HARDOX®

WEAR PLATE

Hardox in Waste Recycling

Cases and Reports 2009

SSAB

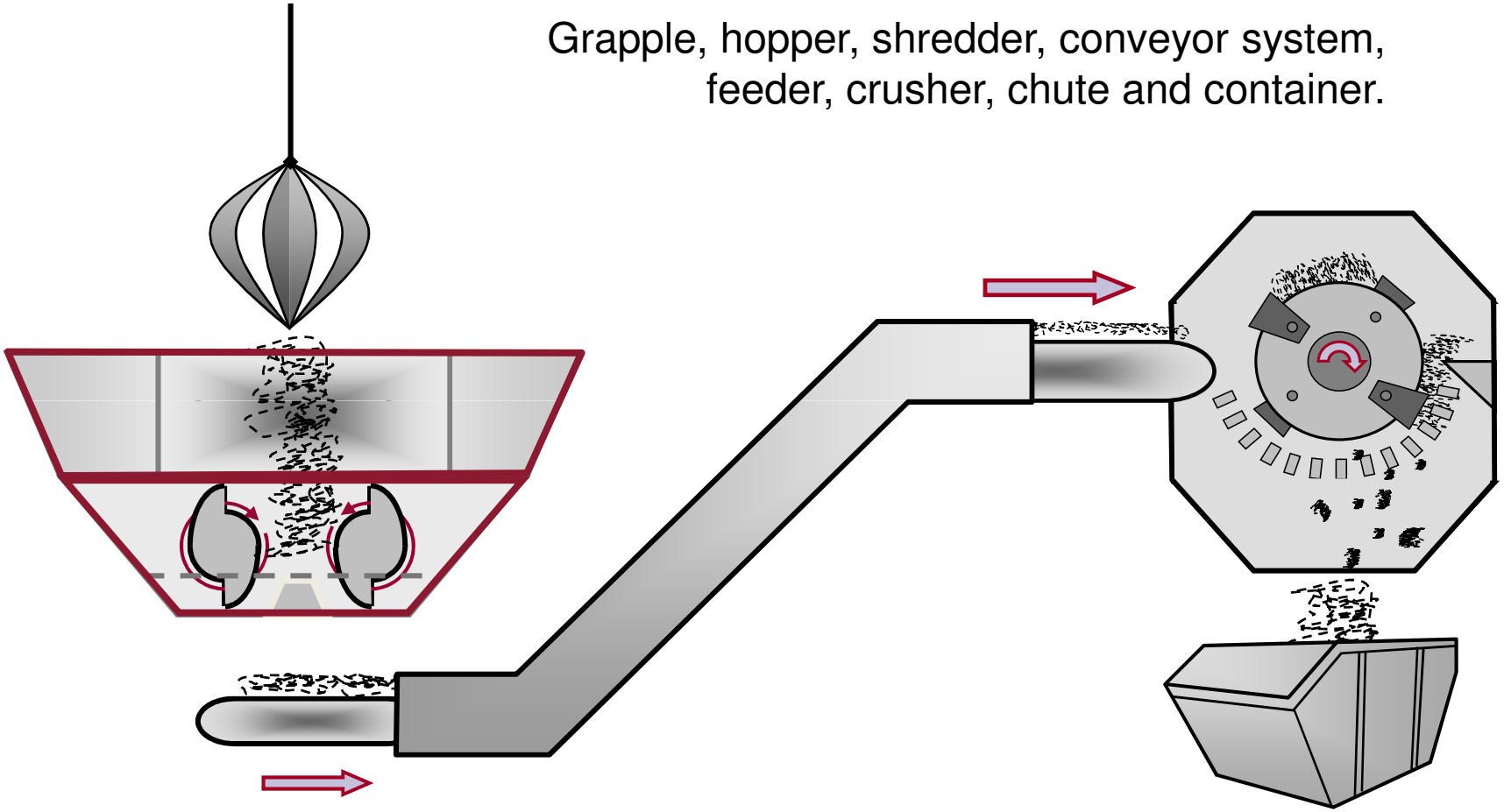
Waste…

…Waste refer here to materials that are not prime products (i.e. products produced for the market) for which the generator has no further use for own purpose of production, transformation or consumption, and which he discards, or intends or is required to discard. Wastes may be generated during the extraction of raw materials during the processing of raw materials to intermediate and final products, during the consumption of final products, and during any other human activity…/ OECD/Eurostat Joint Questionnaire on waste...

