

SIHAZYM Navigator

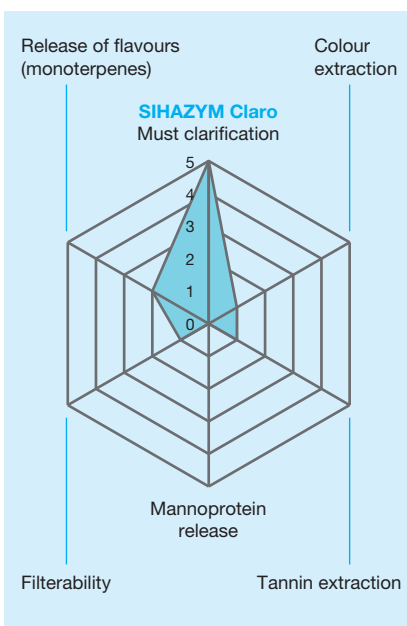


Must Clarification & Mash Extraction

For many production steps the use of wine enzymes is a simple and gentle process. Areas of application for wine

enzymes include must clarification, mash extraction, aroma release in white wines and filtration improvement. Wine enzymes

weren't invented by industry, but mimic the natural enzymes occurring in grapes.



Must clarification: natural and gentle with SIHAZYM Claro

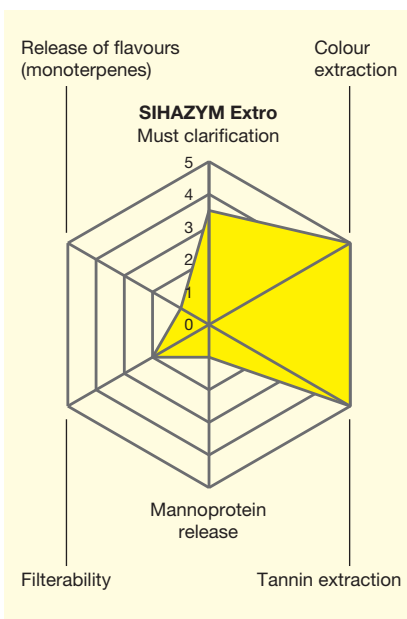
Must clarification plays a key role in speedy fermentation of grape must with complete breakdown of pectin. Grape must can be clarified quickly and effectively with the aid of SIHAZYM Claro, either through flotation or sedimentation.

SIHAZYM Claro is a highly active, pectolytic must clarification enzyme. It enables very fast must clarification at low dosage. Use 1 – 1.5 g/hl at approx. 15 °C in order to obtain pectin-free, clarified must within two to four hours. At must temperatures of approx. 10 °C, a dosage of 2 g/hl has the desired effect within two hours. During enzymatic clarification of cold grape

must SIHAZYM Claro (4 g/hl at ≥ 5 °C) speeds up sedimentation. Since the enzyme is active up to 1,000 mg/l SO_2 , common grape/must sulphurisation (20 – 50 mg/l SO_2) is possible.

Benefits of SIHAZYM Claro:

- ▶ Fast, gentle and natural must clarification
- ▶ Preservation of aroma precursors
- ▶ No input of oxidation, reductive operation possible
- ▶ High clarifying level, low NTU levels
- ▶ 60 % lower sediment than for musts that are not treated enzymatically



Mash extraction: increased juice and colour yield with SIHAZYM Extro

The pulp of grapes cells contains mainly natural, pectolytic enzymes. During maturation they aid continuous growth of the pulp cells. At the end of the maturation they are located in the grape skin and transfer to the mash during the subsequent grape extraction. Their natural enzyme activity is inhibited through this transition, the low pH value and low or excessive mash temperatures.

