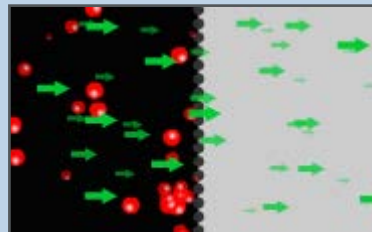


## Stainless Steel in Filtration



Filtration is part of our daily life ...

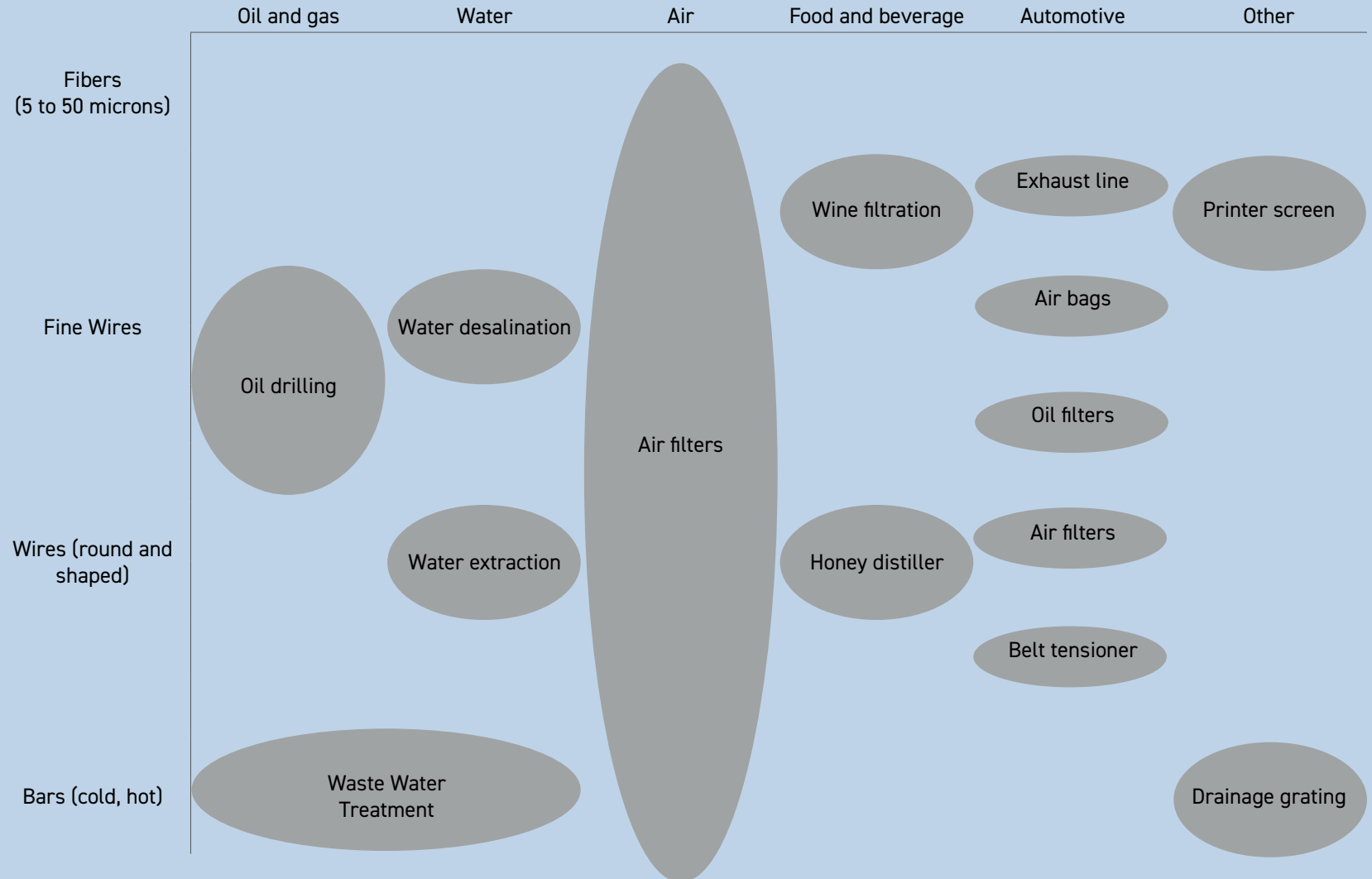


