural origin or wine spirits shall comply with the production conditions fixed for these products by the present Code and to the prescriptions of the *International Oenological Codex*.

Recommendation of OIV:

For objective (a), not accepted
For objective (b), accepted

3. WINES

3.5.2 AROMATISATION(5/82)

Definition :

Addition to wine of artificial or natural aromatic substances.

Objective :

To improve aromatic characters of wine or to confer such characters to wines that are devoid of them.

Prescriptions :

The objectives are achieved by addition:
a) Of natural or artificial flavourings;
b) Of extracts of natural aromatic substances.

Recommendation of OIV :

Not accepted.

3. WINES

3.5.3 BLENDING AND MIXING OR PREPARATION OF THE CUVEE (3/85)

Definition :[31]

Operation consisting of blending different wines.

Objectives :

a) For wines with a geographical indication (for example Recognised Designation of Origin and Recognised Geographical Indication)
- To produce wines of optimal qualitative characteristics representative of each geographical indication.

b) For wines without geographical indication :
- To produce wines with the analytical, sensory and qualitative characteristics desired,
- To produce wines having new and/or better balanced characteristics,
- To produce wines having the desired price.

Prescriptions :

a) In no case shall this operation be conducted to conceal a microbiological or chemical alteration of wines.
b) The composition of the wine after this operation shall conform to the definitions of the present Code and to the requirements of Annex C of the Recueil of International Methods of Analysis for Wines and Musts.

[31] This definition applies solely to wines stricto sensu such as defined in the Part I, chap.3 "Wines" of the present Code.

Recommendation of OIV:

Accepted.

3. WINES

3.5.4 HOT BOTTLING (OENO 9/97)

Definition:

Bottling of wine heated prior to the immediate corking of the bottle.

Objectives:

a) Biological stabilisation of the wine;

b) Elimination of oxygen;

c) Physico-chemical stabilisation.

Prescription:

The wine should not be heated above 45°C.

Recommendation of the OIV:

Accepted.

3. WINES

3.5.5 OXYGENATION (545B/2016)

Classification :

Oxygen *:* processing aid

Definition:

Addition of oxygen or air to wine

Objectives:

a) To use "micro-oxygenation", "macro-oxygenation" and "nano-oxygenation" technologies on wines;
b) to initiate oxidation phenomena with the aim of:

- contributing to stabilisation of colour and maturation of red wines by encouraging in particular the production of acetaldehyde, which can react with flavanols and anthocyanins to cause the formation of new pigments that are more stable and more intensely coloured (hyperchromic and bathochromic effect) than native anthocyanins,
- preparing wines used in treatments to eliminate excess iron (file 3.3.1) through oxidation of ferrous iron into ferric iron;

c) to reduce the concentration of "volatile sulphur compounds" such as hydrogen sulphide, methane-thiol, etc.;
d) to reduce aroma compounds related to vegetal sensory characters;
e) to facilitate fining of wines.

Prescriptions:

d) In the case of "micro-oxygenation", the rate at which the quantity of oxygen is added should be lower than that of the oxygen consumption by the treated wine; in other words,

oxygen should not be accumulated in the wines during treatment. It is preferable to use this technique when wines have a high concentration of free anthocyanins.

e) "Macro-oxygenation" is defined by the addition of higher doses of oxygen compared to "micro-oxygenation" and by a shorter addition period. This is specifically practiced at the end of fermentation, at a post-fermentative stage and up until the first racking off lees.

f) In the case of "nano-oxygenation", oxygen is added at regular intervals in very small quantities, such as 10 to 100 µg oxygen per litre of wine.

g) In the case of treatment of excess iron (file 3.3.1), oxygenation should be followed by an addition of tannin in proportion to the iron concentration of the wine, followed by fining, preferably with casein. The addition of oxygen should always precede the removal of iron by calcium phytate.

h) For stabilisation of the colour and improvement of the quality of a red wine during maturation, the doses to be added to the wine, in the case of "micro-oxygenation", are around 1-5 mg/L per month – depending, mainly, on their initial anythocyanin and polyphenol concentration and concentration of free SO_2. In the case of treatment using "macro-oxygenation", the oxygen doses added are higher to take into account the oxygen consumption by the yeast lees.

i) Due to the potential for the development of oxidative aromas, wine that undergoes oxygenation should be tasted regularly in order to define an optimum duration and temperature depending on the desired aromatic profile of the wine. Micro-oxygenation is not recommended above 22 °C to avoid excessive oxidation or below 8 °C to avoid oxygen accumulation.

j) The aim of oxygenation should not be a reduction in sulphite of wines containing excess sulphur dioxide.

k) Microbiological stability (especially where Brettanomyces bruxellensis is concerned) should be monitored to avoid organoleptic deviations in wines.

Recommendation of OIV:

Accepted.

3. WINES

3.5.6 TREATMENT WITH CARAMEL (5/87)

Definition :

Addition of caramel to wine.

Objectives :

a) To colour the wine.
b) To modify the taste of the wine.

Recommendation of OIV :

Not accepted.

3. WINES

3.5.7 TREATMENT WITH β-GLUCANASES (3/85, OENO 498-2013)

Classification :

Beta-glucanase (β1-3, β1-6)β: processing aid

Definition :

Addition to wine of an enzyme preparation containing activities catalysing the degradation of beta-glucans produced in the grape berry by the fungus *Botrytis cinerea* (noble rot, grey rot).
Enzyme activities involved in the degradation of β–glucans of *botrytis cinerea* are β-glucanases type β-1,3 and 1,6. The β-glucanases including β–1.3-glucanases are also able to degrade β-glucans released by *saccharomyces* type yeasts during alcoholic fermentation and during wine aging on lees.

Objective :

To improve the clarification and filterability of wines.

Prescription :

The glucanase preparation shall comply with the prescriptions of the *International Oenological Codex .*

Recommendation of OIV:

Accepted.

3. WINES

3.5.8 TREATMENT WITH COPPER SULPHATE (2/89)

Classification :

Copper sulphate, pentahydrate : processing aid

Definition :

Addition of copper sulphate pentahydrate ($CuSO_4$ $5H_2O$) to wine

Objective :

To remove the bad taste and odour due to hydrogen sulphide and possibly to its derivatives.

Prescriptions :

a) The dose of copper sulphate pentahydrate necessary to comply with the objective should be determined by a preliminary test. It shall not exceed 1 g/hl.
b) The colloidal cupric precipitate formed must be eliminated from the wine.
c) After treatment, the copper content of the wine should be checked and reduced to a level less than or equal to 1 mg/l by an appropriate procedure, complying with the specifications of Annex C of the *Recueil of International Methods of Analysis for Wines and Musts*.
d) The copper sulphate used shall comply with the prescriptions of the *International Oenological Codex.*

Recommendation of OIV :
Accepted.

3. WINES

3.5.9 CARBON TREATMENT OF SLIGHTLY COLOURED WINE (16/70)

Classification :

Oenological carbon : processing aid

Definition :

Addition of carbon to wine.

Objectives :

Correction of the colour:
- Of white wines produced from red vine varieties with white juice,
- Of white wines accidentally discoloured by contact with containers that have held red wines,
- Of very yellow wines prepared from white varieties,
- Of oxidised wines.

Prescriptions :

a) The processing shall not:
- Serve to de-colour red wine or rosé,
- Be applied successively to must and to the wine that results from it.

b) The quantity of dry carbon used shall be less than 100 g/hl of wine.
c) The carbon used shall comply with the prescriptions of the International Oenological Codex .

Recommendation of OIV:

Accepted.

3. WINES

3.5.10 IN-BOTTLE PASTEURISATION (5/82)

Definition :

Heating wine in bottles to a temperature and for a duration sufficient to prevent subsequent activity of microorganisms in the bottle.

Objective :

See 3.12

Prescriptions :

a) Pasteurisation can be performed :
- By immersing bottles in hot water,
- By running hot water onto bottles.

b) The increase in temperature shall cause no alteration in the appearance, colour, odour or taste of the wine.
c) A sufficient headspace will be provided under the cork to allow for the expansion in volume of the wine and precautions will be taken to avoid explosion of bottles due to excessive pressure.

Recommendation of the OIV:

Accepted.

3. WINES

3.5.11. PARTIAL DEHYDRATION OF WINES (OENO 2/01).

Definition:

Prescriptions to concentrate wine by elimination of water.

Objective:

Increase alcohol strength by volume of wine.

Prescriptions:

a)The objective can be achieved by a variety of methods known as subtractive enrichment techniques.
b)This prescription should not be used on wines showing any organoleptic defects;
c)The elimination of water in wine cannot be done in conjunction with the possible elimination of water in the corresponding grape or must.

OIV Recommendation:

See the sheets on the aforementioned techniques.

3. WINES

3.5.11.1. WINE CONCENTRATION BY FREEZING / CRYOCONCENTRATION.(OENO 3/01)

Definition:

Prescriptions for concentrating wine by partial freezing and physical removal of the ice thus formed.

Objective:

See the sheet "Partial dehydration of wine".

Prescription:

a) See the sheet "Partial dehydration of wine";
b) Concentration can lead to a reduction of 20% of initial volume and should not be increased by more than 2% by volume of the initial alcohol strength of wine.

Recommendation of the OIV:

Accepted.

3. WINES

3.5.12. FERMENTING MUST OR WINES IN CONTACT WITH WOOD (OENO 6/01).

Definition:

Allow fermenting must or wine to come into contact with wood.

Objective:

Put fermenting must or wine in contact with wood to achieve physical and chemical changes.

Prescriptions:

The objective will be achieved by having the fermenting musts or wines come into contact with wood

Recommendation of the OIV:

Accepted.

3. WINES

3.5.12.1. AGEING IN SMALL CAPACITY WOODEN CONTAINERS (OENO 8/01)

Definition:

Ageing of wine in small capacity wooden casks during a set period of time, of a wine suited for an evolution through a natural process, in compliance with the usual practices of each viticulture region.

Objectives:

a)To obtain a natural evolutionary process of wine, with improvement of its sensory characteristics through an oxidative and/or biological or diffusion pathway, according to usual practices for each wine,

b)To favour natural physical and chemical mechanisms through the controlled and continuous oxygenation and the progressive contribution of substances released by wood.

c) To obtain a total or partial physico-chemical stabilisation of the wine.

Prescriptions

a) It is recommended, in order for the ageing to be efficient, that the volume of the recipient not exceed 600 litres;
b) The most commonly used botanical species are: *Quercus petrea* (sissile oak), *Quercus robur* (pedunculated oak) and their hybrids and *Quercus alba* (white American oak). Locally, other botanical species than oak may be used. The traceability of wood origin is recommended;

c) For the making of the container, one will only use woods that retain their natural structure. Cooperage techniques defined for the making of new casks will be used to optimise the objectives. The traceability of wood is recommended, and at the very least, the manufacture date should be visibly engraved;
d) The inside surface of the containers may be regenerated with usual cooperage techniques. In that case, the date on which this is carried out will have to be visibly engraved;
e) Environmental conditions (temperature, humidity, and isolation) allow for the modulation of oxygen supply to the wine to take place;
f) During the ageing process, continuous control of the casks' condition, their level of filling and the degree of modification of the produced sensory characteristics are recommended. The casks are maintained in compliance with hygiene rules and are eliminated after a few years.

Recommendation of the OIV:

Accepted.

