



GEA clearamic BeerFiltration

Filtration with ceramic membranes

Kongres Browarników, 14.-16.10.2015

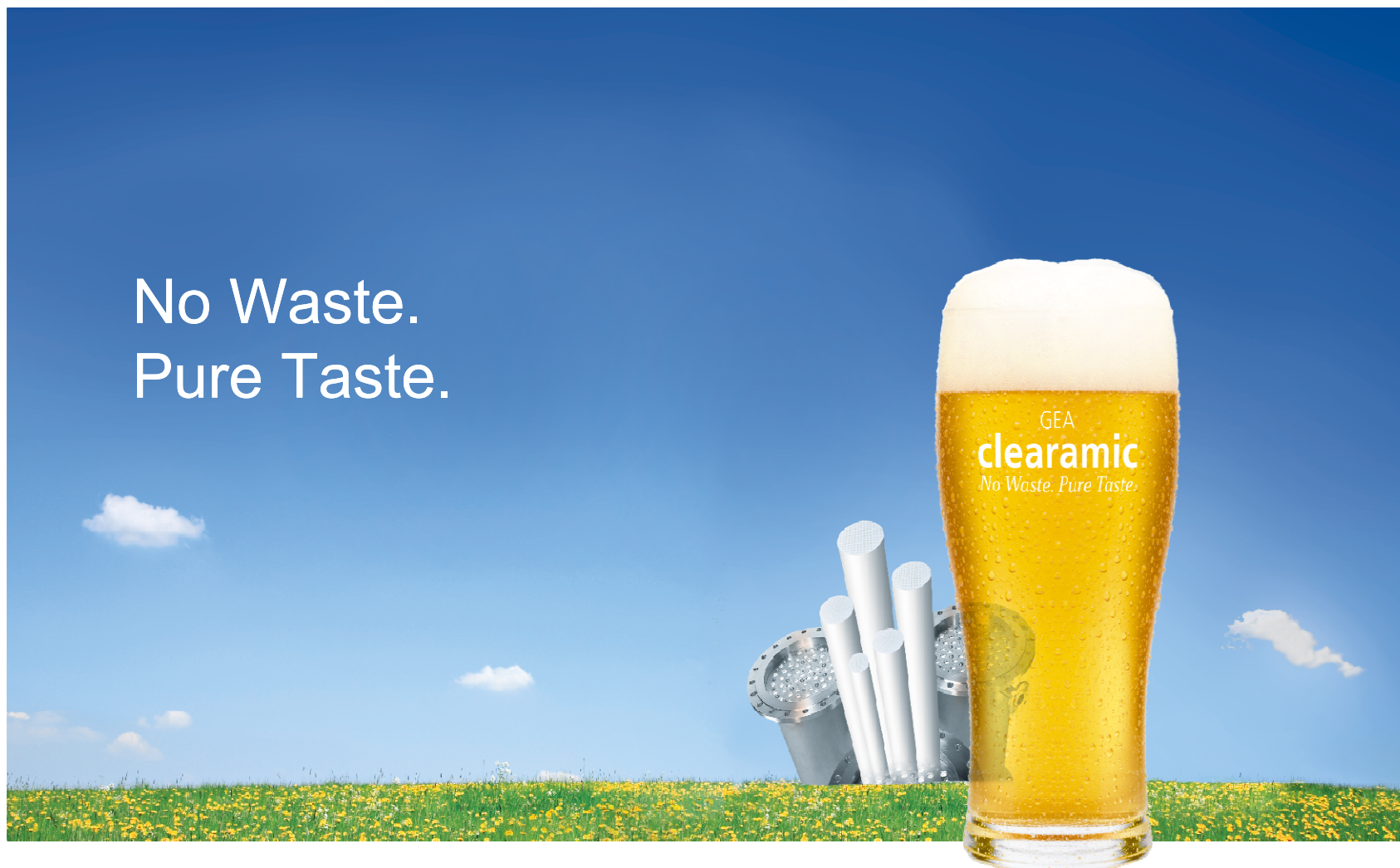
Thomas Hübner, Head of Sales Support

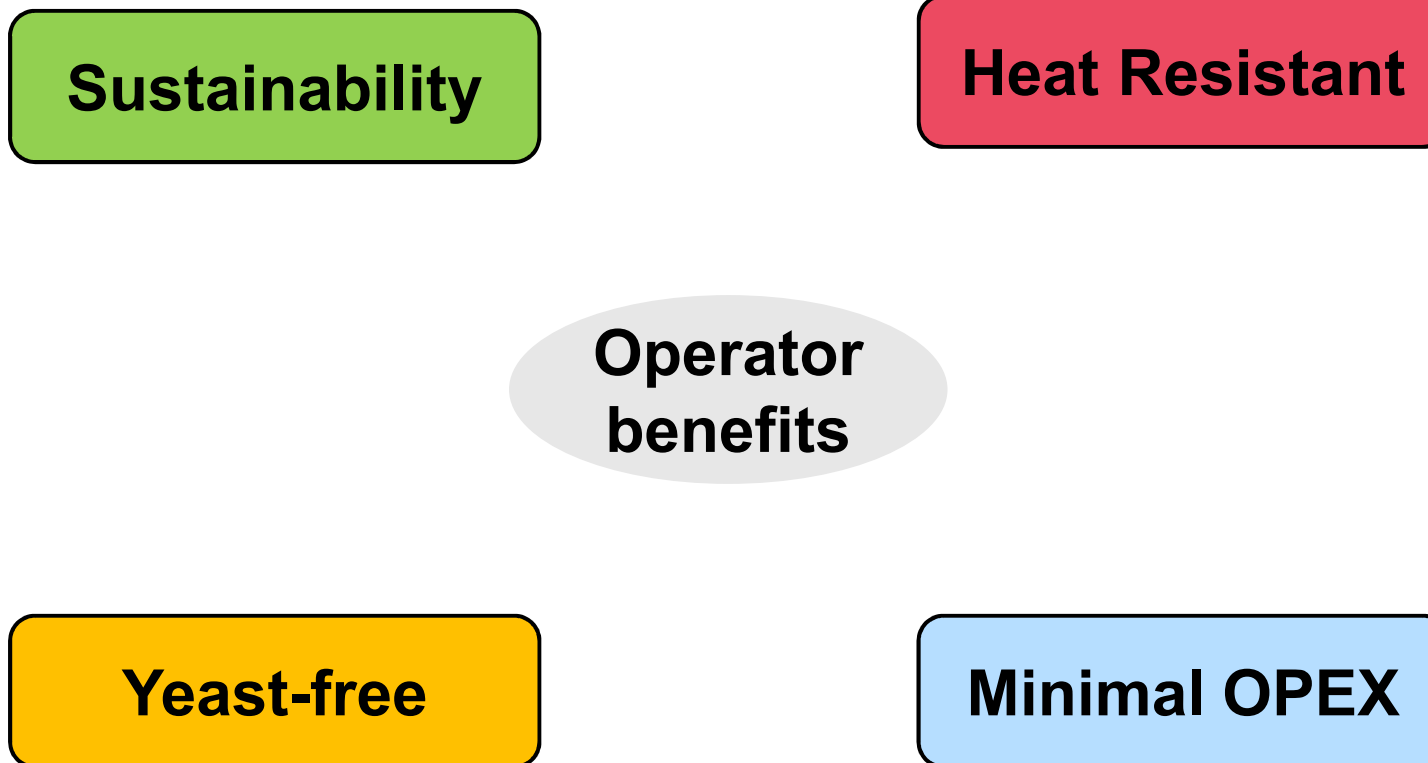
GEA Brewery Systems, APC Beverage & Beer

CLEARAMIC – Kieselguhrfree Beer Filtration



No Waste.
Pure Taste.





Sustainability – No waste

- Process free from waste
- No kieselghur handling and disposal
- Regeneration of membranes
- Lifetime of ceramic membranes > 10 years

Best beer quality – Pure taste

- Permanent high reproducible quality
- Ceramic membranes are inert
- Heat resistant > 120°C – easy to sterilize