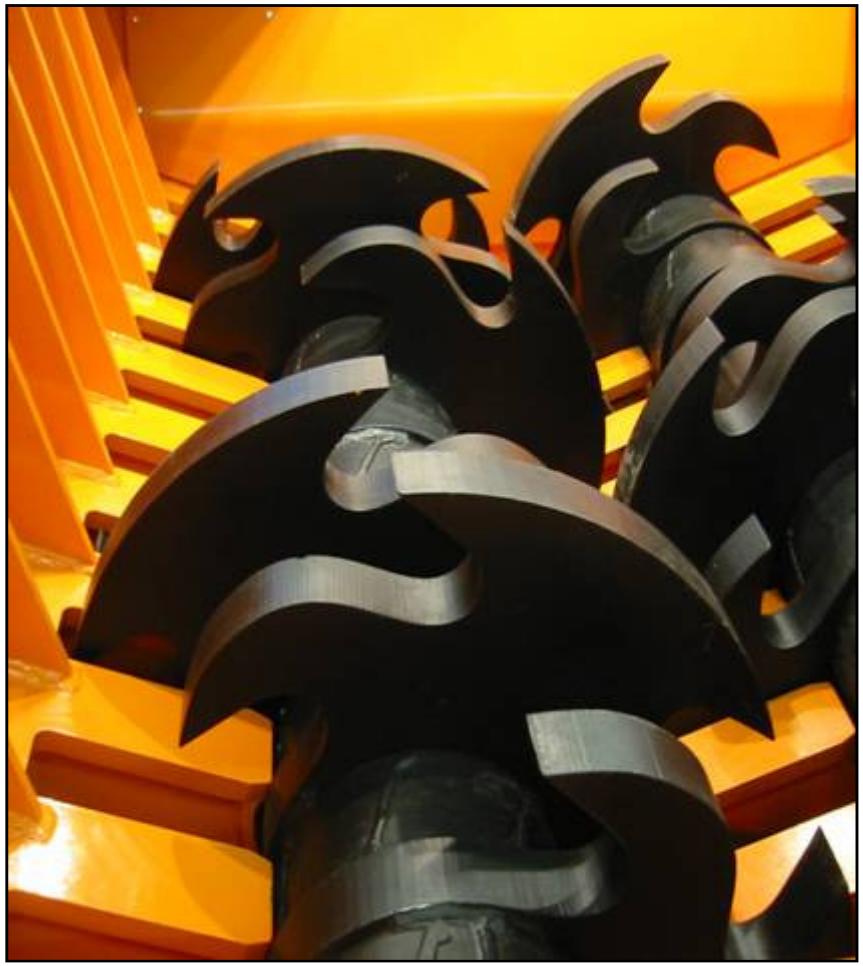
…Trash, Garbage, Food, Clothes, Furniture and Gren waste

Waste to Energy Plant - Recycling flow

Grapple, hopper, shredder, conveyor system,
feeder, crusher, chute and container.

