

HARDOX®

TechSupport

Information from
SSAB Oxelösund.

#28

HARDOX in Glass recycling industry



TechSupport is a series of publications about HARDOX wear plates and WELDOX structural steel plates from SSAB Oxelösund. For more info, contact Customer Service, www.ssabox.com

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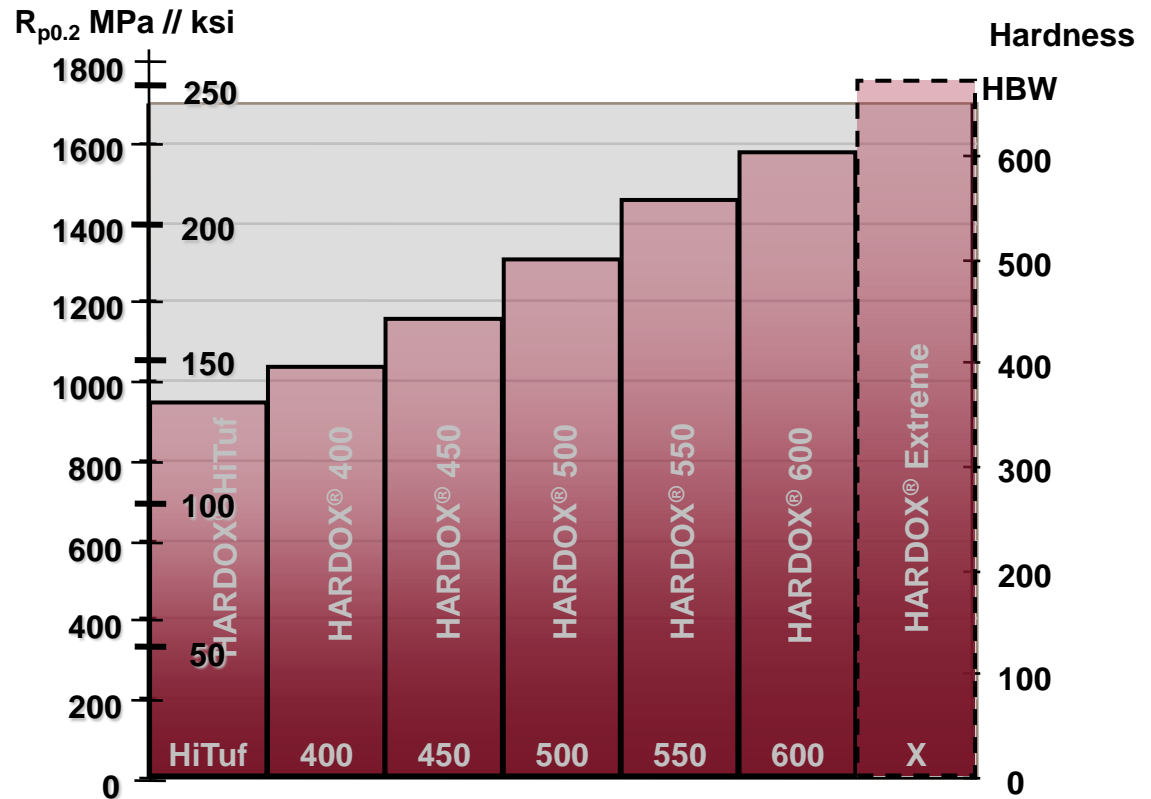
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HARDOX®
WEAR PLATE