Solid from liquid or gas filtration

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

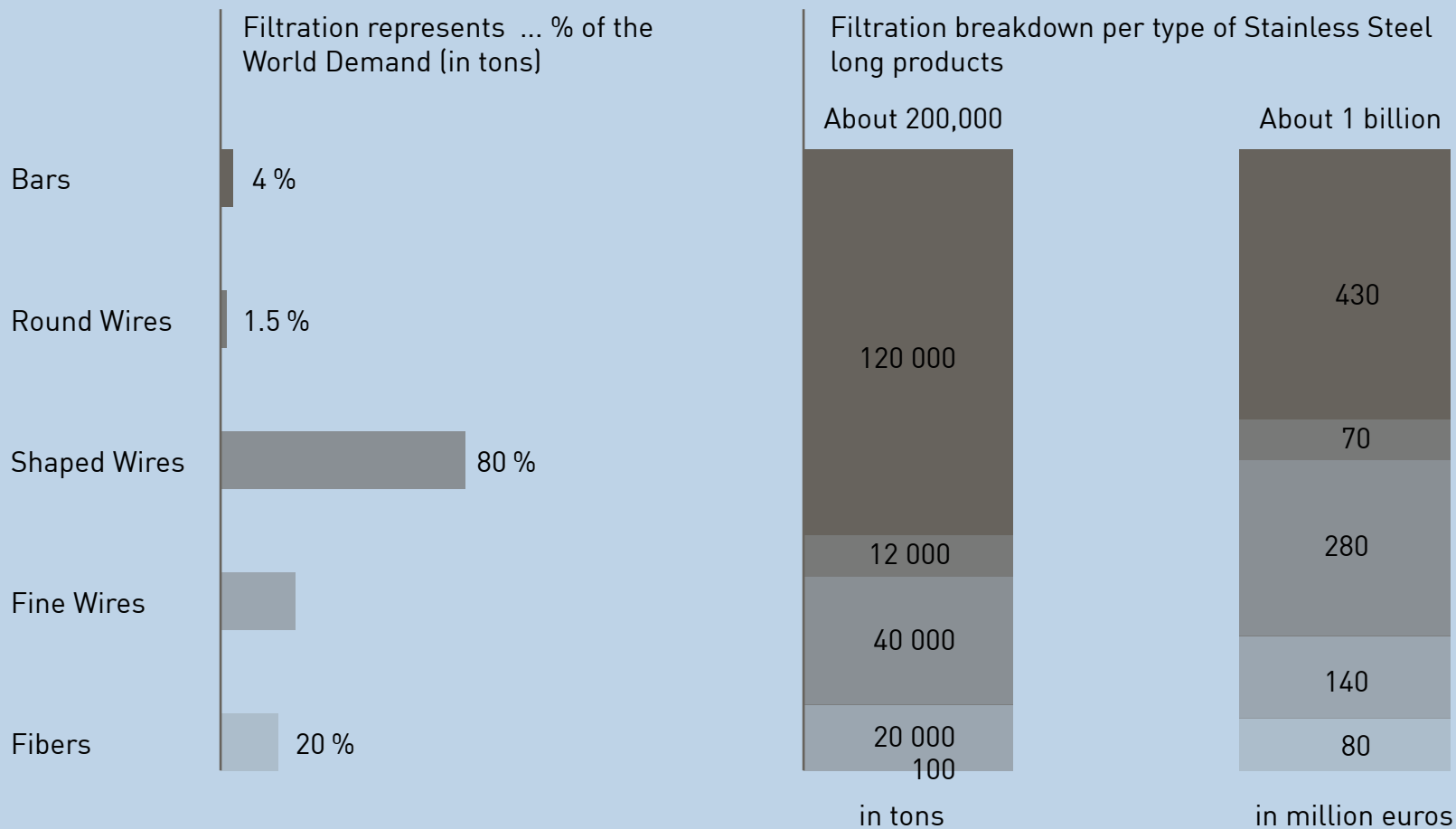
## Stainless Steel in Filtration

### A wide panorama of