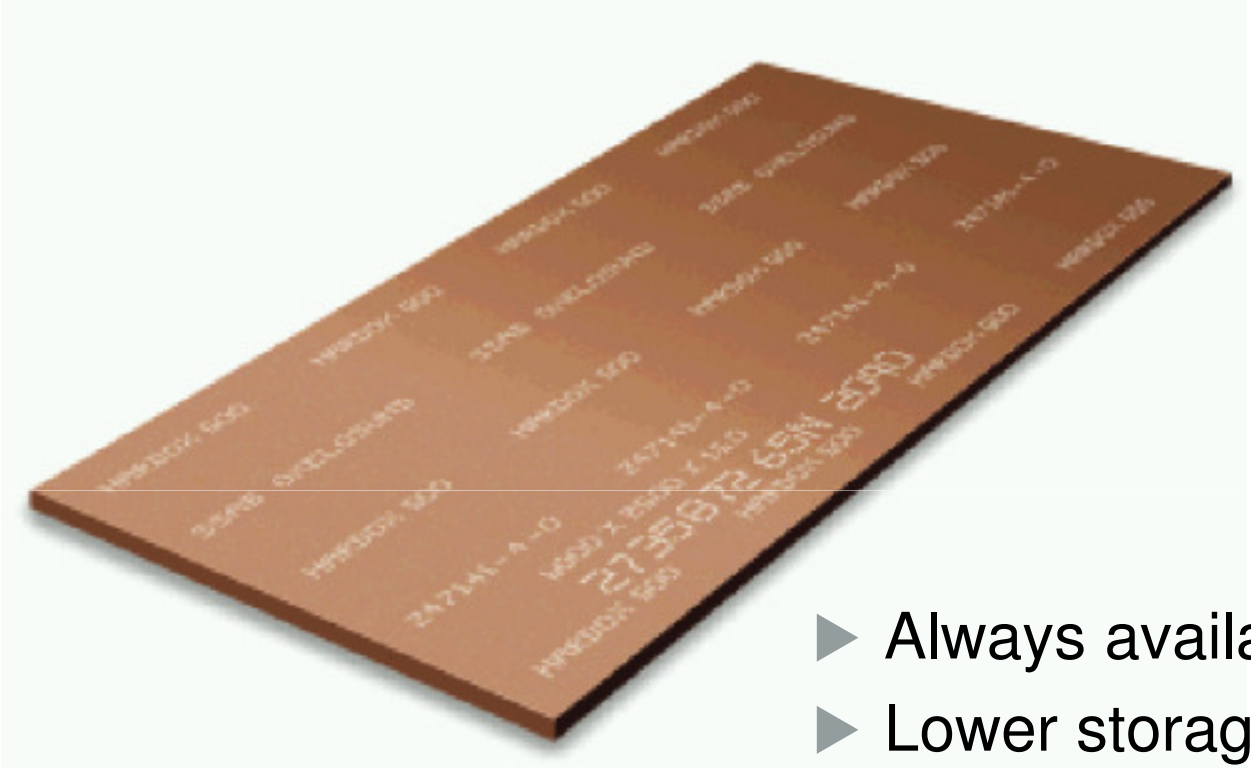


Shredder Knives and Anvils



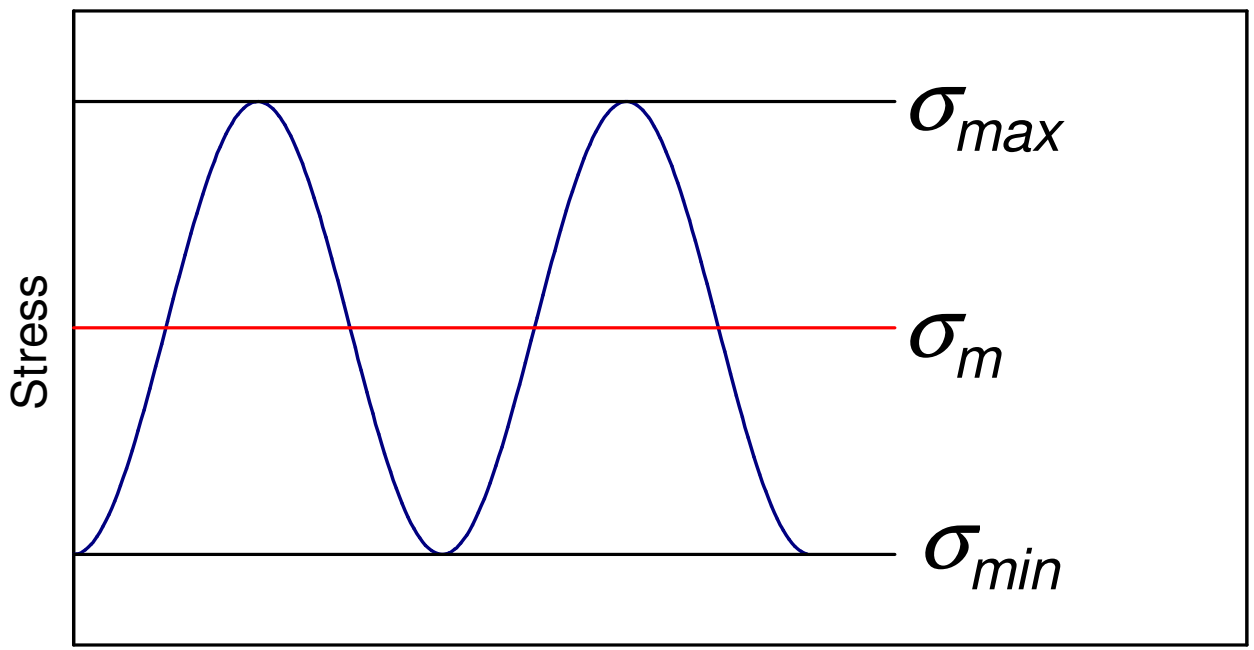
- Excellent sliding wear resistance
- High strength
- Good toughness
- Homogenous mechanical properties
  - → **Hardox 500 or Hardox 550**

