

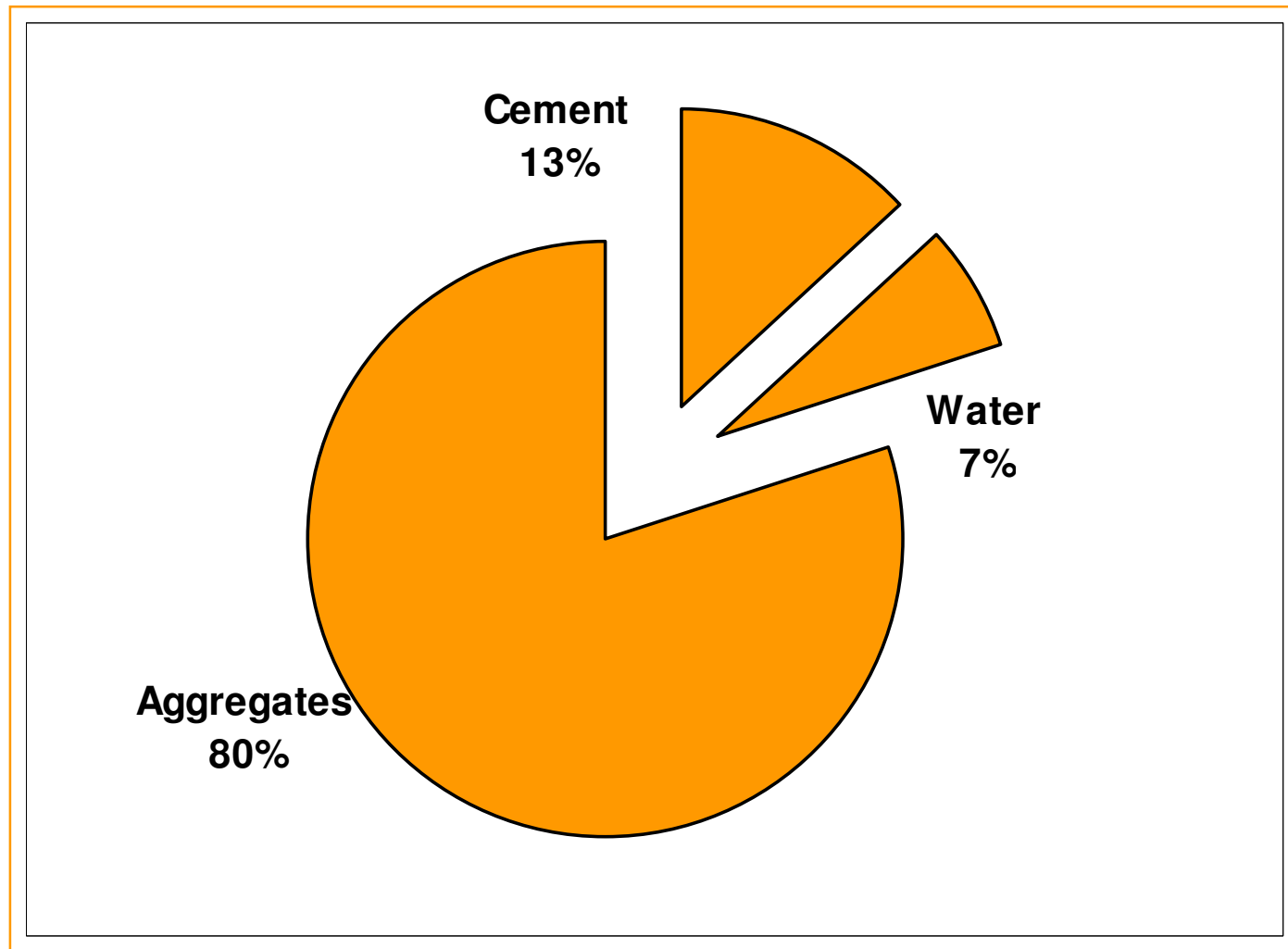
# SSAB



## Concrete industry

This presentation contains general suggestions. SSAB hereby expressly disclaims any liability for their suitability for individual applications. It is the responsibility of the user of this brochure to adapt the recommendations contained herein to the requirements of individual applications

## Concrete composition, example



## Concrete / Mortar / Grouting

- ▶ Concrete (betong) is a mixture of binder, water and aggregate.
  - Binder cement
  - The size of the aggregate, up to 40 mm. The strength, the size, the adhesitivity and the friction is most important.
- ▶ Mortar (bruk) is a mixture of binder, water and aggregate.
  - Binder cement, limestone or a combination.
  - The size of the aggregate is mainly  $< 6\text{mm}$ . The strength is most important.
- ▶ Grouting (puts) is a mixture of binder, water and aggregate.
  - Binder cement, limestone or a combination.
  - The size of the aggregate is mainly  $< 6\text{mm}$ . The adhesitivity is most important.