3. WINES

3.5.12.2. USAGE OF PIECES OF OAK WOOD IN WINEMAKING (OENO 9/01)

Definition:

Usage of pieces of oak wood in winemaking.

Objective:

To introduce the characteristics of certain oak wood constituents into wine.

Prescriptions:

a) The pieces of wood (from Quercus species) will have to be of an appropriate size.
b) The pieces of oak wood may be grilled or burnt but not charred, including on the surface.
c) The quantity of pieces of oak wood to be used in the wine is at the discretion of the winemaker.
d) The pieces of oak wood shall comply with the prescriptions of the International Oenological Codex.

Recommendation of the OIV:

Accepted.

3. WINES

3.5.13. CORRECTION OF THE ALCOHOL CONTENT IN WINES (OENO 394B-2012)

Definition:

Process to reduce excessive ethanol content in wine.

Objective:

To improve the taste balance of wine.

Prescription:

a) The objective can be achieved by methods separation techniques or a combination of techniques.
   - Partial vacuum evaporation
   - Membrane techniques
   - Distillation**
b) This process must not be used on wines with any other organoleptic defects.
c) The elimination of alcohol in wine must not be done in conjunction with a modification in the sugar content in the corresponding musts.
d) The alcohol content may be reduced by a maximum of 20%.
e) The minimum alcoholic strength by volume must comply with the definition of wine in accordance with sheet 3.1.
f) The process shall be placed under the responsibility of an oenologist or specialised technician.

Recommendation of the OIV:

Admitted.

3. WINES

3.5.14. TREATMENT WITH COPPER CITRATE (OENO 1/08)

Classification :

Copper citrate : processing aid

Definition:

Addition of hydrated copper citrate alone or mixed with clarifying agents (for example bentonite)

Objective:

Remove bad taste and odour due to hydrogen sulfide and possibly its derivatives.

Prescriptions :

a) The dose of hydrated copper citrate necessary for fulfilling the objective must be determined by a prior trial test. This dose must not exceed 1 g/hl.
b) Copper colloidal precipitate formed must be eliminated from wine by filtration
c) Following all treatments, the copper content of wine must be monitored and returned to levels equal to or under the residual level of wine set by the OIV in accordance with the specifications of Annex C of the International Compendium of Methods of Analysis of Wines and Musts.
d) The copper citrate used must be in accordance with the provisions of the International oenological Codex.

Recommendation of the O.I.V:

Admitted.

3. WINES

3.5.15. TREATMENT WITH SILVER CHLORIDE (OENO 2009-145, OIV-OENO 707-2022)

WITHDRAWN BY OIV-OENO 707-2022

3. WINES

3.5.16. DEALCOHOLISATION OF WINES (OENO 394A-2012)

Definition:

Process to reduce part or almost all the ethanol content of wines.

Objective:

To obtain vitivinicultural products with a reduced or low alcohol content]

Prescription:

a) The objectives can be achieved by methods separation techniques or a combination of techniques.
   - Partial vacuum evaporation
   - Membrane techniques
   - Distillation**

b) This process must not be used on wines with any organoleptic defects.

c) The elimination of alcohol in wine must not be done in conjunction with the increase of the sugar content in the corresponding musts.

d) The percentage of alcohol may be reduced according to product definitions which prescribe also the levels of alcoholic strength by volume.

e) The process shall be placed under the responsibility of an oenologist or specialised technician.

Recommendation of the OIV:

Admitted [32]

[32] *Note: this practice shall not result in wines of Chapter 3 of Part I of the International Code of Oenological Practices and shall enter into force only following the adoption of product definitions.*

3. WINES

3.5.17. MANAGEMENT OF DISSOLVED GAS IN WINE USING MEMBRANE CONTACTORS (OENO 499-2013)

Definition:

Physical method for the management of dissolved gas concentrations in wine using membrane contactors (hydrophobic membranes) and gases applied in oenology.

Objective:

a) Reduction of the dissolved oxygen level in wine;
b) Increase of the dissolved oxygen level in wine;
c) Reduction of the dissolved carbon dioxide level in wine;
d) Adjustment of the dissolved carbon dioxide level in still or semi-sparkling wines according to the definition in the *International Code of Oenological Practices*;
e) Increase of the dissolved carbon dioxide level in order to obtain carbonated wines according to the definition in the *International Code of Oenological Practices*.

Prescription:

a) See the general sheet on *separative techniques used in the treatment of musts and wines* as well as the sheet on the *application of membrane techniques in wine*.
b) This technique can be used from the end of alcoholic fermentation to packaging to replace the use of bubbling device or venturi type systems.
c) This practice shall be carried out by an oenologist or a qualified technician.

d) For objective b) see the prescriptions of the resolution related to oxygenation of wine.
e) The wine treated or to be treated must comply with the definitions and limits of the OIV.
f) The membranes used must comply with the provisions of the *International Oenological Codex*.
g) The gases used must comply with those allowed and defined in the International Oenological Codex.

Recommendation of OIV:
Admitted

3. WINES

3.5.18. TREATMENT OF WINES USING A MEMBRANE TECHNOLOGY COUPLED WITH ADSORPTION ON DEODORANT ACTIVATED CARBON OR ADSORBENT STYRENE-DIVINIYLBENZENE BEADS TO REDUCE VOLATILE PHENOLS (OENO 504-2014; OIV-OENO 657-2023)

Definition:

Process that consists of reducing the excess content of volatiles phenols in wine using a combination of membrane filtration and treatment of the permeate with deodorant activated carbon or adsorbent styrene-divinylbenzene beads.

Objective:

a) Reduce the content of volatile phenols of:
- Microbial origin (e.g. Brettanomyces spoilage) and/or
- Environmental origin (e.g. smoke volatiles from fire) and/or
- Winery origin (e.g. tained barrels or surfaces)

That might constitute organoleptic defects or mask the aromas of the wine.

Prescription:

a) Refer to the general file on separative techniques used in the treatment of wines (Chapter 3.0) and the file on the application of membrane techniques applied to wine (Chapter 3.01).

b) The objective of the first step of the process is to produce a permeate containing some of the volatile phenols. This can be achieved through a membrane separation technique.

c) The permeate obtained during the first step of the process is treated with a deodorant activated carbon or adsorbent styrene-divinylbenzene beads.

d) The treated permeate is then reincorporated with the retentate.

e) The volume of permeate extracted and treated with the deodorant activated carbon or adsorbent styrene-divinylbenzene beads is dependent on the membrane separation techniques and quantity of volatile phenols to be removed.

f) An oenologist or a qualified technician will be responsible for implementing the treatment.

g) The deodorant activated carbon or adsorbent styrene-divinylbenzene beads and filtration membranes used must comply with the prescriptions contained in the "International Oenological Codex"

OIV recommendation:
Admitted

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.1 BASE WINE (4/80)

Definition :

Wine destined for the production of a sparkling wine.

Prescriptions :

a) The oenological treatments and practices of this *International Code of Oenological Practices* are applicable by analogy, except for the addition of ascorbic acid, sorbic acid and metatartaric acid.
b) Base wines destined for secondary fermentation shall be clarified by the usual processes, taking care to avoid all oxidation,
c) The volatile acidity of the base wine must always be low,
d) The sulphur dioxide content of the base wine must be low,
e) For the continuous method :
Just before secondary fermentation, the base wine, with no added sugar, is submitted to a biological de-oxygenation by addition of a selected yeast culture and leaving protected from oxygen for 24 to 48 hours.
f) The base wine must comply with the definition of wine in the present *International Code of Oenological Practices*.

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.2 CUVEE (4/80)

Definition

Product destined for secondary fermentation, comprising:
- Base wine, or
- Must, or
- Mixtures or blends of:
    - Base wine, or
    - Base wine and of musts, of concentrated musts, of grape sugar and of partially fermented must, or
    - Musts, of concentrated musts, of grape sugar and of partially fermented must.

Prescriptions :

a) Products used for the cuvee must comply with the definitions of the present *International Code of Oenological Practices*;
b) See also : *Base wine*, Prescriptions a), b), c) and d).

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.3 TIRAGE LIQUEUR (4/80)

Definition :

Product added to the cuvee before tirage, comprising wine or a part of the cuvee, with addition either of sugar, must or concentrated must.

Prescriptions :

a) This liqueur is prepared with sucrose (cane or beet sugar) or grape sugar.
b) The sugars shall comply with the prescriptions of the *International Oenological Codex .*

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.4 DOSAGE (3/81)

Definition :

Liqueur that can be added to sparkling wine immediately before final closure of the bottle and which comprises wine, grape must or a blend of wine and grape must, to which is added:

- Sugar,
- Possibly wine spirit,
- Possibly various additives.

a) Either in bottles at filling, or
b) In the closed tank after the fermentation and before bottling.

Objective :

To obtain certain sensory characteristics and the various types of sparkling wine.

Prescriptions :

a) The sugar employed is sucrose (cane or beet sugar) or grape sugar,
b) The addition of the dosage shall not increase by more than 0.5% vol. the actual alcohol content of the sparkling wine,
c) The additives that may be added to the dosage are the following : sulphur dioxide, ascorbic acid, metatartaric acid, sorbic acid, citric acid,
d) The amount of the additives mentioned under c) in the liqueur should be planned in such a way that their levels in the sparkling wine produced comply with the limits fixed whether in Annex C of the *Recueil of International Methods of Analysis*

for Wines and Musts, or in the corresponding sections of the present *International Code of Oenological Practices,*

e) The sugars under a) and the additives under c) shall comply with the prescriptions of the *International Oenological Codex*.

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.5 BLENDING AND MIXING (4/80)

Definition :

Operation that consists of blending :
- Musts or wines coming from various varieties and/or various regions;
- Base wines coming from different years of harvest.

Objective :

To obtain a cuvee having the desired characteristics.

Recommendation of OIV :

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.6 INOCULATION WITH YEASTS (4/80)

Definition :

Inoculation of the cuvee, with added tirage liqueur, by a selected yeast culture.

Objective :

To initiate alcoholic fermentation with a view to obtaining effervescence

Prescriptions :

a) The yeasts used can be in the form of dried, active yeasts or encapsulated yeasts.
b) The yeasts used shall comply with the prescriptions of the *International Oenological Codex .*

Recommendation of OIV :

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.7 PROMOTING SECONDARY FERMENTATION BY THE USE OF NUTRITIVE SALTS AND OF YEAST GROWTH FACTORS (OENO 7/95)

Classification :

Ammonium sulphate: processing aid
Diammonium hydrogen phosphate: processing aid
Thiamine hydrochloride: processing aid

Definition :

Addition of ammonium salts and of thiamin to base wines destined for secondary fermentation.

Objective :

To facilitate the multiplication of yeasts during secondary fermentation in a bottle or in a closed tank still containing grape sugars or with the addition of a tirage liqueur.

Prescriptions :

Nutrititive salts and other growth factors added shall be:

a) For nutritive salts, diammonium phosphate, or ammonium sulphate to a maximum dose of 0.3 g/l (expressed as the salt).
b) For growth factors, thiamin in the form of thiamin hydrochloride to a maximum dose of 0.6 mg/l. (expressed as thiamin).

c) These substances shall comply with the prescriptions of the International Oenological Codex .