Always available



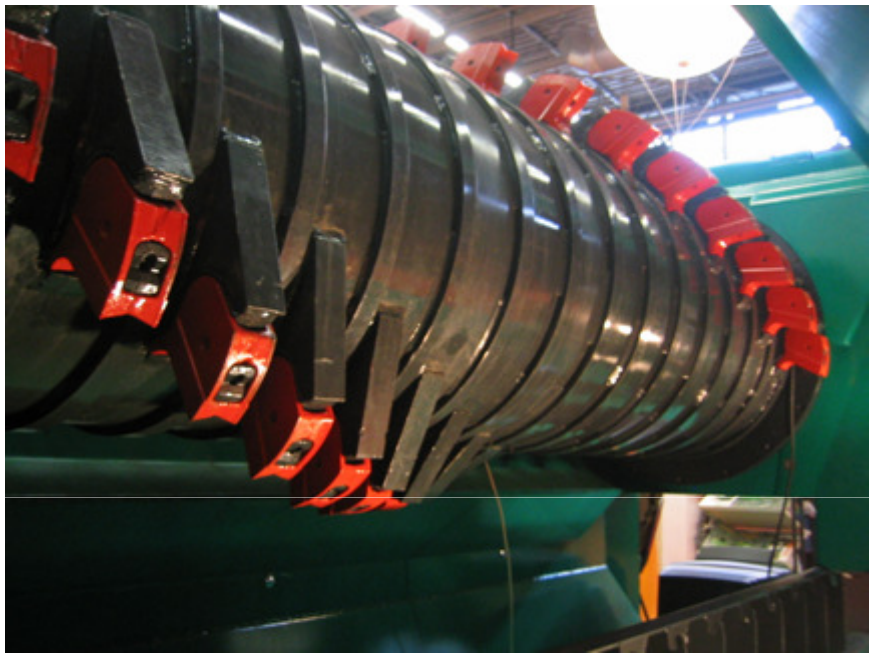
- Always available
- Lower storage costs
- Shorted lead time
- Possibility to modification

To be considered; fatigue and environment



- At dynamic loading.
- At high stress levels.
- In non continuous processes.
- In acid environments.
- Hardox Technical support.

