

Filtration and Beverage Treatment Products



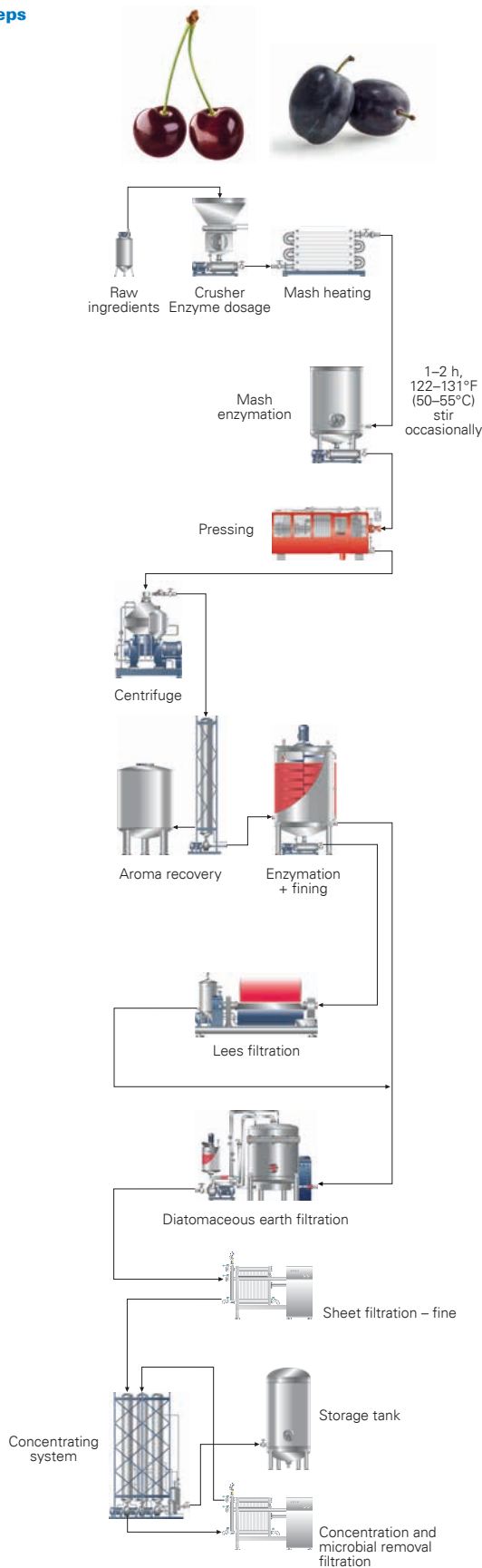
# Fruit Juice and Fruit Wine Guide

**EATON**

*Powering Business Worldwide*

# Fruit Juice Processing from Stone Fruit

## Process steps



## Production of concentrate from sour cherries, clear juice

### Raw ingredients:

Ripe and sound, fresh or frozen fruit  
Thawing of frozen fruit  
Mash heating to 140–158°F (60–70°C)  
Mechanical stone removal, if required

### Mash enzyme dosage:

Low pectin content eliminates mash enzymation and prevents instability of juices.

No mash maceration time.

Continuously fill the press to prevent stones from settling in the mash tank.

### Juice extraction:

Using a press or decanter (only mash from fruit without stones). For belt presses increase thickness of non-destoned mash.

**Pectin degradation:** approx. 1–2 h at 122–131°F (50–55°C)

Panzym® Pro Color enzyme: 0.61–1.53 fl oz/short ton (20–50 ml/t) or Panzym BE XXL enzyme: 0.46–0.92 fl oz/short ton (15–30 ml/t)

For increased filterability:

Panzym Flux enzyme: 0.31–0.92 fl oz/shortton (10–30 ml/t)

Check via alcohol test

**Fining:** 2–4 h at 122–131°F (50–55°C)

SIHA PURANIT™/SIHA PURANIT UF fining agent:

16–32 oz/short ton (500–1,000 g/t)

Levasil® BF30 silica sol fining agent:

15.34–30.68 fl oz/short ton (500–1,000 ml/t)

Gelatine Fine Granules fining agent: 1.60–3.20 oz/short ton (50–100 g/t)

Plant protein as an alternative to gelatine:

SIHA® Pea Protein fining agent: 1.60–3.20 oz/short ton (50–100 g/t)

### Lees filtration with

BECOLITE™ 5000 perlite

Dosage: 102.24–143.42 lb/100 ft² (5–7 kg/m²)

### Diatomaceous earth filtration with

BECOGUR™ 200 diatomaceous earth (approx. 10%)

BECOGUR 3500 diatomaceous earth (approx. 90%)

Dosage: approx. 32–38.41 oz/short ton (1–1.2 kg/t)

### Sheet filtration – fine with

BECO® KD 10 or BECOPAD® 350 depth filter sheets

Flow rate: 0.41 gpm/ft² (1,000 l/m²/h)

### Concentration with

simultaneous microbial removal and polishing filtration of

semi-concentrate (35–40 Brix) at 158–176°F (70–80°C) with

BECO SD 30 or BECOPAD 270 depth filter sheets

Flow rate: 0.20 gpm/ft² (500 l/m²/h)

### Production of concentrate from plums, clear juice

**Raw ingredients:**

Ripe and sound, fresh or frozen fruit  
Thawing of frozen fruit  
Mash heating to 122–131°F (50–55°C)  
Mechanical stone removal, if required

**Mash enzyme dosage:**

Panzym Pro Color enzyme: 3.07–4.60 fl oz/short ton (100–150 ml/t) or  
Panzym BE XXL enzyme: 2.45–3.68 fl oz/short ton (80–120 ml/t)

**Mash enzymation:**

1–2 h at 122–131°F (50–55°C)  
Stir occasionally

**Juice extraction:**

Using a press or decanter (only mash from fruit without stones). For belt presses increase thickness of non-destoned mash.

**Pectin degradation:** approx. 1–2 h at 122–131°F (50–55°C)

Panzym Pro Color enzyme: 1.53–2.45 fl oz/short ton (50–80 ml/t) or  
Panzym BE XXL enzyme: 0.92–1.84 fl oz/short ton (30–60 ml/t)

For increased filterability:

Panzym Flux enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)

Check via alcohol test

**Fining:** 2–4 h at 122–131°F (50–55°C)

SIHA PURANIT/SIHA PURANIT UF fining agent:

16 oz/short ton (500 g/t)

Levasil BF30 silica sol fining agent:

15.34–30.68 fl oz/short ton (500–1,000 ml/t)

Gelatine Fine Granules fining agent: 1.60–3.20 oz/short ton (50–100 g/t)

Plant protein as an alternative to gelatine:

SIHA Pea Protein fining agent: 1.60–3.20 oz/short ton (50–100 g/t)

**Lees filtration with**

BECOLITE 5000 perlite

Dosage: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

**Diatomaceous earth filtration with**

BECOGUR 200 diatomaceous earth (approx. 10%)

BECOGUR 3500 diatomaceous earth (approx. 90%)

Dosage: approx. 32–38.41 oz/short ton (1–1.2 kg/t)