Recommendation of OIV :

Accepted

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.8 TIRAGE (3/81)

Classification :

Active dry yeast : processing aid
Ammonium chloride : processing aid
Potassium alginate : processing aid
Calcium alginate : processing aid

Definition:

Operation that consists of filling into bottles, that are hermetically closed, the cuvee, well mixed with tirage liqueur. An inoculum of selected yeasts is added, and possibly clarifying agents and activators of secondary alcoholic fermentation.

Objective :

To initiate secondary alcoholic fermentation with the aim of obtaining effervescence.

Prescriptions :

a) The following clarifying agents are authorised :
- Bentonites (see Treatment with bentonites),
- Organic fining agents (see Fining),
- Tannins (see Tannin addition),
- Potassium alginate.

b) Activators of secondary alcoholic fermentation are authorised (see Promoting secondary fermentation by the use of nutritive salts and of yeast growth factors)

c) These products shall comply with the prescriptions of the International Oenological Codex .

Recommendation of OIV :

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.9 SECONDARY FERMENTATION (4/80)

Definition:

Alcoholic fermentation in hermetically closed containers.

Objective :

To produce sparkling wine by saturation under pressure with endogenous carbon dioxide.

Prescriptions :

This operation takes place:

a) By the alcoholic fermentation :
- Either of a partially fermented must, or
- Of a cuvee or a base wine with added grape must, concentrated must, grape sugar or sucrose.

b) In the bottle, or
In other pressure-resistant containers (closed tank method):
- Whether by the bulk discontinuous method, or
- By the continuous method.

4 SPECIAL WINES : SPARKLING WINES

4.1 DEFINITIONS COMMON TO ALL SPARKLING WINES

4.1.10 TRANSVASAGE (OENO 7/02)

Definition:

Operation involving the isobarometric transfer of sparkling wine from one wine container to another .

Objectives:

a) Enable the separation of wine from the lees, and/or deposits coming from the addition of clarifying agents, deposited at the bottom of the container

b) Enable the blending and mixing of wines of different origin

c) Enable physical clarification by filtration, centrifuge, etc.

d) Enable the separation of crystals, tartaric stabilization by cooling and separation of tartrate crystals (potassium bitartrate and calcium tartrate)

e) Proceed with isobarometric bottling

Prescriptions:

Transvasage can occur:

a) In the absence of air to avoid any oxidation

b) At room temperature, or preferably after cooling to avoid any possible loss of carbonic gas,

c) Using the law of interconnected vessels or with pumps

d) The end container must be rendered inert by carbon dioxide, nitrogen or argon. These gases must comply with International Oenological Codex prescriptions.

OIV recommendation:

Admitted.

4 SPECIAL WINES : SPARKLING WINES

4.2 SECOND FERMENTATION IN BOTTLE

4.2.1 SECONDARY FERMENTATION IN BOTTLE (4/80)

Definition :

Process in which the secondary fermentation takes place in the bottle.

Objective :

To produce sparkling wines according to this procedure.

Prescription :

To produce sparkling wines according to the following operations:

a) Preparation of the base wine or of the composition of the cuvee,
b) Preparation of the tirage liqueur,
c) Yeast inoculation ,
d) Addition of clarifying agents,
e) Tirage,
f) Placing in stacks,
g) Placing on riddling racks,
h) Riddling,
i) Inverting bottles
j) Disgorging,
k) Addition of the dosage.

Remark :
For the decanting procedure, points (f) to (j) do not apply.

Recommendation of OIV:

Refer to the sections concerning these operations in the present *International Code of Oenological Practices*.

4 SPECIAL WINES : SPARKLING WINES

4.2 SECOND FERMENTATION IN BOTTLE

4.2.2 PLACING IN STACKS (4/80)

Definition :

Storage of the bottle, laying down, after tirage, during the period of secondary fermentation.

Objective :

To favour the secondary fermentation and also the contact of the wine with the deposit.

Prescriptions :

a) Bottles are taken up, agitated and replaced in stacks during storage,
b) The temperature of the cellar or the premises should be sufficiently low to favour obtaining an effervescence of good appearance, without preventing fermentation.

Remark :
In contemporary procedures, which use mechanical riddling, bottles are stacked in palettes.

Recommendation of the OIV:

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.2 SECOND FERMENTATION IN BOTTLE

4.2.3 PLACING ON RIDDLING RACKS (4/80)

Definition:

Placing the bottles on the riddling racks.

Objective :

To facilitate the riddling operation.

Prescription :

During the placement on riddling racks, shake the bottles to detach the deposit from the inside.

Recommendation of OIV :

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.2 SECOND FERMENTATION IN BOTTLE

4.2.4 RIDDLING (4/80)

Definition :

Sum of the operations designed to gather the deposit formed during the secondary fermentation on the closure of the bottle.

Objective :

To allow the elimination of the deposit by disgorging.

Prescriptions :

a) Avoid all re-suspension of the deposit.
b) This operation can be undertaken manually or mechanically.

Recommendation of the OIV:

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.2 SECOND FERMENTATION IN BOTTLE

4.2.5 INVERTING THE BOTTLES (4/80)

Definition:

Placing the bottles with the head down.

Objective :

To keep the deposit on the cork in readiness for disgorging.

Prescription :

Avoid all re-suspension of the deposit.

Recommendation of OIV:

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.2 SECOND FERMENTATION IN BOTTLE

4.2.6 DISGORGING (4/80)

Definition :

Elimination of the deposit gathered on the closure.

Objective :

To assure the clarity of the sparkling wine.

Prescriptions :

a) The operation is facilitated by disgorging bottles after freezing the deposit gathered on the closure.
b) This operation can be undertaken manually or mechanically

Recommendation of OIV:

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.3 BULK SECOND FERMENTATION IN A CLOSED TANK

4.3.1 DISCONTINUOUS SECONDARY FERMENTATION IN A CLOSED TANK (3/81)

Definition :

Secondary fermentation procedure in hermetically closed tanks.

Objective :

To produce sparkling wines in tanks in a discontinuous manner.

Prescriptions :

This process comprises the following operations :

a) Preparation of the base wine or cuvee,
b) Preparation of the tirage liqueur,
c) Inoculation with yeasts,
d) Addition of clarifying agents,
e) Tirage in a closed tank,
f) Storage in a closed tank,
g) Clarification of the sparkling wine,
h) Cooling,
i) Addition of the dosage,
j) Isobaric bottling.

Remark :
Only operations (e), (f), (h), (j) and (i) are different from the operations of secondary fermentation in bottles.

Recommendation of OIV:

Refer to the practices and treatments mentioned in the present *International Code of Oenological Practices.*

4 SPECIAL WINES : SPARKLING WINES

4.3 BULK SECOND FERMENTATION IN A CLOSED TANK

4.3.2 TIRAGE IN A CLOSED TANK (3/81)

Definition:

Operation that entails putting the cuvee, well blended with the tirage liqueur, into a pressure-resistant tank, with the addition of an inoculum of selected yeasts, and possibly of clarifying agents and activators of secondary alcoholic fermentation. All the outlets of the tank are then hermetically closed.

Objective :

To initiate secondary alcoholic fermentation with the aim of obtaining effervescence.

Prescriptions :

a) The following clarifying agents are authorised :
- Bentonites (see Treatment with bentonites),
- Organic fining agents (see Fining),
- Tannins (see Tannin addition),
- Potassium alginate.

b) Activators of secondary alcoholic fermentation are authorised (see Promoting secondary fermentation by the use of nutritive salts and of yeast growth factors)
c) These products shall comply with the prescriptions of the International Oenological Codex.

Recommendation of OIV:

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.3 BULK SECOND FERMENTATION IN A CLOSED TANK

4.3.3 STORAGE IN A CLOSED TANK (3/81)

Definition :

Storage of the cuvee after tirage in a hermetically closed tank, during the period of secondary fermentation.

Objective :

To favour the secondary fermentation and also the contact of the wine with the deposit.

Prescriptions :

a) The tank is stirred on several occasions during storage.
b) The temperature of the tank should be sufficiently low to favour obtaining an effervescence of good appearance, without preventing fermentation.

Recommendation of OIV:

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.3 BULK SECOND FERMENTATION IN A CLOSED TANK

4.3.4 CLARIFICATION OF SPARKLING WINE (3/81)

Definition:

Clarification of the sparkling wine by decanting and racking, centrifugation and filtering under isobaric conditions.

Objective :

To assure the clarity of the sparkling wine.

Prescriptions :

a) To achieve isobaric conditions, the necessary pressure is obtained by means of an inert gas or compressed air.
b) Authorised inert gases are nitrogen, argon and endogenous carbon dioxide. They shall comply with the prescriptions of the International Oenological Codex.

Recommendation of OIV:

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.3 BULK SECOND FERMENTATION IN A CLOSED TANK

4.3.5 ISOBARIC BOTTLING (3/81)

Definition :

Bottling of sparkling wine produced in a closed tank under isobaric conditions, with the possible addition of the dosage.

Objective :

To bottle the sparkling wine produced in a closed tank.

Prescriptions :

a) The sparkling wine is cooled before bottling so as to lower the pressure and facilitate the bottling.
b) To establish isobaric conditions, the necessary pressure is obtained with inert gases or compressed air.
c) Authorised inert gases are nitrogen, argon and endogenous carbon dioxide. They shall comply with the prescriptions of the International Oenological Codex .

Recommendation of OIV :

Accepted.

4 SPECIAL WINES : SPARKLING WINES

4.4 CONTINUOUS SECOND FERMENTATION IN A CLOSED TANK

4.4.1 CONTINUOUS SECONDARY FERMENTATION IN A CLOSED TANK (3/85)

Definition :

Process of secondary fermentation, in a system of several tanks, hermetically closed and connected to one another, in which the base wine is introduced in a continuous manner at the entry of the system.

Objective :

To produce sparkling wines in a continuous manner.

Prescriptions

This process comprises the following operations:
a) Preparation of the base wine,
b) Preparation of the tirage liqueur,
c) Inoculation with yeasts,
d) Tirage under constant pressure in a closed tank, in a continuous manner,
e) Continuous passage through the tanks of the system in which the yeasts are retained and remain immobilised, bound or deposited for a long time,
f) Cooling to -3°C and clarification of the sparkling wine,
g) Addition of the dosage,
h) Isobaric bottling.
The system, once started, functions non-stop for several years (3 to 5 years according to circumstances).
Remark :

Only operations (c) and (d) above are different from the operations of secondary fermentation in a closed tank.

Recommendation of OIV :

Refer to the sections concerning these operations in the present *International Code of Oenological Practices.*
The other operations are executed in a continuous manner, without external intervention.

4 SPECIAL WINES : SPARKLING WINES

4.4 CONTINUOUS SECOND FERMENTATION IN A CLOSED TANK

4.4.2 CONTINUOUS TIRAGE UNDER CONSTANT PRESSURE IN A CLOSED TANK (3/85)

Definition :

An operation that consists of introducing to the beginning of the continuous system (under constant pressure and in a continuous manner) the biologically deoxygenated base wine, well blended with the tirage liqueur and with a culture of selected yeasts.

Objective :

To allow the second alcoholic fermentation in order to produce the effervescence, in a continuous manner.

Recommendation of OIV:

Accepted.

5 GENERAL FILES

5.1 PREVENTION OR MINIMISATION OF CONTAMINANTS (OENO 362-2011)

Definition of contaminant:
Contaminant, in the context of a vitivinicultural product, means any substance not intentionally present in the product as a result of the production, processing, treatment, packing, packaging, transport or holding of such product, or as a result of environmental contamination, the presence of which has an impact on the safety and/or quality of the product.