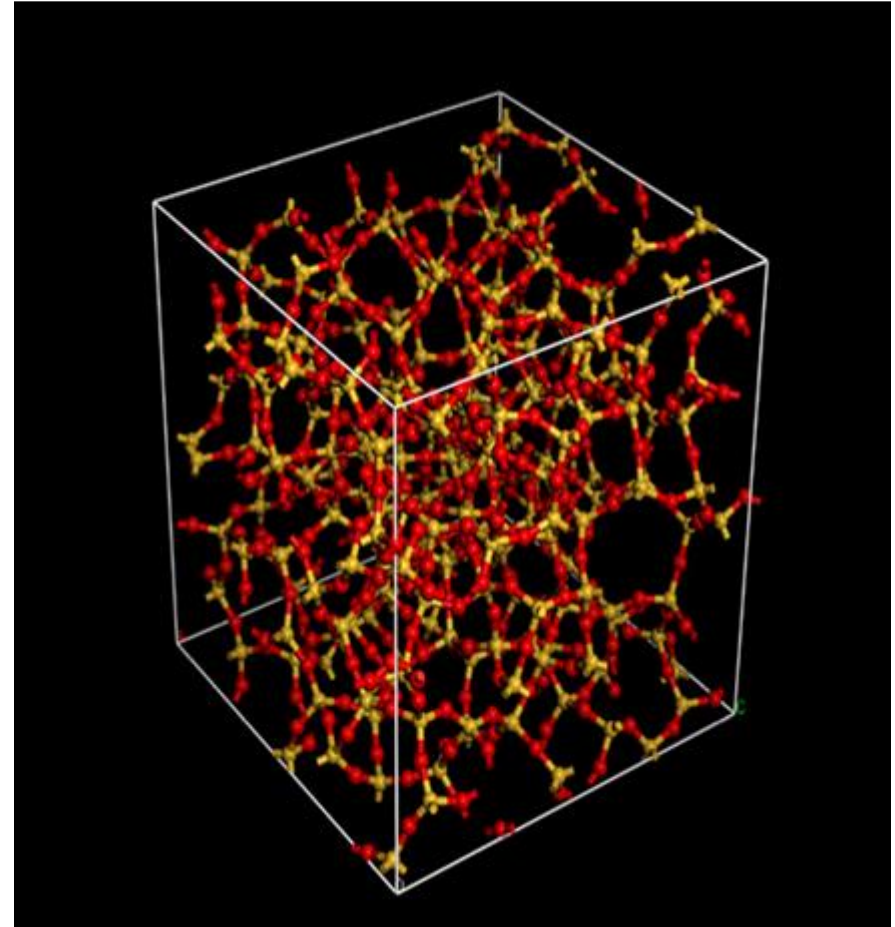
- Hardness
- Through hardness
- Toughness
- Yield strength
- Consistency





Glass – An amorphous material

- Very hard and abrasive material.
- No crystalline grain structure.
- Considered a solid liquid.