**Sheet filtration – fine with**

BECO KD 10 or BECOPAD 350 depth filter sheets

Flow rate: 0.41 gpm/ft<sup>2</sup> (1,000 l/m<sup>2</sup>/h)

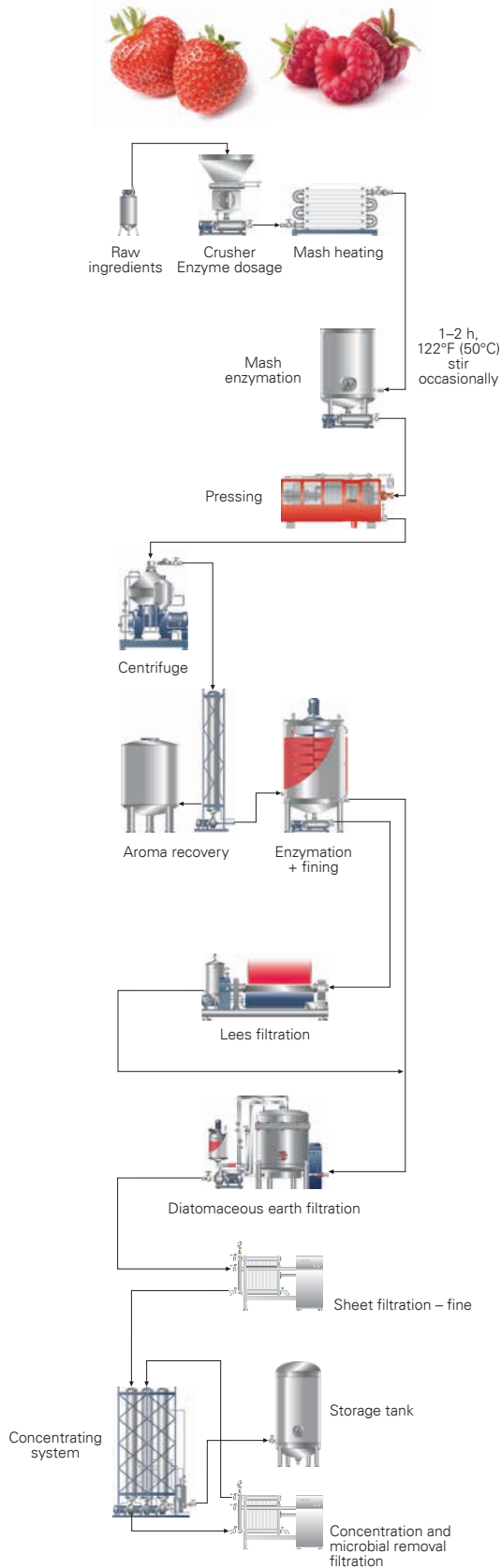
**Concentration with**

simultaneous sterile and polishing filtration of semi-concentrate (35–40 Brix) at 158–176°F (70–80°C) with BECO SD 30 or BECOPAD 270 depth filter sheets  
Flow rate: 0.20 gpm/ft<sup>2</sup> (500 l/m<sup>2</sup>/h)



# Fruit Juice Processing from Soft Fruit

## Process steps



## Production of concentrate from strawberries, clear juice

### Raw ingredients:

Ripe and sound, fresh or frozen fruit

Thawing of frozen fruit

Mash heating to 120–131°F (50–55°C) or

cold enzyming at approx. 68°F (20°C) to protect the color

### Mash enzyme dosage:

Panzym Pro Color enzyme: 1.53–2.45 fl oz/short ton (50–80 ml/t) or

Panzym BE XXL enzyme: 0.92–1.53 fl oz/short ton (30–50 ml/t)

For frozen fruit, the dosages may have to be increased significantly.

For cold enzyming, the dosages should be doubled.

### Mash enzymation:

1–2 h at 122–131°F (50–55°C) or

2–4 h at 68°F (20°C)

Stir occasionally

### Juice extraction:

Using a press or decanter

**Pectin degradation:** approx. 1–2 h at 122–131°F (50–55°C)

Panzym Pro Color enzyme: 0.61–1.53 fl oz/short ton (20–50 ml/t) or

Panzym BE XXL enzyme: 0.46–0.92 fl oz/short ton (15–30 ml/t)

For increased filterability:

Panzym Flux enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)

Check via alcohol test

**Fining:** 2–4 h at 122–131°F (50–55°C)

SIHA PURANIT/SIHA PURANIT UF fining agent:

16 oz/short ton (500 g/t)

Levasil BF30 silica sol fining agent:

15.34–30.68 fl oz/short ton (500–1,000 ml/t)

Gelatine Fine Granules fining agent: 1.60–3.20 oz/short ton (50–100 g/t)

Plant protein as an alternative to gelatine:

SIHA Pea Protein fining agent: 1.60–3.20 oz/short ton (50–100 g/t)

### Lees filtration with

BECOLITE 5000 perlite

Dosage: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

### Diatomaceous earth filtration with

BECOGUR 200 diatomaceous earth (approx. 10%)

BECOGUR 3500 diatomaceous earth (approx. 90%)

Dosage: approx. 32–38.41 oz/short ton (1–1.2 kg/t)

### Sheet filtration – fine with

BECO KD 10 or BECOPAD 350 depth filter sheets

Flow rate: 0.41 gpm/ft<sup>2</sup> (1,000 l/m<sup>2</sup>/h)

### Concentration with

simultaneous microbial removal and polishing filtration of

semi-concentrate (35–40°Brix) at 158–176°F (70–80°C) with

BECO SD 30 or BECOPAD 270 depth filter sheets

Flow rate: 0.20 gpm/ft<sup>2</sup> (500 l/m<sup>2</sup>/h)



## Production of concentrate from raspberries, clear juice

### Raw ingredients:

Ripe and sound, fresh or frozen fruit  
Thawing of frozen fruit  
Mash heating to 122–131°F (50–55°C)

### Mash enzyme dosage:

Panzym Pro Color enzyme: 1.84–3.68 fl oz/short ton (60–120 ml/t) or  
Panzym BE XXL enzyme: 1.53–3.07 fl oz/short ton (50–100 ml/t)  
For frozen fruit, the dosages may have to be increased significantly.

