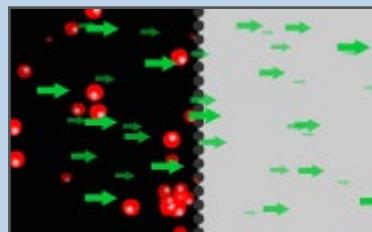


Stainless Steel in Filtration



Filtration is part of our daily life ...

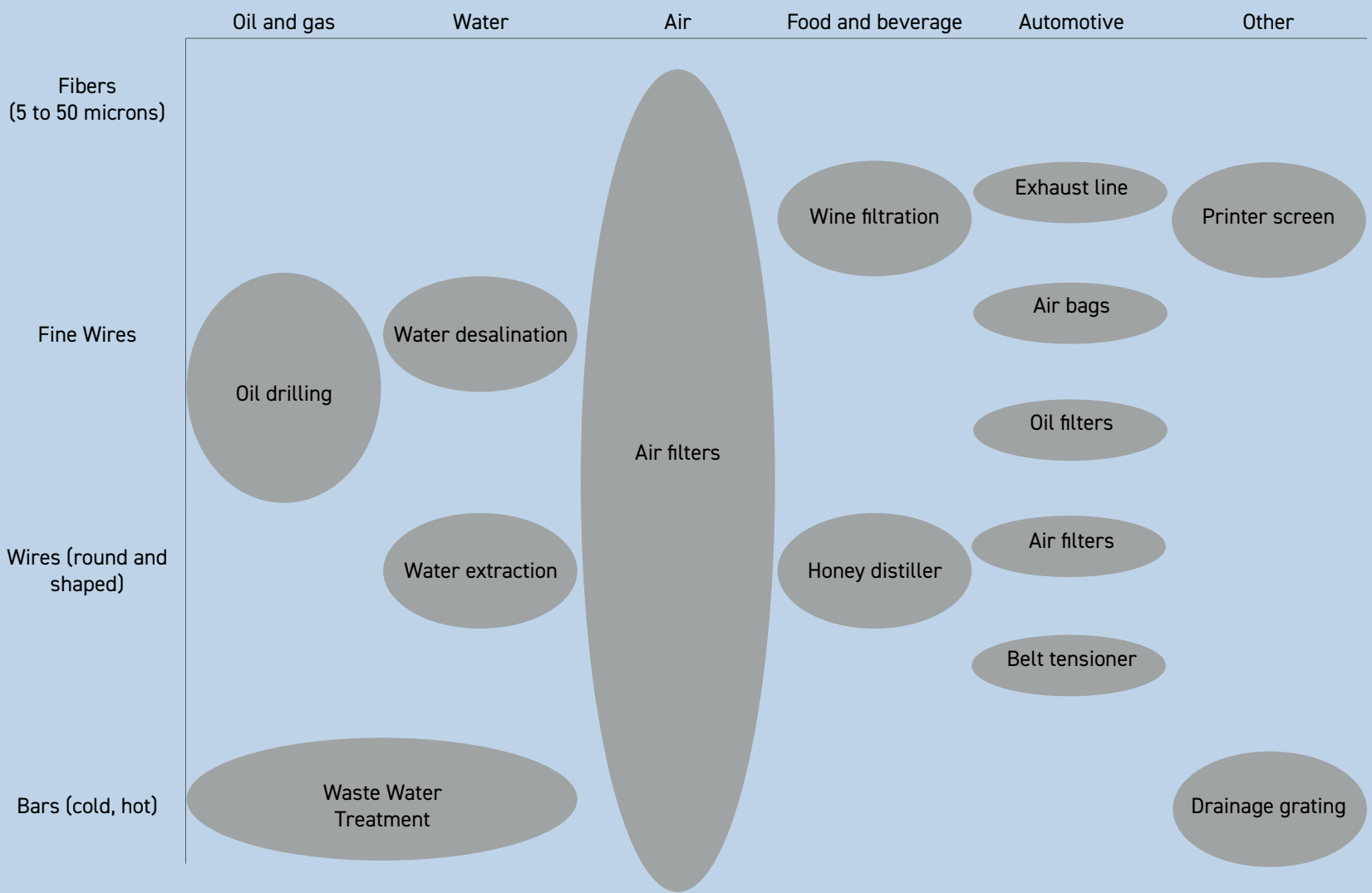


Solid from liquid or gas filtration

... and stainless steel is the material of choice for filtration.