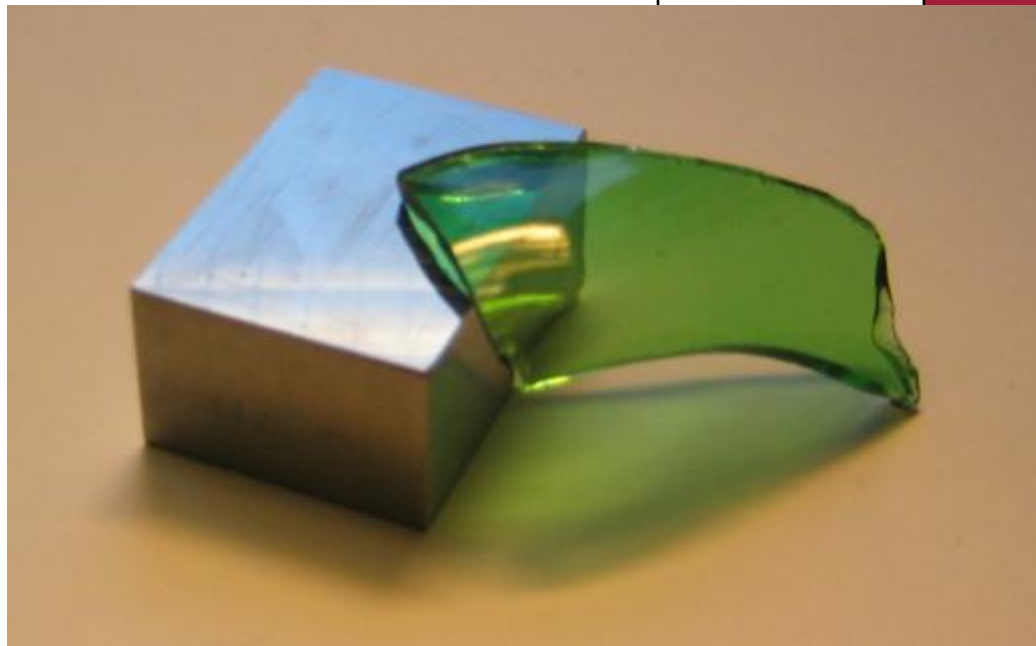
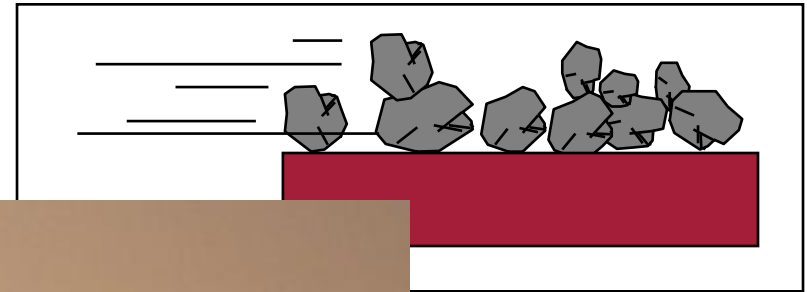




Abrasive sliding wear

ABRASIVE HARDNESS: Glass

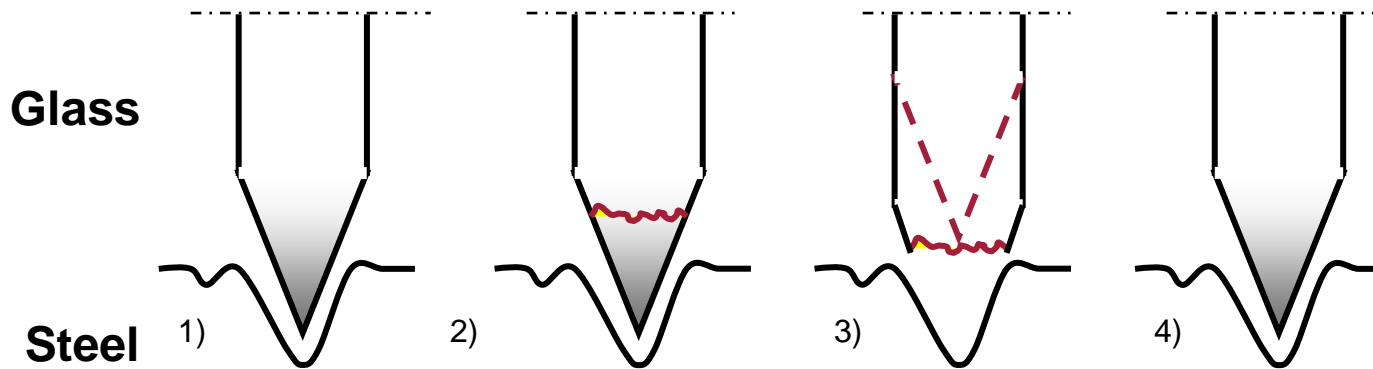
- 460-580 HV measured in micro Vickers.
- In practice >700 HV