# Aggregates in concrete

## Aggregates example\*;

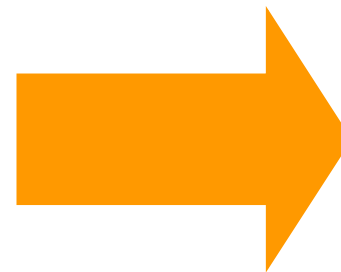
Basalt (780 HV), Granite (713 HV), Trachyte (677 HV), Diabase (780 HV), Limestone (725 HV), Slagg (600-600 HV), Diorite (753 HV). Sandstone (quartz bearing).



\*) Hardness according to WearCalc

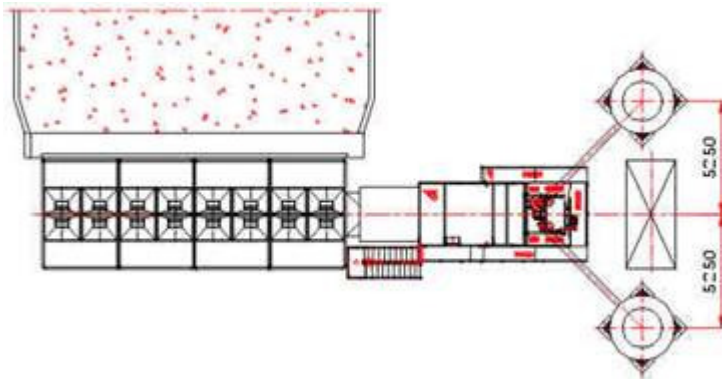
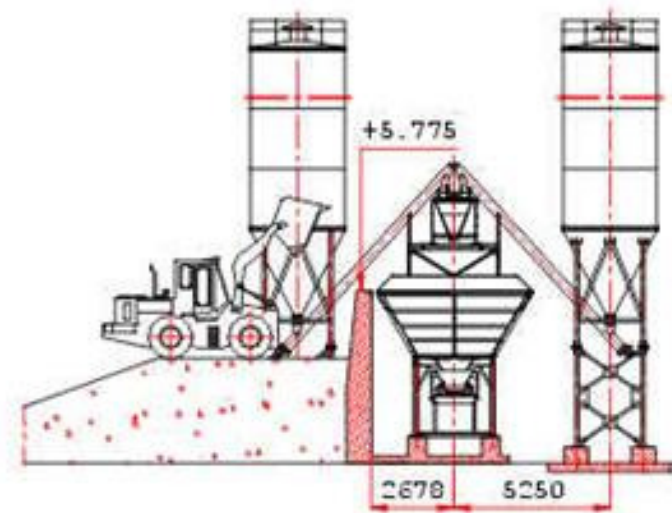
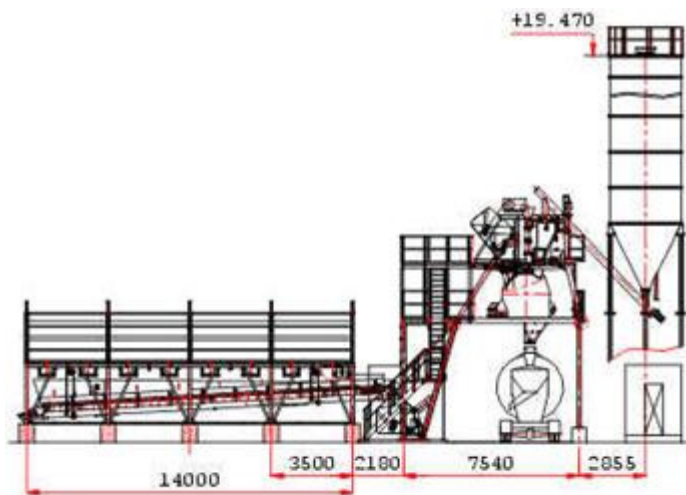
## The wear from concrete

- ▶ Different aggregates
  - Hardness, size and shape.
- ▶ Different proportions
  - Water / binder / aggregates.
- ▶ The water influence
  - Lubricating substance, hardness.
- ▶ Way of production
  - Hydration time.
- ▶ Stop time.
  - Corrosion and cleaning.



Very difficult to  
estimate the  
Concrete wear  
rate.

