

CODE OF PRACTICES FOR WINE GRAPES AND WINE

Background: Indian wine industry has been growing at a fast pace but there are no wine laws to define various standards to check frauds, safety of consumers while international wine business is controlled through legislative controls.

In India no data is available on the standards to be followed in case of wines. BIS have set some standards but those are not elaborated based on the scientific findings. Further the definition of the different kinds of wines is absent in India to define the category of the wines or other products. However OIV has clearly defined the definitions of the grapes, wines and other processed products derived from grapes like musts. These definitions are widely accepted globally and therefore these definitions have been considered for making standards.

1. Definitions¹

1.1 Wine grapes: 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.

1.2 Grape must: 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.

1.3 Preserved grape must: 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.

¹ Definitions adopted from International Code of Oenological Practices 2012 Issue , **INTERNATIONAL ORGANISATION OF VINE AND WINE**

1.4 Concentrated grape must: 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.

1.5 Caramelized grape must: 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.

1.6 Wine:

1.6.1 Basic definition: 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.

1.6.2 Complementary definitions relating to sugar content:

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 10 g/L when 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

Dry	Medium	Semi-sweet	Sweet
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4g/L sugar or 9 g/L sugar when total acidity is < 2 g/L	12 g/L or 18 g/L, when difference between sugar content and total acidity is < 10 g/L	45 g/L sugar	>45 g/L sugar
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1.6.3 Complementary definitions relating to carbon dioxide content:

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.

Wine type	<i>Still</i>	<i>Semi-sparkling</i>
Carbon dioxide content at 20°C	< 4g/L	3g/L and <5 g/L

1.7 Special Wines:

1.7.1 Flor or Film Wines

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, rectified food alcohol or alcohol of viticultural 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, rectified food alcohol or alcohol of viticultural origin which may be added must comply with the conditions fixed for the production of these products in the International Code of oenological practices and with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

It is recommended that the rectified food alcohol used is exclusively of viticultural origin.

1.7.2 Liqueur Wine

Fortified wines produced from fresh grapes, musts or wines with a natural total alcohol content of at least 12 % vol., to which only wine spirit, rectified food alcohol or rectified alcohol of viticultural origin are added. A part of the actual alcohol content of the finished product, that

shall not be less than 4 % vol., must come from the total or partial fermentation of the initial sugar.

Prescriptions :

The wine spirit, rectified food alcohol or alcohol of viticultural origin which are added must comply with the conditions fixed for the production of these products in the International Code of oenological practices and with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

It is recommended that the rectified food alcohol used is exclusively of viticultural origin.

1.7.3 Syrupy Wines

Fortified wines produced from fresh grapes, musts or wines with a natural total alcohol content of at least 12 % vol. to which are added both wine spirit, rectified food alcohol or rectified alcohol of viticultural origin, and concentrated or caramelised grape musts, or over ripened fresh grapes, or mistelles, or several of these products. A part of the actual alcohol content of the finished product, that shall not be less than 4 % vol., must come from the total or partial fermentation of the initial sugar of the grapes, musts or wines used.

Prescriptions :

The wine spirit, rectified food alcohol or alcohol of viticultural origin which are added must comply with the conditions fixed for the production of these products in the *International Code of oenological practices* and with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

It is recommended that the rectified food alcohol used is exclusively of viticultural origin.

1.7.4 Sparkling Wines

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.

1.7.5 Carbonated Wines

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.

1.7.6 Sweet Wines with Residual Sugar Derived from Grapes

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 45 g/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.

1.7.7 Icewine - Eiswein

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.

1.8 Mistelles

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, rectified food alcohol or alcohol of viticultural 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.

	Mistelles destined for further processing	Mistelles destined for direct consumption
total natural alcohol content	8.5 %	12 %
actual alcohol content of the finished product	12 to 15 %	15 to 22 %

Prescriptions :

The wine spirit, rectified food alcohol or alcohol of viticultural origin which are added must comply with the conditions fixed for the production of these products in the *International Code of oenological practices* and with the prescriptions of the *International Oenological Codex*.