- Yeast-free
- Filtrate quality meets the highest sensory and analytical demands

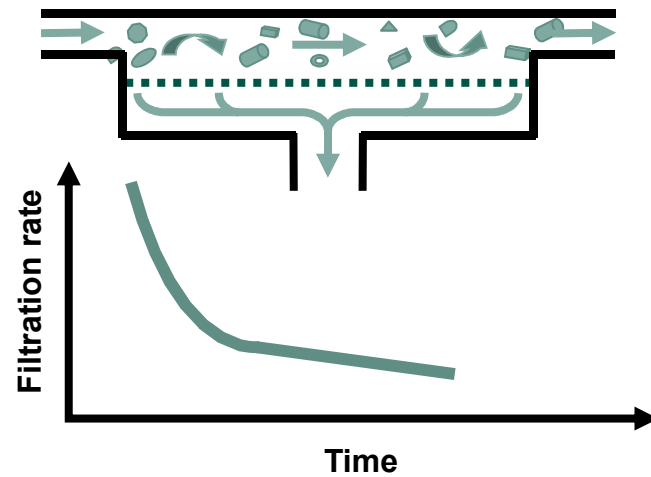
High economic efficiency – Low OPEX

- Significantly reduced material purchase
- No costs for filter additives
- Reduced costs for cleaning
- Low personnel costs
- Low operation costs

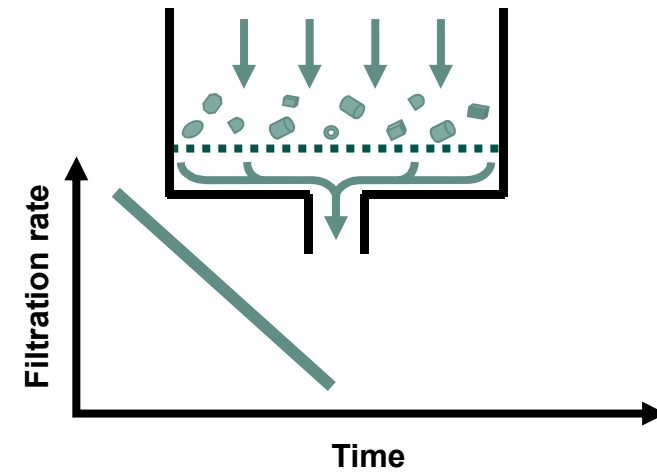
Crossflow filtration



Cross-flow



Dead end



Cross-flow

The retentate flow is tangential to the surface of the filter

The retained particles do not build up on the filter surface because the fluid stream keeps them in suspension
-> continuous process possible