stainless steel usage in filtration applications



## Stainless Steel in Filtration

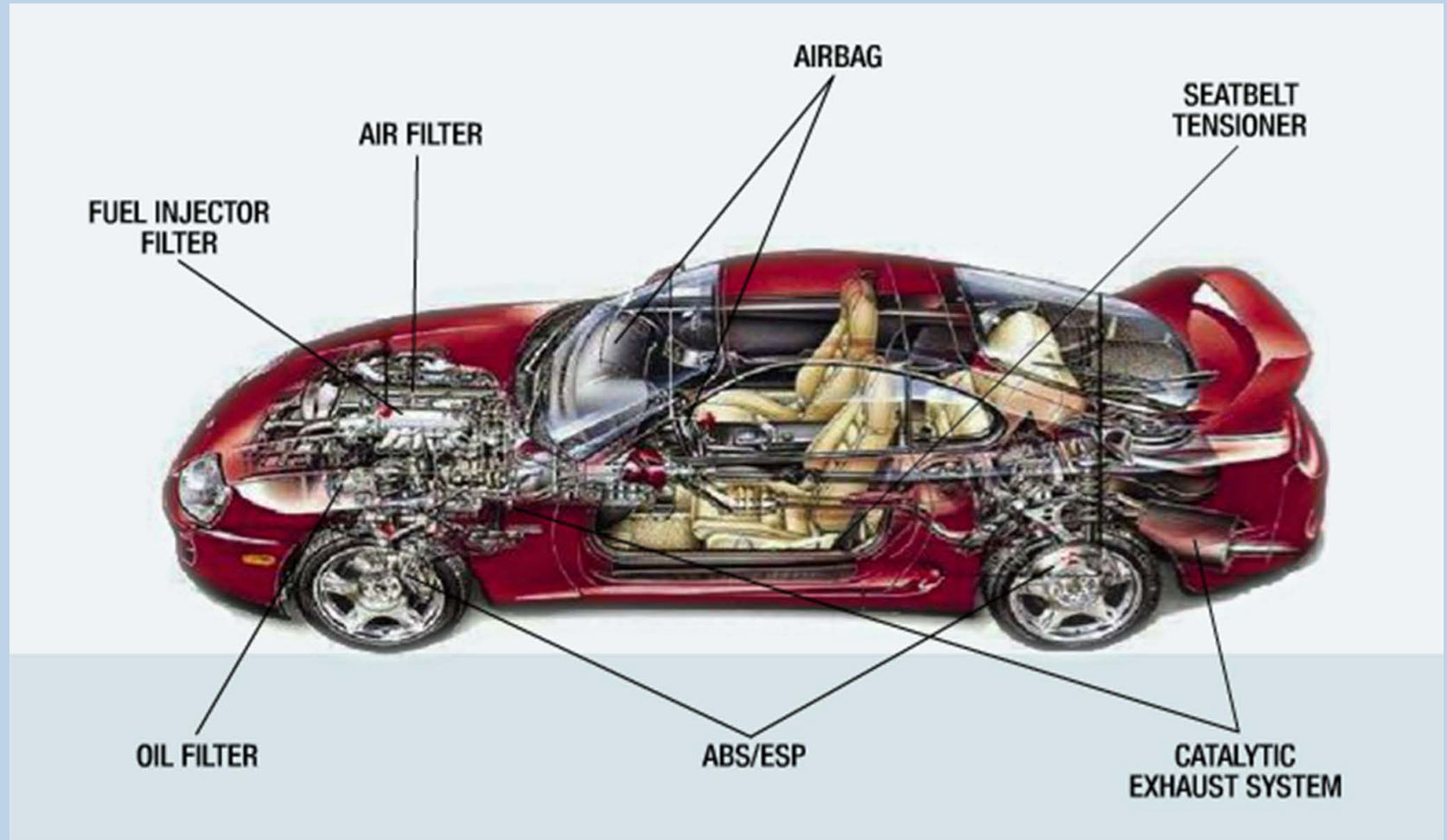
That generate a 1 billion Euro market yearly demand