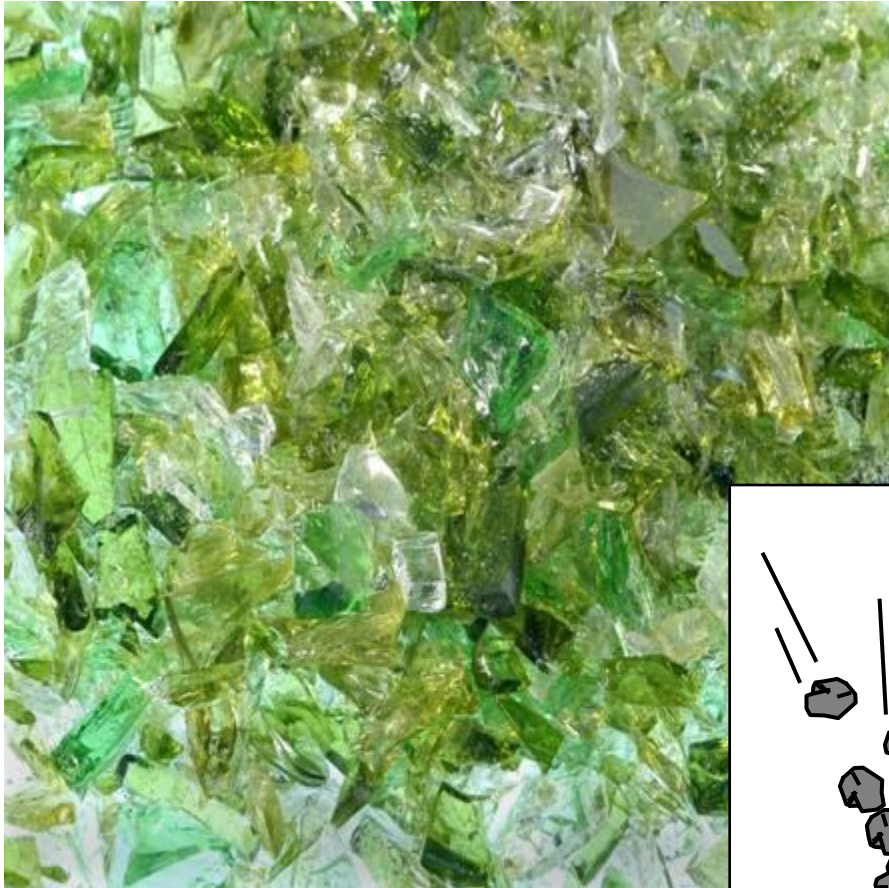
Properties of a brittle material

How can a brittle material such as glass be that abrasive ?



- The amorphous material is self sharpening.
- During the wear process the glass edges will break creating new fresh and sharp edges.
- The numbers of sharp edges will increase the more the glass is crushed.