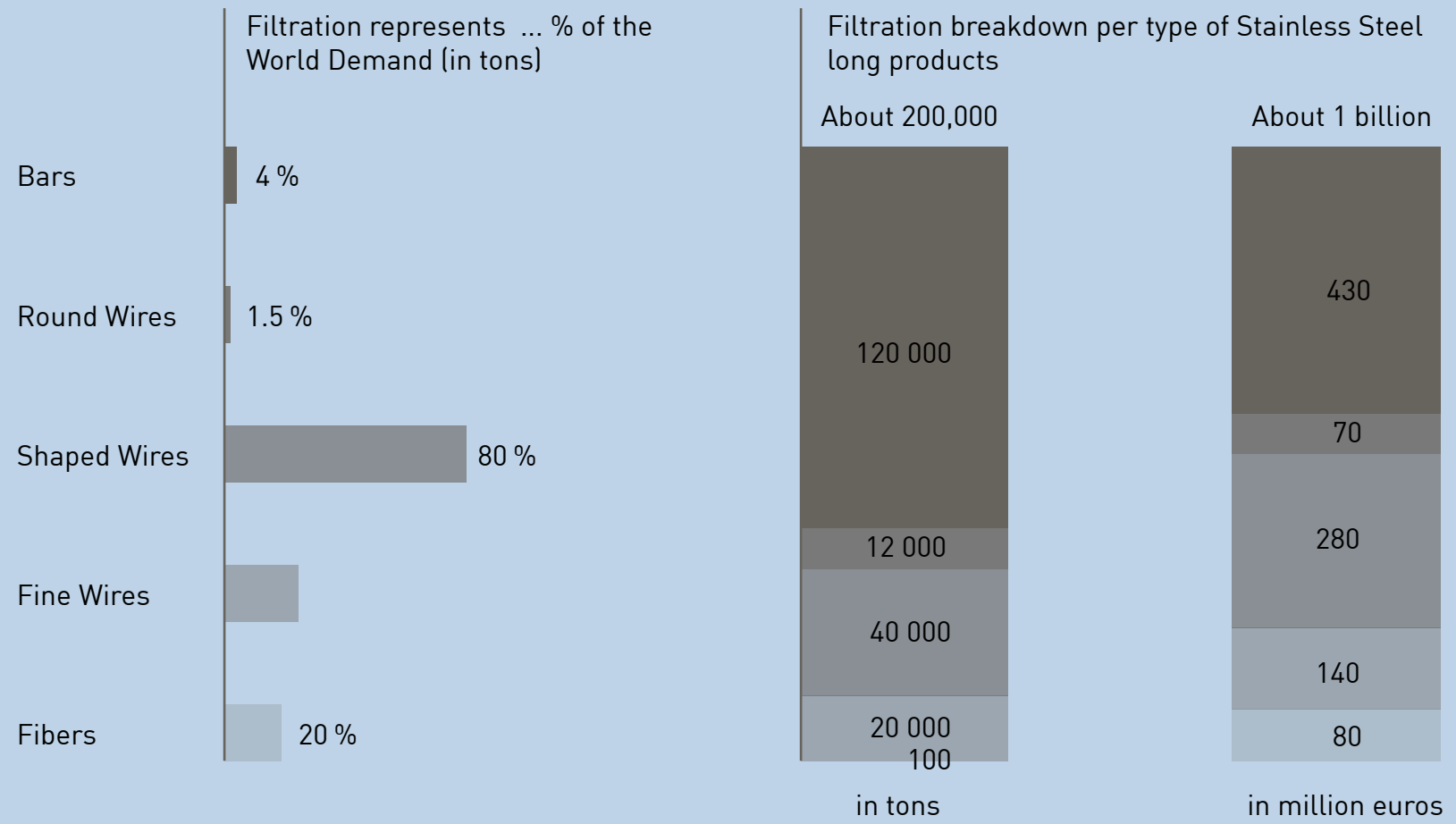
Stainless Steel in Filtration

A wide panorama of stainless steel usage in filtration applications



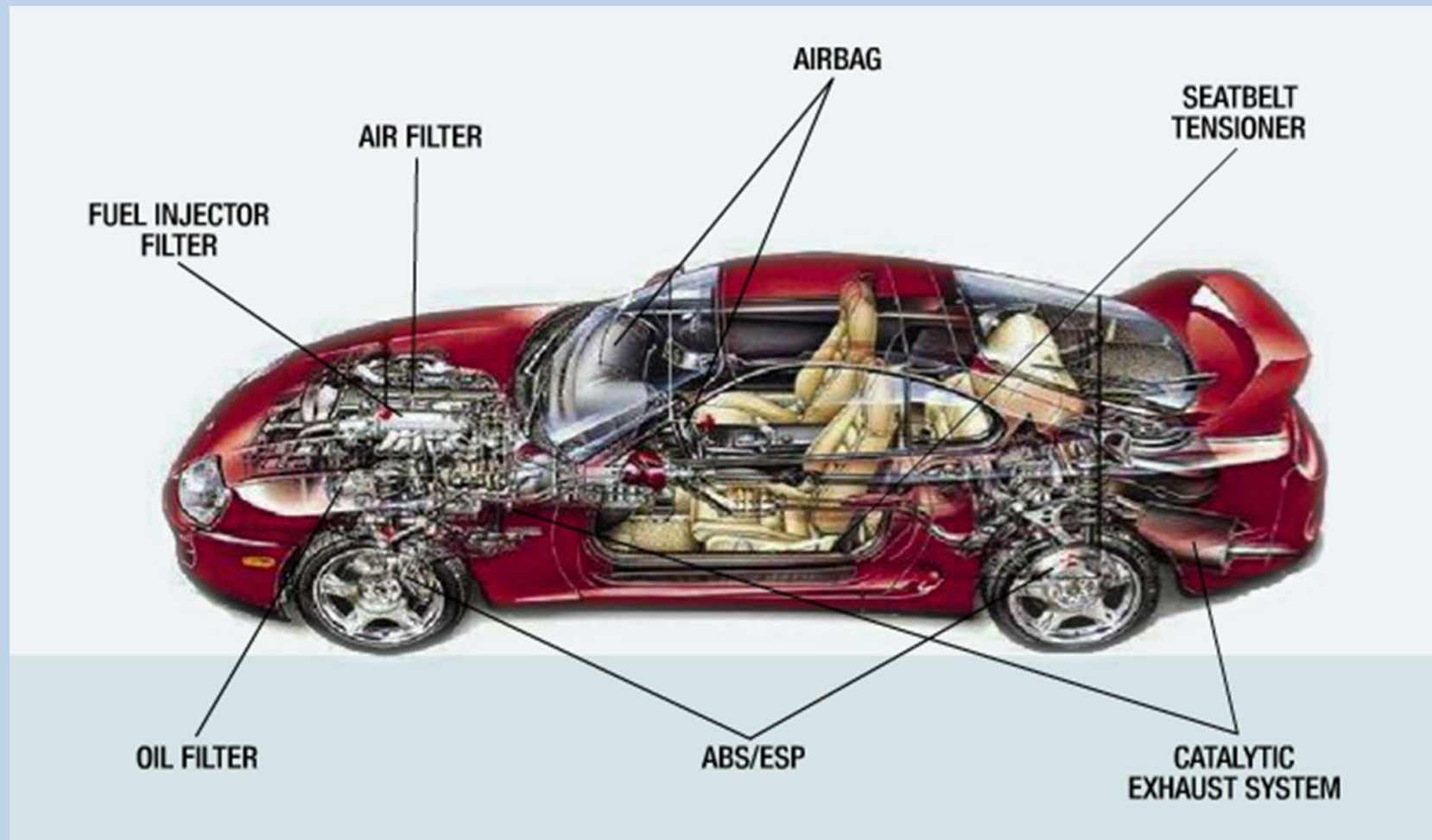
Stainless Steel in Filtration

That generate a 1 billion Euro market yearly demand



Stainless Steel in Filtration

Automotive: Some filtration applications



Stainless Steel in Filtration

Oil, gas, air filtration in automotive

Automotive: various filters

Objective:

to stop dangerous particles for mechanical parts in order to protect passengers and environment

Stainless steel filter characteristics:

- Woven wire
- Retention level: standards between 1 to 10 μ

Competing material:

Woven fabric made from polypropylene, polyester and paper

Why stainless steel?

- Chemical inertia
- Cleanable
- Pressure resistance
- Superior efficiency
- Fashioning



