

Filtration and **Beverage Treatment** Products

Guide for Brewers

EATON

Powering Business Worldwide

Effective beer filtration with Eaton filtration solutions

Eaton is a leading supplier of complete depth filtration solutions and develops, manufactures and provides high-quality depth filtration media for food, beverage, fine chemical and pharmaceutical applications.

In addition to a wide range of depth filter sheets, stacked disc cartridges, filter cartridges, filter aids and stabilizers, the product range also includes filtration systems for breweries in various designs and sizes.

Classic systems:

- BECO COMPACT PLATE™ multi-sheet plate and frame filters

Enclosed systems:

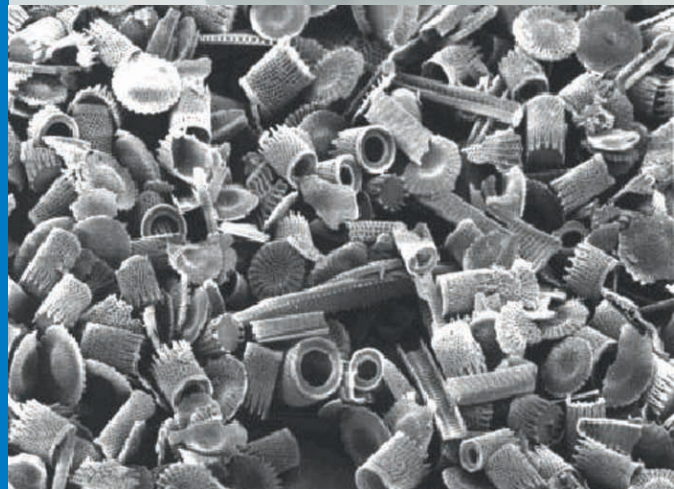
- BECO INTEGRA CART™ cartridge housings
- BECO INTEGRA DISC™ stacked disc cartridge housings
- BECO INTEGRA LAB™ laboratory filters

Automatic systems:

- StepFlow® filtration systems

Eaton also provides ideal filtration solutions for **craft breweries**. These include:

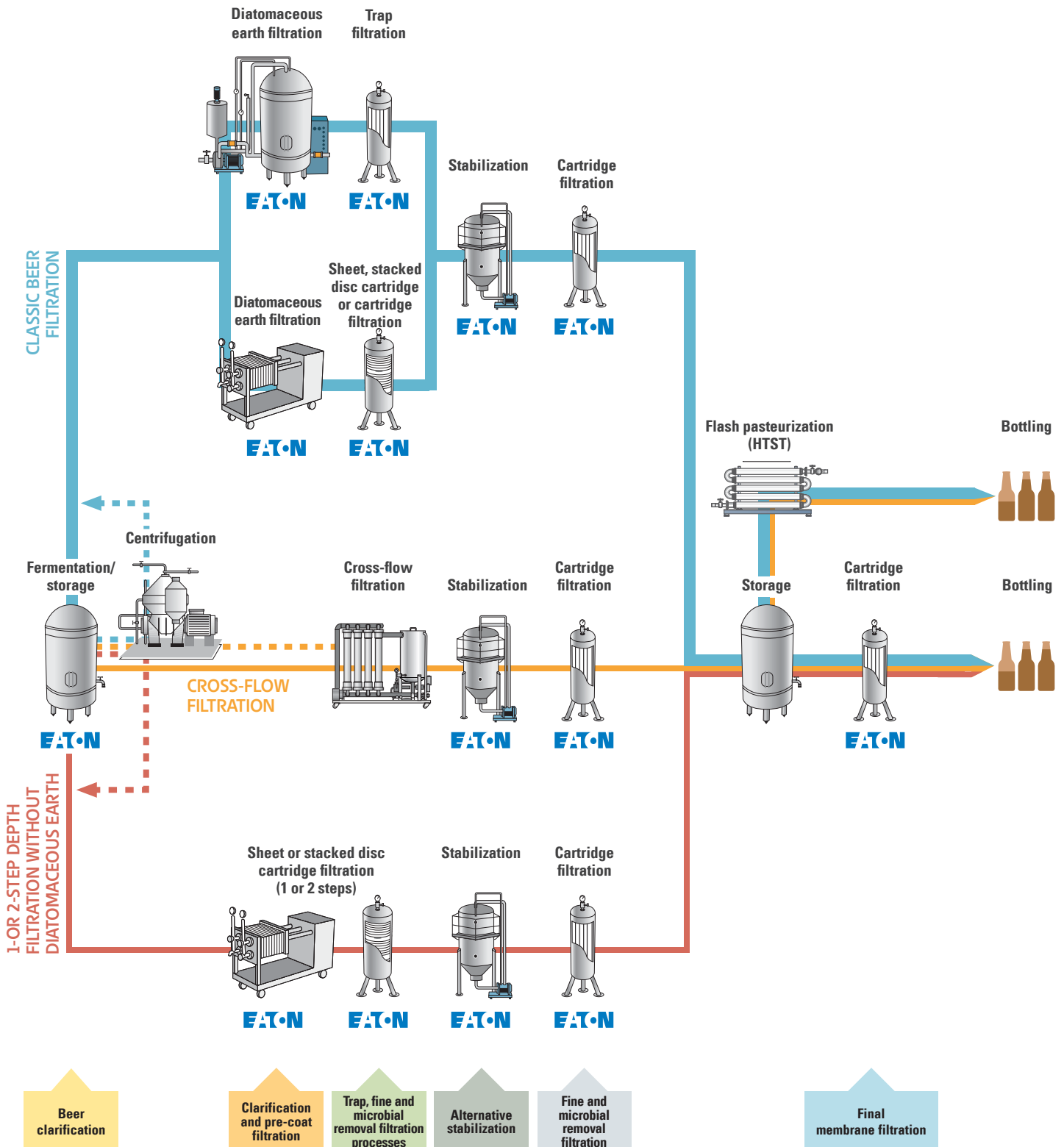
- BECOPAD® depth filter sheets and systems
- BECODISC® stacked disc cartridges and housings
- BECO® filter cartridges and housings
- Silica sol
- Filter bags and bag housings