### Mash enzymation:

1–2 h at 122–131°F (50–55°C)  
Stir occasionally

### Juice extraction:

Using a press or decanter

**Pectin degradation:** approx. 1–2 h at 122–131°F (50–55°C)

Panzym Pro Color enzyme: 0.61–1.53 fl oz/short ton (20–50 ml/t) or  
Panzym BE XXL enzyme: 0.46–0.92 fl oz/short ton (15–30 ml/t)

For increased filterability:

Panzym Flux enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)

Check via alcohol test

**Fining:** 2–4 h at 122–131°F (50–55°C)

SIHA PURANIT/SIHA PURANIT UF fining agent:

16 oz/short ton (500 g/t)

Levasil BF30 silica sol fining agent:

15.34–30.68 fl oz/short ton (500–1,000 ml/t)

Gelatine Fine Granules fining agent: 1.60–3.20 oz/short ton (50–100 g/t)

Plant protein as an alternative to gelatine:

SIHA Pea Protein fining agent: 1.60–3.20 oz/short ton (50–100 g/t)

### Lees filtration with

BECOLITE 5000 perlite

Dosage: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

### Diatomaceous earth filtration with

BECOGUR 200 diatomaceous earth (approx. 10%)

BECOGUR 3500 diatomaceous earth (approx. 90%)

Dosage: approx. 32–38.41 oz/short ton (1–1.2 kg/t)

### Sheet filtration – fine with

BECO KD 10 or BECOPAD 350 depth filter sheets

Flow rate: 0.41 gpm/ft<sup>2</sup> (1,000 l/m<sup>2</sup>/h)

### Concentration with

simultaneous sterile and polishing filtration of

semi-concentrate (35–40°Brix) at 158–176°F (70–80°C) with

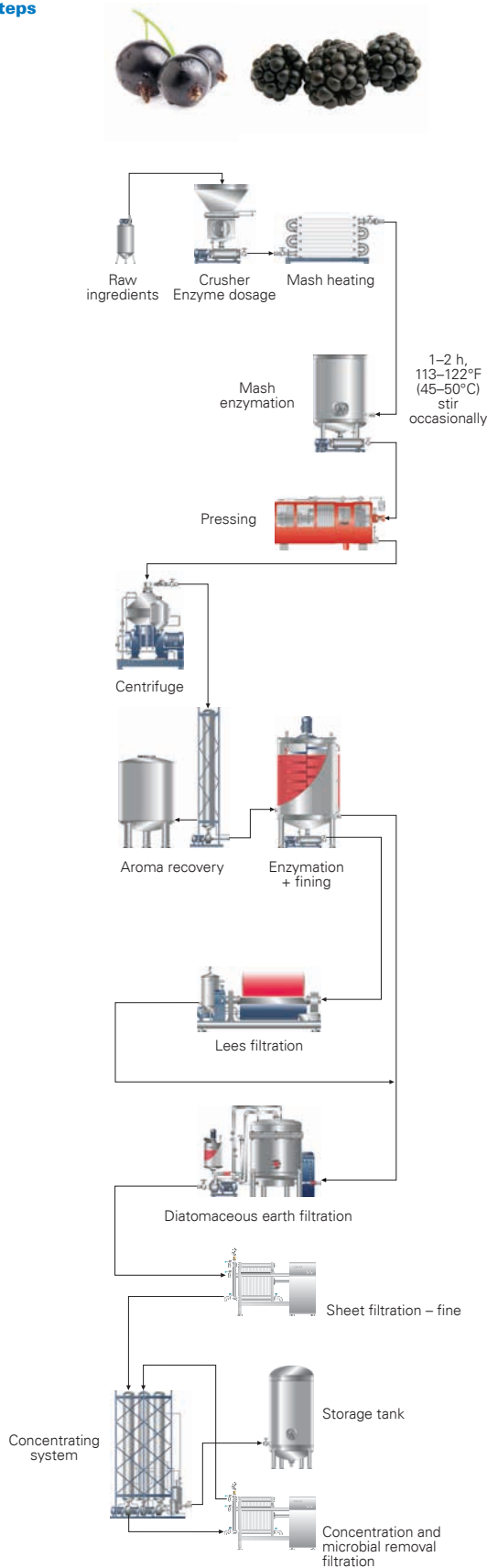
BECO SD 30 or BECOPAD 270 depth filter sheets

Flow rate: 0.20 gpm/ft<sup>2</sup> (500 l/m<sup>2</sup>/h)



# Fruit Juice Processing from Soft Fruit

## Process steps



## Production of concentrate from blackcurrants, clear juice

### Raw ingredients:

Ripe and sound, fresh or frozen fruit

Thawing of frozen fruit

Mash heating to 113–122°F (45–50°C)

### Mash enzyme dosage:

Panzym Pro Color enzyme: 3.07–6.14 fl oz/short ton (100–200 ml/t) or

Panzym BE XXL enzyme: 2.45–4.91 fl oz/short ton (80–160 ml/t)

For frozen fruit, the dosages may have to be increased significantly.

### Mash enzymation:

1–2 h at 113–122°F (45–50°C)

Stir occasionally

### Juice extraction:

Using a press or decanter

### Pectin degradation:

approx. 1–2 h at 122–131°F (50–55°C)

Panzym Pro Color enzyme: 0.92–1.84 fl oz/short ton (30–60 ml/t) or

Panzym BE XXL enzyme: 0.61–1.23 fl oz/short ton (20–40 ml/t)

For increased filterability:

Panzym Flux enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)

Check via alcohol test

### Fining:

2–4 h at 122–131°F (50–55°C)

SIHA PURANIT/SIHA PURANIT UF fining agent:

16–32 fl oz/short ton (500–1,000 g/t)

Levasil BF30 silica sol fining agent:

15.34–30.68 fl oz/short ton (500–1,000 ml/t)

Gelatine Fine Granules fining agent: 3.20–6.40 oz/short ton (100–200 g/t)

Plant protein as an alternative to gelatine:

SIHA Pea Protein fining agent: 3.20–6.40 oz/short ton (100–200 g/t)

### Lees filtration with

BECOLITE 5000 perlite

Dosage: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

### Diatomaceous earth filtration with

BECOGUR 200 diatomaceous earth (approx. 10%)

BECOGUR 3500 diatomaceous earth (approx. 90%)

Dosage: approx. 32–38.41 oz/short ton (1–1.2 kg/t)

### Sheet filtration – fine with

BECO KD 10 or BECOPAD 350 depth filter sheets

Flow rate: 0.41 gpm/ft<sup>2</sup> (1,000 l/m<sup>2</sup>/h)

### Concentration with

simultaneous microbial removal and polishing filtration of

semi-concentrate (35–40°Brix) at 158–176°F (70–80°C) with

BECO SD 30 or BECOPAD 270 depth filter sheets

Flow rate: 0.20 gpm/ft<sup>2</sup> (500 l/m<sup>2</sup>/h)

### Production of concentrate from blackberries, clear juice

**Raw ingredients:**

Ripe and sound, fresh or frozen fruit  
Thawing of frozen fruit  
Mash heating to 122–131°F (50–55°C)

**Mash enzyme dosage:**

Panzym Pro Color enzyme: 2.45–4.91 fl oz/short ton (80–160 ml/t) or  
Panzym BE XXL enzyme: 1.84–3.68 fl oz/short ton (60–120 ml/t)  
For frozen fruit, the dosages may have to be increased significantly.