Filter for injectors



Air filter: Standard ▲

Custom ▼



Oil filter (bikes)



Old



Stainless Steel in Filtration

Exhaust line applications have their own filtration systems

Automotive: in exhaust system

Objective:

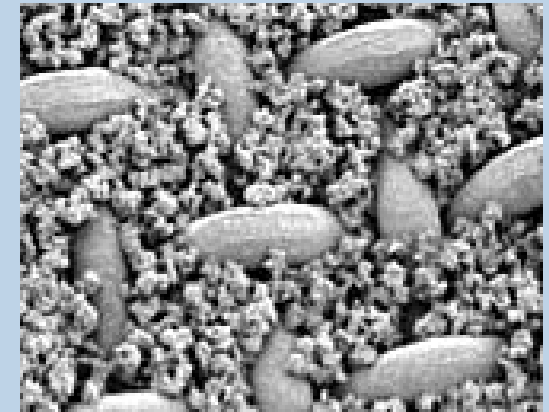
To have a good substrate for catalytic beds operating at high temperature

Stainless steel filters characteristics:

- Woven wire
- Wool

Why stainless steel?

- Chemical inertia
- High temperature resistance
- Pressure resistance
- Quicker achievement of operation temperature
- Recyclability



Catalyst wire mesh



Stainless Steel in Filtration

Filtration is also part of car safety devices

Automotive: Safety

Objective:

To stop the dusts after the blast and remove dangerous particles in oleo dynamic circuits

Stainless steel filter characteristics:

- Woven wire
- Wool

Why stainless steel?