Abrasive impact wear



Due to the structure

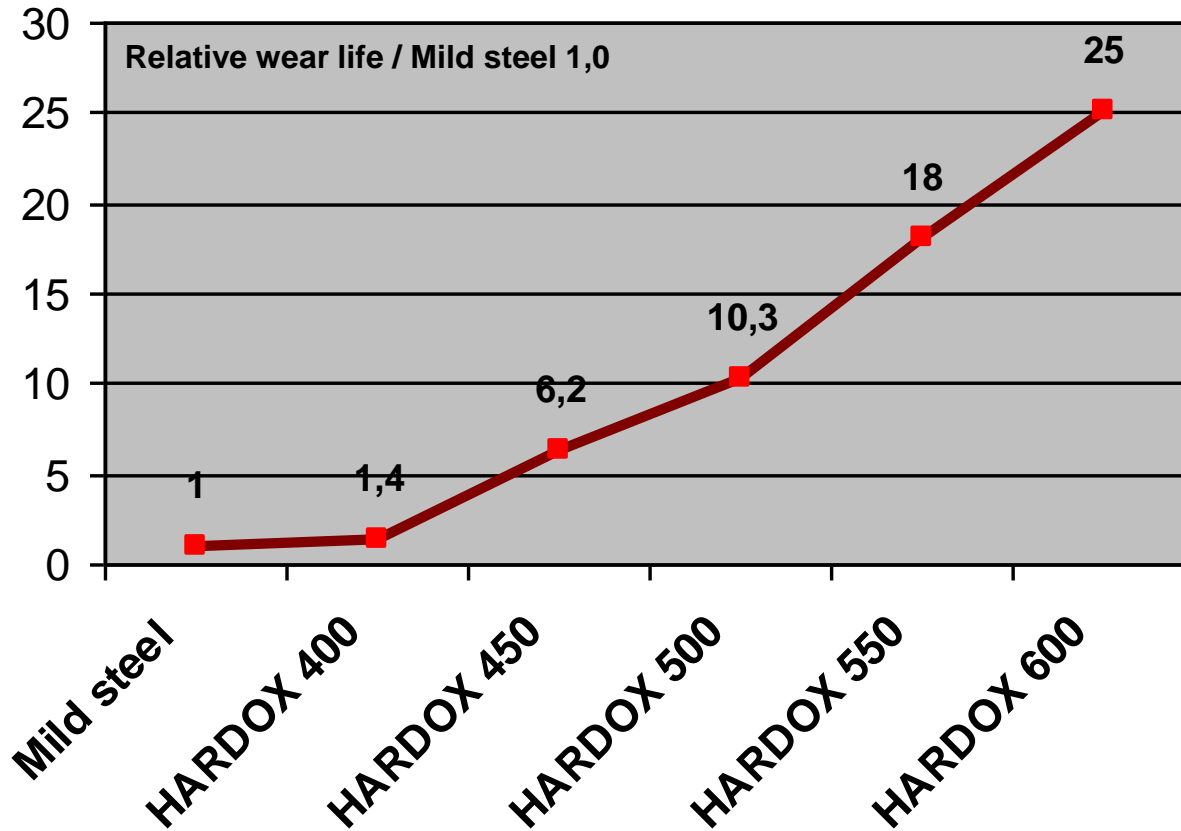
- Less impact wear relative to the hardness.
- Glass is easily crushed.





Relative wear life

Estimated relative wear life provided sliding wear and abrasive glass, 750 HV.



Contamination



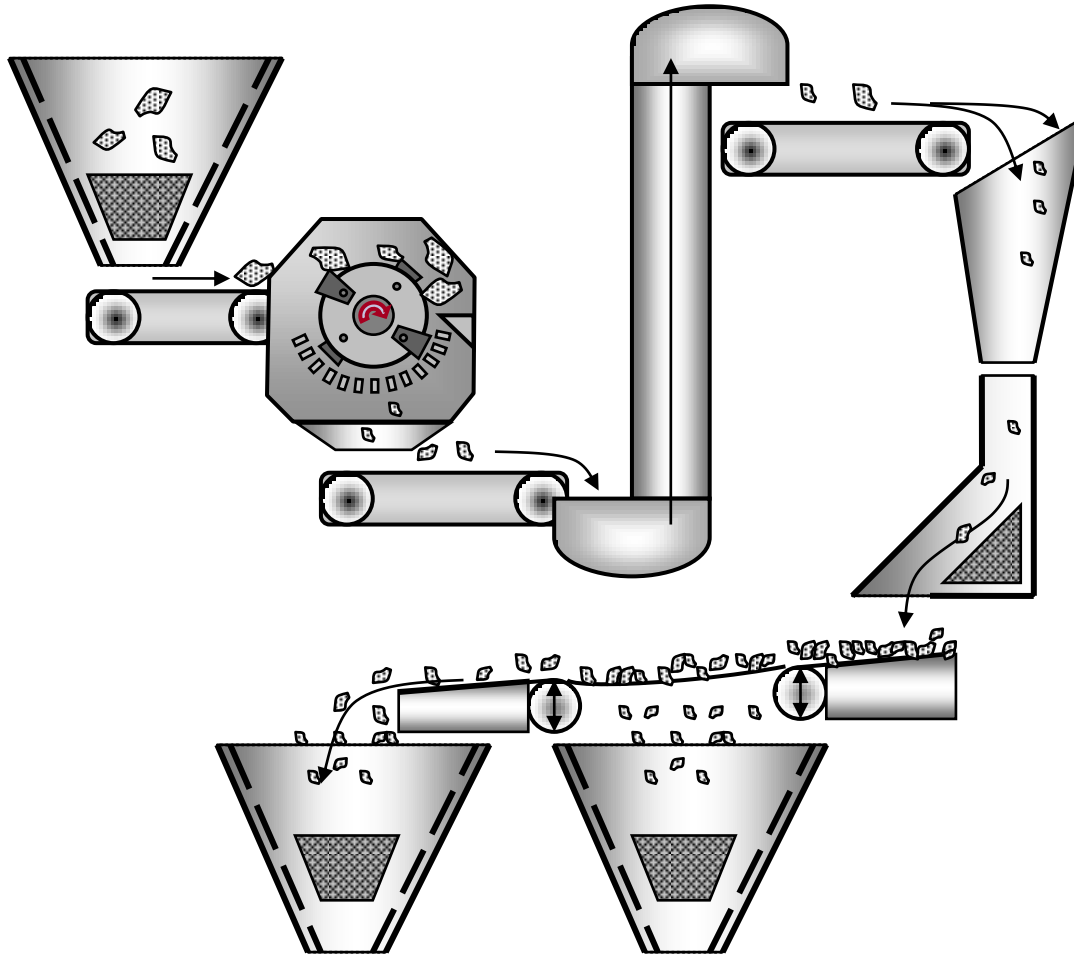
- A high degree of purity is required in glass cullet.
- Wear plates made of ceramics or steel contributes to the contamination.
- Going from a mild steel to HARDOX 500 reduces the contamination by 90%.