**Mash enzymation:**

1–2 h at 122–131°F (50–55°C)  
Stir occasionally

**Juice extraction:**

Using a press or decanter

**Pectin degradation:** approx. 1–2 h at 122–131°F (50–55°C)

Panzym Pro Color enzyme: 0.61–1.53 fl oz/short ton (20–50 ml/t) or  
Panzym BE XXL enzyme: 0.46–0.92 fl oz/short ton (15–30 ml/t)

For increased filterability:

Panzym Flux enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)

Check via alcohol test

**Fining:** 2–4 h at 122–131°F (50–55°C)

SIHA PURANIT/SIHA PURANIT UF fining agent:

16–32 fl oz/short ton (500–1,000 g/t)

Levasil BF30 silica sol fining agent:

15.34–30.68 fl oz/short ton (500–1,000 ml/t)

Gelatine Fine Granules fining agent: 3.20–6.40 oz/short ton (100–200 g/t)

Plant protein as an alternative to gelatine:

SIHA Pea Protein fining agent: 3.20–6.40 oz/short ton (100–200 g/t)

**Lees filtration** with

BECOLITE 5000 perlite

Dosage: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

**Diatomaceous earth filtration** with

BECOGUR 200 diatomaceous earth (approx. 10%)

BECOGUR 3500 diatomaceous earth (approx. 90%)

Dosage: approx. 32–38.41 oz/short ton (1–1.2 kg/t)

**Sheet filtration – fine** with

BECO KD 10 or BECOPAD 350 depth filter sheets

Flow rate: 0.41 gpm/ft<sup>2</sup> (1,000 l/m<sup>2</sup>/h)

**Concentration** with

simultaneous sterile and polishing filtration of  
semi-concentrate (35–40°Brix) at 158–176°F (70–80°C) with

BECO SD 30 or BECOPAD 270 depth filter sheets

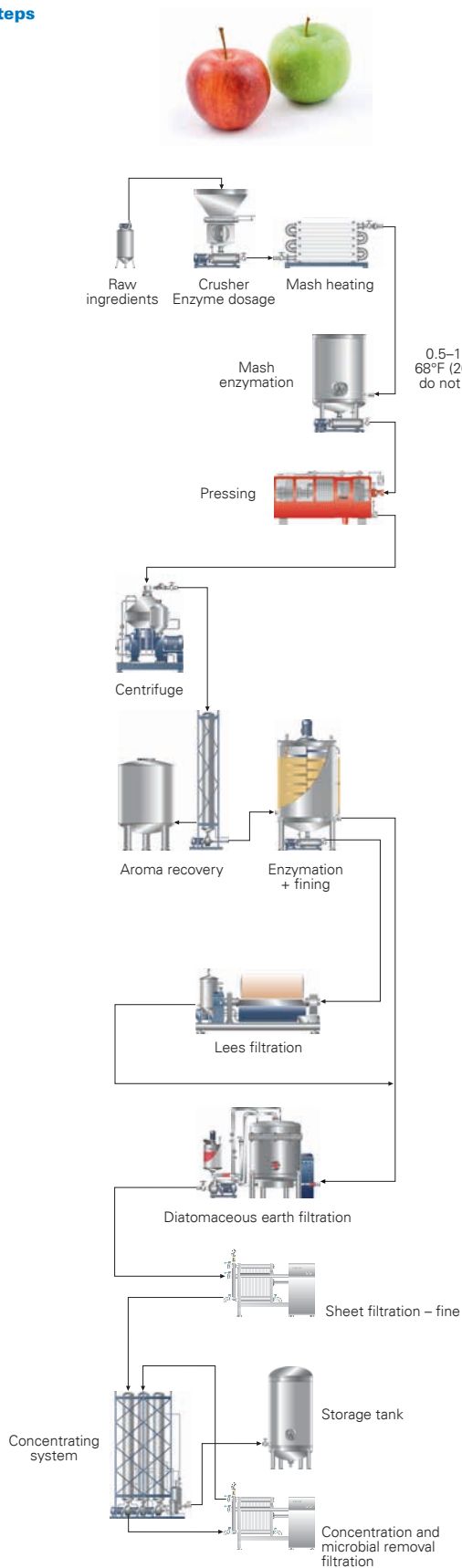
Flow rate: 0.20 gpm/ft<sup>2</sup> (500 l/m<sup>2</sup>/h)





# AJC and Fruit Juice Processing from Pomaceous Fruit

## Process steps



## Production of AJC with hot clarification and sterile filtration

### Raw ingredients:

Ripe, sound, washed

### Mash enzyme dosage:

Panzym YieldMASH XXL enzyme: 1.53–2.15 fl oz/short ton (50–70 ml/t) or  
Panzym First Yield enzyme: 2.15–3.07 fl oz/short ton (70–100 ml/t)

### Mash enzymation:

At approx. 68°F (20°C), without stirring  
Bucher press: 0.5–1 h  
Belt press: 1 h  
Decanter: 1 h

### Juice extraction:

With possible secondary extraction  
pomace/water ratio = 1:0.5–1

### Starch degradation:

approx. 1 h at 122–131°F (50–55°C)  
Panzym HT 300 enzyme: 0.61–1.84 fl oz/short ton (20–60 ml/t) or  
Panzym AG XXL enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)  
Check via iodine test

### Pectin degradation:

approx. 1 h at 122–131°F (50–55°C)  
Panzym Pro Clear enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t) or  
Panzym XXL enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)  
For increased filterability:  
Panzym Flux enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)  
Check via alcohol test

### Fining:

2–4 h at 122–131°F (50–55°C)  
SIHA PURANIT/SIHA PURANIT UF fining agent:  
32 oz/short ton (1,000 g/t)  
Levasil BF30 silica sol fining agent:  
15.34–30.68 fl oz/short ton (500–1,000 ml/t)  
Gelatine Fine Granules fining agent: 3.20–6.40 oz/short ton (100–200 g/t)  
Plant protein as an alternative to gelatine:  
SIHA Pea Protein fining agent: 3.20–6.40 oz/short ton (100–200 g/t)

### Lees filtration with

BECOLITE 5000 perlite  
Dosage: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

### Diatomaceous earth filtration with

BECOGUR 200 diatomaceous earth (approx. 10%)  
BECOGUR 3500 diatomaceous earth (approx. 90%)  
Dosage: approx. 32–38.41 oz/short ton (1–1.2 kg/t)

### Sheet filtration – fine with

BECO KDS 12 or BECOPAD 350 depth filter sheets  
Flow rate: 0.41 gpm/ft<sup>2</sup> (1,000 l/m<sup>2</sup>/h)

**Alternative: Ultra filtration (UF)**, if necessary with following  
**sterile filtration (ACB/TAB)** with BECO PROTECT® CS 115 0.2 µm  
as pre-filter and BECO MEMBRAN PS Pure 0.2 µm as final filter cartridges

### Concentration with

simultaneous microbial removal and polishing filtration of  
semi-concentrate (35–40°Brix) at 158–176°F (70–80°C) with  
BECO SD 30 or BECOPAD 270 depth filter sheets  
Flow rate: 0.20 gpm/ft<sup>2</sup> (500 l/m<sup>2</sup>/h)



## Production of clear apple juice with cold clarification

### Raw ingredients:

Ripe, sound, washed

### Mash enzyme dosage:

Panzym YieldMASH XXL enzyme: 1.53–2.15 fl oz/short ton (50–70 ml/t) or  
Panzym First Yield enzyme: 2.15–3.07 fl oz/short ton (70–100 ml/t)

### Mash enzymation:

At approx. 68°F (20°C), without stirring  
Bucher press: 0.5–1 h  
Belt press: 1 h  
Decanter: 1 h