Objectives:
The techniques for prevention or minimisation of contaminants are aimed:

c) to minimise the food safety risks associated with consumption of the product.
d) to optimise the organoleptic quality of the product,

Prescriptions:

c) Preventative practices to avoid contamination in the first place should be favoured referred to the "Good Practices Guide" of the OIV and the specifications of oenological products of International Oenological Codex.
d) Oenological practices aimed at reducing contaminant levels are based principally on absorptive techniques, and must be in accordance with the OIV International Code of Oenological Practices.
e) It is necessary to conduct preliminary testing prior to implementation of an oenological practice to assess its effectiveness and/or its effects on the processed product.

f) The application of HACCP method as defined by the Codex Alimentarius, to protect consumer health must be integrated into a guide of good hygiene practices to master the contaminants.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.0. GENERAL REMARKS

The practices defined in the International Code of oenological practices for wines, are applied to aromatised wines, beverages based on vitivinicultural products and wine-based beverages.
Subject to compliance with the definitions of the OIV International Code of Oenological Practices concerning them, the wine or special wine, grape must, partially fermented grape must and/or must of fresh grape must fermented until alcohol, may, during the preparation process of aromatised wines, beverages based on vitivinicultural products and wine-based beverages, undergo the following treatments:

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.1 SWEETENING (OENO 439-2012)

Definition:
Addition of sweeteners.

Objectives:
Balancing of taste properties of the product.

Prescription:
By sweetening, one intends the use of one or more of the following substances:

A)
- concentrated, rectified grape must
- concentrated grape must, fresh grape must
- semi-white sugar
- white sugar
- refined white sugar
- dextrose
- fructose
- glucose syrup
- inverted liquid sugar
- inverted liquid sugar syrup
- caramel (it means the product obtained by controlled heating of saccharose without the addition of bases, mineral acids or other chemical additives).

- honey
- carob sugar
- other glucidic substances having similar effect to that of products listed above.

B)
- other sweeteners having similar effect to that of products listed above, in accordance with the regulations of producing and consumer countries.

Recommendation of the OIV:

- aromatised wines: admitted for substances listed at paragraph A
- Beverages based on vitivinicultural products and wine-based beverages: admitted for substances listed at paragraphs A and B.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.2 COLOUR (OENO 439-2012)

Definition:
Addition of caramel or colouring admitted.

Objectives:
Giving to the product the specific desired colour.

Prescription:
Colour is the use of one or more colouring substances admitted in the food regulation of producing and customer countries. The colours can be divided in:

A. caramel and one or more substances giving yellow and/or red colour
B. other colouring substances.

Recommendation of the OIV:
- aromatised wines: admitted for substances listed at paragraph A
- Beverages based on vitivinicultural products and wine-based beverages: admitted for substances listed at paragraphs A and B.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.3 FLAVOURING (OENO 439-2012)

Definition:
Addition of flavouring and/or tasty ingredients.

Objectives:
To give the product particular organoleptic properties, including bitterness.

Prescription:
Flavouring is the use of:

A) flavouring substances and/or flavouring preparations and/or other flavours defined as follows:

- A.1) "flavouring substance": a defined chemical substance which has flavouring properties

- A.2) "natural flavouring substance": a flavouring substance obtained by appropriate physical processes (including distillation and food solvent extraction) or by enzymatic or microbiological processes from plant or animal material, at its natural state or after its transformation for human consumption by means of food preparation traditional processes (including drying, roasting and fermentation);

- A.3) "flavouring preparation": a product other than a flavouring substance with flavouring properties and obtained by appropriate physical processes (including distillation and food solvent extraction) or by enzymatic or microbiological processes, by traditional food preparation processes (including drying, roasting and fermentation) from plant or animal material, at its natural state or after its transformation for human consumption;

- A.4) "other flavours": chemical compound, obtained by chemical synthesis or purification processes, having flavouring properties and meant for food regulation of producing and customer countries. In order to flavour aromatised wines, beverages based on vitivinicultural products and wine-based products, flavours can be divided into:
  - A.4.1) flavours exactly alike compounds naturally contained in plants and/or animal products, such as vanillin or mixture of flavouring substances identical to natural compounds,
  - A.4.2) other artificial flavours;

B) herbs and/or spices and/or fruits or vegetable parts and/or tasty food.

Recommendation of the OIV:
- aromatised wines: admitted for the flavourings mentioned in A.2, A.3, A.4.1 and B).
- Beverages based on vitivinicultural products and wine-based beverages: admitted.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.4 ADDITION OF ALCOHOL (OENO 439-2012)

Definition:
Addition of one or more products among the following ones:
- ethyl alcohol of vitivinicultural origin and ethyl alcohol of agricultural origin
- wine distillate

Objectives:
a) increasing the alcoholic strength of the product and its stability
b) dilute or dissolve colourants, flavourings or any other authorized additives

Prescription:
The ethyl alcohol of vitivinicultural and/or agricultural origin and the wine distillate must satisfy the treatment conditions set by this Code as well as the prescriptions of the International oenological Codex.

Recommendation of the OIV:
- Admitted for aromatised wines;
- Not admitted for beverages based on vitivinicultural products and wine-based beverages for the objective foreseen in a) but admitted for the objective foreseen in

b) only in the doses strictly necessary to dilute or dissolve colourants, flavourings or any other authorized additives.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.5 WATER ADDITION (OENO 439-2012)

Definition:
Water addition.

Objectives:
- preparing flavouring essences
- dissolving colours and sweeteners
- setting the final composition of the product.

Prescription:
The water added must respect WHO prescriptions and, if necessary, can be treated to remove dissolved salts.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.6 CHEMICAL ACIDIFICATION (OENO 439-2012)

Definition:
Increasing titration acidity and real acidity (pH lowering) of aromatised wines, beverages based on vitivinicultural products and wine-based beverages by means of organic acids addiction.

Objectives:
Giving the desired tasting properties to the product.

Prescription:
a) Only L and D lactic, L-malic, L-tartaric and citric acid are admitted to be used,
b) Acid addition must not be used to hide a fraud,
c) Mineral acid addiction it is forbidden,
d) The acid(s) used must satisfy the prescriptions of the International oenological Codex.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.7 CHEMICAL DEACIDIFICATION (OENO 439-2012)

Definition:
Lowering of titration acidity and real acidity (pH increasing) of aromatised wines, beverages based on vitivinicultural products and wine-based beverages by means of potassium tartrate, potassium hydrogen carbonate, calcium carbonate containing, if necessary, small amounts of double calcium L-tartaric and L-malic acid salt.

Objectives:
Developing aromatised wines, beverages based on vitivinicultural products and wine-based beverages with balanced taste properties.

Prescription:
a) The process of double salt formation (neutral double calcium salt of tartaric and malic acids) aims at a further decrease of titration acidity, since wine is very rich in malic acid content and precipitating of tartaric acid alone is not efficient enough,
b) Acid addition must not be used to hide a fraud,
c) The products used must satisfy the prescriptions of International oenological Codex.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.8 FILTRATION (OENO 439-2012)

Definition:
Physical process in which aromatised wines or wine-based beverages flow through filters that trap suspended particles or substances in solution or materials in colloid state.

Objectives:
a) Obtain transparency of aromatised wines, beverages based on vitivinicultural products or wine-based beverages, if necessary by means of sequential steps
b) Obtain biological stability of aromatised wines, beverages based on vitivinicultural products or wine-based beverages by micro-organism elimination,
c) Obtain physic-chemical stability.

Prescription:
Filtration can be performed:
a) by alluviation, with appropriated aids like diatomaceous earths, perlite, cellulose…,
b) on plates made of cellulose or other suitable materials,
c) on organic or mineral membranes, including semi-permeable membranes.

Filtering materials must meet the prescriptions of the International oenological Codex. If materials not included in the International oenological Code are used, they must not, in any

case, contaminate aromatised wines, beverages based on vitivinicultural products or wine-based beverages, so to cause a risk to human health.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.9 GUM ARABIC TREATMENT (OENO 439-2012)

Definition:
Addition of arabic gum to aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

Objectives:
a) Avoiding copper casse,
b) Protecting aromatised wines, beverages based on vitivinicultural products and wine-based beverages against light iron haze,
c) Avoiding the precipitation of substances like dyes that are in colloidal form.

Prescription:
a) Arabic Gum must be added to aromatised wines, beverages based on vitivinicultural products and wine-based beverages after the last filtration, or just before bottling
b) Arabic Gum must meet the prescriptions of the International oenological Codex.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.10 CHARCOAL TREATMENT (OENO 439-2012)

Definition:
Treatment with oenological charcoal by addition or by passage in column.

Objectives:
Giving to aromatised wines, beverages based on vitivinicultural products and wine-based beverages the desired specific organoleptic characteristics.

Prescription:

a) The used charcoal must meet the prescriptions of the International oenological Codex
b) The maximum dose of dry charcoal that is admitted is equal to 200 g/hL of wine or must

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.11 PARTIAL DEHYDRATATION OF WINES (OENO 439-2012)

Definition:
Wine concentration by water removal.

Objectives:
Increasing the alcoholic strength and the structure of aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

Prescription:
a) The target can be reached through several techniques, called subtractive enrichment techniques, provided by the International oenological Code
b) The final alcoholic strength of aromatised wines, beverages based on vitivinicultural products or wine-based beverages must respect minimum and maximum limits fixed by its Definition in this Code.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.12 CRYOCONCENTRATION (OENO 439-2012)

Definition:
A method of concentrating base wines by means of freezing and physical removal of ice thus formed.

Objectives:
Increasing the volumetric alcoholic strength and the structure of aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

Prescription:
The alcoholic strength of aromatised wines, beverages based on vitivinicultural products and wine-based beverages must meet minimum and maximum limits reported in its Definition.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.13 REFERMENTATION (OENO 439-2012)

Definition:
Addition of fermentable sugars and monitoring of fermentation by means of selected yeasts.

Objective:
Increasing the alcoholic strength and causing capture of foam.

Prescription:
Fermentable sugars used for fermentation must be included in the list of permitted sweetening substances section A) (see 1. SWEETENING).

Recommendation of the OIV:
- Aromatised wines: not admitted
- Beverages based on vitivinicultural products and wine-based beverages: admitted

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.14 MIXING OF WHITE WINES OR MUSTS WITH RED WINES OR MUSTS (OENO 439-2012)

Definition:
Mixing of white wines or musts with red wines or musts.

Objectives:
a) Adjusting the final colour of aromatised wines, beverages based on vitivinicultural products and wine-based beverages
b) Obtaining the desired colour of aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

Prescription:
Controlling the conditions of tartaric stability and transparency of obtained products.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.15 CARBON DIOXIDE USE (OENO 439-2012)

Definition:
Addition of carbon dioxide.

Objectives:
a) Protecting aromatised wines, beverages based on vitivinicultural products or wine-based beverages against oxidation by displacing oxygen
b) Making aromatised wines, beverages based on vitivinicultural products or wine-based beverages into sparkling products.