## 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 $\mu$

**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:

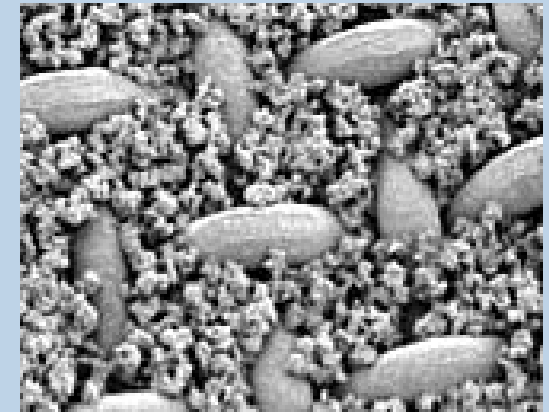
To have a good substrate for catalytic beds operating at high temperature

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:

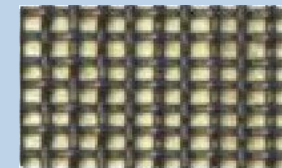
to remove contaminants from the reactor bed, in order to avoid catalyst damages

Stainless steel characteristics:

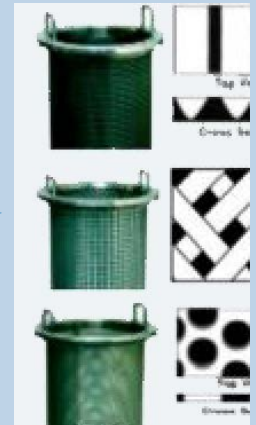
- woven wire,
- slotted, defined pore or perforated stainless steel wire mesh
- retention level: standards between 5 to 10 $\mu$

#### 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:

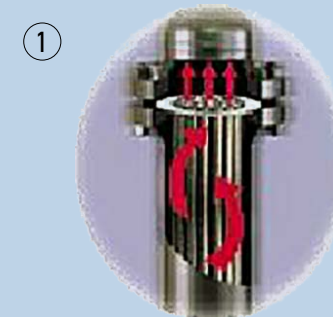
- woven wire,
- slotted, defined pore or perforated stainless steel wire mesh
- retention level: as low as 2 micrometer

#### 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

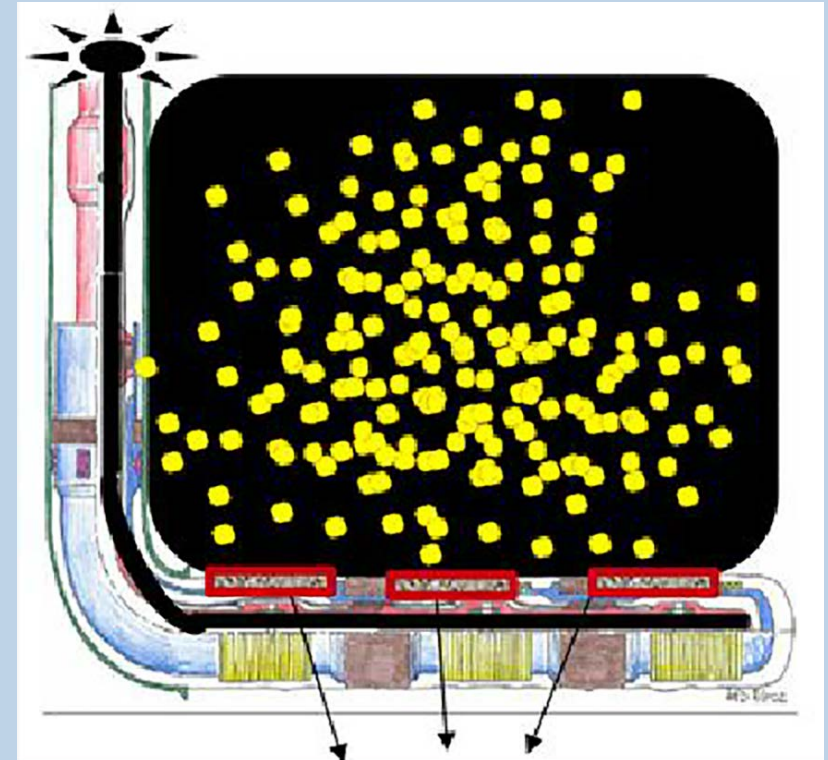
Stainless steel filters characteristics:

- 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

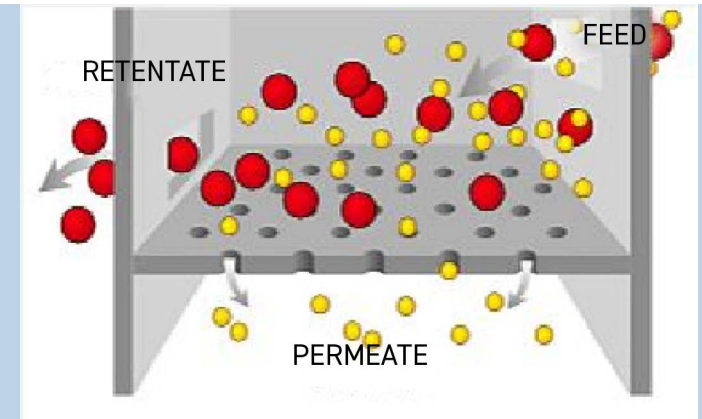
### Stainless steel filtrates most of our daily food and beverage

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

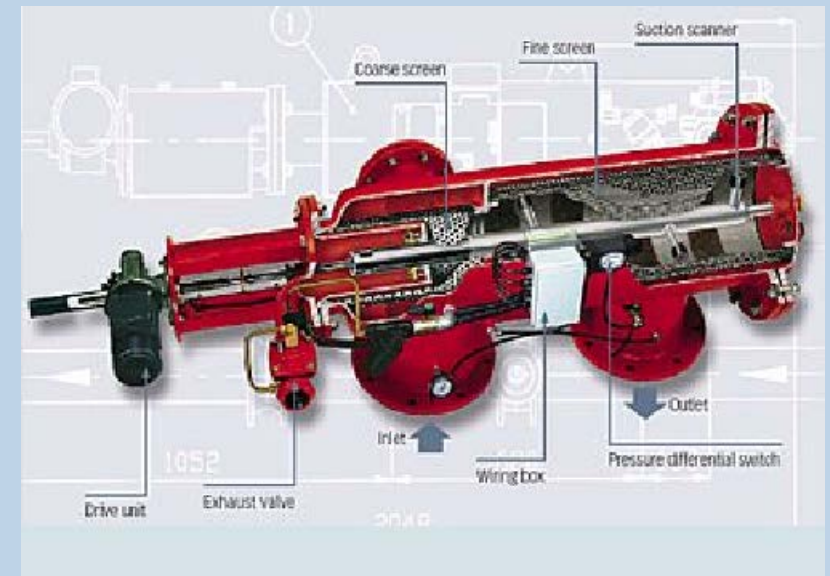
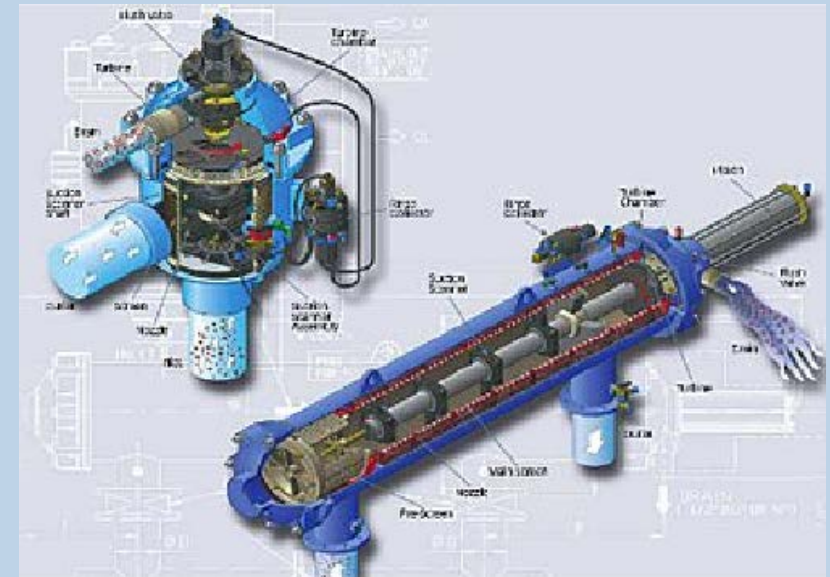
Objective: to assure high quality filtered water and to avoid equipment corrosion