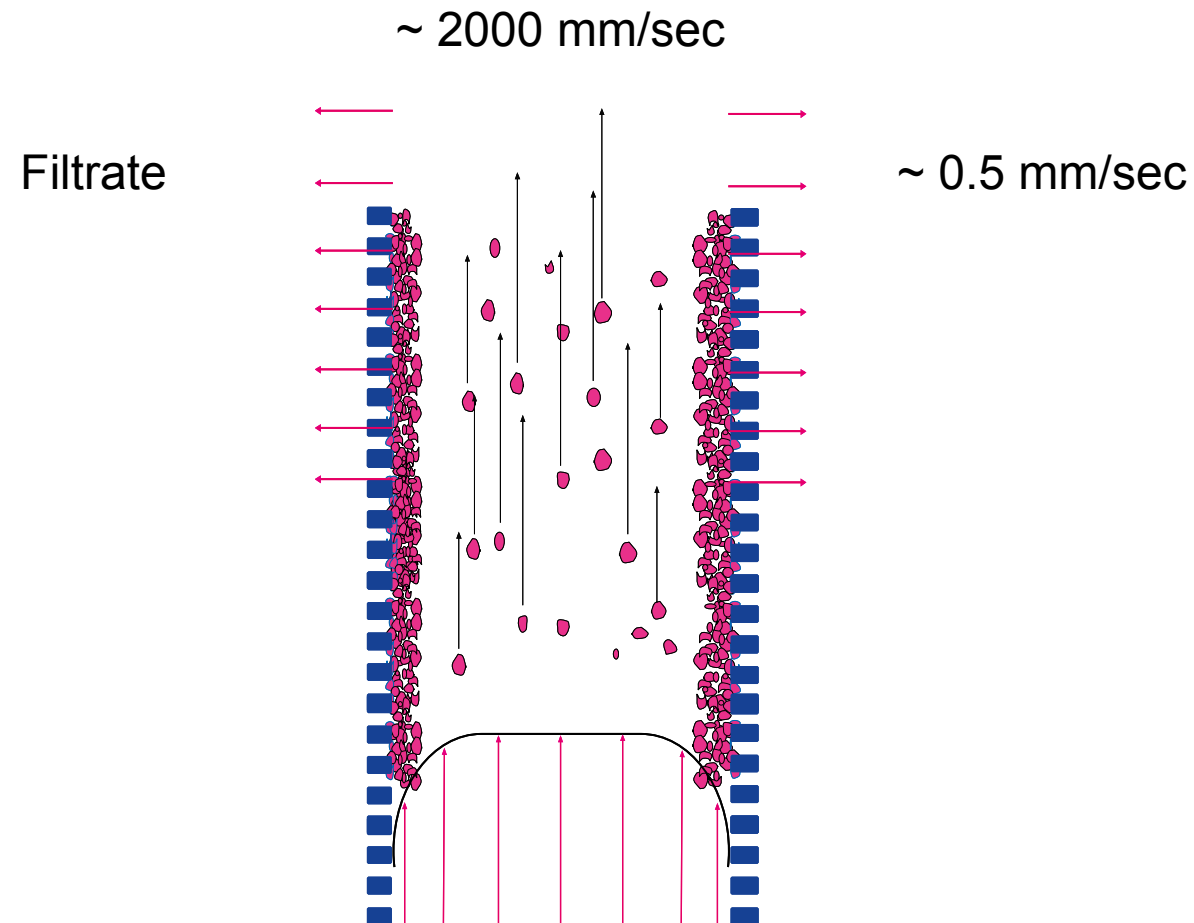
Dead end

The flow is directly transported into the filter

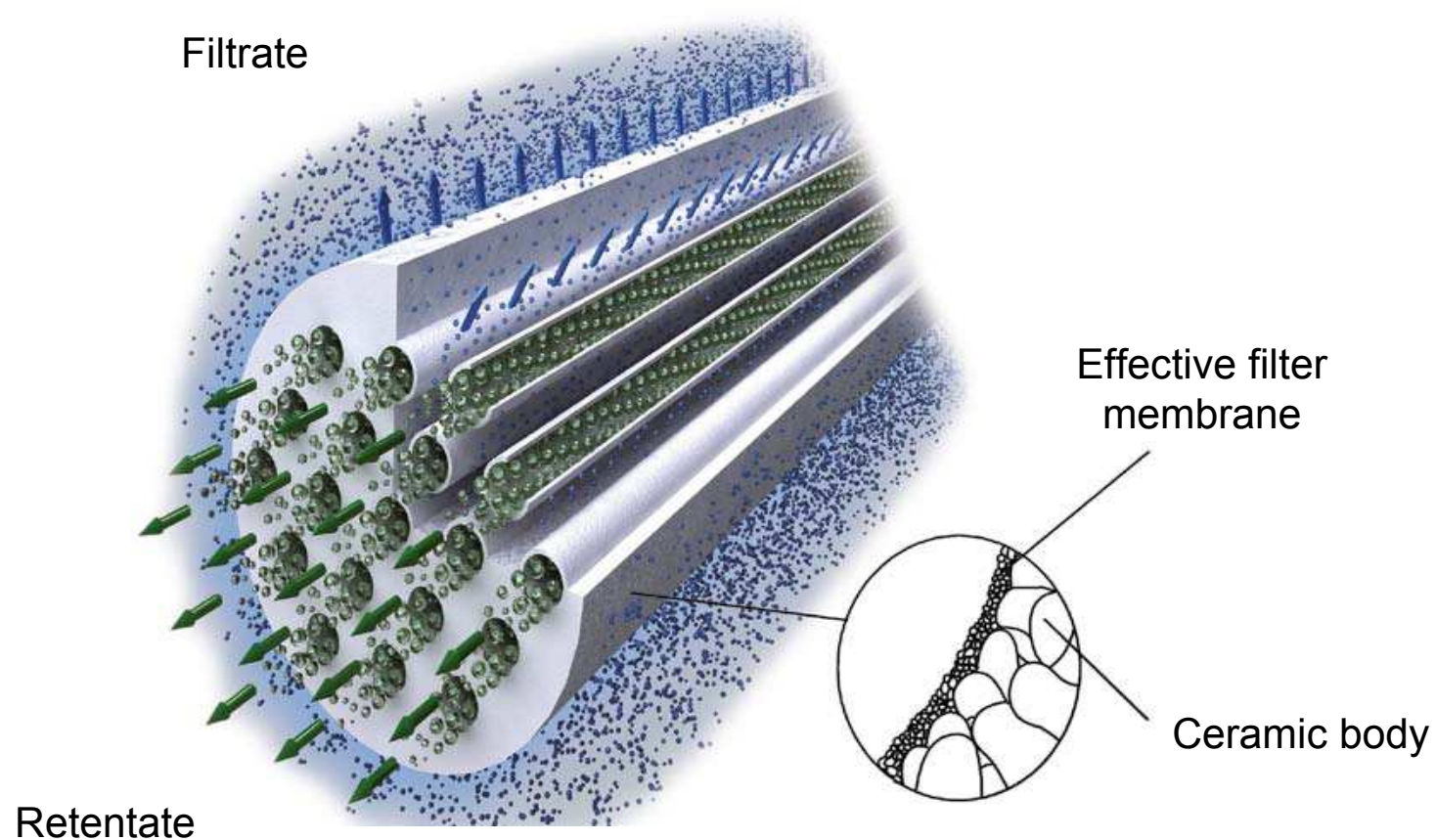
The particles are retained on the surface or inside the filter material