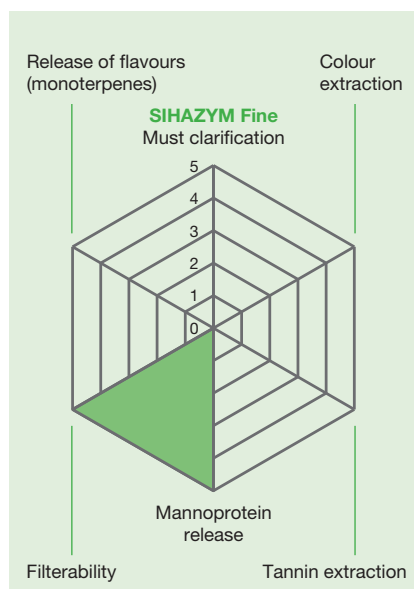
SIHAZYM Extro enhances the natural enzyme activities, resulting in optimal mash extraction. In addition to pectinolyases, it contains pectinesterases and polygalacturonases as an enzyme complex and is therefore ideally adapted to

the specific oenological requirements. SIHAZYM Extro is effective in a wide pH range between 2.9 and 4.0 and large temperature range (10 – 60 °C).

The benefits of SIHAZYM Extro:

- ▶ Highly active enzyme for white and red mash
- ▶ Faster and more effective breakdown of residual pectins
- ▶ Fast sedimentation, low NTU content
- ▶ Fast must clarification
- ▶ Increased proportion of free-run grape must
- ▶ Increased aroma and colour extraction

Filtration Improvement



Filtration improvement: gentle and simple breakdown of filtration-inhibiting substances with SIHAZYM Fine

Filtration problems can be ascribed to the state of health of the grapes. The main filtration-inhibiting substance is β -glucan, which is produced by *Botrytis cinerea* on the grapes. This inhibitor can cause filtration problems from 0.6 mg/l. The only way to break down β -glucan is to use β -glucanase, which is contained in SIHAZYM Fine.

SIHAZYM Fine can be used during alcoholic fermentation or in young wine. The required dosages depend on the degree of decomposition of the grapes. Another application of β -glucanase is

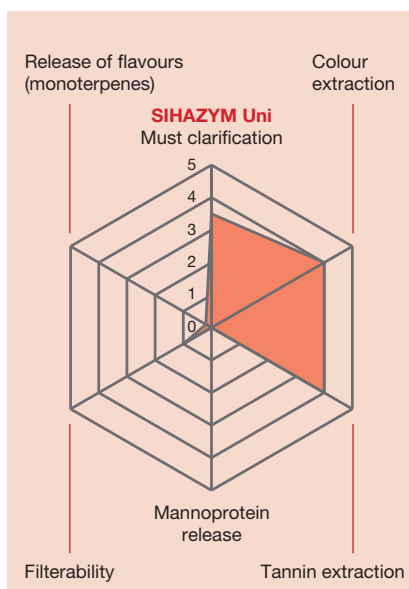
release of mannoproteins during yeast storage (bâtonnage). During bâtonnage the temperature must be kept above 16 °C over a period of 2 – 3 weeks in order to achieve optimal enzyme activity.

Benefits of SIHAZYM Fine:

- ▶ Improved filtration of grapes affected by botrytis
- ▶ Simple fining and clarification of the wines
- ▶ Increased extraction of mannoproteins during yeast storage (bâtonnage)

Application – wine production stage		Use in	Use in	Temperature
SIHAZYM Extro	Mash stage	Mash transport, mash maceration time, mash fermentation, recooled mash (approx. 50 °C)	White and red mash	8 – 18 °C
			White and red mash	18 – 25 °C
			Conventional red wine mash fermentation	15 – 25 °C
			Flash pasteurisation	30 – 40 °C
SIHAZYM Claro	Must stage	Clarification tank, flotation, sedimentation	Must clarification: sedimentation	approx. 10 °C
			Must clarification: sedimentation	approx. 15 °C
			Flotation	approx. 15 °C
SIHAZYM Fine	End of fermentation, yeast storage, extraction of mannoproteins	Fermentation tank, young wine storage	Grapes affected by botrytis, fermentation tank	approx. 16 °C
			Abating fermentation	> 16 °C
			Yeast storage, mannoproteins	> 16 °C
			Difficult to filter young wines	> 16 °C
SIHAZYM A	Release of monoterpenes, young wine stage, only for white wines	Storage tank	Young wine with yeast storage	> 16 °C
			Young wine without yeast storage	> 16 °C
SIHAZYM Uni	Must and mash stage	Mash transport, mash maceration time, mash fermentation, recooled mash (approx. 50 °C), clarification tank, flotation, sedimentation	White wine mash	
			Conventional red wine mash fermentation	
			Recooled mash	approx. 50 °C
			Must clarification: sedimentation	approx. 15 °C
			Difficult to filter young wines	