Teeth or striker bars



- Impact wear resistance
- Good support for the teeth

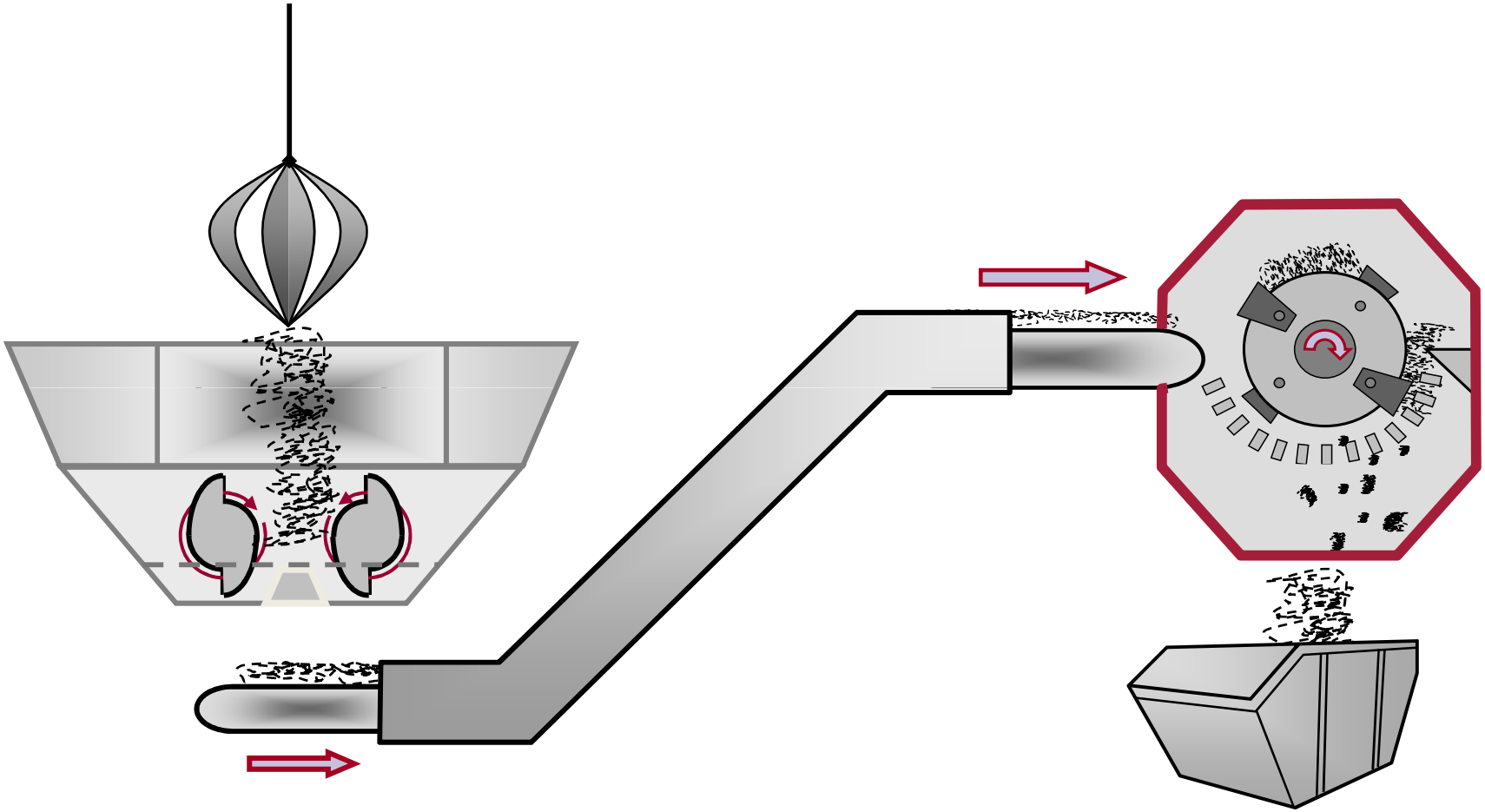
  → **Hardox 600.**

Hoppers

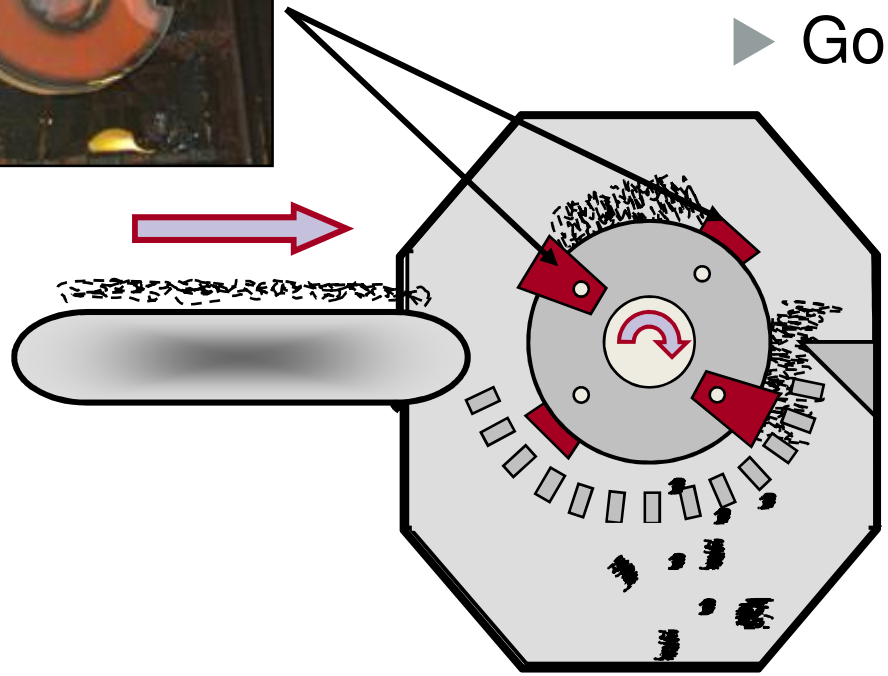
- The impact wear resistance
- Increasing production accessibility
- Possibility to reduced weight