After a certain period of time the filter has to be replaced

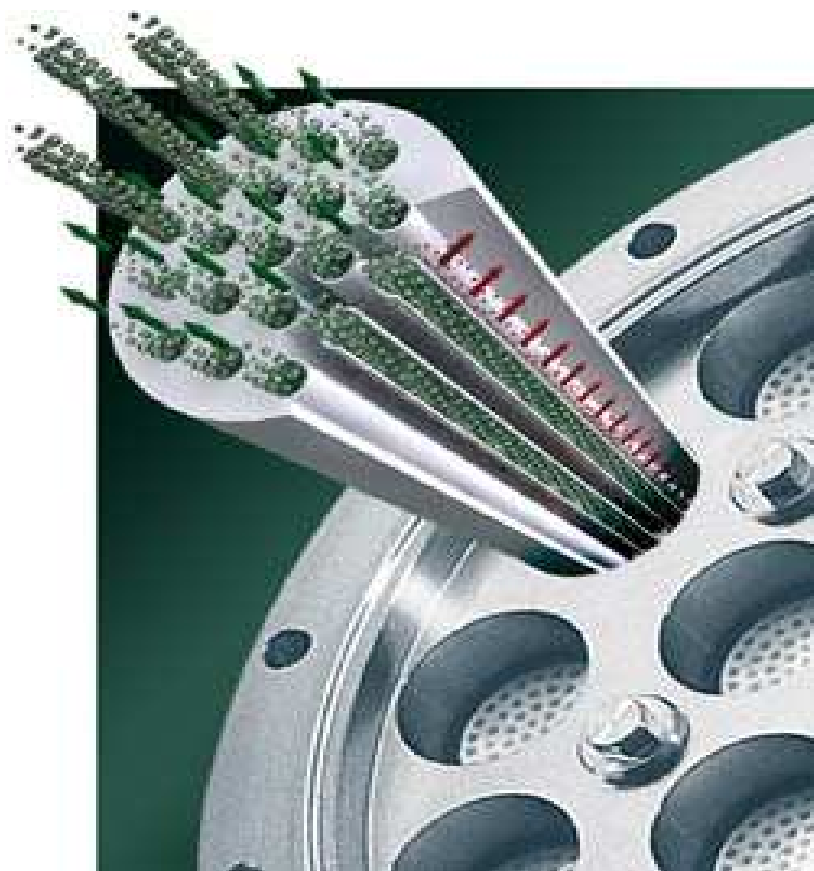
Cross-flow filtration with membranes



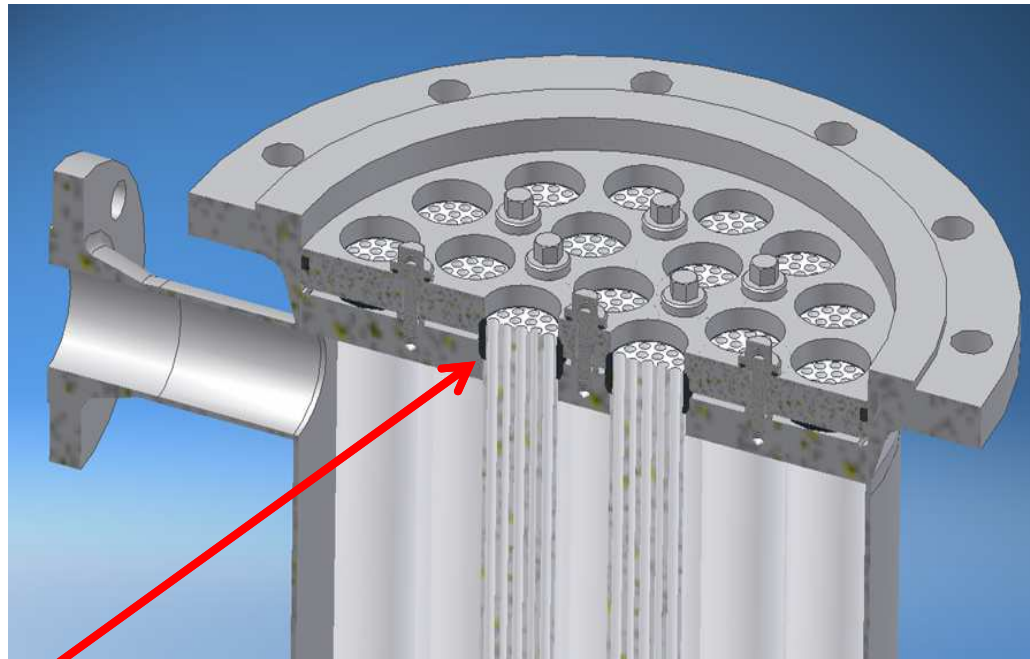
Multi-channel filter element