Recommendation of the OIV:

It is recommended that the rectified food alcohol used is exclusively of viticultural origin.

1.9 SPIRITS, ALCOHOLS AND SPIRIT BEVERAGES OF VITIVINICULTURAL ORIGIN

1.9.1 Distillate of Vitivinicultural Origin

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.

1.9.2 Wine Distillate

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 abovementioned raw materials.

1.9.3 Neutral Alcohol of Agricultural Origin

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.

1.9.4 Neutral Alcohol of Vitivinicultural Origin

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.

1.9.5 Wine Spirits

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.

1.9.6 Brandy/Weinbrand

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.

1.10 Raisins:

Definition in FSSAI: Raisins means the product obtained by drying sound, clean grapes of proper maturity belonging to *Vitis vinifera L.* The product may be washed, with or without seeds and stems and may be bleached with Sulphur Dioxide.

Definition in OIV: 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. Check list to be followed in case of quality of wine grapes, wine grape growers, drawing grape samples, wine grape varieties grown and standards to be followed for harvesting, etc.

2.1 Quality

- **Quality** refers to the '*degree to which a set of inherent characteristics fulfils requirements*', where the requirements may differ from one person to the next.
- To a consumer, quality may refer to the intrinsic value in terms of both sensory and image perception.
- To a winemaker, quality may refer to the diversity and persistence of flavour and the wines ability to age.

- Broad measures of quality (visual and chemical) can be tested in the vineyard
- **Visual Tests** - uniformity of berry ripening, exposure to sun, disease, berry characteristics (size, seeds, colour and taste).
- **Chemical Tests** – acidity, anthocyanins (colour), T.S.S. (sugars)
- Wine quality is about a series of objective measures rather than a single measure of quality.
- At a basic level, this refers to a wine that lacks faults or is sound.
- Sound wines are then measured by both objective and subjective attributes which define their relative greatness.

2.2 General requirements for wine grape growers

Growers will:

- Manage their vineyard with due care to the environment and in accordance with quality assurance programs where required.
- Comply with mandatory reporting requirements, such as reporting of agrochemical use in the form of a spray diary and submitting crop estimates when required.
- Comply with winery grape sampling requirements.
- For machine harvesting, grapes will be harvested in the cooler part of the night to minimize spoilage, especially with white grapes.
- The delay between the commencement of harvest and delivery to the winery should be minimized unless other instructions have been given by the winery.
- Inform winery representatives of any information or change that could affect the expected grape quality or yield.
- Take reasonable steps to produce timely and accurate crop estimates.
- Manage cropping levels to meet winery grape purchasing agreement tolerances.

2.3 Assessment in the vineyard

Many grape quality parameters are assessed at the receival point, and some assessments can only be undertaken at that point, but vineyard assessment is a form of quality assurance that has become a critical step in the winemaking process. It enables the winemaking potential of the grapes to be identified prior to receival at the winery and more importantly, it prevents the delivery of unsound grapes to the winery. Although the focus is mostly on berry development,

vineyard and vine characteristics may also be assessed. These assessments enable wineries to batch similar parcels of grapes, and optimize wine quality and winery efficiency.

Inspections during the growing season and especially during ripening, allow the winemaker, or winemaker's representative to follow progress and determine the time of harvesting that will result in the best combination and expression of flavours and other attributes. **Flavour and character requirements are determined by wineries according to their product requirements and their winemaking styles.**

This process of assessment may continue well after the receival point, as is the case where 'end-use' bonuses are applied by some wineries, e.g. when grapes with particularly sought after characteristics are used to create premium wines.

2.4 Taking wine grape samples

Vineyard assessment involves standardized representative sampling and measurements wherever possible and such results can be used which can help explain any differences in grape quality between blocks or sites. Characteristics such as flavour, leaf condition, bunch exposure, berry size, berry shrivel, sugar/acid balance, skin chewiness/thickness and tannin intensity cannot be easily or quickly measured using a tool or laboratory test and require subjective assessment by trained staff following specific guidelines. These types of assessments help wineries with batching grapes and determining a potential wine style or 'end use' product.