- Chemical inertia
- High temperature resistance
- Pressure resistance
- High efficiency



ABS - ESP



Airbags / seatbelt tensioner

Stainless Steel in Filtration

Oil and gas filtration within the refining process

Stainless steel for catalytic beds applications

Objective:

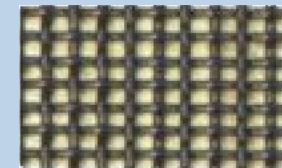
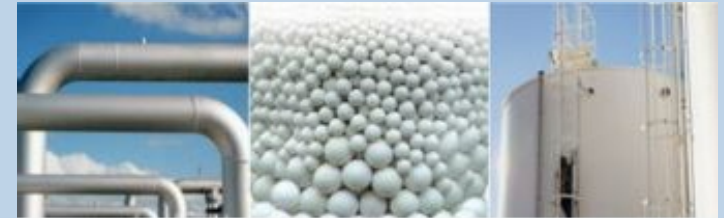
to remove contaminants from the reactor bed, in order to avoid catalyst damages

Stainless steel characteristics:

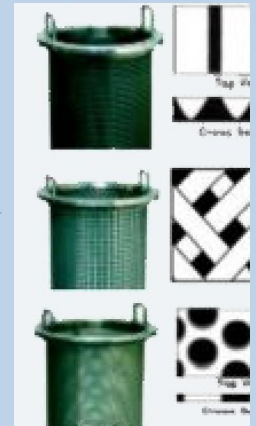
- woven wire,
- slotted, defined pore or perforated stainless steel wire mesh
- retention level: standards between 5 to 10 μ

Why stainless steel?

- Resistance against acid, alkali and corrosion
- Heat resistance
- Fatigue and pressure resistance
- Life cycle cost better than that of carbon steel



wire mesh



wire



woven

Stainless Steel in Filtration

Oil and gas filtration within the refining process

Stainless steel for slurry oil filtration

Objective:

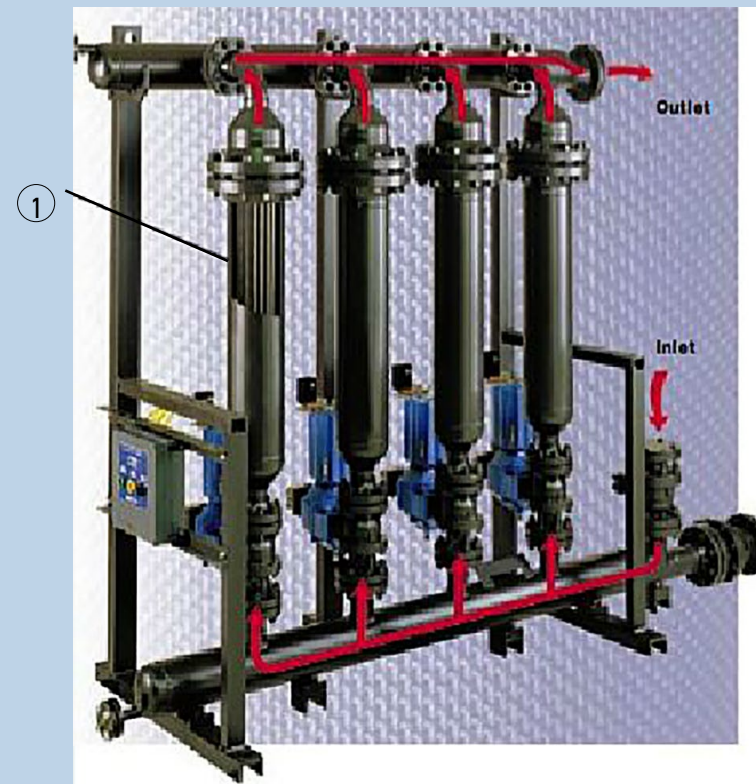
To assure a filtered stream quality sufficient to be sold or reintroduced into the Fluid catalytic cracking unit, and to remove particles to avoid equipment erosion.

Stainless steel filters characteristics:

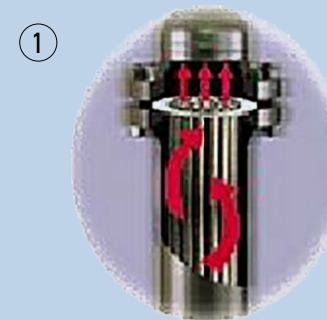
- woven wire,
- slotted, defined pore or perforated stainless steel wire mesh
- retention level: as low as 2 micrometer

Why stainless steel?

- Resistance against acid, alkali and corrosion
- Fatigue and pressure resistance
- Abrasion resistance



Tubular cleanable backwashing systems





Stainless Steel in Filtration

Oil and gas filtration within the refining process

Stainless steel for amine filtration (gas separation)

Objective:

To remove the problem causers, to secure the unit's capacity and protect the system against corrosion, erosion, wearing, plugging, amine foaming...

Stainless steel filters characteristics:

- wire mesh, slotted, defined pore or perforated stainless steel

Competing material:

Woven fabric made from polypropylene and polyester

Why stainless steel?