Stainless steel housings/ filter modules



Stainless steel housings/ filter modules



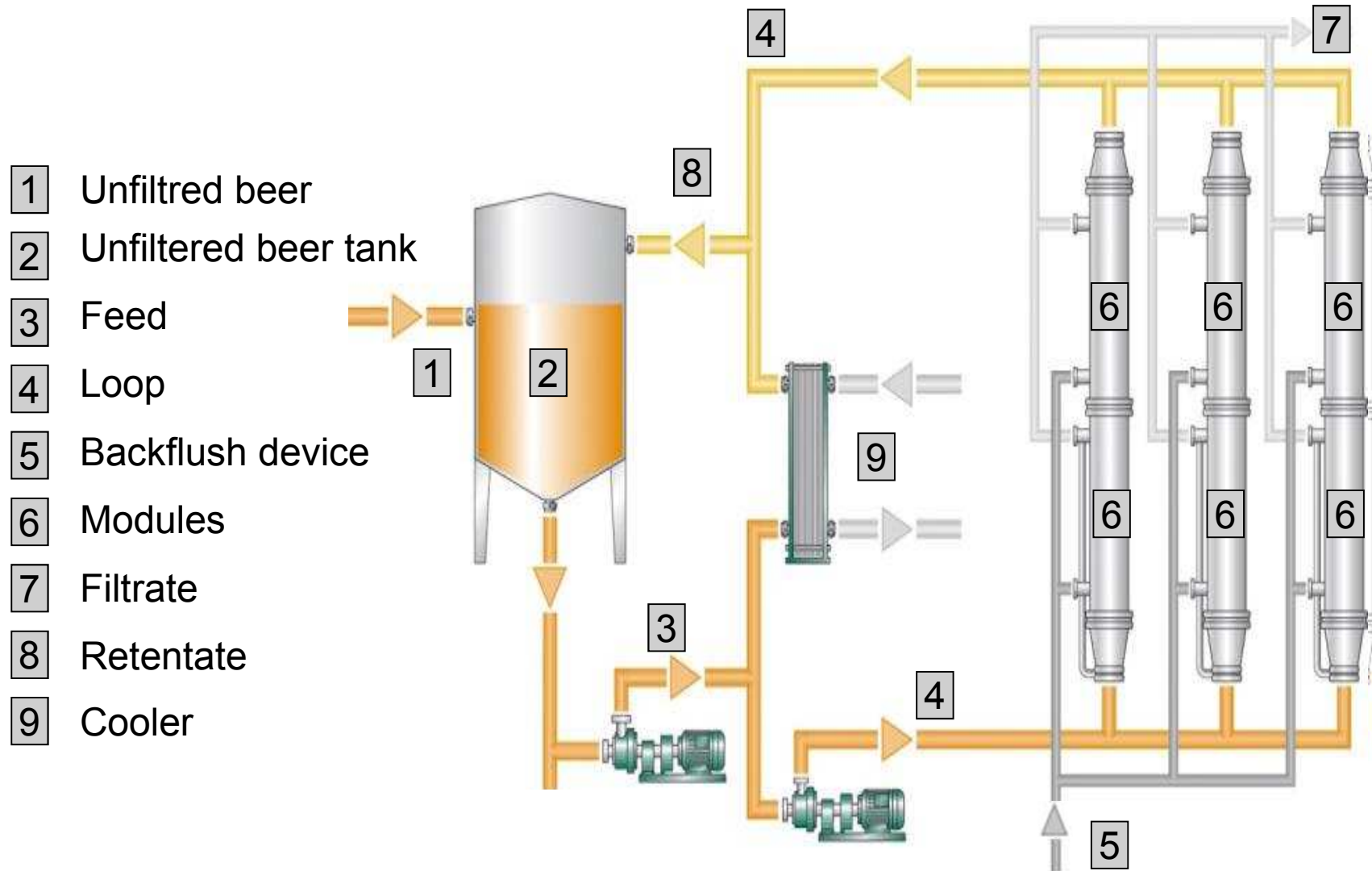
Sealing to prevent the metal from damaging the ceramic and to guarantee impermeability

