

Hardox® HiAce lasts longer in corrosive environments

Hardox® HiAce is ideal for equipment in a palm oil mill, since it's developed to withstand corrosive wear. It has a hardness of 450 HBW and can give more than 5 times longer service life than mild steel in the acidic and low pH environments present in palm oil processing equipment.

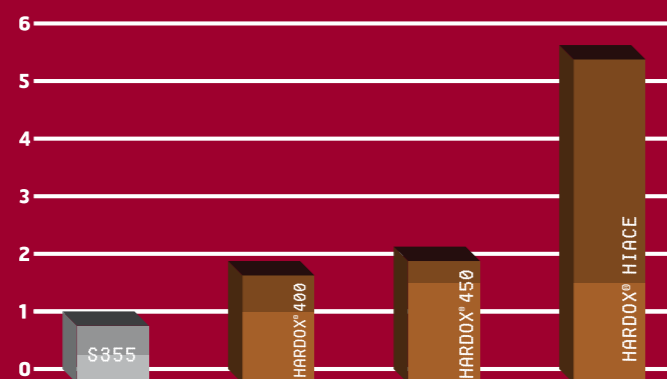
Hardox® HiAce has the same excellent mechanical properties as Hardox® 450, such as hardness, yield strength and toughness. The difference is how Hardox® HiAce deals with corrosive wear.



When pH levels go down, different wear mechanisms kick in. A harder steel won't necessarily provide a longer equipment service life.

Hardox® HiAce performs the same as a 450 HBW steel in a regular wear environment. However, at lower pH levels it can extend service life several times, as shown in the table below.

Hardox® HiAce has been compared to stainless steel using different acids and abrasives. The results indicate that Hardox® HiAce can outperform ordinary stainless steel such as SS304, by nearly 20%.

Relative service life in different environments



 Wear resistance in non-corrosive environments
 Wear resistance in corrosive environments

HARDOX®
WEAR PLATE

Wear: The inside story

Your choice of wear plate has consequences for your business. Hardox® wear plate maximizes the wear performance of your equipment and machines, reduces workshop lead times and increases the overall productivity of your operations.

Thanks to the consistent properties of Hardox® steel, you can always rely on its high performance. It also gives you a highly predictable service life, allowing you to optimize your maintenance planning.

With its combination of high hardness, high strength, and toughness, Hardox® steel can be used in a variety of applications.

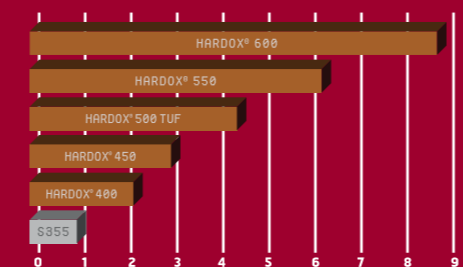
What's the secret behind Hardox® wear plate? It starts early in production with state-of-the-art steelmaking and a unique hardening and quenching process, resulting in wear plates with outstanding hardness, toughness, and workshop friendliness.

Support at your service

In addition to our steel products, SSAB provides you with technical support from SSAB Tech Support and SSAB Knowledge Service Center. Our technical support can help with everything from optimizing your product design to hands-on workshop issues. Our technical development managers and material specialists have decades of experience in solving wear challenges.

Service life

Choosing the most suitable Hardox® grade for your application can have a major impact on the service life of your equipment. The table shows the relative service life of some Hardox® grades, with mild steel as a reference.*



* The calculations are based on sliding wear with granite.

Hardox® WearCalc

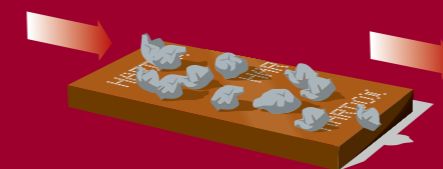
Hardox® WearCalc app is a powerful prediction tool that calculates wear and helps you optimize your choice of Hardox® wear plate. Visit hardox.com to download.

Different types of wear

Wear comes in different forms, and each has a different impact on the service life of your application. The most common wear types are sliding wear and impact wear. Each type of rock is composed of a unique combination of minerals which contribute to the specific type of abrasive wear damage.

Sliding wear

Hardox® steel has great resistance to sliding wear since it's difficult for abrasive materials to cut into the steel's hard surface.