- High corrosion resistance
- Abrasion resistance
- Pressure resistance

High volume amine
filtration system



Stainless steel wire mesh
pleated filter cartridge

Stainless Steel in Filtration

Oil and gas filtration within the refining process

Stainless steel for sand control applications

Objective:

To optimise productivity and maximise quality filtration to keep the well in good working order

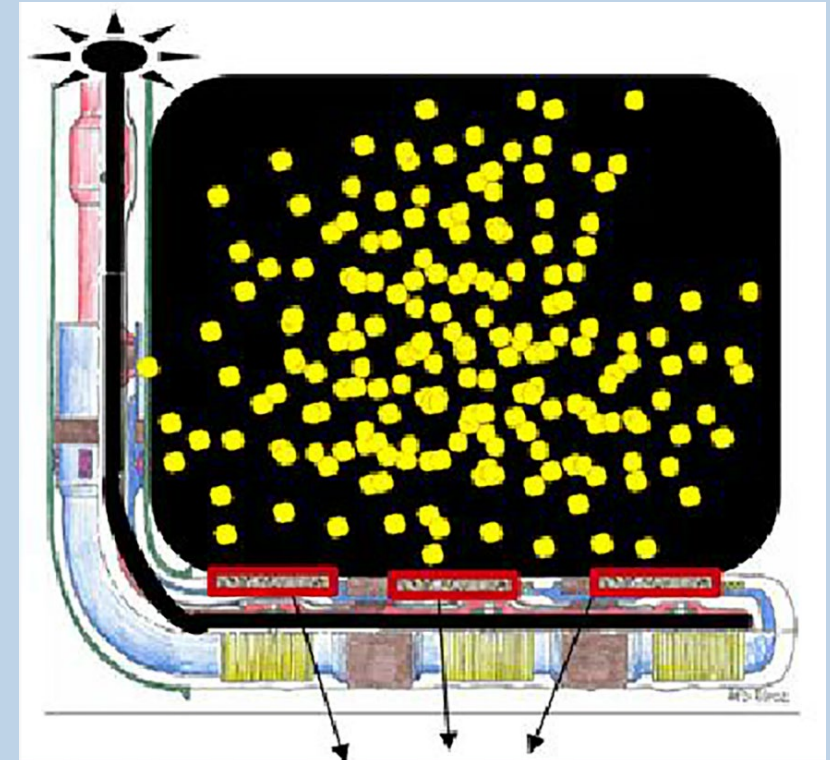
Stainless steel filters characteristics:

- wire wrapped
- wire mesh ↔ expandable sand screens
- metal mesh

Why stainless steel?

- High corrosion resistance, even to H_2S
- Abrasion resistance
- Pressure resistance
- High temperature resistance

Pure oil



Sand screens

Stainless Steel in Filtration

Stainless steel filtrates most of our daily food and beverage

Honey, potato related product, shrimp, ...

Objective:

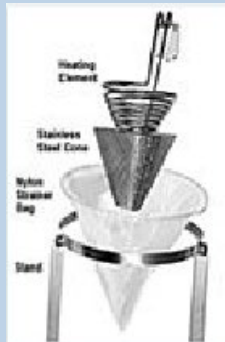
to remove particles (ex: pulps) from food products

Stainless steel filter characteristics:

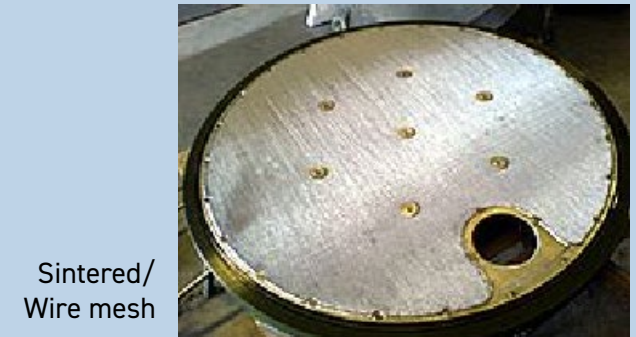
- fine wires, stainless steel wire mesh
- slotted, defined pore or perforated stainless steel wire mesh

Why stainless steel?

- Resistance against corrosion
- Heat resistance
- Fatigue and pressure resistance
- Life cycle cost better than carbon steel
- Hygiene and cleanability



Wire mesh



Sintered/
Wire mesh



Stainless Steel in Filtration

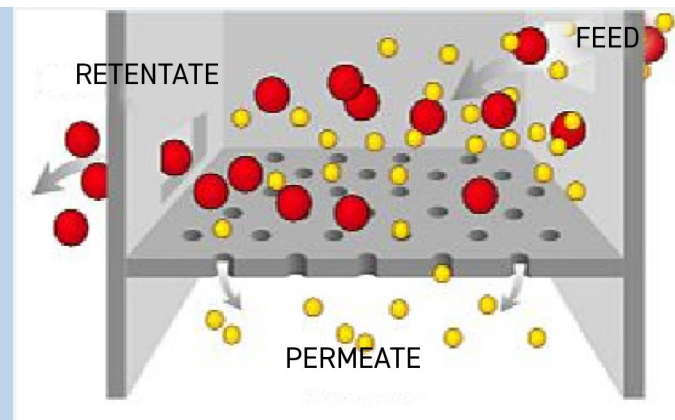
Stainless steel filtrates most of our daily food and beverage

Dairy, Fruit, Juice, Beer, Wine, Coffee, ...