# Concrete plant design





## Ready mixers



# Ready mixers

» Horizontal mixer



» Vertical mixer





# Wear plate recommendations

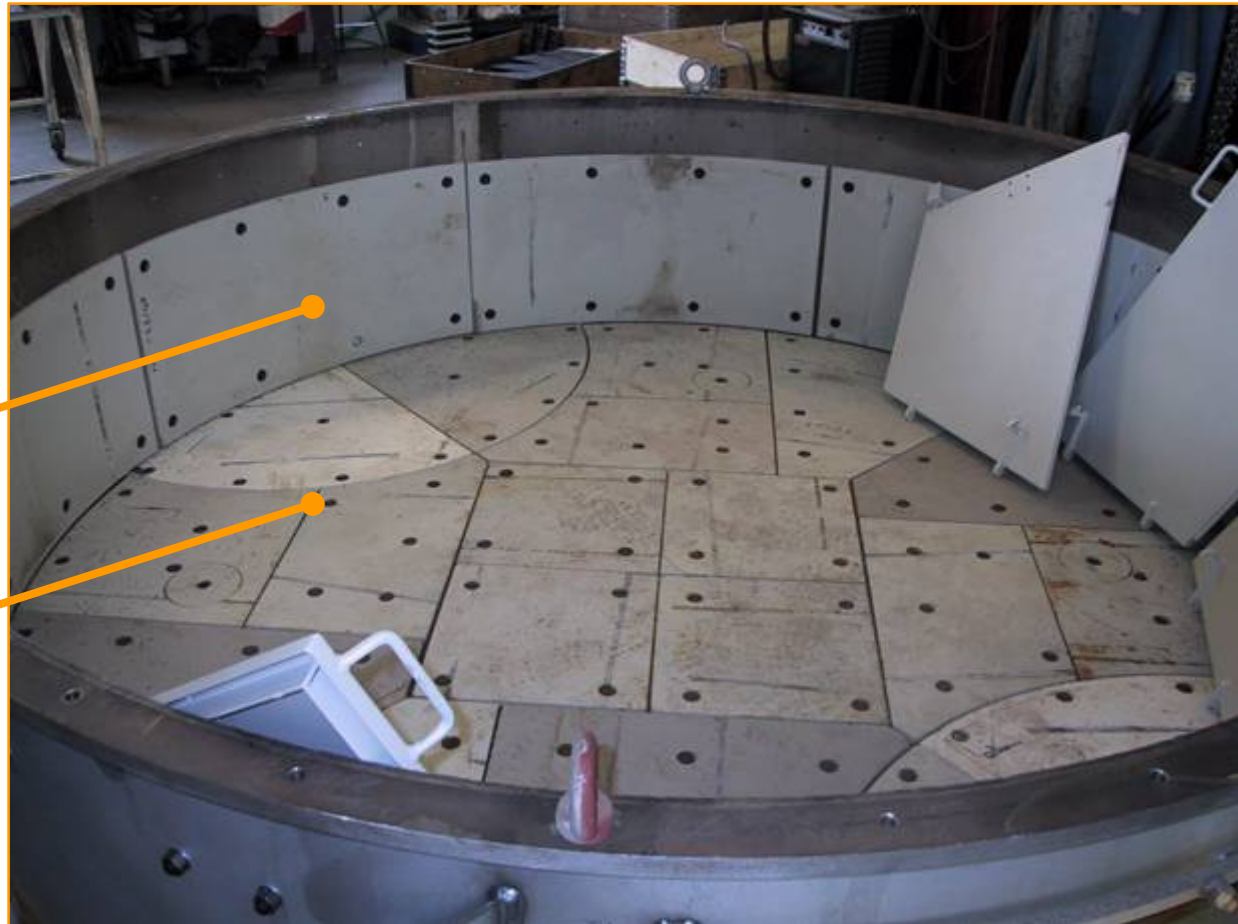
## Side plates

HARDOX 400  
HARDOX 450  
HARDOX 500  
HARDOX 550

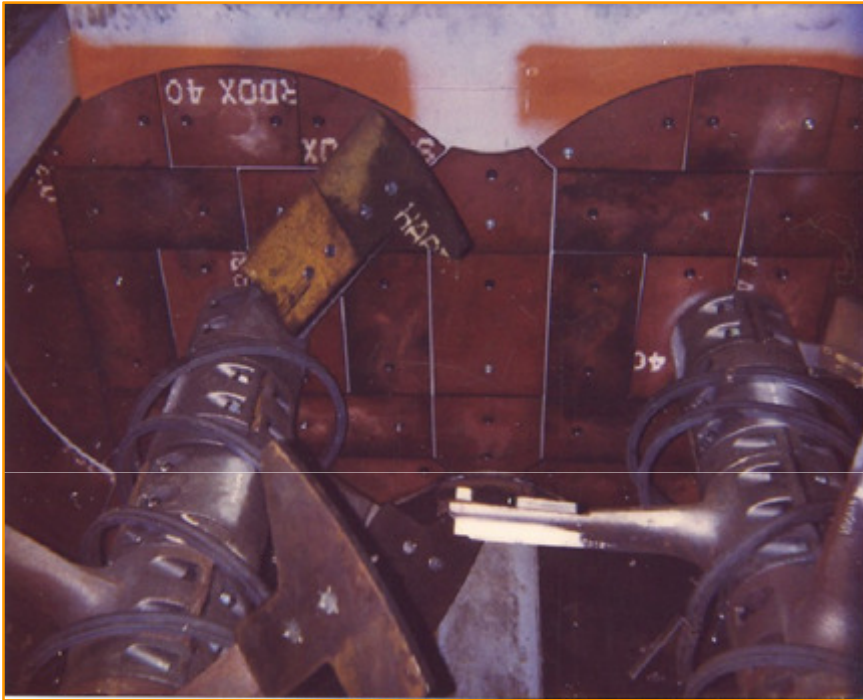
Bended !!!

## Bottom plates

HARDOX 500  
HARDOX 550  
HARDOX 600

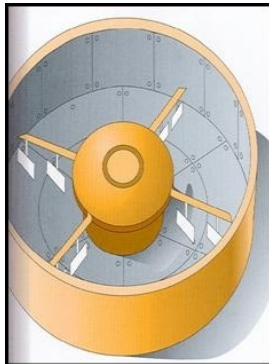


## HARDOX liners



Hardox 400 liners in a vertical  
and horizontal mixers

## Liner to concrete mixer



Technical data:

Height of side wall: 400mm

Diameter: 1.9m

Material: HARDOX500, thickness 10-20mm

Operating time and condition:

Depending on the life of the concrete mixer, the lining is replaced every year or once in three years.