  → **Hardox 450**

Recycling flow -crusher



WTE Plant - Crusher -hammers



- Impact wear resistance
- Sliding wear resistance
- Good toughness

→ **Hardox 550**

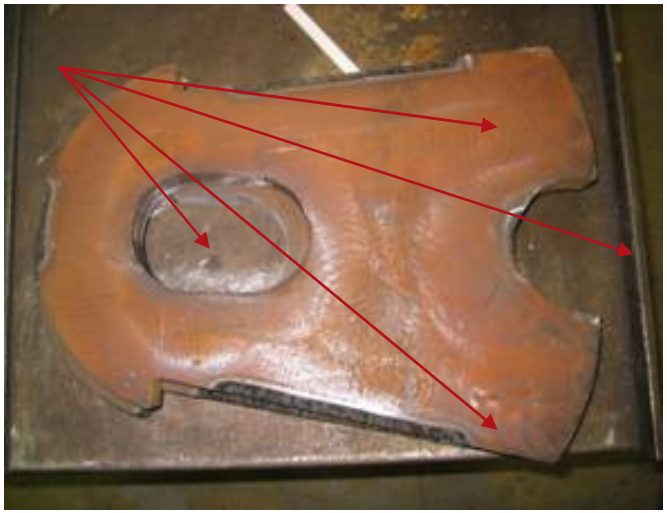
Hammers made out of plates

- The design is easily modified
- Homogeneous mechanical properties
- Constant weight
- Always available

Lamellar hammer design

- Tougher material
- Fracture arrest

Assembling



- Weld configuration
- Austenitic electrodes limits preheating

Optimal performance

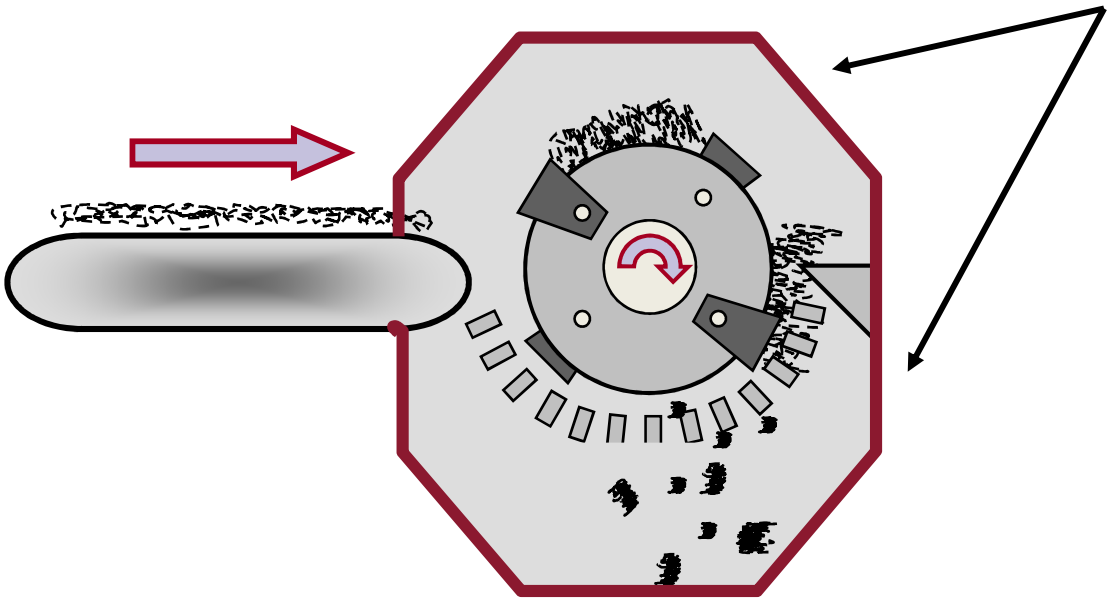
- Be observant on the hammer shaft. Grind notches and scale off the shaft opening of the hammer.

To reach optimal hardness;

- Use cutting under water or abrasive water jet.
- Always use cutting speed and sequences according to the Hardox cutting recommendations.