Wineries should carry out final vineyard assessments within 1-2 weeks before harvest so as to give growers sufficient notice of the harvest date, and any notification of concerns about possible problems meeting specifications

2.5 List of wine grape varieties grown in India and used for wine making

Wine Grape Varieties			
Red		White	
Main Varieties	Other Important Varieties	Main Varieties	Other Important Varieties
Cabernet Sauvignon, Shiraz	Merlot, Malbec, Zinfandel, Pinot Noir, Tempranillo, Cabernet	Sauvignon Blanc, Chenin Blanc	Chardonnay, Riesling, Viognier, Muscat, Gewrzt traminer, Vermentino,

	franc, Cinsault, Greneche noir, Cot		Muscat Petit grains, Gros manseng, Semillon, Symphony, Greneche Blanc, Chasseleas Blanc, Garganega, Muscat of Alexandria, Ugni Blanc, Clairette
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2.6 Standards of grape varieties

Growing Quality Grapes to Winery Specifications explains and defines six key quality parameters (sugar, pH, berry size, Titratable acidity, colour and contaminants such as fungal disease) as well as detailing the latest sampling procedures, the influence of the local environment and management options that growers can use to manipulate these wine grape quality parameters.

2.7 Wine grape harvesting based on TSS and pH

For example, a wine with 22°Bx and .75 TA will have almost a 30:1 Brix:TA ratio. According to the Davis researchers, the most balanced table wines tend to have a Brix to TA ratio between 30:1 - 35:1. Another method is to multiply the pH reading by itself and then multiply that number by the Brix reading. Using this method, when white wine grapes gets close to 200 and red wine grapes close to 260, it can be a good rule of thumb of when to harvest. For example white wine grapes have a pH of 3.3 and Brix of 20, after going through that formula they will have a finally number of 217.80 which is well within an acceptable harvest range for some winemakers.

3. Vinification:

3.1 The winemaking should be carried out in the buildings maintained in an orderly, hygienic, and neat and tidy condition.

3.2 A record of the quantities and variety of wine grape, must or grape juice received in the winery should be maintained.

3.3 Pressing records should be kept so that all batches of product can be identified and amounts of raw materials used identified.

3.4 Whenever blending of different grape varieties or grapes from different growing locations is carried out, necessary record of the blending process should be maintained by the winery.

3.5 All additives and processing aids for use in the production of wine, sparkling wine, and fortified wine or wine products should be used according to OIV guidelines (**International Code of Oenological Practices and International Oenological Codex**)

3.6 Only food grade additives and ingredients should be purchased and used in winemaking.

3.7 A record of quantities added of additives during production of wine should be maintained.

3.8 Where preservatives such as sulfur dioxide, sorbic acid and sorbates are added prior to bottling, the concentration should be determined and verified to ensure legal conformance.

3.9 Sampling and analysis of wines or grape must should be carried out during the process of vinification whenever necessary. The results of the analysis should be recorded.

All the records should be made available to the inspection agency e.g. IGPB whenever required.

3.10 Wherever the specific varietal mention is there on the label, there should be 75% of the variety as minimum percent. Other than wine grape varieties are not allowed to make wine.

3.11 The addition of water and sugar from external source during winemaking process is not allowed. However sugar from viticultural origin can be added for making of fortified wines.

Note: For the Oenological practices and treatments recommended during winemaking, kindly refer “International Code of Oenological Practices, 2012 ISSUE”.

For the details of products used in oenology, kindly refer “International Oenological Codex, 2012 ISSUE”. This document gathers descriptions of the main chemical, organic and gas products used in the making and the keeping of wines. Conditions for usage and the directions and the limits of use are set out. The identifying characteristics and the degree of purity of the products used in the winemaking are described. In addition to the minimum efficiency required to be qualified as "conforming to the International Oenological Codex". The definition or the formula, with possible synonymy, of every product is provided. Molecular weight, general characteristics, and in particular the solubilities are mentioned.