### Juice extraction:

With possible secondary extraction  
pomace/water ratio = 1:0.5–1

Without previous aroma recovery

**Starch degradation:** approx. 4 h at approx. 68°F (20°C)  
Panzym F2 enzyme: 1.53–4.60 fl oz/short ton (50–150 ml/t)  
Check via iodine test

**Pectin degradation:** approx. 4 h at approx. 68°F (20°C)  
Panzym Pro Clear enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t) or  
Panzym XXL enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)  
For increased filterability:  
Panzym Flux enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)  
Check via alcohol test

**Fining:** 2–4 h at 122–131°F (50–55°C) or 4–8 h at approx. 68°F (20°C)  
SIHA PURANIT/SIHA PURANIT UF fining agent:  
16–32 fl oz/short ton (500–1,000 g/t)  
Levasil BF30 silica sol fining agent:  
15.34–30.68 fl oz/short ton (500–1,000 ml/t)  
Gelatine Fine Granules fining agent: 3.20–6.40 oz/short ton (100–200 g/t)  
Plant protein as an alternative to gelatine:  
SIHA Pea Protein fining agent: 3.20–6.40 oz/short ton (100–200 g/t)

### Lees filtration with

BECOLITE 5000 perlite  
Dosage: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

### Diatomaceous earth filtration with

BECOGUR 200 diatomaceous earth (approx. 10%)  
BECOGUR 3500 diatomaceous earth (approx. 90%)  
Dosage: approx. 32–38.41 oz/short ton (1–1.2 kg/t)

### Sheet filtration – fine with

BECO KDS 12 or BECOPAD 350 depth filter sheets  
Flow rate: 0.41 gpm/ft<sup>2</sup> (1,000 l/m<sup>2</sup>/h)

**Alternative: Ultra filtration (UF),** if necessary with following  
**sterile filtration (ACB/TAB)** with BECO PROTECT CS 115 0.2 µm  
as pre-filter and BECO MEMBRAN PS Pure 0.2 µm as final filter cartridges

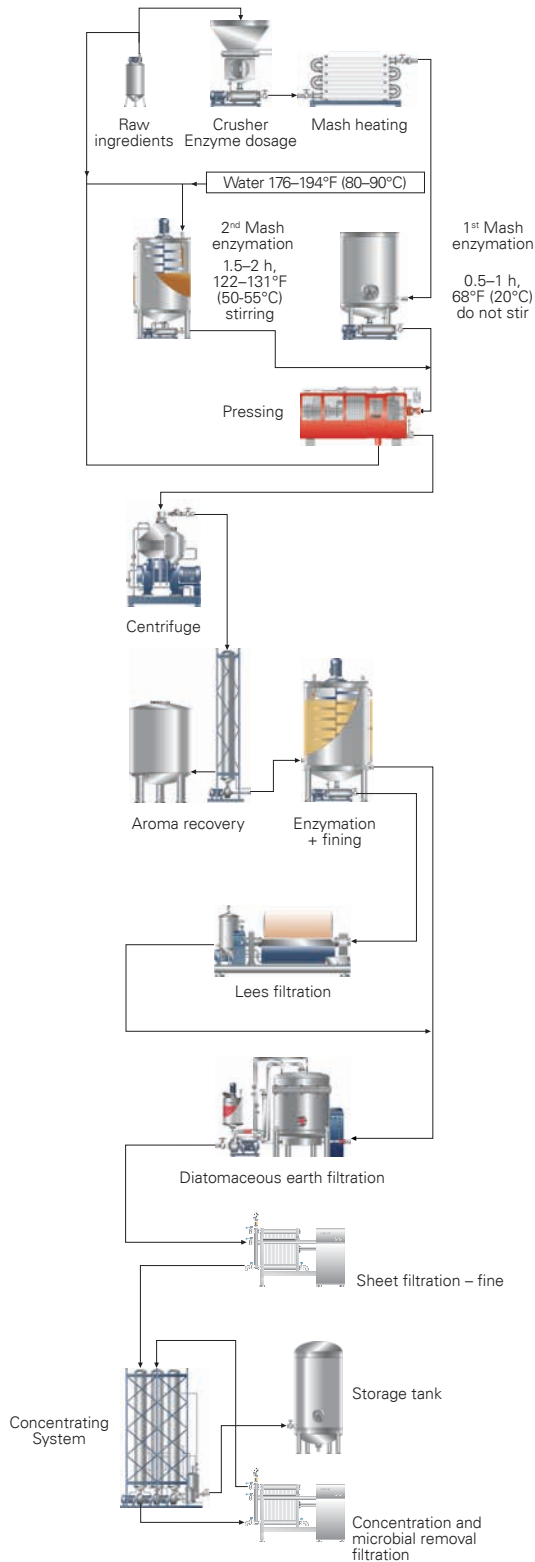
### Particle filtration before bottling with

BECO PROTECT PG depth filter cartridges (5 µm)  
Flow rate: 800 l/h/30" filter cartridge  
Storage or bottling



# Mash Enzymation and Fruit Juice Processing from Pomaceous Fruit

## Process steps



## Yield increase through 2<sup>nd</sup> mash enzymation

### Raw ingredients:

1 part pomace from 1<sup>st</sup> pressing  
 + 0.6–1 part (depending on first yield from 60–80%)  
 Demineralized water at 176–194°F (80–90°C)

### Mash enzyme dosage, depending on first yield:

Panzym Second Yield enzyme  
 a) 80% yield: 7.67–15.34 fl oz/short ton (250–500 ml/t) pomace  
 b) 70% yield: 4.91–11.66 fl oz/short ton (160–380 ml/t) pomace  
 c) 60% yield: 3.68–7.36 fl oz/short ton (120–240 ml/t) pomace

### 2<sup>nd</sup> mash enzymation tenure:

1.5–2 h at 122–131°F (50–55°C)  
 With vigorous stirring

### Juice extraction:

Using a press or decanter  
 possibly followed by blending of 1<sup>st</sup> juice and 2<sup>nd</sup> juice

### Starch degradation:

approx. 1 h at 122–131°F (50–55°C)  
 Panzym HT 300 enzyme: 0.61–1.84 fl oz/short ton (20–60 ml/t) or  
 Panzym AG XXL enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)  
 Check via iodine test

### Pectin degradation:

approx. 1 h at 122–131°F (50–55°C)  
 Panzym Pro Clear enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t) or  
 Panzym XXL enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)  
 For increased filterability:  
 Panzym Flux enzyme: 0.31–0.92 fl oz/short ton (10–30 ml/t)  
 Check via alcohol test

### Fining:

2–4 h at 122–131°F (50–55°C)  
 SIHA PURANIT/SIHA PURANIT UF fining agent: 32 oz/short ton (1,000 g/t)  
 Levasil BF30 silica sol fining agent:  
 15.34–30.68 fl oz/short ton (500–1,000 ml/t)  
 Gelatine Fine Granules fining agent: 3.20–6.40 oz/short ton (100–200 g/t)  
 Plant protein as an alternative to gelatine:  
 SIHA Pea Protein fining agent: 3.20–6.40 oz/short ton (100–200 g/t)