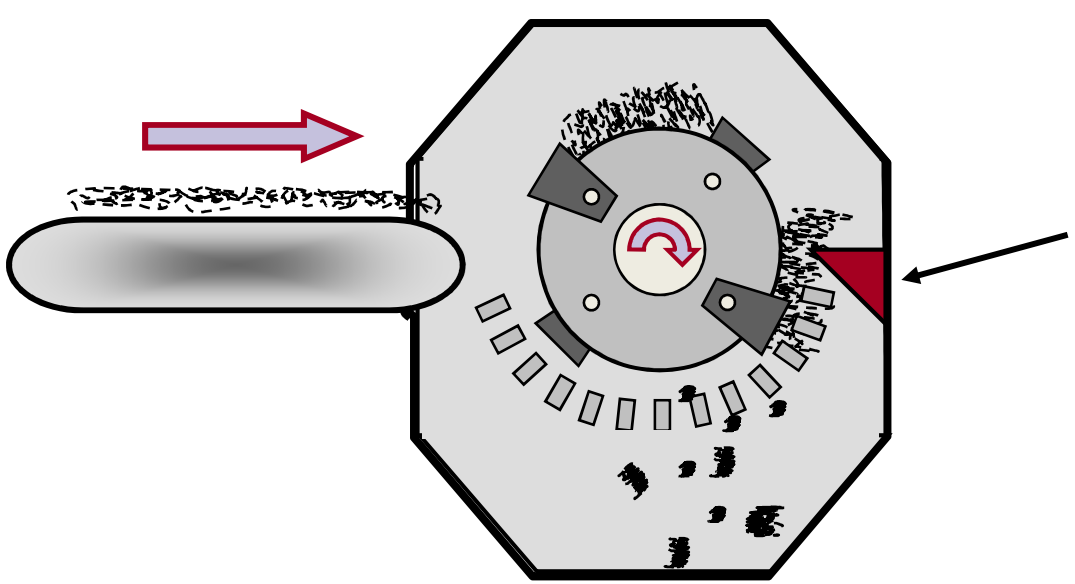
Crushers –liner plates

- Impact wear resistance
- Bending and welding properties
- Hardox 450



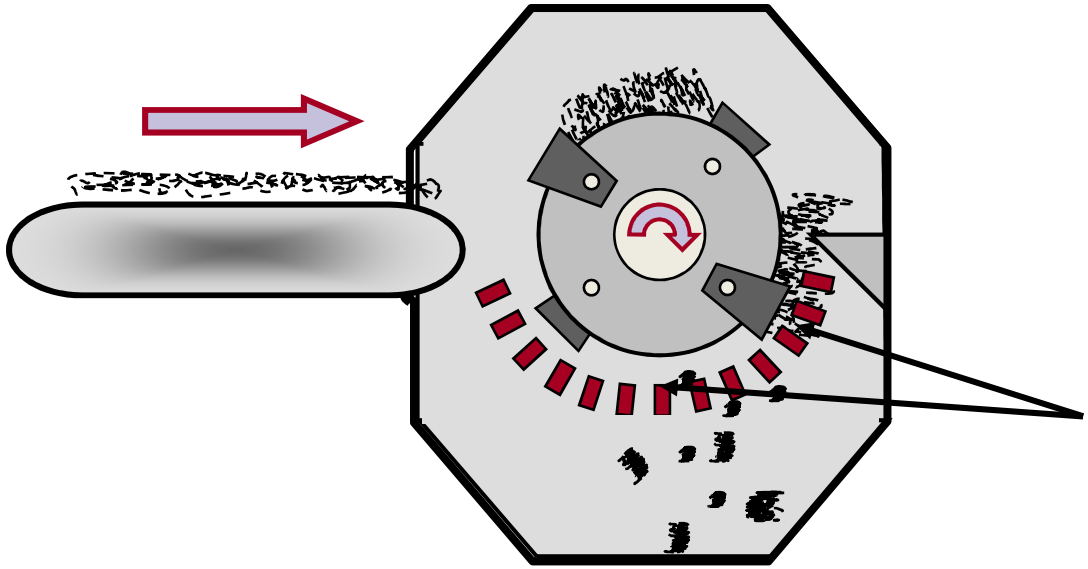
Crushers –anvil

- Sliding wear resistance
- Welding properties
- Hardox 550



Crushers – grid screens

- Sliding wear resistance
- Welding properties
- Hardox 500



Field study –hammers in Hardox 550

- Field study at an incinerator plant processing 200 000 ton waste per year.
- In their crusher they previously used 75 tonnes of cast manganese steel hammers per year.