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

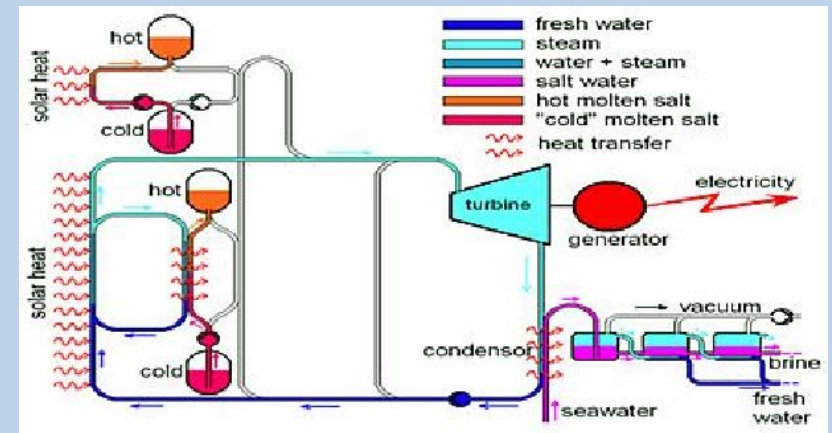
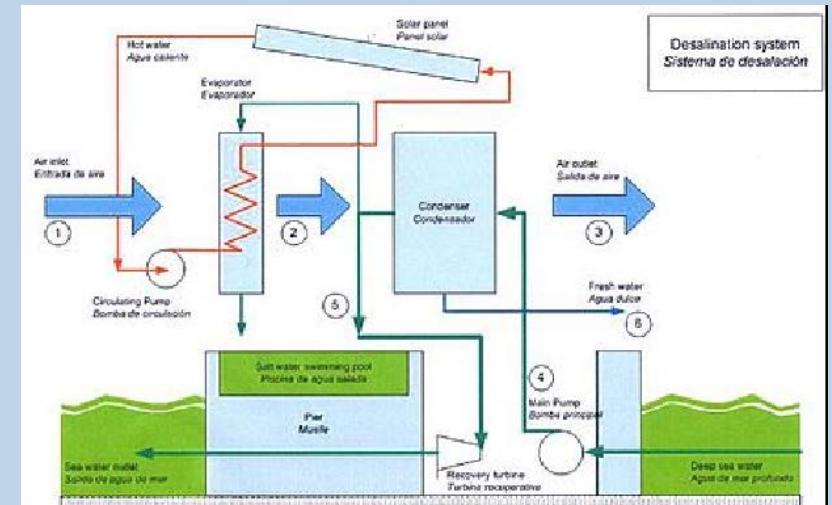
Objective: to remove salt and contaminants from the seawater, in order to get drinkable water

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

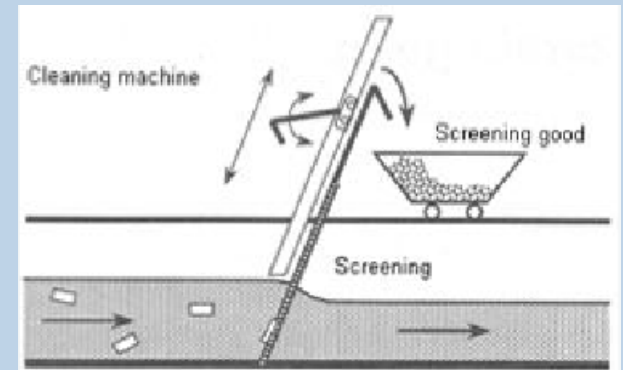
Objective: to remove contaminants from the water, in order to avoid damages in other processes or to send treated water to the environment