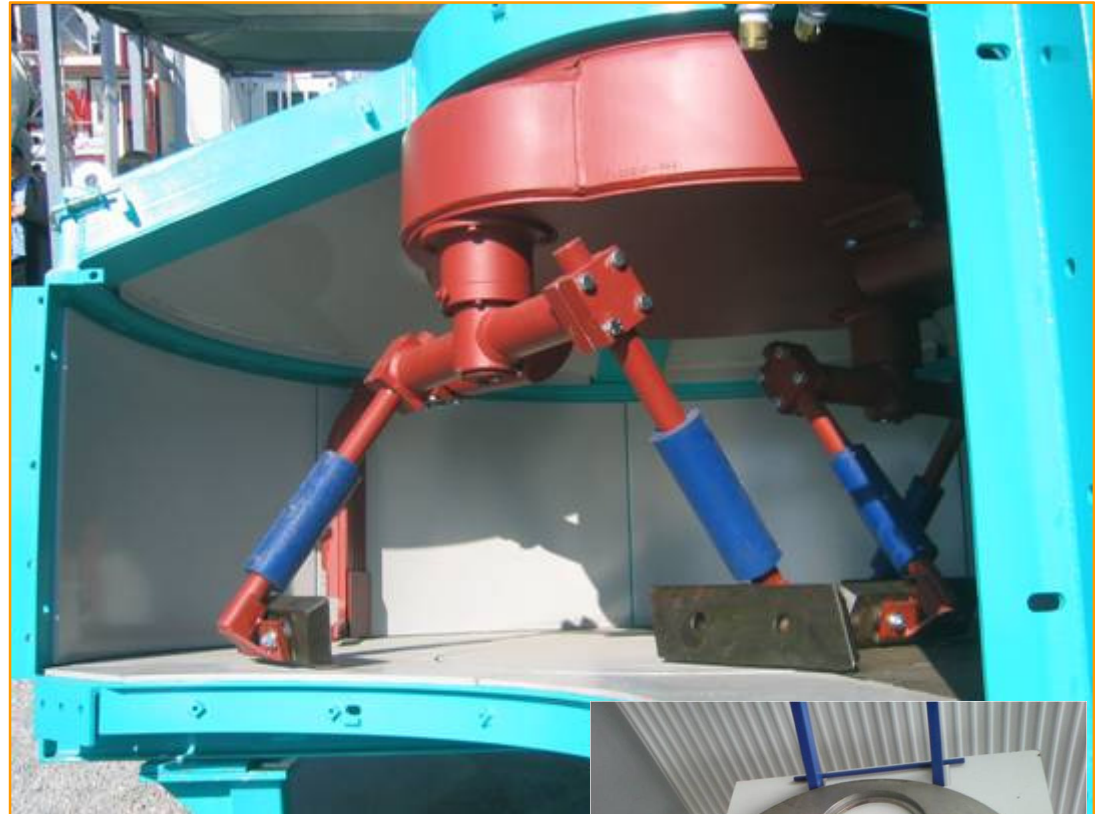


# Ready mixer Paddles

- **Paddles / Scrapers**

- HARDOX 500
- HARDOX 550

- HARDOX 600  
-can be an alternative  
if the support is good.



Hardox 450, 10-30mm. 3 times better than ST52

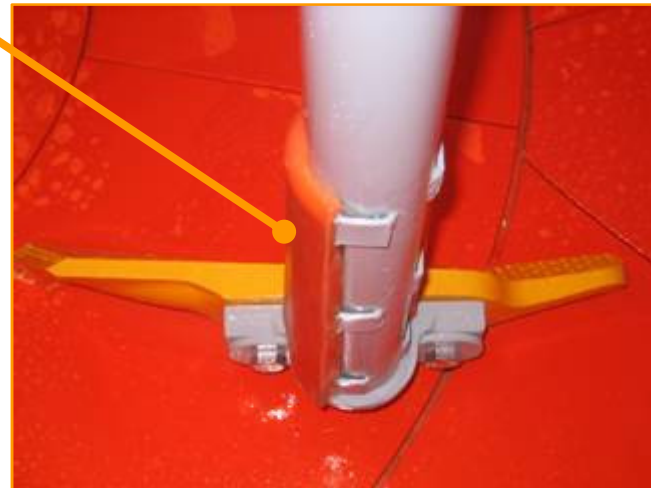


## Ready mix Arm Liners

### ► Arm liners

Less wear compared to the paddles.

- HARDOX 400
  - HARDOX 500
  - HARDOX 550
  - HARDOX 600
- can be an alternative if the support is good and if they don't need to be bended.

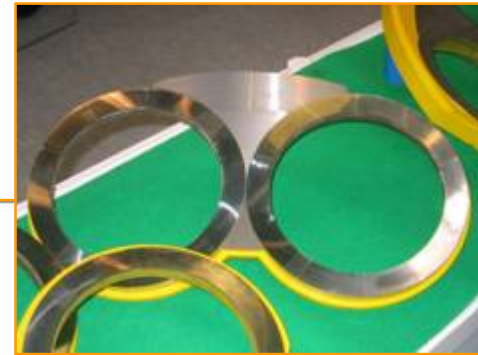
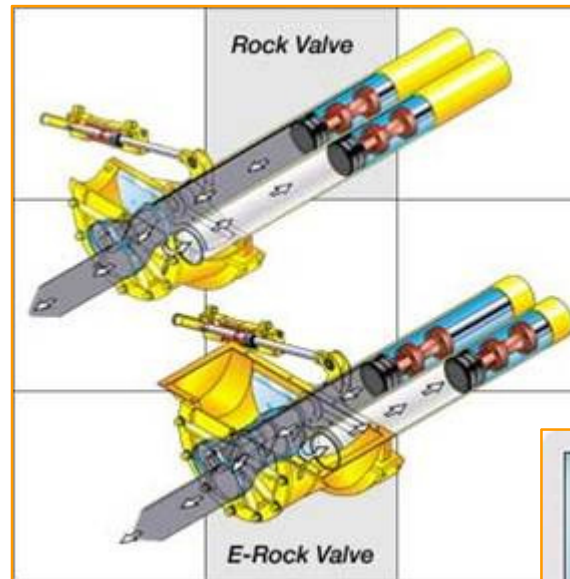




# Valve

- **Valve**
  - HARDOX 550
  - HARDOX 600

Competing material  
Tungsten carbide



# Concrete Pumps



- **Concrete pumps**
  - Structural steel
  - In some areas  
WELDOX 700 or  
WELDOX 900.