Prescription:
Carbon dioxide must meet the prescriptions of the International oenological Codex.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.1. OENOLOGICAL SPECIFIC PRACTICES FOR AROMATISED WINES, BEVERAGES BASED ON VITIVINICULTURAL PRODUCTS AND WINE-BASED BEVERAGES (OENO 439-2012)

6.1.16 TARTARIC STABILIZATION BY CATIONIC EXCHANGE (OENO 439-2012)

Definition:
Process during which the base wine flows through a column filled with polymeric resin reacting as undissolvable polyelectrolyte and whose cations can be exchanged with cations of the surrounding environment.

Objective:
Obtaining tartaric stability of aromatised wines, beverages based on vitivinicultural products and wine-based beverages:
a) face to face of potassium hydrogen tartrate,
b) face to face of calcium tartrate (and other calcium salts).

Prescription:
a) Treatment should be limited to the removal of excess cations.
b) Treatment should be applied by using resins regenerated by acid cycle.
c) A wine-making expert or a specialized technician should supervise all operations.
d) Resins must meet the International oenological Code Prescription and must not cause excessive changes in the physico-chemical composition and sensorial properties of wine.

Recommendation of the OIV:
Admitted for aromatised wines, beverages based on vitivinicultural products and wine-based beverages.

6. PRODUCTS DERIVED FROM GRAPES, GRAPE MUST OR WINE

6.2. OENOLOGICAL SPECIFIC PRACTICES FOR WINE VINEGARS (OIV-OENO 658-2023)

6.2.1 METALS REMOVAL FROM AGED WINE VINEGARS BY CHELATING RESINS OF STYRENE-DIVINYLBENZENE WITH IMINODIACETIC FUNCTIONAL GROUP (OIV-OENO 658-2023)

Definition:
Physical partial extraction of metal ions from aged wine vinegars by chelating resins.

Objective:
Reduce the concentrations of metal ions (iron and copper) to avoid stability problems in aged wine vinegars (aged in barrels for a minimum of two years)

Prescription:
a) the treatment will be performed using chelating resins with iminodiacetic active group regenerated in the acid cycle;
b) the treatment must be limited to the elimination of excess metal ions;
c) the treatment will only be used on aged wine vinegars to remove metals acquired (enriched) during the ageing process;
d) the treatment will preferably be carried out by percolation. In this case, the duration of the cycle must be controlled to avoid desorption of fixed ion metals;
e) as an alternative, the resin could be directly introduced into the tank of wine vinegar (for 12 to 48 hours), in the quantities required, then separated by filtration;

f) disposal of regeneration water must be carried out in an environmentally friendly manner;
g) all operations will be placed under the responsibility of an oenologist or a qualified technician;
h) the resins must comply with the prescriptions of the International Oenological Codex

Recommendation of the OIV:
Admitted.

PART III

GOOD PRACTICES GUIDE

Partie III - Guide pour le transport du vin en vrac

GOOD PRACTICES GUIDE FOR BULK WINE TRANSPORTATION

1. USE OF THE GUIDE

This Guide of Good Practices has been developed by the International Wine Office (OIV) and adopted by its members States during its 80th General Assembly, the 23rd of June 2000[33]. It incorporates procedures to which Suppliers and Purchasers on the one hand and Freight Forwarders and Ship Owners on the other, should refer when negotiating contracts concerning bulk wine transport operations.

The Guide is advisory in nature, but all the practices proposed, subject to their conformity with the applicable regulations in the various regions concerned, are in actual and successful use. With proper application, they contribute to the quality of the wine during transit and to guaranteeing its authenticity.

2. SCOPE

[33] *The OIV acknowledges with gratitude that this Guide is based to a large extent on "A Guide of Practice Relating to the Transportation of Wines, Spirits and Concentrated Grape Must in Bulk", published by the Wine and Spirit Association of Great Britain and Northern Ireland in 1994.*

The Guide of Good Practices applies to the handling of wine (both table wine and quality wine) in bulk. It contains the minimum requirements to ensure acceptable cleanliness and freedom from any defect or contaminant which could adversely affect the characteristics or quality of the wine being carried, including its authenticity

3. INTRODUCTION

3.1 GENERAL

Two types of alteration can occur in wine during the operations dealt with in this Guide; oxidation and contamination. The susceptibility of wine to alteration depends upon several factors including the type and characteristics of wine under consideration. These should be considered when transporting the wine.

3.1.1 Oxidation

Contact of wine with oxygen, present in the atmosphere, causes chemical changes in the wine which change its quality. Much can therefore be gained by limiting to a maximum the amount of air contact with the wine and this principle is the basis of several of the recommendations in this Guide. Oxidation proceeds more rapidly as temperature increases, so each operation should be carried out at the lowest practicable temperature but without stimulating tartrate precipitation where either the supplier or the purchaser wants to avoid it. In any case, it is worth noting that oxygen is more soluble in wine at low temperature than at higher temperature. The rate of oxidation may be increased by the catalytic action of certain metals, even when trace amounts are present. Because of this, great care should be taken in the selection of materials which come into contact with the wine during transport.

3.1.2 Contamination

Undesirable contamination may be chemical, physical or microbiological in nature. It may arise from residues of a previous material handled in the equipment, from ingress of dirt, rain or seawater or through the deliberate or accidental addition

of a different product. In ships, particular difficulty may be experienced ensuring cleanliness of valves and pipelines, especially where they are common for different tanks. Contamination is avoided by good design of the systems, adequate and strict cleaning routines and an effective inspection and sampling service, and the rejection of tanks which have carried unsuitable previous cargoes.

3.2 DEFINITIONS

3.2.1 Supplier
The company or companies from whose cellars the wine is to be collected for shipment.

3.2.2 Purchaser
The Party that has placed a contract for the wine to be collected from the Supplier and transported.

3.2.3 Ship Owner/Agent/Freight Forwarder
The Party that has been contracted to transport the wine, whether this be Ship Owner, Agent, tankcontainer/roadtanker operator or a commissioner of transport

3.24 Acceptable cleanliness
For tanks, pipelines, and all ancillary equipment, including pumps with which the wine comes into contact, a state of Acceptable Cleanliness is defined, after cleaning and disinfection, as follows:

- All items shall be free from taint or perceptible odor.
- No traces of solvents or debris shall remain.
- No traces of previous cargoes shall remain.
- No traces of detergents or sanitising agents shall remain.

- Equipment must be disinfected and rinsed before use, according to the use of the equipment and the nature of the wine.

3.2.5 Conditions of use
Tanks, containers and all ancillary equipment must be in excellent condition, physically and mechanically, and fit for the purpose intended. It should be noted that alcoholic beverages may be classified under IMO and or ADR as flammable cargoes and that tanks carrying such substances should comply with appropriate construction criteria for transport.

3.2.6 Washing
Cleaning must be conducted by a pressure spray system using a rotating head, or by a system of equivalent efficacy. Water and cleaning agents should be used. The water used for all rinsing operations of surfaces in contact with wine must be clean and free from microbial or other contamination, and without residues of organic or inorganic disinfectants, whether oxidative or not (Cl_2, O_3, …). It must also have a low content of calcium and iron.

4. TRANSPORTATION

4.1 CONSTRUCTION OF TANKS AND ANCILLARY EQUIPMENT

4.1.1 General
All materials used in the construction of tanks and of ancillary equipment, such as hoses, hose connections, pipelines, seals and gaskets, valves, strainers, pumps, temperature gauges or sampling apparatus, should be inert to wine, and should meet

any appropriate legislation concerning materials in contact with food.

Copper and its alloys, such as brass, bronze or gun metal, should not be used in the tanks or ancillary equipment of a ship or road/rail tanker that are designed for the transport of wine. Temperature gauges containing mercury should not be used. Glass equipment and glass sample bottles should be avoided where breakage might lead to contamination.

4.1.2 Tanks

All tanks, pumps and fittings should be constructed of stainless steel, of polished AISI 304 or 316 (EN58J) quality or equivalent rating. Where existing vessels with tanks constructed of materials other than AISI 304 or 316 stainless steel are required to be used, the Purchaser must be informed and his approval to use the vessel obtained in writing in advance. In this event, the Purchaser should notify the Supplier or Agent that approval has been given for the vessel to be loaded subject to the condition of the vessel being acceptable immediately prior to loading.

In all cases, tanks should be fitted with a bottom outlet valve capable of being connected to the pumps to assist cleaning and sanitising procedures, to ensure complete drainage, and to allow bottom loading and discharge of the wine. This is an essential requirement for tankcontainers and roadtankers.

Ideally, ships' tanks should each be fitted with an independent pump which should be reversible to allow wine to be loaded and discharged via a bottom outlet valve. Pumps must be capable of being cleaned, sanitised and inspected as described in Sections 6.2 and 5.1, respectively.

Internal fittings within the tank should be kept to a minimum and should be constructed of the approved grade of stainless steel. For roadtankers and tankcontainers, all internal fittings should be constructed of the agreed grade(s) of stainless steel (see above). Internal ladders must have fully sealed ends except in the case of the side supports of a ladder being specifically designed for use as a loading or discharge pipe. In this case the ladder rungs must be completely sealed from the loading/discharge section.

Tank doors or manways should be of sound construction and well-fitting. They should be easily accessible for steaming, washing with a pressure spray system using a rotating head or other cleaning and sanitising procedures. Sealing gaskets/washers should be detachable from the tank door or manway to allow manual cleaning and replacement at regular intervals.

It may be useful to equip each compartment of the container or tank with a cleaning-in-place system, correctly sized and positioned. However, this should be avoided if the container or tank is also used to transport viscous liquid foodstuffs.
Tank closing or sealing devices should be constructed in such a way that will not allow the intake of air or liquid during a sea voyage. Where necessary, seals should be tamper evident or should comply with appropriate excise requirements.

Expansion pipes and pressure relief valves should be constructed of stainless steel and be of sound construction. They must be capable of being cleaned and sanitised and should include a non-return valve to prevent the return to the tank of the expanded liquids, with suitable provision to avoid a consequential vacuum in the tank. Particular attention must be given to the pressure in tanks during transport and discharge.

Fittings should be of a common size either 80 mm, 90 mm, 100 mm or 150 mm, preferably of the bayonet type with free jointing or male screw thread. Where non-standard fittings are in use, suitable cleaned and sanitised stainless steel adapters should be made available by the Ship Owner or Freight Forwarder.

It is strongly recommended that tanks should be insulated against temperature variations which might be reasonably anticipated in the course of transit. Where appropriate, further temperature control equipment should be fitted, to give in all cases the possibility to refrigerate the tank or the wine and to monitor temperature.

4.1.2.1 Flexible containers

The containers should be constructed from inert materials, approved for wine contact and impervious to oxygen and potential volatile contaminants (such as chloroanisoles, petroleum, fuel oil,….).

4.1.3 Hoses, pipelines and pumps

All flexible hoses used during loading and unloading must be of inert material suitable for contact with wine, be suitably reinforced and be of such a length to make cleaning easy. Couplings should be of stainless steel or other inert materials. When not in use, all flexible hoses for delivery of the wine shall be stored with the ends capped after draining and not in contact with the floor. There must be clear marking or identification systems for pipelines.