Objective: to remove particles (ex: pulps) from beverages

Stainless Steel filter characteristics:

- fine wires, stainless steel wire mesh
- slotted, defined pore or perforated stainless steel wire mesh



Why stainless steel?

- High resistance against corrosion
- Heat resistance
- Fatigue and pressure resistance
- Life cycle cost better than carbon steel
- Hygiene and cleanability



Stainless Steel in Filtration

Various stainless steel filtration applications to get drinkable water

Water treatment: various applications

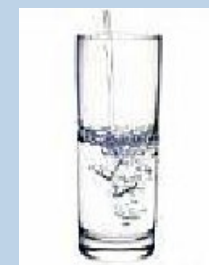
Objective: to remove contaminants from the water, in order to get drinkable water

Stainless steel filter characteristics:

- fine wires, stainless steel wire mesh
- screening, stainless steel bars
- tubes and pumps in stainless steel
- easy handling
- good balance cost/benefits

Why stainless steel?

- Resistance against micro bacteria attacks and corrosion
- Heat resistance
- Fatigue and pressure resistance
- Life cycle cost better than carbon steel



Stainless Steel in Filtration

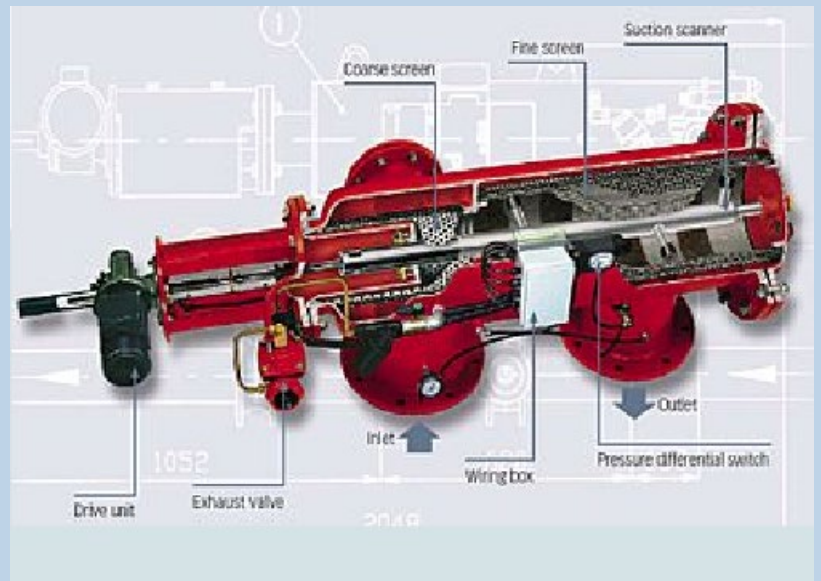
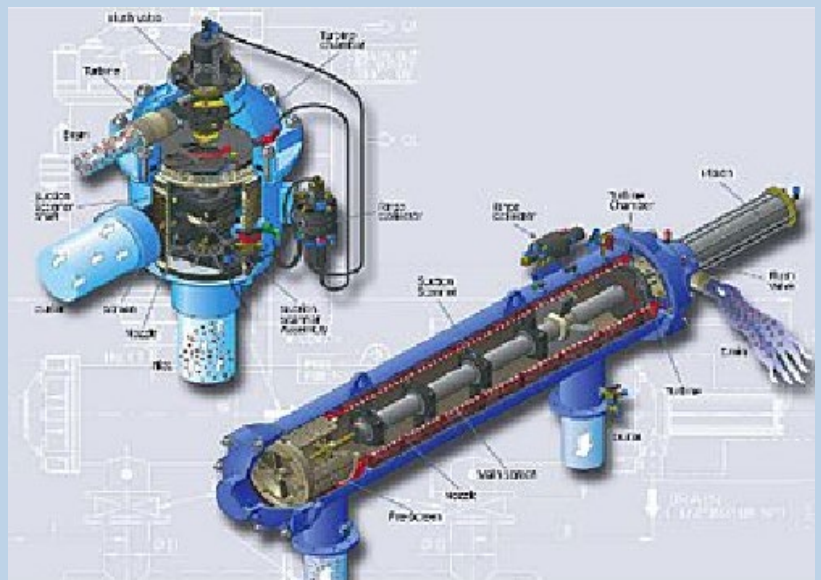
Various stainless steel filtration applications to get drinkable water

Stainless steel for water filtration
Objective: to assure high quality filtered water and to avoid equipment corrosion

- Stainless steel filter characteristics:
- Corrosion resistance
 - Pressure resistance

Why stainless steel?