Contamination – an example



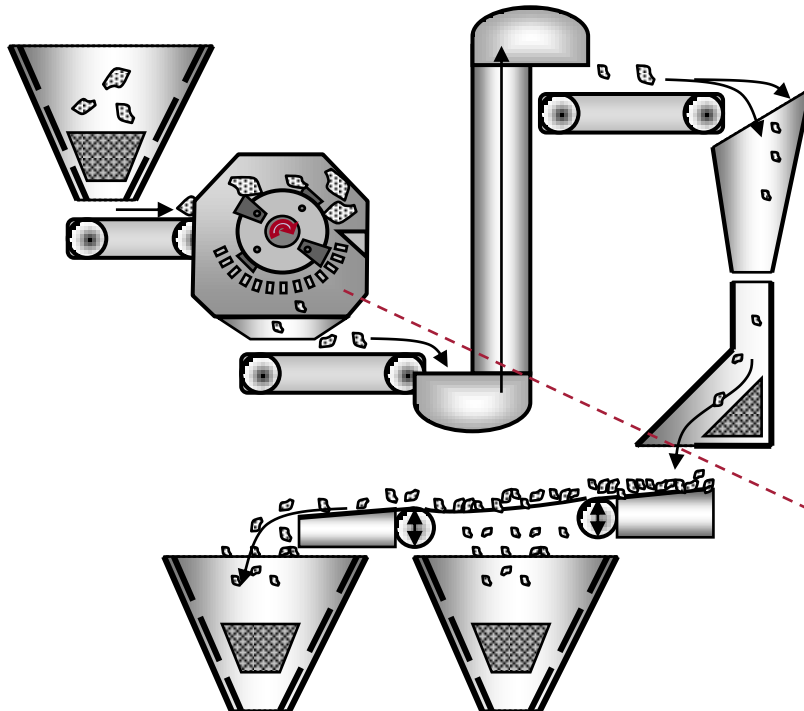
- A glass recycling plant is processing 100 000 tonnes per year.
- The contamination separators are placed in the middle of the process.
- An wear plate can be considered as consumed when 30 % is worn.
- By using wear plates in 400 HBW hardness, the yearly consumption will be about 20 tonnes.
 - 3 tonnes of steel is added to the recycled glass, equivalent to 30 g / ton.
- By changing to 500 HB wear plates, the consumption is reduced to 10 tonnes.
 - 1,5 ton is added to the process, equivalent to 15 g / ton.