Conclusions Field study

ADVANTAGES : HARDOX 550 vs. Manganese steels

- Hardox 550 hammers were harder and had longer service life than Mn hammers.
- Hardox 550 hammers were hard from the beginning.
- The wear on Hardox 550 was much less severe on the sides of the hammer, important for the cutting function.
- Less storage costs and less lead time due to local manufacturing.
- Less problems with health risks during cutting or repairing.
- All hammers had the same weight, no balancing of the machine was needed.
- Homogenous material, no material separations due to casting defects.
- Possibility to use twin hammers.
- The twin hammers could be shifted in order to increase the service life.
- The maintenance organisation appreciate one type of wear material in different applications.
- The design of the hammers could be modified depending on the processed material.
- The design of the hammers could be modified to give longer service life.

Field study – Economical result

Costs:

- Material
- Cutting
- Grinding
- \+ Welding

Totally <200 € each.

..which is less then the cast alternative.

- The maintenance cost was reduced by 100 000 € per year.
- The availability of each crusher increased by 6.5 %.
- The crushing process was improved.

Composting plant - Tumbling and sorting

Before sorting the material needs to be tumbled in a rotary screen, Hardox 450.

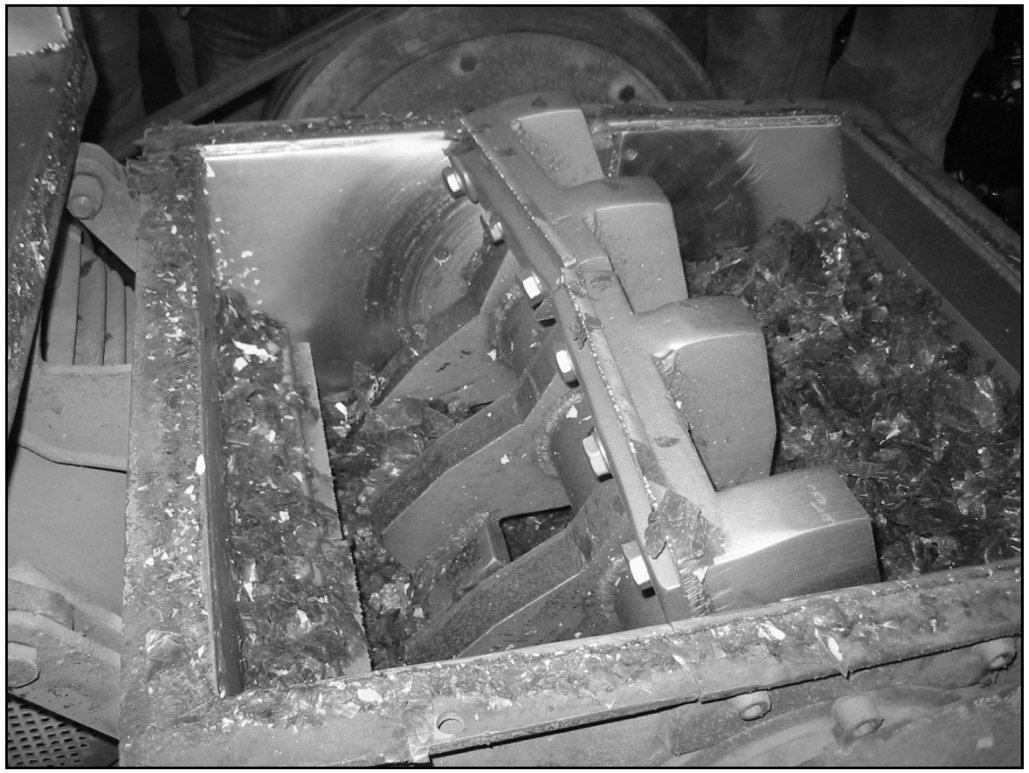
Composting - Ripening and Composting

Before composting, the material needs to be turned and fragmentized. In this machine Hardox 600 are tested as blade material.

Recycling - Compressing and bailing

Compressing of paper, cans or other recyclable materials. Hardox 400, 450 and 500 in hoppers, liner plates, bars and rails. Hardox 600 in compressing wear material.

Recycling - Fragmentation with cutter



Materials as plastics are fragmentized with cutter machines. Linear plates of Hardox 450, axes made of Hardox 400, cutters and anvils made of Hardox 600.

Advantage Hardox

Knifes, teeth, striker bars, anvils, chutes, feeders, hoppers, hammers, liner plates, sieves, compactors, bailing equipments, conveyor systems, rosters, drums, rotor discs…

Advantage Hardox due to:

- Excellent wear resistance
- High impact toughness
- Homogenous mechanical properties
- Possibilities saving weight
- Work shop friendliness: cutting, welding and bending
- Professional technical support
- Good availability of plates

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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