4.1.4 Precautions against unnecessary exposure to air

Pipelines and their connections should be designed to prevent the admission of air. It may be appropriate to sparge the wine with nitrogen, carbon dioxide or a mixture of nitrogen and carbon dioxide to remove oxygen during loading and unloading. Tank

filling should be done wherever possible from the bottom of the tank. Where filling is done over the top of the tank, the pipe (cleaned on the inside and outside) should lead to near the bottom to avoid cascading and thus aeration. It is preferable to purge the pipeline leading to the tank with inert gas before use. However, if air is used a suitable means must be provided to prevent it coming into contact with the wine in the tanks. It is essential that any air or inert gases used in these operations be of food quality.

Where necessary, equipment for the provision of inert gas blanketing of the wine during transport should be fitted in accordance with the appropriate construction and operating regulations or recommendations for tankcontainers.

Containers, tanks or their compartments should be fully filled so as to limit the risk of oxidation.

4.2 CARGOES CARRIED

It is preferable that tanks and containers used for bulk transport of wine should be dedicated to carrying only must, grape sugar, wine or potable spirit. Particular care should be taken with tank cleaning when the previous cargo contained aromatic spirit or other aromatic food commodity.

Other foodstuffs may be carried as previous cargo but only with express written agreement of the Purchaser. In the case of oils, fats, dairy products, animal feed or other substances that may technically be considered as foodstuffs (food-grade products for pharmaceutical use, for example) particular precautions must be applied in regard to cleaning. The precise cleaning and sanitising

steps used should be adapted according to the nature of the immediate previous cargo (see section 6.2).

For ships' tanks, the Purchaser should be advised in advance in writing of the exact nature of the previous cargo carried. In some cases, Purchasers may require details of a number of the cargoes carried prior to the shipment of the Purchaser's wine where the use of common loading or discharge equipment may cause contamination or loss of its quality. Other cargoes on the vessel at the time of loading and those planned to be handled prior to off-loading should also be identified.

For tankcontainers, the previous cargo should be noted on the cleaning certificate or certificate of intervention.

The different parties (3.2.1., 3.2.2., 3.2.3.) must be informed of any passivation that may have been performed on the tank.

It is not permissible for Freight Forwarders to use tankcontainers that have previously carried non foodstuff cargoes[34].

[34] *For sea transport, seawater must in no case be used in tanks in a regular manner to ensure the stability of the vessel. Use of seawater for ballast is only permitted exceptionally because of difficult meteorological conditions. Seawater cannot be considered as a foodstuff.*

5. INSPECTION, CERTIFICATION AND SAMPLING

5.1 INSPECTION AND CERTIFICATION

5.1.1 Ships' tanks

It is imperative that an independent surveyor is employed to check all aspects of the tanks, containers and ancillary equipment. This surveyor should be trained so that he/she has a full understanding of the Guide, the Supplier's and Purchaser's written requirements and the specific requirements of the wines being transported. In addition, it is strongly recommended that a member of the Supplier’s technical staff attends loadings to ensure that the surveyor is fully briefed and effective and check that the ship's crew is aware of the nature of the product being transported.

In accordance with the terms laid down in the charter party, it is the responsibility of the Ship's Master to provide (for the shipment and discharge of wine) tanks or containers, pumps, pipelines, hoses and any other ancillary fittings which are in good repair, of satisfactory cleanliness (see section 6.2) and free from any taint or defect which could adversely affect the quality or characteristics of the Purchaser's wine.

The Purchaser, his Accredited Agent or any independent surveyor (recognized as competent in the area of international transport of foodstuffs) appointed by the Purchaser (and acceptable to both the Purchaser and Ship's Owner) should carry out an examination of all tanks, containers and other equipment to be used. A certificate of inspection (see example in Appendix 1) should be completed and signed by the Ship's Master/Chief Officer.

The certificate of inspection should contain the following information:

- The Plan of Loading
- The nature of products carried on the previous voyage (or more if requested by the Purchaser (see 4.2)).
- The nature of any additional cargoes being carried at the same time as the Purchaser's wines together with details of any discharges carried out prior to the Purchaser's destination.
- Precise details of cleaning procedures used to remove residues of previous cargoes and subsequent sanitising procedures.
- Suitability of tanks, pumps, hoses, etc., to receive the wine (i.e. freedom from damage or defect, cleaning completed satisfactorily, visual appearance acceptable, etc.).
- Guarantee of perfect segregation of the cargo.
- Additional information as required by individual Purchasers.

Any details regarding unacceptable standards in the tanks or equipment to be used should be recorded, together with the action taken by the Ship's Master/Chief Officer to rectify those standards.

The independent surveyor has the right to reject any individual tank or item of equipment which he/she considers to be in an unacceptable condition for loading the wine, giving his reasons in writing to the Ship's Master/Chief Officer, and to require the Ship's Master/Chief Officer to take the necessary steps to bring the tank or equipment up to the required standard.

Loading will not normally be permitted until the certificate of inspection has been completed and approved by the surveyor/accredited Agent. However, in the event of the majority of tanks and equipment being passed as acceptable, loading may commence into these tanks and equipment while action is being undertaken to bring the unacceptable tanks and equipment up to the required standards.

One copy of the completed certificate of inspection should be made available to each of the following:

- Ship's Master
- Surveyor
- Purchaser's Agent (if different from the Surveyor)
- Ship's Owners
- Purchaser

Copies for the Ship's Owners and the Purchaser should be dispatched by airmail or fax to be available in advance of the ship's arrival at its destination. The Ship's Owner is required to notify the Purchaser of the previous cargoes carried in the ship, preferably 5 days in advance of the ship being presented for loading.

5.1.2 Other tanks, including flexible containers

The transport operator shall not be responsible for the provision or condition of any hoses, pumps, pipelines or other ancillary equipment used for the loading and/or discharge of the goods unless previously agreed with the Supplier or Purchaser.

Certificates of cleanliness should be issued after cleaning for each tank (see Appendix 2 for an example). Presentation of these certificates may be made directly to the loading bay, or by arrangement between the Freight Forwarder and the Purchaser.

Details may be notified by telex or fax and the original certificates retained on file.

Tankcontainers and roadtankers carrying alcoholic beverages classified under appropriate regulations as flammable liquids must be equipped and labeled to comply with the appropriate regulations. The consignor has a statutory duty to ensure that these regulations are complied with before dispatch of the transport unit.

5.2 SAMPLING OF THE WINE

5.2.1 Introduction
It is strongly recommended that adequate samples should be taken at each stage at which the wine is handled so that, in the event of a defect (including lack of authenticity) or contamination being found in the wine the cause and source of the defect or contamination can be established. It is the responsibility of the party taking the samples to ensure that the samples are taken under conditions of strict hygiene in such a manner that will neither infect nor contaminate the sample or the wine in the tank.

Samples should be taken in clean, sterile bottles kept solely for the purpose. Samples should be representative of the condition of the wine being sampled and should be clearly labelled, hermetically closed, possibly sealed and stored under suitable conditions. The used of receptacles having tamper-evident closures is recommended.

Sampling cans used in ships' tanks operations must be thoroughly cleaned and rinsed in fresh, potable water before use.

Ideally, they should also be sanitised by immersion in a suitable sanitising solution followed by rinsing in fresh, sterile-filtered or sterilised potable water.

Where necessary, the Purchaser will arrange for suitable sterile sample bottles to be provided by the Supplier or other nominated Agent at the points of loading and discharge.

The samples should be clearly labelled, hermetically closed and possibly sealed, in a manner acceptable to all parties.

All the samples taken must be retained for at least 90 days or any period specified in the contracts signed by the Purchaser, the Supplier and the shipping Agent. In cases of dispute over the quality or the condition of the wine, these samples may be analysed by accepted experts so as to establish when the fault occurred. Additional samples may be requested by the buyers involved.

5.2.2. Sampling prior to loading

5.2.2.1 Supplier's cellars

The Supplier should take at least 4 samples of between 0.5 and 1.0 litres from each vat from which the wine is to be drawn for shipment. Samples should be drawn under strictly hygienic conditions from the heart of the tank or compartment and should be representative of the condition of the wine immediately prior to shipment. Samples should be hermetically closed, possibly sealed, clearly labelled and signed by the Supplier or in his/her presence.

- One sample should be retained by the Supplier.
- One sample should be retained by the Freight Forwarder, Ship Owner or his Agent.

- Two samples should be available to the Purchaser.

5.2.2.2 Transportation to ship's side

In the event of the wine being transported to ship's side by means of a container, tanker, rail wagon, etc., samples may be required from each container, tanker, rail wagon etc., after loading. Details of the number of samples required and of the parties requiring these samples should be agreed in writing between the Supplier and the Purchaser or the Purchaser's accredited Agent.

5.2.3 Sampling at loading

A minimum of 3 samples of between 0.5 and 1.0 litres should be taken from each tank containing the wine immediately after loading has been completed. The samples should be taken hygienically and representatively, as specified in 5.2.2.1

Ideally, samples should be taken by the Supplier or loading point Staff in the presence of a representative of the Freight Forwarder. The samples should be clearly labelled, hermetically closed and possibly sealed in a manner mutually acceptable to all parties.

One sample should be signed for and retained by the Supplier, Freight Forwarder or Ship's Master. One sample should be retained by the Purchaser's accredited Agent. One sample should be retained for the Purchaser.

5.2.4 Sampling on arrival

Samples should be taken from each tank prior to the commencement of unloading at the point of discharge. The

samples should be taken hygienically and representatively, as specified in 5.2.2.1.
The number of samples required may vary and should be agreed in advance between the Supplier, Freight Forwarder or Ship's Owner, and the Purchaser or the Purchaser's accredited Agent.

Samples should be taken by the Purchaser in the presence of a representative of the Freight Forwarder. Representatives of other interested parties may be present if the contract permits.

6. OPERATIONS

6.1 LOADING AND UNLOADING

6.1.1 Preparation of the wine for shipment
The wine to be transferred to tanks for transport shall conform to the specifications of the purchaser and to the legislation in the destination country concerning organoleptic and physico-chemical properties. The microbiological quality of the wine shall be defined by agreement between the Purchaser and the Supplier. In effect, the wine must remain of merchantable quality throughout its journey.

The correct pre-treatment, such as filtration, addition of preservatives, is the responsibility of the Supplier in agreement with the Purchaser and is normally carried out under the immediate control of the Supplier.
It is the responsibility of the Supplier and/or the Purchaser to ensure that any treatments, additions of preservatives, etc., do not infringe regulations of the country importing the wine.

It is the responsibility of those supervising the loading of tankcontainers to satisfy themselves that the overall condition of the tankcontainer reaches an acceptable standard for the transport of its cargo. If the tankcontainer is presented in a contaminated, dirty or otherwise unserviceable condition contrary to the terms on which it is hired, then the Supplier may refuse to load it. If he/she chooses to load, it is done at the Supplier's responsibility. If not, it is the responsibility of the Freight Forwarder to arrange effective cleaning and sanitisation of the defective tankcontainer or to provide a satisfactory alternative tankcontainer.

6.1.2 Readiness of tanks and containers for loading or unloading

6.1.2.1 Ships' tanks

The vessel shall not be considered ready for loading or unloading until it has been inspected and it is confirmed that all equipment such as tanks, pumps, manifolds, hoses, fittings, are in a condition of Acceptable Cleanliness.

If the accredited surveyor / Agent at the point of loading or unloading is not satisfied with the condition of the equipment to be used, the vessel shall not be deemed ready for loading / unloading until the necessary steps have been taken by the Ship's Master / Chief Officer to bring the condition of the equipment involved up to the required standard.