Schematic flow of recycling plant



- Hoppers
- Chutes
- Feeders
- Contamination Separators
- Conveyor system
- Crusher
- Sieves

Crusher – design solution

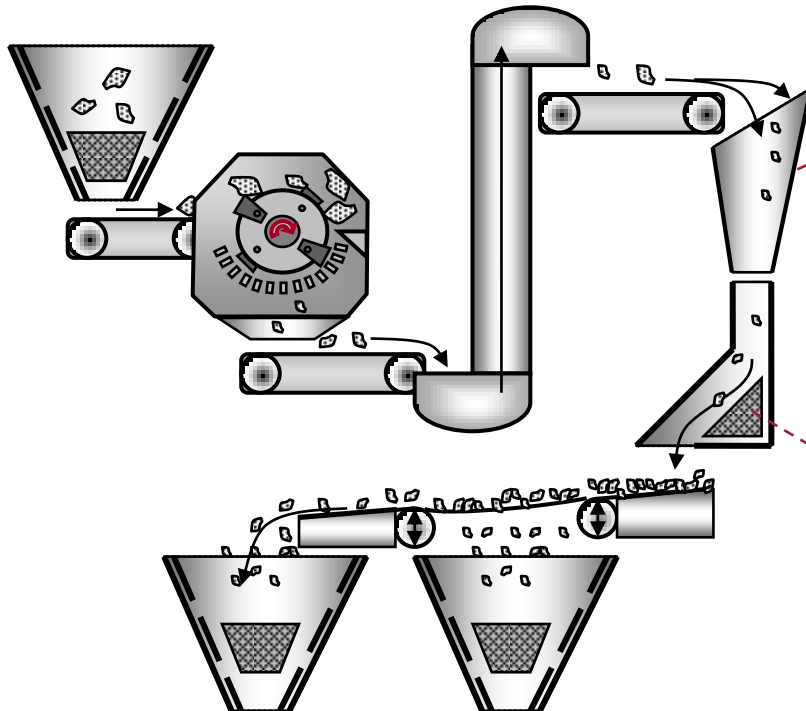


- Jaw crusher.
- Hammer crusher.
- Rolling crusher.
- Disc crusher.



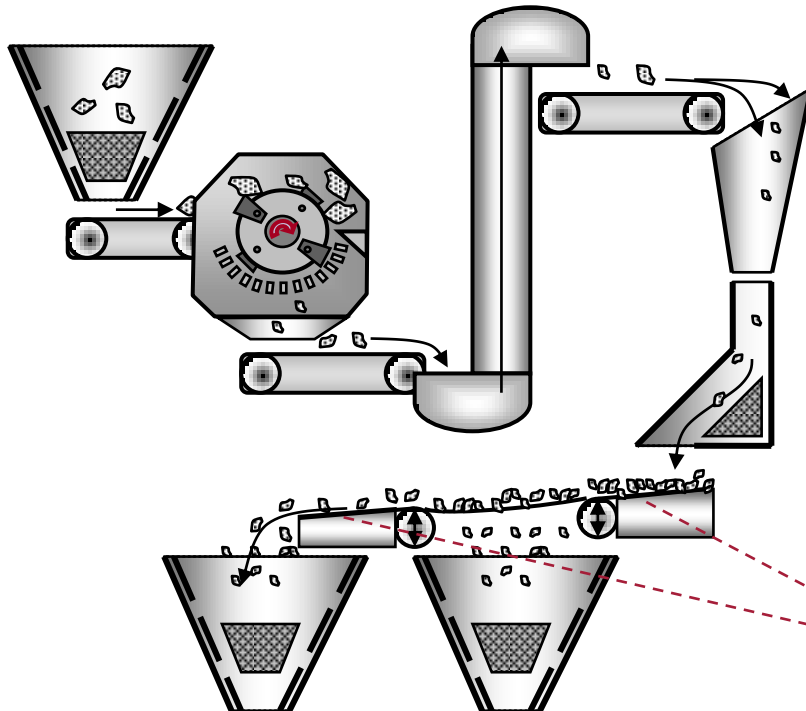
- Impact wear.
- Liner plates HARDOX 450
- Hammers HARDOX 500.