### Lees filtration with

BECOLITE 5000 perlite  
 Dosage: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

### Diatomaceous earth filtration with

BECOGUR 200 diatomaceous earth (approx. 10%)  
 BECOGUR 3500 diatomaceous earth (approx. 90%)  
 Dosage: approx. 32–38.41 oz/short ton (1–1.2 kg/t)

### Sheet filtration – fine with

BECO KDS 12 or BECOPAD 350 depth filter sheets  
 Flow rate: 0.41 gpm/ft<sup>2</sup> (1,000 l/m<sup>2</sup>/h)

### Alternative: Ultra filtration (UF), if necessary with following

sterile filtration (ACB/TAB) with BECO PROTECT CS 115 0.2 μm  
 as pre-filter and BECO MEMBRAN PS Pure 0.2 μm as final filter cartridges

### Concentration with

simultaneous microbial removal and polishing filtration of  
 semi-concentrate (35–40°Brix) at 158–176°F (70–80°C) with  
 BECO SD 30 or BECOPAD 270 depth filter sheets  
 Flow rate: 0.20 gpm/ft<sup>2</sup> (500 l/m<sup>2</sup>/h)

### Production of naturally cloudy apple juice

**Raw ingredients:**

Fully ripe (low starch content), sound and washed

**Mash enzyme dosage:**

Panzym YieldMASH XXL enzyme: 0.92–1.53 fl oz/short ton (30–50 ml/t) or  
Panzym FirstYield enzyme: 1.23–1.84 fl oz/short ton (40–60 ml/t)

**1<sup>st</sup> Mash enzymation:**

0.5–1 h at approx. 68°F (20°C)  
Without stirring

**Juice extraction:**

Using a press or decanter

Vitamin C dosage: 6.40–12.80 oz/short ton (200–400 g/t) \*  
directly into the buffer tank

Removal of instable solids via centrifuge

Early pasteurization without long intermediate storage to prevent  
solid loss of stability through enzymatic activity and fermentation.

**Storage or filling:**

If no centrifuge was used for the removal of instable solids, the juice  
should be drawn off the coarse unfiltered sediment in the storage  
tank prior to bottling.

\* Please refer to national law

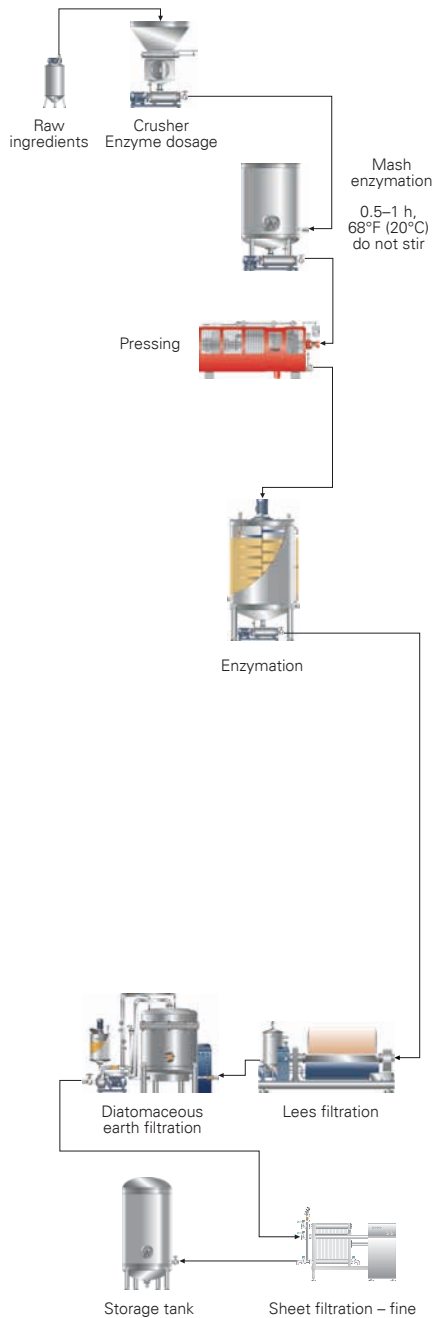




# Fruit Juice Processing from Pomaceous, Pitted and Soft Fruit

## Small-scale fruit processors and fruit distilleries: Recommendations for processing of clear juices

### Process steps



### Pomaceous fruit, clear juice

#### Raw ingredients:

Pomaceous fruit: Apple, pear, quince  
Ripe, sound, washed and grinded fruits

#### Mash enzymation:

approx. 1 h at 68°F (20°C), without stirring  
Panzym Univers enzyme: 12.80 fl oz/1,000 gal (10 ml/hl)  
Pay attention to an even distribution of enzyme in the mash

#### Juice extraction:

Pressing

#### Oxidation protection, as required:

Ascorbic acid stabilizer: 1.67–3.34 lb/1,000 gal (20–40 g/hl)

#### Juice enzymation:

2–4 h at 68°F (20°C):

#### Starch degradation:

Panzym F2 enzyme: 0.64–2.56 fl oz/1,000 gal (0.5–2 ml/hl)

#### Pectin degradation:

Panzym Univers enzyme: 1.28–2.56 fl oz/1,000 gal (1–2 ml/hl)

#### Fining:

6–8 h at 68°F (20°C):

SIHA PURANIT fining agent: approx. 8.35 lb/1,000 gal (100 g/hl)

[at pH < 3.5 and 68°F (20°C) SIHA Ca-Bentonite G fining agent:

approx. 8.35 lb/1,000 gal (100 g/hl)]

Levasil BF30 silica sol fining agent: 64–128 fl oz/1,000 gal (50–100 ml/hl)

Gelatine Fine Granules fining agent: 0.83–2.5 lb/1,000 gal (10–30 g/hl)

(higher dosing required for fruit rich in tannin)

Plant protein as an alternative to gelatine:

SIHA Pea Protein fining agent: 0.83–2.5 lb/1,000 gal (10–30 g/hl)

#### Lees filtration with

BECOLITE 5000 perlite: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

#### Coarse filtration:

BECOGUR 200 diatomaceous earth:

approx. 10% at 0.84–1.67 lb/100 gal (100–200 g/hl)

BECOGUR 3500 diatomaceous earth:

approx. 90% at 0.84–1.67 lb/100 gal (100–200 g/hl)

or BECOPAD 580 depth filter sheet

#### Fine filtration:

BECOPAD 350 depth filter sheet

#### Particle filtration before bottling with

BECO PROTECT PG depth filter cartridges (5 µm)

Flow rate: 800 l/h/30" filter cartridge

**Bottling** at approx. 176°F (80°C), depending on germ load and heat holding time

### Pitted fruit/soft fruit, clear juice

**Raw ingredients:**

Pitted fruit: Cherry, plum, mirabelle plum  
Soft fruit: Blackcurrant, strawberry, blackberry  
Ripe, sound, washed and grinded fruits

**Mash enzymation:**

1–2 h at 113–131°F (45–55°C), occasional stirring  
Rich-colored fruit: Panzym Univers enzyme:  
12.80 fl oz/1,000 gal (10 ml/hl)