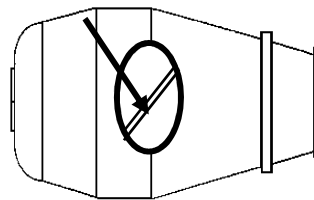
## mild steel → high strength steel

Rule of thumb

$$t_{HS} = \sqrt{\frac{R_{eMS}}{R_{eHS}}} \times t_{MS}$$

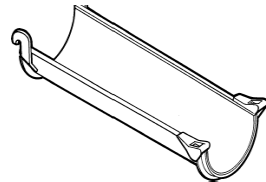
### Examples:

Blades  
inside the drum



mild steel 6 mm → Hardox 400 4 mm

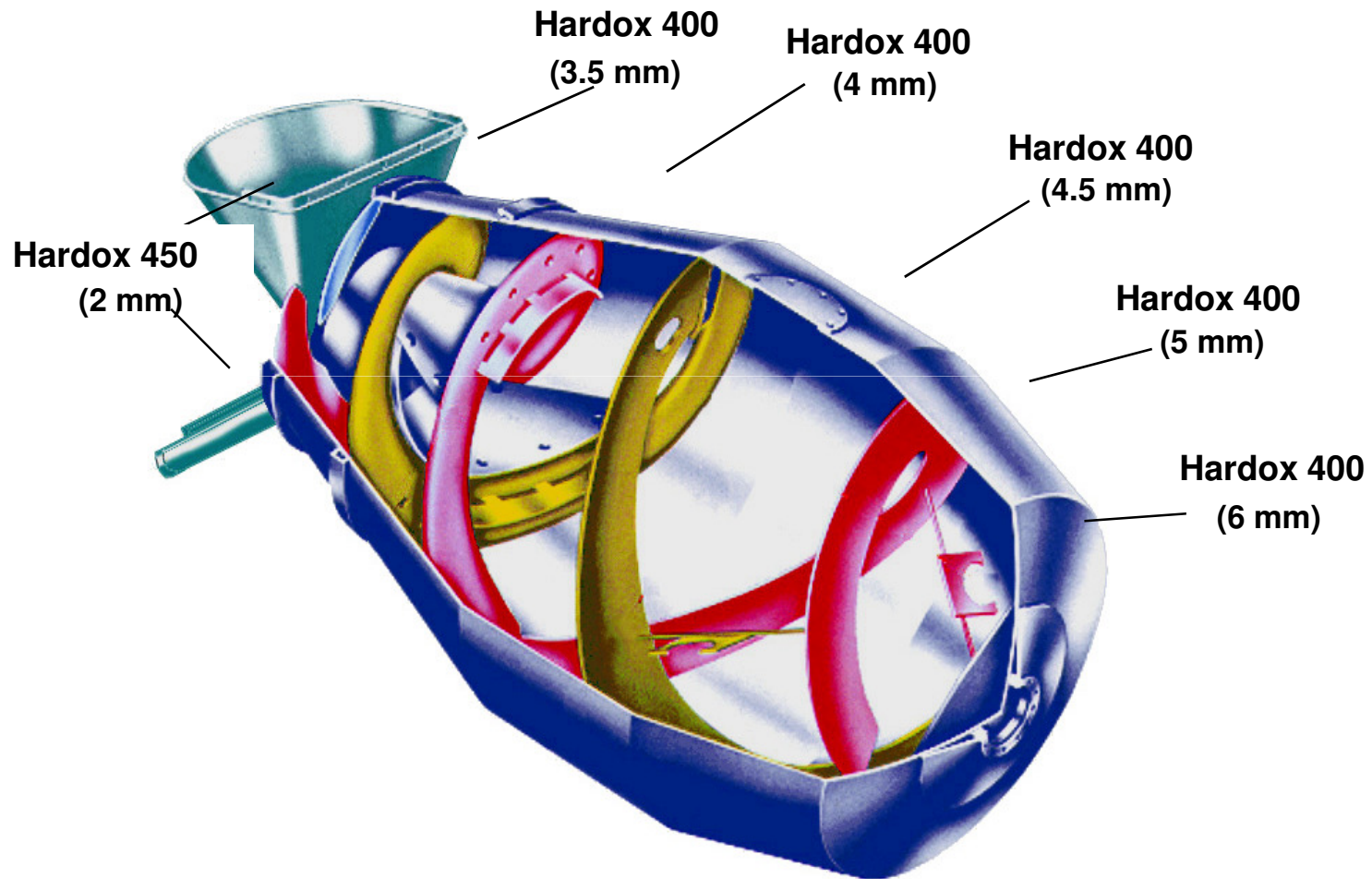
Chutes



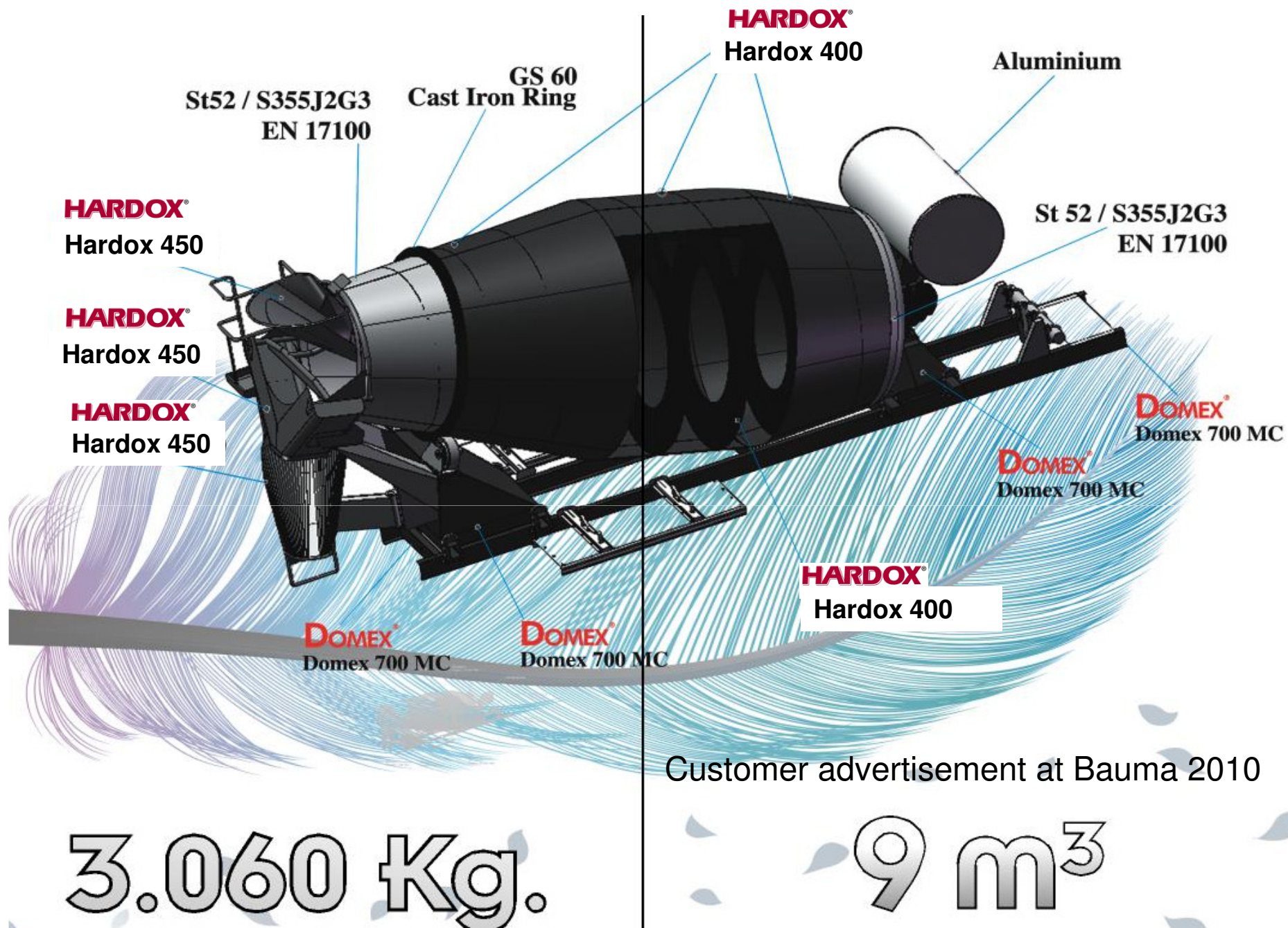
mild steel 3 mm → Hardox 450 1,8 mm