- Resistance against micro bacteria attacks and corrosion
- Safety maintenance
- Life cycle cost better than carbon steel



Stainless Steel in Filtration

Various stainless steel filtration applications to get drinkable water

Stainless steel for sea water filtration

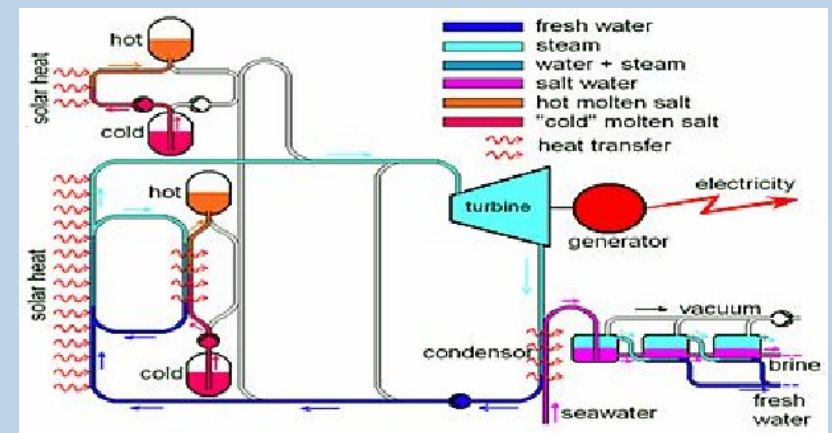
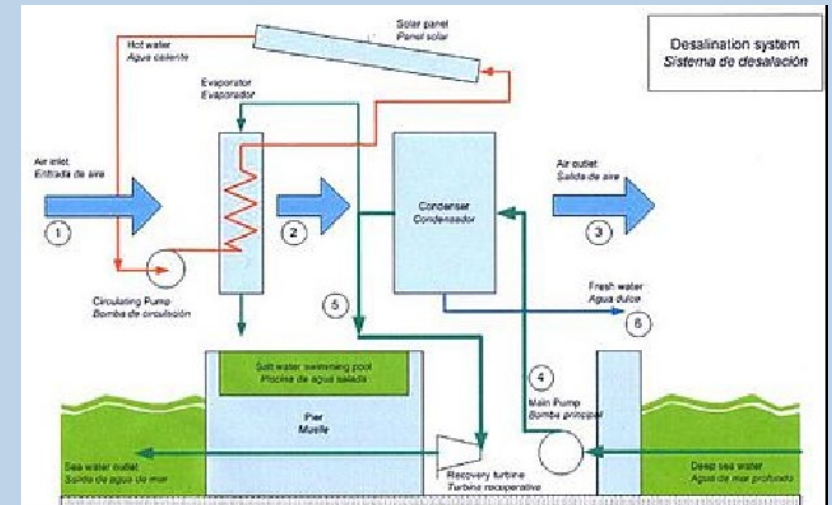
Objective: to remove salt and contaminants from the seawater, in order to get drinkable water

Stainless steel filters characteristics:

- Fine wires, stainless steel wire mesh
- Screening, stainless steel bars

Why stainless steel?

- Resistance against corrosion
- Heat resistance
- Fatigue and pressure resistance
- No product contamination





Stainless Steel in Filtration

Various stainless steel filtration applications to get drinkable water

Waste water plants applications

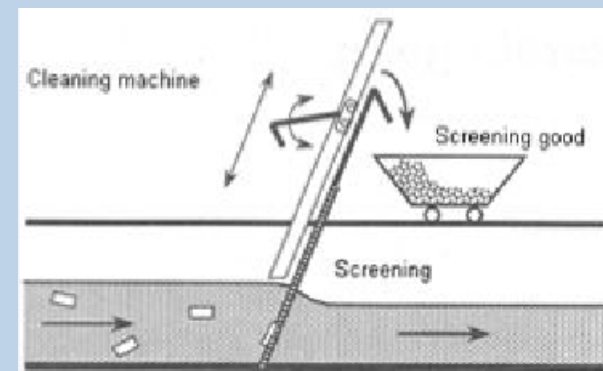
Objective: to remove contaminants from the water, in order to avoid damages in other processes or to send treated water to the environment

Stainless steel filter characteristics:

- screening, stainless steel bars
- woven wire
- slotted, defined pore or perforated stainless steel wire mesh

Why stainless steel?

- Good resistance against corrosion
- Fatigue and pressure resistance
- Life cycle cost better than carbon steel



Stainless Steel in Filtration

And stainless steel filtration at home

Sanitary

Objective: remove particles from potable water and drain waste waters

Stainless steel filters characteristics:

- Woven wire
- Reqs
- Grating

Why stainless steel?