**Alternatively for cherry processing:**

Hot pressing at 140–158°F (60–70°C) without using enzymes

**Juice extraction:**

Pressing

**Juice enzymation:**

2–4 h at 122–131°F (50–55°C) or  
8–12 h at 68°F (20°C):  
Panzym Univers enzyme: 2.56–10.24 fl oz/1,000 gal (2–8 ml/hl)

**Fining:**

1–2 h at 122–131°F (50–55°C) or  
4–8 h at 68–86°F (20–30°C)  
SIHA PURANITF fining agent: 2.09–4.17 lb/1,000 gal (25–50 g/hl)  
[at pH < 3.5 and 68°F (20°C) SIHA Ca-Bentonite G fining agent:  
approx. 2.09–4.17 lb/1,000 gal (25–50 g/hl)]  
Levasil BF30 silica sol fining agent: 6.4–25.6 fl oz/100 gal (50–200 ml/hl)  
Gelatine Fine Granules fining agent: 0.42–1.67 lb/1,000 gal (5–20 g/hl)  
Plant protein as an alternative to gelatine:  
SIHA Pea Protein fining agent: 0.42–1.67 lb/1,000 gal (5–20 g/hl)

**Lees filtration with**

BECOLITE 5000 perlite: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

**Coarse filtration:**

BECOGUR 200 diatomaceous earth:  
approx. 10% at 0.84–1.67 lb/100 gal (100–200 g/hl)  
BECOGUR 3500 diatomaceous earth:  
approx. 90% at 0.84–1.67 lb/100 gal (100–200 g/hl)  
or BECOPAD 580 depth filter sheet

**Fine filtration:**

BECOPAD 350 depth filter sheet  
Colored juices: BECOPAD 450 depth filter sheet

**Particle filtration** before bottling with

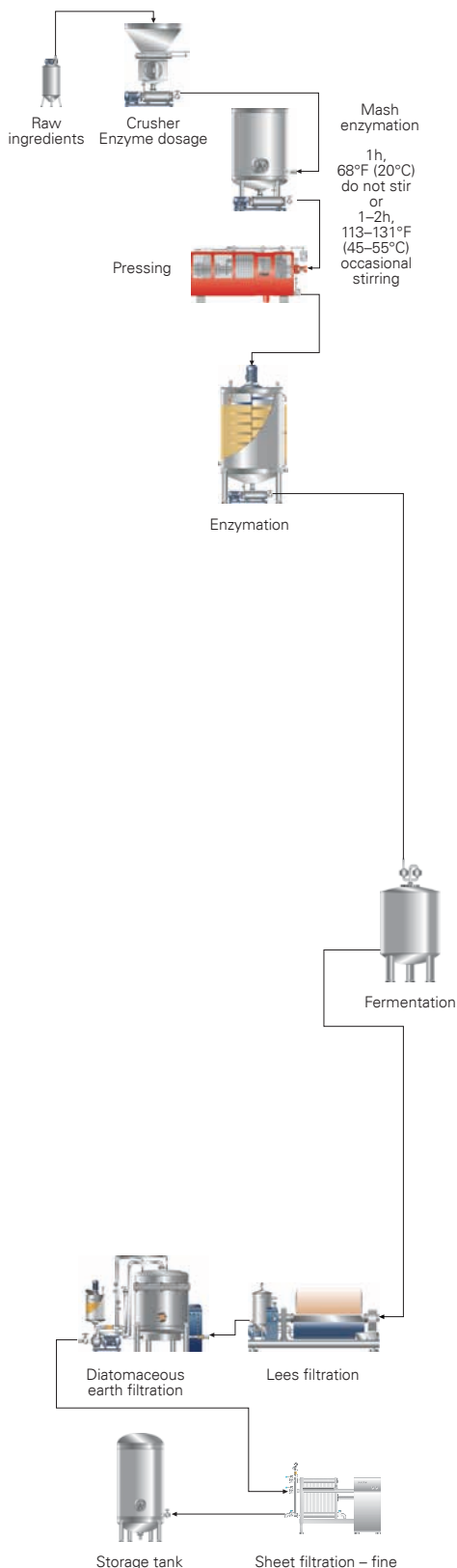
BECO PROTECT PG depth filter cartridges (5 µm)  
Flow rate: 800 l/h/30° filter cartridge

**Bottling** at approx. 176°F (80°C), depending on germ load and heat holding time



# Fruit Wine Processing from Pomaceous, Pitted and Soft Fruit

## Process steps



## Fruit wine

### Raw ingredients:

Pomaceous fruit: Apple, pear, quince  
 Pitted fruit: Cherry, plum, mirabelle plum  
 Soft fruit: Blackcurrant, strawberry, blackberry  
 Ripe, sound, washed and grinded fruit

### Mash enzymation:

Pomaceous fruit: approx. 1 h at 68°F (20°C) without stirring,  
 Panzym Unifers enzyme: 12.80 fl oz/1,000 gal (10 ml/hl)  
 Pitted and soft fruit: 1–2 h at 113–131°F (45–55°C), occasional stirring  
 Rich-colored fruit: Panzym Unifers enzyme: 12.80–38.4 fl oz/1,000 gal (10–30 ml/hl)

### Juice extraction: Pressing

### Juice stabilization: Addition of sulfur to pressed juice:

SIHA Potassium Pyrosulphite stabilizer: 0.25–0.83 lb/1,000 gal (6–10 g/hl)  
 Addition should follow the microbiological burden of incoming fruit

### Juice enzymation:

#### Starch degradation (pomaceous fruit):

Panzym F2 enzyme: 0.64–2.56 fl oz/1,000 gal (0.5–2 ml/hl)

**Pectin degradation:** Panzym Unifers enzyme: 0.64–2.56 fl oz/1,000 gal (0.5–2 ml/hl)

**No holding time:** Starch and pectin degradation occur during fermentation

### Chaptalization, as required

### Acidification:

Lactic Acid 80% stabilizer: max. 3.13 lb/100 gal (3.75 g/l)\* (optional for fruits low in acid)

### Fermentation (make sure to only use cleaned fermentation vessels with fermentation air locks):

SIHA Active Yeast 3: 1.67 lb/1,000 gal (20 g/hl)

SIHA Active Yeast 8 (Burgundy Yeast): 1.67 lb/1,000 gal (20 g/hl)

Rehydration of active dry yeast in juice water mixture (50:50) with  
 SIHA® SpeedFerm™ yeast nutrient

### Yeast nutrient:

Fermentation Salt yeast nutrient: max. 8.35 lb/1,000 gal (100 g/hl),  
 step-wise addition until mid of alcoholic fermentation

SIHA Vitamin B1 yeast nutrient: max. 0.01 lb/1,000 gal (0.6 g/1,000 l)

SIHA PROFERM™ H+2 combined yeast nutrient: max. 3.34 lb/1,000 gal (40 g/hl)

### After fermentation: Racking followed by sulfurization with

SIHA Potassium Pyrosulphite stabilizer: 0.83–1.34 lb/1,000 gal (10–16 g/hl)