Filtration with ceramic membranes – Advantages

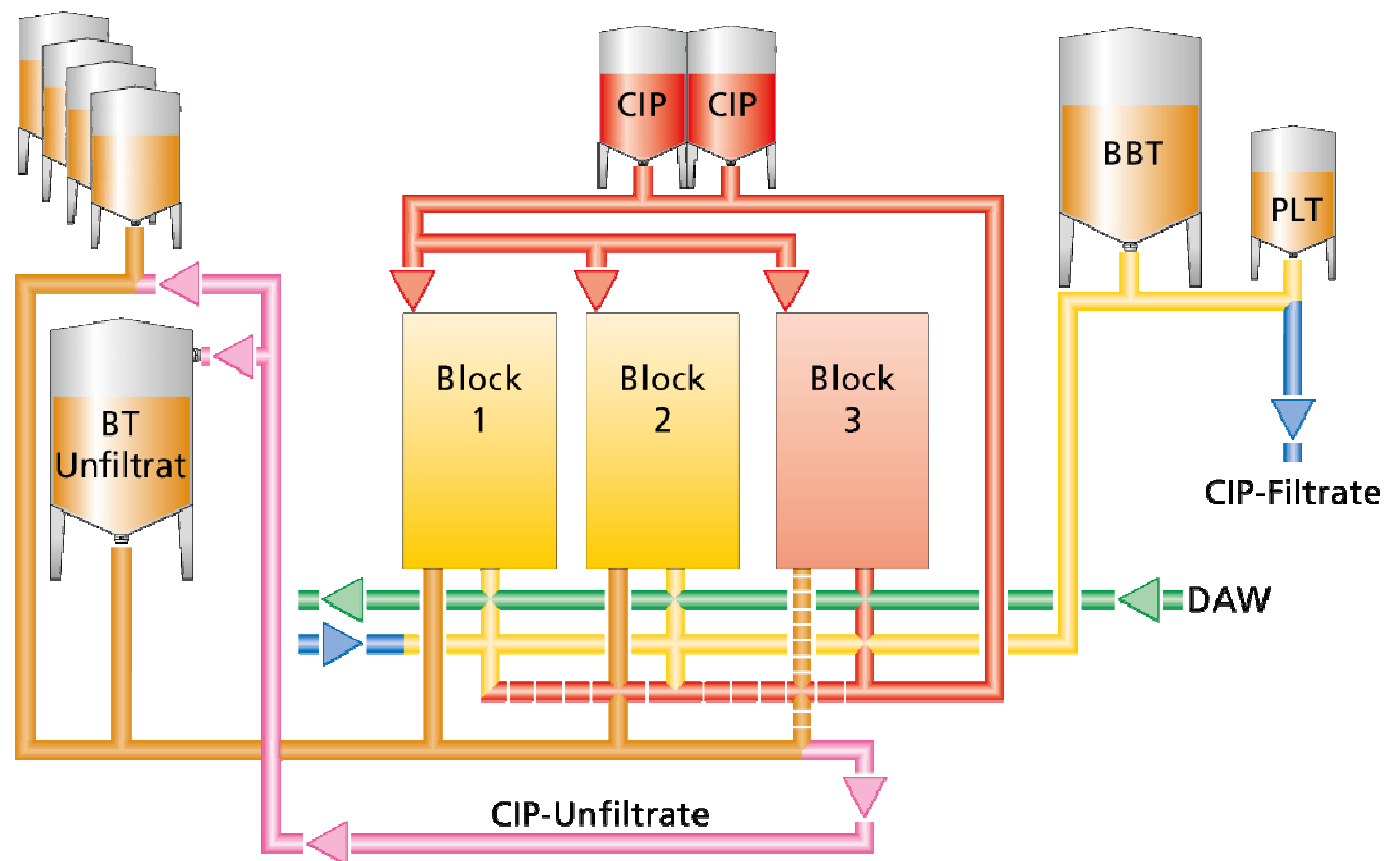


	Kieselguhr	Polymer	Ceramic
High temperature	120 °C	< 55 °C	120 °C
Sterilization	yes	no	yes
pH-range	0 -14	1.8-10.8	0-14
Dry matter	n/a	< 25 %	<35 %
Lifetime	single use	1-3 years	>10 years
Back flush	no	no	yes