# Docol & Domex Wear

- First choice in mixer drums







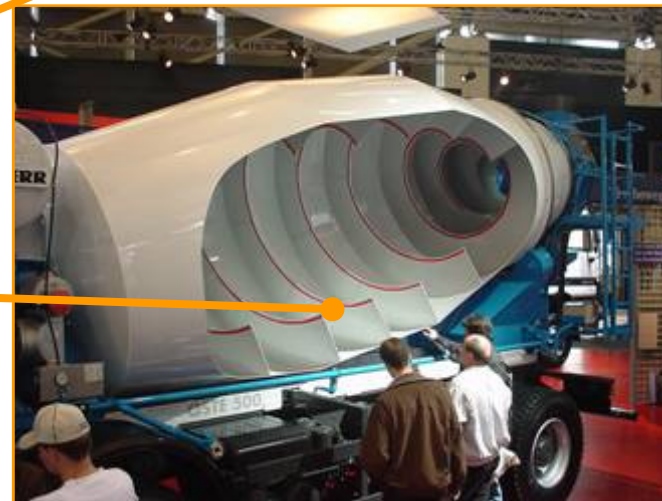
Customer advertisement at Bauma 2010



# Concrete Trucks



- **Shell (mixer drum)**
  - the design criteria is usually not wear in wet mixing processes.
  - but in dry mixing processes wear can be the design criteria
- **Chutes**
  - could in some cases be a HARDOX application.
- **Mixing blades**
  - could be made out of Hardox (4 mm).