Processes in Beer Production

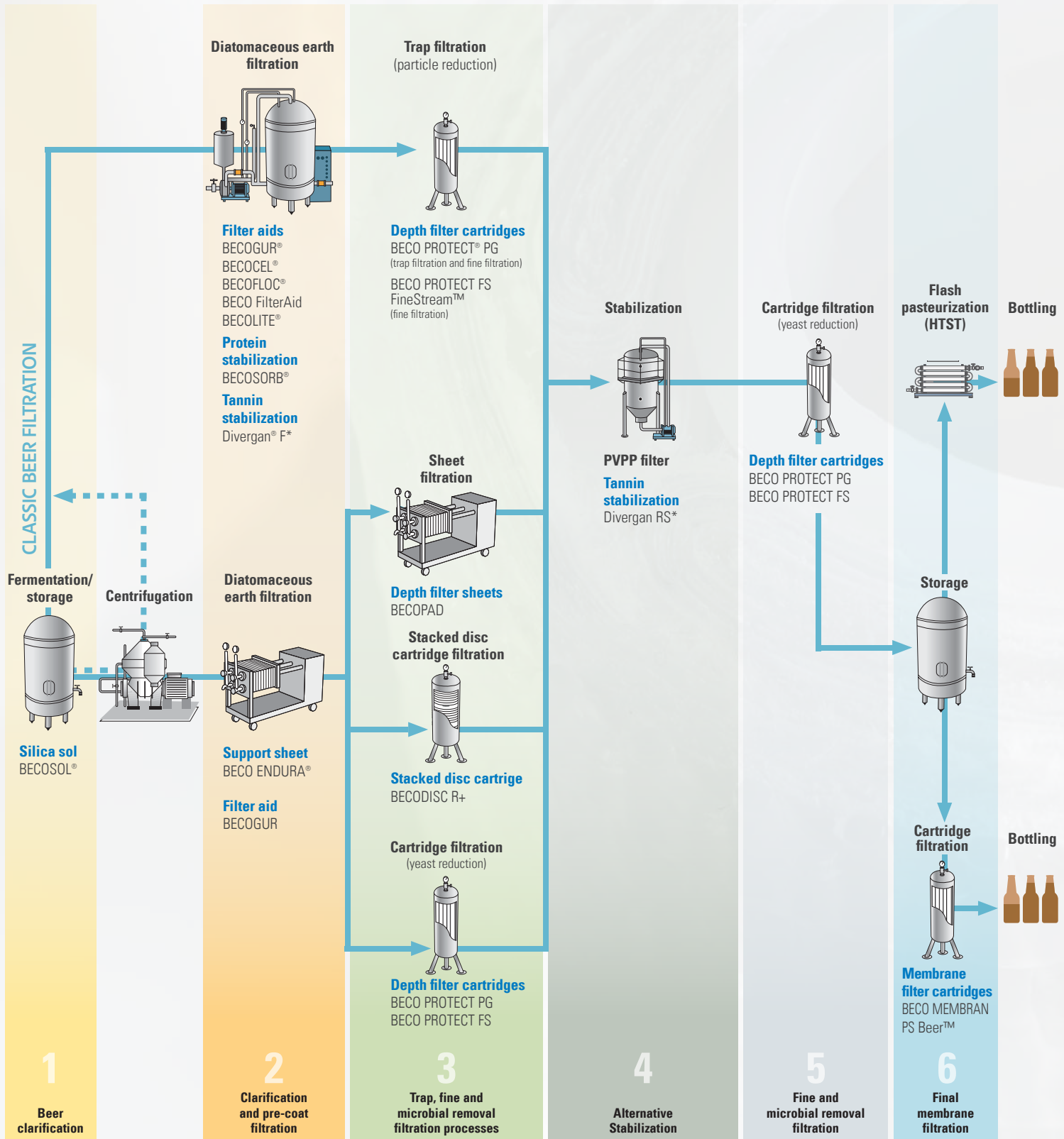
Most beers undergo a filtration process after storage. In this process, protein-based and tannin-based compounds, hop resins, yeast cells and beer-spoiling bacteria are removed so that a level of beer clarity can be achieved that would not be possible using the standard clarification process during storage. The following filtration processes are commonly used:

- CLASSIC BEER FILTRATION (pre-coat filtration)
- CROSS-FLOW FILTRATION
- 1- OR 2-STEP DEPTH FILTRATION WITHOUT DIATOMACEOUS EARTH



Filtration Media in the Classic Beer Filtration Process

The Eaton product range for classic beer filtration meets even the highest demands for clarity and stability at the brewery.