Cleaning agents	standard	special	standard
Cleaning time	2.5 - 3 h	2.5-3 h	~ 2 h
Stability (pressure)	sensitive	sensitive	high
Flux rates	high	low	low
TCO	low	high	low

Filtration plant – How it works



Plant layout – filtration with parallel CIP



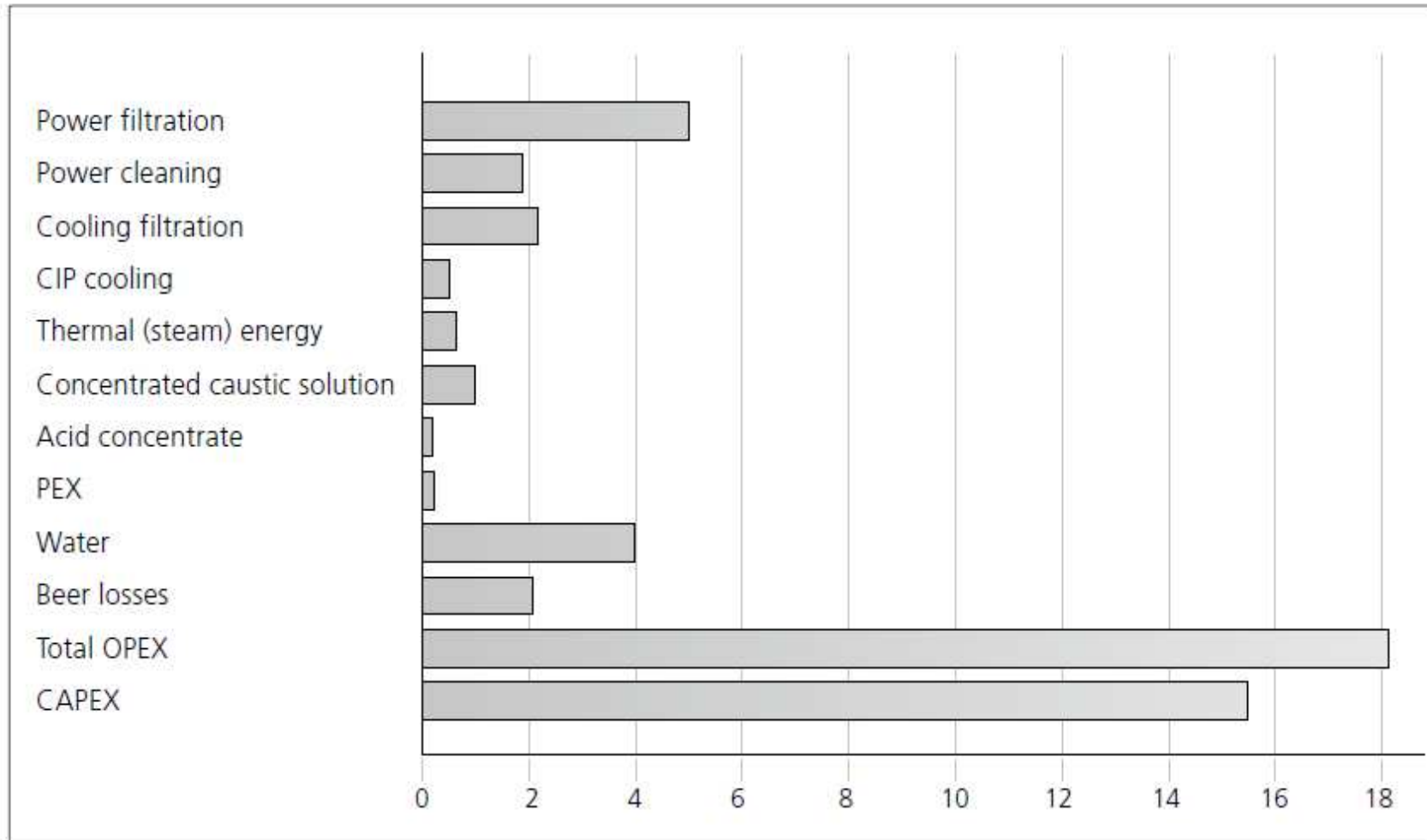
Images of filtration plants



What does it cost?