Liner plates – design solution



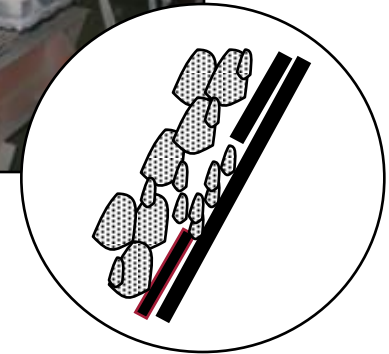
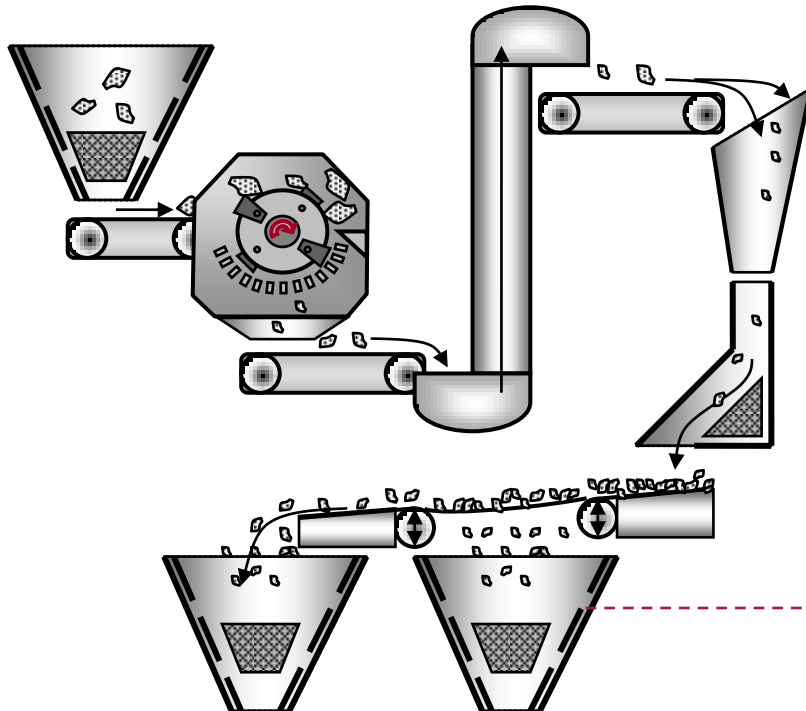
- Very high impact wear.
- High speed due to the conveyor band.
- Incident angle between 45 and 90 .
→ **HARDOX 500-600**
- Impact wear.
- Design with a deep pocket of abrasive material. The glass material shelters the surface from wear.
→ **HARDOX 500**

Feeder table – design solution



- Very high sliding wear.
→ **HARDOX 600.**

Hoppers - design solution



- Wear strips at right angle to the flow. The material wears on itself.

→ **HARDOX 500.**

Advantage HARDOX



Chutes, hoppers, feeders, crusher hammers, anvils, liner plates, containers, buckets ...



- Advantage HARDOX due to:
- Excellent wear resistance.
- Homogenous mechanical properties.
- Work shop friendliness: cutting, welding and bending.
- Professional technical support.
- Good availability of plate



Glass demands plates with high wear resistance.

**HARDOX wear plate
is the best choice on the market.**

HARDOX[®]
WEAR PLATE