Process step		Recommended product	Advantages	Note
1 Beer clarification	Adding silica sol	BECOSOL 30 silica sol	<ul style="list-style-type: none"> Improved filtration properties 	<ul style="list-style-type: none"> Added to the hot finished wort In the storage tank
2 Clarification and pre-coat filtration (optional stabilization)	Diatomaceous earth filtration (vessel filters)	BECOGUR 3500 diatomaceous earth <ul style="list-style-type: none"> To form the first pre-coat layer BECOGUR 1200/200 diatomaceous earth for continuous dosing BECOLITE 3000 perlite used partially to replace coarse diatomaceous earth (BECOGUR 3500) 	<ul style="list-style-type: none"> Maximum clarification due to a unique grain size distribution Optimal dirt-holding capacity Reliable filtration effect caused by rapid build-up of a firmly adhesive filter cake Economical due to an optimal flow rate to clarification ratio Maximum purity 	To solidify and stabilize the filter cake: <ul style="list-style-type: none"> BECOFLOC 7/10 filter flakes BECOCEL 250 cellulose BECO FilterAid to facilitate pre-coating and continuous dosing
	Diatomaceous earth filtration (frame filters)	BECO ENDURA support sheet <ul style="list-style-type: none"> Adding BECOGUR 3500, 1200 or 200 filter aids 	<ul style="list-style-type: none"> Renewable High strength for a longer service life 	
	Protein stabilization	BECOSORB 2500 silica gel	<ul style="list-style-type: none"> Moisture content approx. 40% Filtration properties of fine diatomaceous earth (amount of diatomaceous earth can be reduced) Selective adsorption Nearly dust-free handling 	<ul style="list-style-type: none"> Add to the storage tank Add during pre-coating filtration <p>Alternatives: BECOSORB 1000 (xerogel) BECOSORB 6000 (hydrogel)</p>
	Tannin stabilization	Divergan F* polyvinylpyrrolidone (PVPP)	<ul style="list-style-type: none"> Selective tannin adsorption 	<ul style="list-style-type: none"> Add during pre-coating filtration
3 Trap, fine and microbial removal filtration processes	Trap filtration (particle reduction) with cartridge filters	BECO PROTECT PG depth filter cartridges (10 µm) Alternatives: 5 µm und 3 µm, depending on customer requirements	<ul style="list-style-type: none"> Easy backwashing ensures long service life Reliably reduces particles and yeast Graded filter structure for high particle absorption capacity 	<ul style="list-style-type: none"> After the diatomaceous earth filter (horizontal sieve filter or slot filter cartridge) After adding PVPP <p>Alternatives: BECO PROTECT FS FineStream depth filter cartridges for a higher flow rate</p>
	Fine and microbial removal filtration processes (yeast reduction) with cartridge filters	BECO PROTECT PG depth filter cartridges (0.3 µm or 0.5 µm) Alternative: 0.6 µm, depending on customer requirements	<ul style="list-style-type: none"> Yeast-reduced or yeast-free Reduces levels of fine haze 	<ul style="list-style-type: none"> Removes fine haze and yeasts Final filtration before bottling <p>Alternatives: BECO PROTECT FS FineStream BECO PROTECT PP Pure™</p>
	Fine filtration with sheet or stacked disc cartridge filters	BECOPAD 450 and 350 depth filter sheets	<ul style="list-style-type: none"> High bursting strength Backflushable Preserves color and aroma High dirt-holding capacity for a longer service life Biodegradable High microbiological retention capacity when used with filter sheets for microbial removal Low adsorption of hop oils** 	<ul style="list-style-type: none"> All types are available as backflushable BECODISC R+ stacked disc cartridges in enclosed systems
	Microbial removal filtration with sheet or stacked disc cartridge filters	BECOPAD 270 and 220 depth filter sheets		
4 Alternative stabilization	Alternative tannin stabilization	Divergan RS* PVPP	<ul style="list-style-type: none"> Selective tannin adsorption 	<ul style="list-style-type: none"> Renewable PVPP for use in a PVPP filter
5 Fine and microbial removal filtration	Cartridge filtration	BECO PROTECT PG depth filter cartridges (0.3 µm or 0.5 µm) Alternative: 0.6 µm, depending on customer requirements	<ul style="list-style-type: none"> Yeast-reduced or yeast-free Reduces levels of fine haze 	<ul style="list-style-type: none"> Removes fine haze and yeasts Final filtration before bottling <p>Alternatives: BECO PROTECT FS FineStream BECO PROTECT PP Pure</p>
6 Final membrane filtration	Cartridge filtration	BECO MEMBRAN PS Beer membrane filter cartridges	<ul style="list-style-type: none"> Long service life Beer-spoiling microorganisms are reliably retained High mechanical, thermal and chemical resistance for easy cleaning 	<ul style="list-style-type: none"> Final filtration for cold-sterile bottling

* Product availability may vary in different countries.

** cf. with technical article: On hops, filters and precious oils, Dr. Ilona Schneider
Divergan® is a registered trademark of BASF.



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