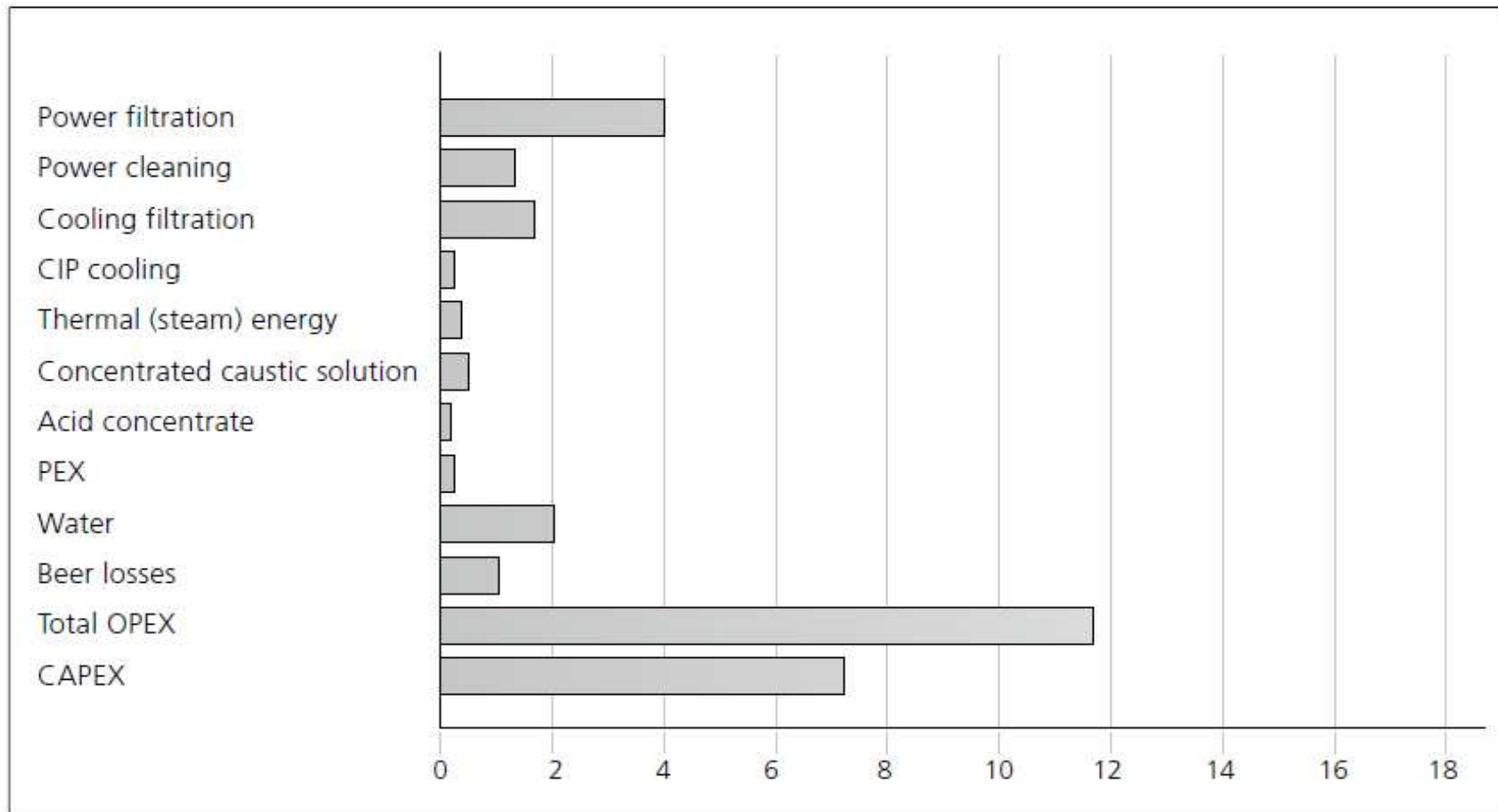


Costs – example for poor filterability



Filtration costs in ct/hl with poor filterability

Costs – example for good filterability



Filtration costs in ct /hl with good filterability

Consideration

- **Ceramic** membranes are purchased with the system, but last for the entire service life time of the system -> **higher investment costs**
- **Polymer** membranes or filter additives can be found in the running costs -> **lower investment costs**
- Brewery specific conditions (e. g. products, expandability, ...) have to be taken into account
- ✚ **Comparability of offers (polymer vs. ceramic) is not possible with the offer for the system alone**

CLEARAMIC - Advantages



- Crystal clear beer in premium quality
- Yeast –free filtrate
- Sustainable and waste-free process
- High economic efficiency - Low OPEX
- Reliable and proven cross-flow filtration with ceramic membranes
- Easy and flexible to integrate

No Waste.
Pure Taste.

Thomas Hübner
Head of Sales Support
GEA APC Beverage & Beer





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