### Fining:

SIHA Active Bentonite G fining agent: approx. 2.09–8.35 lb/1,000 gal (25–100 g/hl)

[at pH < 3.5 SIHA Ca-Bentonite G fining agent: approx. 8.35 lb/1,000 gal (100 g/hl)]

Levasil BF30 silica sol fining agent: 6.4–25.6 fl oz/1,000 gal (50–200 ml/hl)

Gelatine Fine Granules fining agent: 0.42–1.67 lb/1,000 gal (5–20 g/hl)

(higher dosing required for fruit rich in tannin)

Plant protein as an alternative to gelatine:

SIHA Pea Protein fining agent: 0.42–1.67 lb/1,000 gal (5–20 g/hl)

### Stabilization:

SIHA Potassium Pyrosulphite stabilizer: Target value, free SO<sub>2</sub>: 4.67–6.68 oz/1,000 gal (35–50 mg/l)

Potassium Sorbate stabilizer: max. 2.24 lb/1,000 gal (26.8 g/hl) (for wines with residual sugar)

**Lees filtration** with BECOLITE 5000 perlite: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

### Coarse filtration:

BECOGUR 200 diatomaceous earth: approx. 10% at 0.84–1.67 lb/100 gal (100–200 g/hl)

BECOGUR 3500 diatomaceous earth: approx. 90% at 0.84–1.67 lb/100 gal (100–200 g/hl)

or BECOPAD 580 depth filter sheet

**Fine filtration:** BECOPAD 350 depth filter sheet

**Microbial removal or sterile filtration:** BECOPAD 220 depth filter sheet or

alternatively BECO PROTECT CS 115 and

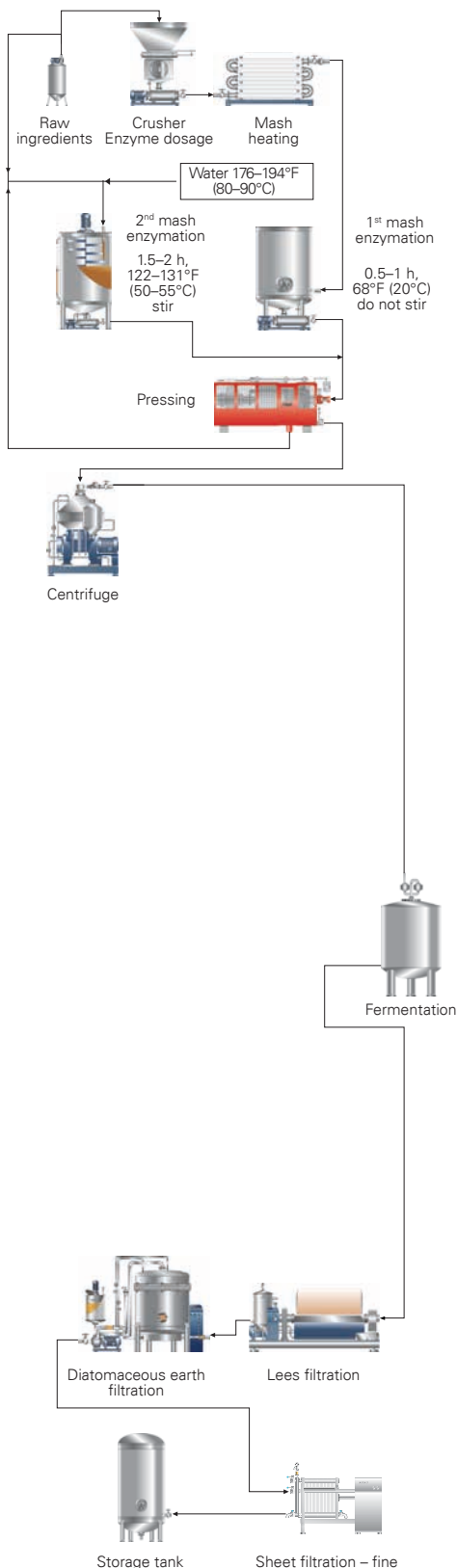
BECO MEMBRAN PS Pure filter cartridges 0.45 µm or 0.65 µm

\* Guidelines from March 1, 2003



# Fruit Wine Processing from Apples and Pears (Cider)

## Process steps



## Cider

### Raw ingredients:

Ripe, sound and washed fruit

### 1<sup>st</sup> mash dosage:

Panzym First Yield enzyme: 8.96–12.8 fl oz/short ton (7–10 ml/hl)

### 1<sup>st</sup> mash enzymation:

0.5–1 h at approx. 68°F (20°C), without stirring

### Possible process step: Juice extraction with secondary extraction (2<sup>nd</sup> mash enzymation):

Maximum yield, Panzym Second Yield enzyme:

12.8–25.6 fl oz/short ton (10–20 ml/hl) pomaceous fruit

1.5–2 h at 122–131°F (50–55°C), with vigorous stirring

### Juice extraction:

Possibly blending of first and second juice

### Alcoholic fermentation:

SIHA Active Yeast 3 or SIHA Active Yeast 8 (Burgundy Yeast): 1.67 lb/1,000 gal (20 g/hl)

Rehydration of active dry yeast in juice water mixture (50:50) at 95°F (35°C)

Fermentation temperature: 63–72°F (17–22°C)

### Enzymation/alcoholic fermentation:

Panzym Flux enzyme: 1.28–3.84 fl oz/short ton (1–3 ml/hl) for pectin degradation and improved sedimentation

Higher alcohol yield with Panzym HT 300 enzyme:

2.56–3.84 fl oz/short ton (2–3 ml/hl)

### Rehydration of active dry yeast:

SIHA SpeedFerm yeast nutrient: 1.67 lb/1,000 gal (20 g/hl)

### Yeast nutrients/alcoholic fermentation:

Fermentation Salt yeast nutrient: max. 8.35 lb/1,000 gal (100 g/hl), step-wise addition until mid of alcoholic fermentation

SIHA Vitamin B<sub>1</sub> yeast nutrient: max. 0.01 lb/1,000 gal (0.6 g/1,000 l)

SIHA PROFERM H<sup>+</sup> combined yeast nutrient: max. 3.34 lb/1,000 gal (40 g/hl)

### Optional: Malolactic fermentation (MLF):

SIHALACT™ Oeno lactic acid bacteria (citrate-positive) after alcoholic fermentation (see Wine Navigator brochure, chapter MLF)

### Lees filtration with

BECOLITE 5000 perlite: 102.24–143.42 lb/100 ft<sup>2</sup> (5–7 kg/m<sup>2</sup>)

### Diatomaceous earth filtration:

BECOGUR 200 diatomaceous earth: approx. 10% at 0.84–1.67 lb/100 gal (100–200 g/hl)

BECOGUR 3500 diatomaceous earth: approx. 90% at 0.84–1.67 lb/100 gal (100–200 g/hl)

### Stabilization:

Cold stabilization: BECO Steril 40 or BECO KDS 15 depth filter sheets

Room temperature: BECOPAD 220, BECO KD 10 or BECO Steril 40 depth filter sheets

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