The Purchaser or his accredited surveyor / Agent should undertake to carry out the inspection of the vessel and equipment as soon as possible after notification by the Ship's Master / Chief Officer that the vessel is deemed ready for loading or unloading subject only to local working practices.

6.1.2.2 Tankcontainers, roadtankers and flexible containers
The unit shall not be considered ready for loading until it has been inspected and it is confirmed that all fittings (i.e. valves, man lids etc.) are in a condition of Acceptable Cleanliness.
If the Supplier at the point of loading is not satisfied with the cleanliness of the unit he/she should reject it and instruct the tank(er) operator to re-present it once it has been brought up to the required standard.

The Supplier and tank(er) operator should ensure that the tank/tanker is labelled in accordance with the regulations relevant to the journey it is to undertake.

6.1.3 Loading procedures

In order to reduce the risk of oxidation, tanks should normally be fully filled from the bottom via the outlet valve. This is particularly important when loading tankcontainers and roadtankers with wine.

If tanks have to be filled from the top through the manway door (which should be avoided whenever possible), it is the responsibility of the Supplier, Freight Forwarder or Ship's Master/Chief Officer to ensure that every care is taken during loading to prevent undue aeration and turbulence by use of a standpipe reaching to the bottom of the tank.

It is essential to ensure that tankcontainers and roadtankers are positioned on a level surface prior to loading.

After each tank has been loaded and adequate time has elapsed to allow the wine to settle, the absence of air pockets and the level of filling should be verified from the man-hole and the

temperature of the wine taken. This information should be recorded on an ullage/temperature report.

Tanks should be closed and sealed to prevent airborne contamination. Where appropriate, tamper-evident seals may be used.

6.1.4 Unloading procedures

6.1.4.1 Ships' tanks

It is strongly recommended that the Purchaser or the Purchaser's Agent be present at the time of arrival of the ship for discharge. The Purchaser or the Purchaser's Agent should be satisfied that the tank has remained hermetically sealed during shipment and that the quality and characteristics of the wine and the cleanliness of the ancillary equipment to be used for discharge are of the required standard, as per the contract.

The programme and order of discharge of the wine should be mutually agreed in writing between the Ship's Master/Chief Officer and the Purchaser's Agent or his Representative. Following acceptance of the programme, the Ship's Master/Chief Officer should sign the programme, retaining one copy for himself/herself and returning one copy to the Purchaser or his Agent.

No deviation from this agreed discharge programme is permitted without consultation with the Purchaser's receiving Agent or Warehouseman. In this event, discharge should cease completely prior to the consultation with the Purchaser/Agent/ Warehouseman without prejudice to demurrage charges.

Any deviation from the agreed discharge programme made without consultation with the Purchaser/Agent/Warehouseman

which subsequently is found to be the cause of delays in discharge, cargo mixing, contamination or any other problem, is the sole responsibility of the Ship's Master. In this event, a letter of protest should be drawn up immediately by the Purchaser's accredited Agent. In the presence of the Ship Owners' Agent, the letter should be given to and acknowledged in writing by the Ship's Master/Chief Officer. Copies should be retained by the Purchaser's Agent and despatched to the interested parties. This procedure should also be adopted in the event of any defect in the wine.

Where wines of different characteristics are to be discharged using the same pump, manifold or hose system, the Purchaser may require these to be cleaned between wines to avoid contamination. This is indispensable if wines of different colours are unloaded successively.

Any claim, of whatever nature regarding the wine, must be reported immediately in writing to the interested parties.

Ship's crews should be made fully aware that mishandling of the wine can cause serious or irrevocable damage to the quality and type of the wine.

6.1.4.2 Tankcontainers, roadtankers and flexible containers

Prior to unloading, the Purchaser should satisfy himself/herself that any tamper-evident tank seals are intact and that their numbers correspond with those shown on the accompanying documentation. He/She should also check that the tank fittings are in sound condition.

Where appropriate, the Purchaser should check that the headspace (ullage) does not exceed the specified volume and that the inert gas pressure (if applicable) is within specification.
The Purchaser should check that the wine is of the nature, substance and quality expected prior to discharge.

Pumps, pipelines, receipt tanks, etc., must all be confirmed as being in a state of Acceptable Cleanliness, adapted to suit the Purchaser and permitting unloading to occur.

6.2 CLEANING AND SANITISING

6.2.1 Methods

6.2.1.1 Introduction

All operators carrying out cleaning and sanitising procedures should be made fully aware of the appropriate regulations regarding entry to tanks and the safety precautions necessary for materials and procedures being used. They should be provided with the necessary protective clothing and equipment. It must be particularly noted that 'overproof' spirits are classifiable as hazardous 'inflammable liquids', and tanks may in addition contain residual narcotic fumes. When entering a tank, suitable rubber footwear should be worn to avoid scratching or damaging the internal surfaces on the tank.

Procedures for achieving suitable and Acceptable Cleanliness should include steps which will effect the following functions.

- Pre-cleaning (using a pressure spray system with rotating head or equivalent with fresh, possibly softened, potable water).
- Cleaning (using a pressure spray system with rotating head or equivalent with a solution of a suitable cleaning agent in fresh potable water).
- Rinsing (using a pressure spray system with rotating head or equivalent with fresh potable water).
- Sanitising (By use of steam, hot potable water or approved chemical sanitiser).
- Rinsing after chemical sanitisers have been used (using a pressure spray system with rotating head or equivalent with fresh potable water).

- Draining. A sample of the final rinse water should be visibly clear, free from odour and containing no traces of sanitisers after testing. After cleaning, tanks should be thoroughly drained of rinse water in such a manner as to minimise any re-infection.
- Possible drying of the tank to avoid ice formation.

It may be useful to retain a sample of the final rinse water with a view to performing taste tests and microbiological analyses.

Tankcontainer and roadtanker operators should ensure that tanks are not moved prior to the completion of the draining process and that the valves and man lid covers have been closed.

6.2.1.2 Tank cleaning

All tanks used for transporting wine shall be of Acceptable Cleanliness before use.

An approved methodology for tank cleaning should be agreed between the Freight Forwarder, the Supplier and the Recipient of the wine.

Cleaning is to be carried out with the aid of a solution of cleaning agents and water, hot and/or cold as required, according to the manufacturer's recommendation.

Manual cleaning of tanks may be necessary periodically, and this may be carried out by means of scrubbing the internal surfaces with a soft brush and a solution of cleaning agent. Brushes should be free of any metal or rough parts that may damage or scratch the tank surfaces.

Special attention should be paid to the cleanliness of the manway door, manway seal, outlet valves and their washers. These

should be manually brushed with cleaning agent and rinsed thoroughly, possibly after dismantling.

Manway door seals and any outlet valve washers should be examined regularly and replaced as required to ensure their continued fitness for use.

During the cleaning cycle, outlet valves should be opened to allow a flow of the cleaning solutions to pass through.

After cleaning, all traces of chemicals/cleaning agents used must be completely removed by rinsing. The rinsing cycle should be continued until a sample of the rinse water is visually clear and free from any chemical odour or taste. The rinse water should not contain after testing (coloured indicator, pH paper….) residues of cleaning or sanitising agents.

Ideally, tanks should be given the full cleaning procedure immediately after unloading of the wine has been completed. When this is not possible, all items must be rinsed immediately after unloading and the complete cleaning procedure carried out as soon as possible thereafter. The selection of a suitable chemical/cleaning agent depends on the regulations in the country concerned and to some extent on the nature of the previous cargo.

For effective cleaning, it is essential that chemical/cleaning agent strengths, the contact time and the temperature are maintained at the Manufacturer's recommended levels at all times.

All tanks to be used for the transportation of wine shall undergo cleaning procedures that include a chemical/cleaning agent cycle and a rinse prior to sanitising procedures.

Flexible containers are cleaned externally by high-pressure spraying with detergent solution and brushing as necessary to remove dirt and grease marks, followed by rinsing. Before the use of hot water, cleaning with detergent can be useful to avoid incrustation of wine residues. If the material will tolerate it, internal cleaning is by the use of hot water spraying at 85°C - 87°C for a minimum of 25 minutes, and until such time that the outlet water is completely clean and free from any solids or traces of previous cargoes. These procedures are conducted on a container previously placed on a cleaning cradle and inflated to 35 hPa using a low-pressure, high-volume industrial blower fitted with a filter suitable to prevent contamination and re-infection of the flexible container.

6.2.1.3 Tank sanitising

Sanitising may be carried out by the use of steam, hot fresh, potable water or chemical sanitisers approved in the regulations of the country concerned. Flexible containers are usually sanitised by the use of chemicals, except for operational fittings, where chemicals and/or steam are used as appropriate. An approved method should be agreed by the Purchaser or his Agent and the Freight Forwarder depending on the facilities available. If air is used after sanitising, it is imperative to filter it.

In countries with a cold climate, the trapdoor of the tankcontainer may be rinsed after cleaning and sanitation with 1 to 2 litres of a solution of pure ethanol, having an alcohol content of 70% to finish the sanitation process and to prevent icing of the trapdoor and the valve.

6.2.1.3.1 Steam

Steam should be applied through the manway door using suitable injection equipment (rotating head system or equivalent) to allow the steam to penetrate thoroughly to all parts of the tank and

fittings. A sufficient supply of steam should be applied in such a way that, for example, a temperature of at least 82°C is measured at the outlet for at least 20 minutes. This can be determined by the use of temperature indicating tape, discs or contact thermometer. The steam supply must be clean and free from any taint or contamination (some boiler feed treatments may result in contamination from phenolic material or calcium). A suitable steam filter should be fitted if necessary. Before attaching the steam supply to the tank, the steam hoses should be blown through for 5 minutes or until all condensate has been removed.

The manway door and any additional valves or outlets in the tank should be partially closed during steaming to allow for maximum contact or should be separately sanitised.

After steaming is complete, the condensate should be drained away and care taken to allow sufficient venting (with filtered air or neutral gas) during cooling to prevent implosion. This should be done in such a manner as to minimise re-infection. Tankcontainers and roadtankers should not be moved until adequately vented and all man lids and valves have been closed.

In the case of ships' tanks, when sanitising has been completed the tank should be closed, sealed so as to avoid possible re-infection or recontamination and labelled CLEANED/SANITISED with the initials of the operator. If the need arises, according to the agreement of the parties, the cleaner may be required to place seals on the tanks.

6.2.1.3.2 Hot water

Sanitising may be effected by the use of hot, fresh, potable water, providing that a constant water temperature of 82°C can

be maintained for a minimum of 30 minutes, timed from the point when the hot water draining from the tank reaches 80°C (reference table to be used). Hot water should be applied either by high pressure spray using a rotating head or equivalent capable of impinging the hot water on all surfaces of the tank. Scavenging of hot water from the bottom of the tank during this process should be sufficient to prevent build-up of water in the bottom of the tank.

The hot, potable water supply must be clean and free from any taint or contamination.

After the hot flushing has been completed, the tank must be allowed to drain and cool completely.

When sanitising has been completed, the tank should be hermetically closed to prevent possible re-infection or contamination and possibly sealed.

6.2.1.3.3 Chemical Products

Various chemical sanitisers are available, and the choice of a sanitiser should be made from a list of approved chemicals to be agreed between the Freight Forwarders or Ship Owners and the Purchasers, in conformity with the regulations of the countries concerned.