- Good resistance against corrosion
- Aesthetics
- Hygienic
- Easy to clean
- Durable



Thermostatic cartridge
and aerators for mixers

Filter for under sink valve



Grating



Filter for floor
drains

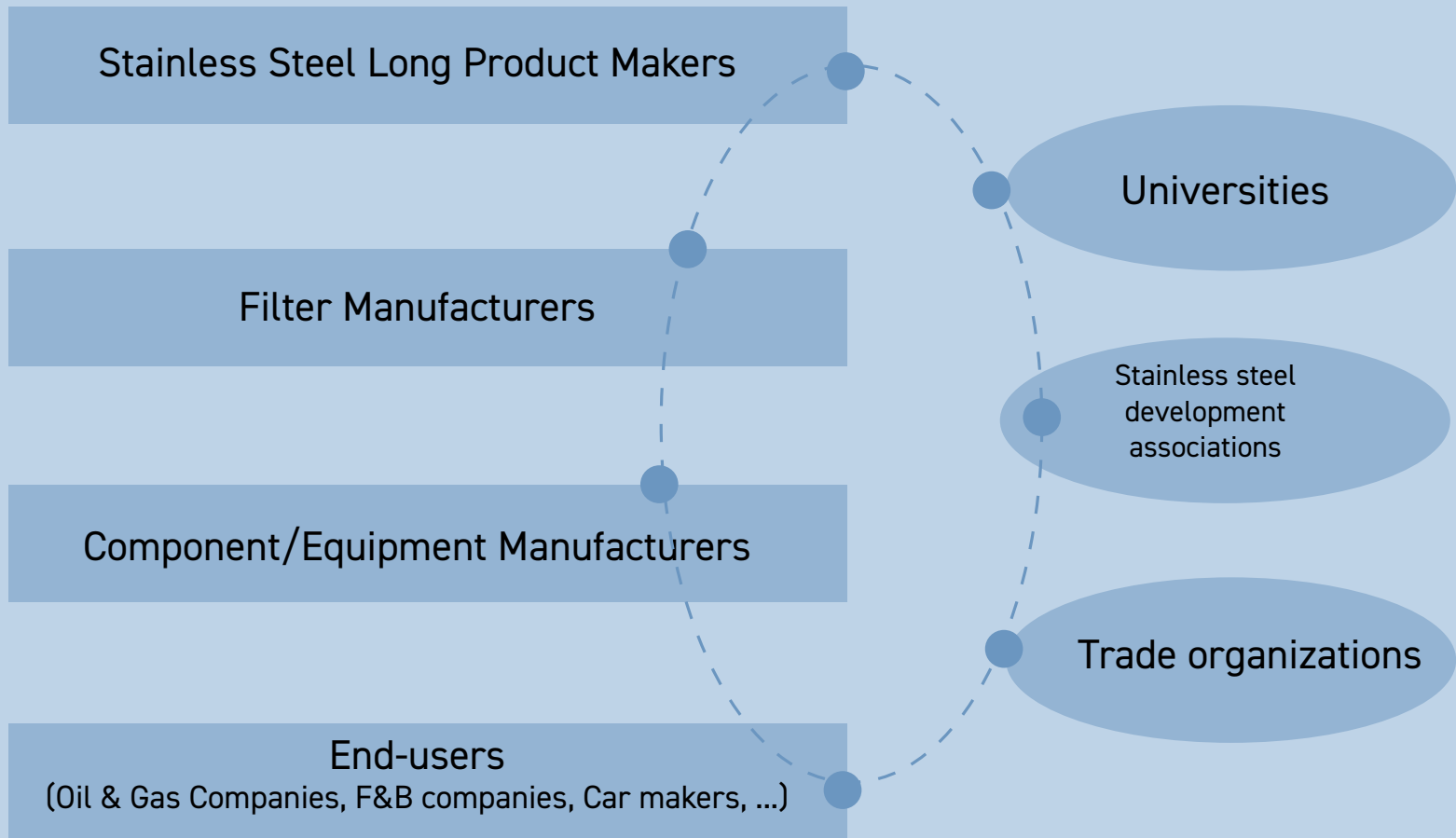
Stainless Steel in Filtration

Stainless steel is selected as a material of choice in filtration because of its properties

Stainless steel major properties...	... of interest in filtration applications		
	Most of the time	Often	Sometimes
Corrosion resistance	✓		
Abrasion resistance	✓		
Hygiene and cleanability	✓		
High temperature properties		✓	
Strength and toughness		✓	
Energy absorption		✓	
Aesthetics			✓
Magnetic properties			✓
Physical properties			✓
Cryogenic/low temperature			✓
Environment	✓		

Stainless Steel in Filtration

The stainless steel industry is ready to support decision makers in new development in filtration



Stainless Steel in Filtration

ISSF Members producing stainless steel long products

Company	Website
Acerinox S.A.	acerinox.com
Aichi Steel Corporation	aichi-steel.co.jp
Böllinghaus Steel GmbH	boellinghaus.de
Cogne Acciai Speciali S.p.A.	cogne.com
Daido Steel Co. Ltd.	daido.co.jp
NIPPON STEEL Stainless Steel Corporation	stainless.nipponsteel.com
North American Stainless	northamericanstainless.com
Outokumpu Oyj	outokumpu.com
SeAH Changwon Integrated Special Steel Corp.	seahss.co.kr
Schmolz+Bickenbach Group	schmolz-bickenbach.com