# More payload & lower fuel consumption



The Spanish semi-trailer with a concrete mixer from Baryval Serviplus received the 2007 Swedish Steel Prize. With a concrete mixer made of high strength steel with thinner dimensions, it has become two tonnes lighter corresponding to an increased load capacity by 20%. In other words could every fifth trip be saved

# Lighter concrete mixer trailer

Wear resistant steels



Baryval, Spain

Domex chassis and body

- Reduced weight
- Improved wear resistance

## Cement silo Busses by 2,1mm Docol 1000 Roll





# Concrete mould cutters

## Steel grade

Hardox 400

## Thickness range

10 to 30 mm

## Description of the application

"Cutters" made out of HARDOX 400. The cutters is attached to a wagon that's runs on a straight track. With the purpose to cut the semi wet concrete to long concrete blocks.

## Previous material

mild steel

## Service life

6 months

## Competitive advantage

Service life

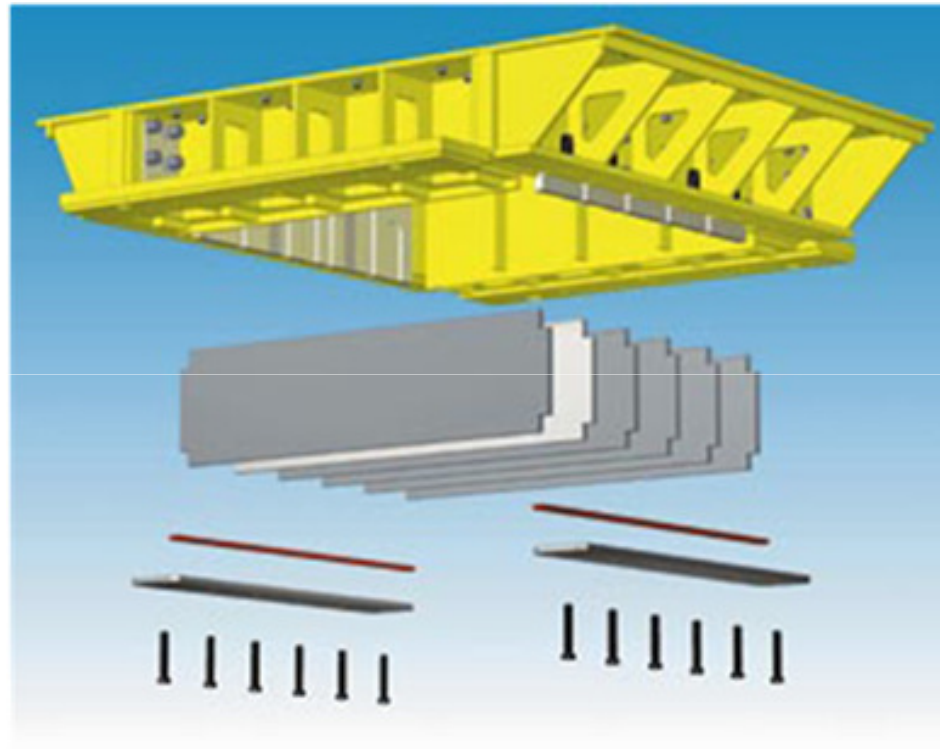
## Manufacturing steps

Cutting method - Gas cutting; Drilling -





## Toolox 33 -Nitrided wearplate for concrete moulds





## **Steel grade**

Hardox 500

## **Description of the application**

Bims is a kind of very abrasive Gravel used in concrete moulds. The wear is a serious problem.

## **Previous material**

St 52

## **Competitive advantage**

3 times higher wear life compared to ST-52

## **Manufacturing steps**

Cutting method - Gas cutting;  
welding -

## Other applications



**Pavers**



**Moulds**



**Prefabrication**



**Concrete conveyors**

For further information on performance, production recommendations and selection of materials, please get in touch with your local technical SSAB contact.

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