Universal Enzyme



General application: must clarification and mash extraction with SIHAZYM Uni

SIHAZYM Uni is a special enzyme combination for must clarification and mash extraction. A dosage of 3 g/hl at approx. 15 °C during must clarification results in pectin breakdown and clarification of the grape must within 4 – 10 hours. For mash extraction dosages of 3 – 4 g per 100 kg of mash are required, in order to achieve improved process yield, i.e. more free-run must.

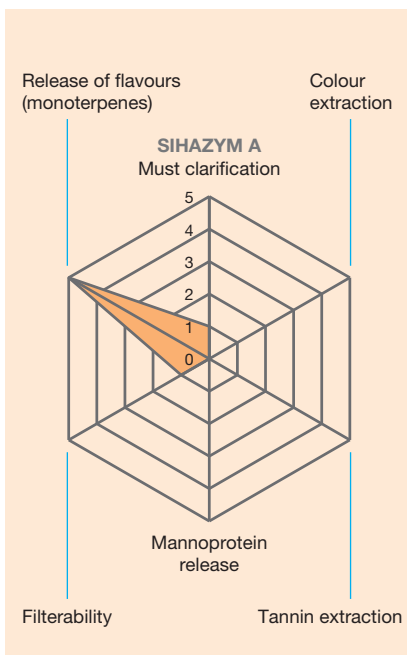
Benefits of SIHAZYM Uni:

- ▶ Wide action spectrum
- ▶ Fast must clarification with low NTU levels
- ▶ Higher quantity of free-run must
- ▶ Enhanced extraction of pigments (anthocyanins)

Application table:

Dosage	Time	Cinnamyl esterase activity	Product formulation	Production process
3 – 4 g/100 kg	4 hours – 2 days	Cleaned, free	Granulate	Submers method
2 g/100 kg	5 – 20 days			
2 – 3 g/100 kg	5 – 20 days			
2 g/100 kg	0.5 – 6 hours			
2 g/hl	2 – 6 hours	Cleaned, free	Granulate	Combination of solid-phase and submers method
1 – 1.5 g/hl	2 – 4 hours			
2 g/hl	0.5 – 1 hour			
3 – 5 g/hl	8 – 14 days Bis 21 days Bis 8 days	Cleaned, free	Granulate	Combination of solid-phase and submers method
3 – 4 g/hl				
4 – 5 g/hl				
5 – 8 g/hl				
4 – 6 g/hl	2 – 8 weeks	Weak	Granulate	Combination of solid-phase and submers method
3 – 5 g/hl	1 – 2 weeks			
3 – 4 g/100 kg	2 – 4 hours	Cleaned, free	Granulate	Combination of solid-phase and submers method
3 – 5 g/100 kg	5 – 20 days			
3 g/100 kg	2 – 4 hours			
3 g/hl	4 – 10 hours			
3 g/hl (+ SIHAZYM Fine 3 g/hl)	2 – 6 hours			

Must Clarification & Mash Extraction



Monoterpene release: release of odour-active aromas with SIHAZYM A

In aroma-intensive white wines a variety of flowery aromas are bonded in the grape skin. These β -glucosidically-bonded aromas transfer to the wine after pressing and fermentation. The application of SIHAZYM A releases the odour-active aromas and makes them sensorially noticeable for the wine taster.

SIHAZYM A is optimised for application in white wine. Since the enzyme is inhibited by must sugar it cannot release the aroma substances until after the alcoholic fermentation and should therefore be used at the young wine stage. After the required reaction time

it should be deactivated through bentonite fining.

Since SIHAZYM A splits pigments, resulting in decolourisation, it should not be used in red wine.

Benefits of SIHAZYM A:

- ▶ Release of monoterpenes in white wines
- ▶ Increased content of flowery aromas
- ▶ High β -glucosidase activity
- ▶ Temperature range > 16 °C



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