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

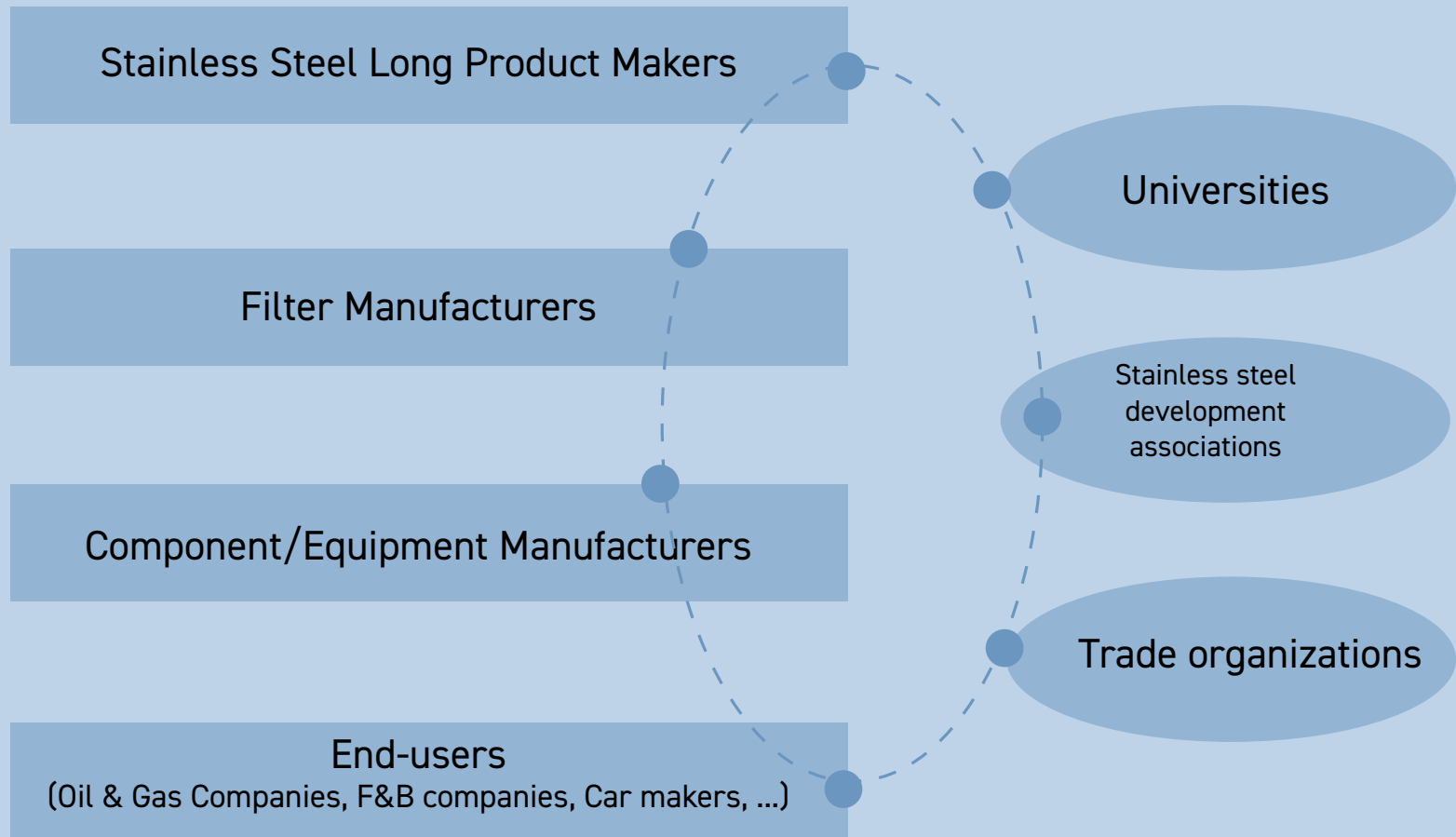
## Stainless Steel in Filtration

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

### worldstainless Members producing stainless steel long products

Company	Website
Acerinox S.A.	<a href="http://acerinox.com">acerinox.com</a>
Aichi Steel Corporation	<a href="http://aichi-steel.co.jp">aichi-steel.co.jp</a>
Böllinghaus Steel GmbH	<a href="http://boellinghaus.de">boellinghaus.de</a>
China Baowu Steel Group Corporation	<a href="http://tisco.com.cn">tisco.com.cn</a>
Cogne Acciai Speciali S.p.A.	<a href="http://cogne.com">cogne.com</a>
Daido Steel Co. Ltd.	<a href="http://daido.co.jp">daido.co.jp</a>
NIPPON STEEL Stainless Steel Corporation	<a href="http://stainless.nipponsteel.com">stainless.nipponsteel.com</a>
North American Stainless	<a href="http://northamericanstainless.com">northamericanstainless.com</a>
SeAH Changwon Integrated Special Steel Corp.	<a href="http://seahss.co.kr">seahss.co.kr</a>
Swiss Steel	<a href="http://swisssteelgroup.com">swisssteelgroup.com</a>