The concentration of the solution used, the temperature and the minimum contact time required vary with the type of product used, and it is essential that the manufacturer's recommendations should be strictly followed.

The correct working strength of the chemical sanitiser must be maintained throughout the sanitising procedures if effective

sanitising is to be achieved, and facilities for checking this should be made available.

The sanitising solution should be applied by pressure spraying with a rotating head or equivalent, capable of impinging the sanitiser on all surfaces of the tank or container. Scavenging of the sanitiser from the bottom of the tank during this process should be sufficient to prevent a build-up of sanitising solution in the bottom of the tank.

After sanitising has been completed, all traces of the sanitiser must be removed by adequate rinsing with fresh, possibly softened, potable water. Potable water used for rinsing must be clean, free from any taint or contamination, and of an acceptable biological condition.

The rinsing cycle should be continued until a sample of the rinse water is visually clear, free from any chemical odour or taint and from chemical residues detectable using appropriate tests (pH paper, coloured indicator,...)

When rinsing has been completed, the tank should be allowed to drain completely. The tank should then be hermetically closed to prevent re-infection or contamination, and possibly sealed.

Chemical sanitising is suitable for use on stainless steel and most tank materials, but advice should be sought before selecting a chemical sanitiser as approved by the Supplier or Purchaser to ensure that the chemical is suitable for the construction materials of the equipment being used and for the micro-organisms to be eliminated.

For ships' tanks, sanitising should be carried out the same day as loading.

Sanitising for tankcontainers and roadtankers should be carried out within an elapsed time agreed between the Freight Forwarder and the Supplier or Purchaser.

6.2.1.4 Ancillary equipment

All pumps, pipelines, hoses, fittings, etc., used to carry wine to or from the tanks should be rinsed with water before use (see 3.2.6) and after use, cleaned, sanitised and maintained in a fit condition.

Cleaning and sanitising of ancillary equipment should be carried out by any one of the methods previously described.

Outside surfaces of hoses and fittings should be kept in a clean, sound condition. Inside surfaces of hoses and any sealing washers should be regularly examined for signs of wear. If wear is observed, the worn items should be replaced.

In the interest of overall cleanliness and hygiene, any item of equipment which may come into contact with the wine, such as sample cans, dipsticks, etc., should be effectively cleaned and sanitised before use. The equipment should then be rinsed with fresh, potable water prior to use.

6.2.2 Microbiological standards of acceptable cleanliness

It is recommended that interested parties carry out microbiological examinations at regular intervals to monitor the effectiveness of the cleaning and sanitising procedures.

Freight Forwarders may not have the necessary facilities of their own with which to monitor the effectiveness of their sterilisation procedures. However, it is in their own interests to ensure that the required standard of commercial hygiene is achieved and the services of a suitably qualified analyst may be engaged to carry

out this work. The Purchaser may also be prepared to assist in carrying out a microbiological survey and random audits of cleaning stations.

The recommended microbiological standards following sanitation are specified in the International Oenological Codex.

6.3 MAINTENANCE

Regular maintenance checks should be made, preferably as part of a properly planned maintenance programme. They should include thermometers, thermostats, recording thermometers, weighing equipment and any gauge meters for function and accuracy; all leakage detection devices for the pumps and thermostat; integrity of tank coatings; hoses (internal and external) and condition of tanks and ancillary equipment.

Acceptable repairs for tanks and tankcontainers: The integral surfaces of the tank must be in good, undamaged condition. Any minor faults in the surfaces may be repaired by polishing or buffing. More serious faults should be repaired by cutting back and welding to agreed specifications laid down by a recognised authority. All repair work must be signed off by a competent member of the repairing depot's staff and the relevant accreditation body where applicable.

Flexible containers should be tested for damage at the time of cleaning and sanitising. Mouldings and drain assemblies, fittings, harness and valise, comer clamps should all be examined, together with the top and bottom surfaces of the container. In addition, the container should be inflated to 35 hPa prior to examining its internal surfaces. Small leaks may be detected during the cleaning process where detergent is used on outer surfaces of the inflated container and will be made apparent by the formation of bubbles. All necessary repairs should be made to bring the container into an acceptable condition for use without risk to the Supplier or Purchaser.

GLOSSARY

ADR - Accord Dangereux Routiers (European Agreement for the International Carriage of Dangerous Goods by Road)
AISI - American International Standard for Stainless Steel
EN58J - European Standard for Stainless Steel
IMO - International Maritime Organisation
ISO - International Organisation for Standardisation

APPENDIX 1

SHIPS TANKS ONLY

CERTIFICATE OF CLEANLINESS AND FITNESS OF SHIP'S TANKS, PIPELINES AND ANCILLARY EQUIPMENT.

Complement to certificate(s) of cleaning or certificate(s) of intervention number(s)……
If the tank(s) is/are sealed before loading, the number(s) of the seal(s)……

This document to be completed before the loading of the tank(s)

To the Master/Chief Officer of ……..

..... have entrusted us with the control of the cleanliness of your vessel's tanks and ancillary equipment with which their cargo will come into contact during loading and subsequent sea voyage.

Would you please complete the attached questionnaire concerning the tanks to be filled and provide the information requested below.

Date.....Signed.....
Surveyor/Accredited Agent

****

1. The plan of loading.
.....
.....
.....
2. Nature of other products handled through your ship's pumps and pipelines during the previous loading/discharge operation prior to loading the Purchaser's cargo.
.....
.....
.....
.....
3. Nature of all other products aboard your vessel during the sea voyage.
.....

.....
.....
2. Other information (as specified by the Agent).

APPENDIX 2

CLEANING CERTIFICATE/CERTIFICATE OF INTERVENTION

Certificate No ....
Name and Address of cleaning plant.....
Approval number of cleaning station (if the need arises)……
Tank-container/Tanker No:.....
Number of compartments:.....

Cleaned by :.....on.....
(Name of operative) (Date cleaned)

Previous Product(s).....

The above mentioned tank-container/tanker has been carefully cleaned in accordance with the OIV Guide of Good Practices for the bulk wine transportation.

The operations performed include the following:
☐ Prewash
☐ Cleaning with detergent
☐ Rinsing
☐ Sanitation – Method used:
☐ Steam ☐ Hot water ☐ Sanitiser – name :……
☐ Rinsing and draining
☐ Drying
☐ Inert gas flushing
☐ Placing of seals ☐ With numbers – numbers of seals :……
☐ Without numbers
☐ Other (specify)……

The following auxiliary equipment has been cleaned (delete those which do not apply)
☐ Pumps ☐ Hoses ☐ Fittings ☐ Pipes

Before leaving our depot the tank-container/tanker was visually inspected and found to be clean and odour free.
Whilst every effort is made to ensure that the tank is dry, we cannot be held responsible for condensation forming after cleaning.

Name and signature of cleaner..... Dated .....

I recognise that the container/tank conforms to the specifications above

Name and signature of transporter……Dated……

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ANNEX
MAXIMUM ACCEPTABLE LIMITS

Product	Amount used in the treatment	Residue in the wine	Source (*)
Acidity	Lactic acids, L(-) or DL malic acid and L(+) tartaric and citric acids can be only be added to musts under condition that the initial acidity content is not raised by more than 54 meq/l (i.e. 4 g/l expressed in tartaric acid),		Code
Ammonium Sulphate	0.3 g/l		Code
Arsenic		0.2 mg/l	Compendium
Ascorbic acid	250 mg/l	300 mg/l	Code
Boron		80 mg/l (expressed as boric acid)	Compendium
Bromide		1 mg/l (limit exceeded exceptionally in wines coming from certain vineyards with brackish subsoil)	Compendium
Cadmium		0.01 mg/l	Compendium
Calcium tartrate	200 g/l		Code

Product	Amount used in the treatment	Residue in the wine	Source (*)
Carbon	100 g/hl		Code
Citric acid		1 g/l	Compendium
Copper (Oeno 434-2011)		1 mg/l 2 mg/l for liqueur wines produced from unfermented or slightly fermented grape must	Compendium
Copper sulphate	1 g/hl		Code
Diammonium phosphate	0.3 g/l		Code
Diethylene glycol		≤ 10 mg/l, to the quantification limit.	Compendium
Ethanediol/ Ethylene glycol		≤ 10 mg/l	Compendium
Fluoride		1 mg/l except for vineyards treated with cryolite in accordance with the national law; in this case the fluoride content shall not exceed 3 mg/l	Compendium
Gum arabic	0.3 g/l		Code
Lysozyme	500 mg/l		Code
Malvidin diglucoside		15 mg/l (determined by the quantitative method described in the Collection)	Compendium
Lead		Wine: 0.10 mg/L (starting from the 2019 harvest year)	Compendium

		Liqueur wines: 0.15 mg/L (starting from the 2019 harvest year)	
Metatartaric acid	10 g/hl		Code
Methanol Oeno 19/04		400 mg/l for wines rouges 250 mg/l for white wines and rosés	Compendium
Natamycine Oeno 461-2012)		5 µg/L[35]	Compendium
Copolymer PVI/PVP	< 500 g/hl	Vinylpyrrolidone < 10 µg/l Vinylimidazole < 10 µg/l Pyrrolidone < 25 µg/l Imidazole < 150 µg/l	Code
Polyvinylpoly-pyrrolidone	80 g/hl		Code
Propane-1,2-diol Propylene glycol		Still wines: 150 mg/l Sparkling wines: 300 mg/l	Compendium
Sodium Carboxymethyl cellulose	0.2 mg/L		Code
Sodium in excess		80 mg/l	Compendium
Sorbic acid	200 mg/l		Code

Product	Amount used in the treatment	Residue in the wine	Source (*)

[35] *As there is lack of a reliable interlaboratory estimate of the critical level, a decision limit of 5 µg/l is temporarily adopted until a reliable interlaboratory estimate or other robust indicators of the critical level can be obtained*

Sulphates		1 g/l (expressed as potassium sulphate)	Compendium
		1.5 g/l for wines aged in casks for at least 2 years, for sweetened wines, for wines obtained by addition of alcohol or spirit to musts or to wines.	Compendium
		2 g/l for wines with added concentrated musts, for naturally sweet wines	Compendium
		2.5 g/l for film or flor wines	Compendium
Sulphur dioxide (total)		150 mg/l for red wines containing at the most 4 g/l of reducing substances	Compendium
Sulphur dioxide (total)		200 mg/l for white wines and rosés containing at the most 4 g/l reducing substances	Compendium
		300 mg/l: red wines, rosés and whites containing more than 4 g/l of reducing substances	Compendium
		400 mg/l: exceptionally in certain sweet white wines	Compendium
Volatile acidity		20 milliequivalents/l i.e. 1.2 g/l (expressed as acetic acid). The volatile acidity of some old wines of particular	Compendium

		elaboration (wines subject to a particular legislation and monitored by the government) can exceed this limit.	
Yeast ghosts	40 g/hl		Code
Zinc		5 mg/l	Compendium

(*) These limits are fixed in the *International Code of Oenological Practices* (Code) or in the *Compendium of International Methods of Analysis for Wines and Musts* (Compendium).

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INTERNATIONAL ORGANISATION OF VINE AND WINE
1, rue Monge, Hôtel Bouchu dit d'Esterno
F-21000 DIJON
Tél. +33 (0)1.44.94.80.80 - Tlc. +33 (0)1.42.66.90.63
E-mail: contact@oiv.int