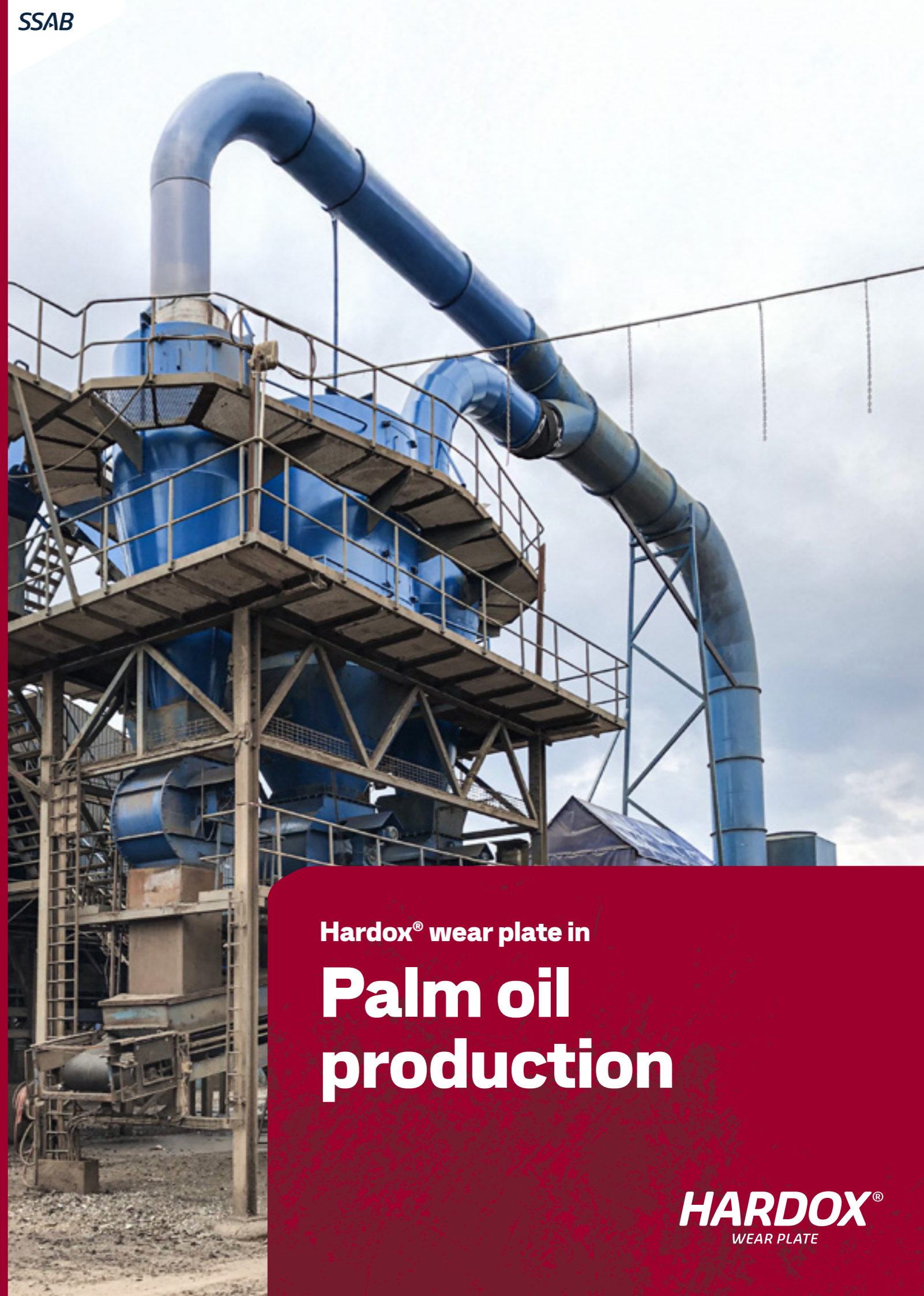


Impact wear

Hardox® is a wear steel with high toughness, which makes it stand up to impact from rocks and other heavy objects striking the steel.



SSAB



Hardox® wear plate in

Palm oil production

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SSAB is a Nordic and US-based steel company that builds a stronger, lighter and more sustainable world through value added steel products and services. Working with our partners, SSAB has developed SSAB Fossil-free™ steel and plans to reinvent the value chain from the mine to the end customer, largely eliminating carbon dioxide emissions from our own operations. SSAB Zero™, a largely carbon emission-free steel based on recycled steel, further strengthens SSAB's leadership position and our comprehensive, sustainable offering independent of the raw material. SSAB has employees in over 50 countries and production facilities in Sweden, Finland and the US. SSAB is listed on Nasdaq Stockholm and has a secondary listing on Nasdaq Helsinki. Join us on our journey! www.ssab.com

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HARDOX®
WEAR PLATE

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What is your wear challenge?

Palm oil production is a hot and humid process. This creates a corrosive environment leading to excessive wear on mild steel. Upgrading your steel equipment with wear-resistant Hardox® wear plate can extend the service life and reduce the need for maintenance. You can look forward to more reliable and cost-effective production.

Sustainability in action

Choosing Hardox® wear plate is a sustainable action you can take right now. Hardox® wear plate reduces the environmental impact of the equipment.

Its combination of high strength, hardness and toughness allows you to use less steel to build stronger yet lighter and more resource-efficient equipment that lasts longer.



Fruit grabbers

Fruit grabbers in Hardox® HiAce can be made in thinner dimensions and still last longer than mild steel.



Fruit bins

Fruit bins can be made lighter with longer service life by using Hardox® HiAce.



Fertilizer spreaders

Fertilizer spreaders are exposed to corrosive wear and will benefit from an upgrading to Hardox® HiAce. The high hardness and toughness of Hardox® HiAce compared to SS304 or mild steel will make it resist permanent deformation and dents.



Thresher drums

Thresher drums can be made lighter with Hardox® HiAce. This steel can reduce the lifetime cost of the equipment and increase the efficiency of the drum drive.



Palm oil fruit tippers

Fruit tippers are traditionally made with mild steel in a welded box shape. A more modern design with Hardox® HiAce lasts longer and can be made lighter, which allows for more payload.



Fruit cages

Fruit cages designed to take full advantage of Hardox® HiAce are lighter and last much longer than fruit cages in mild steel. This can also reduce the maintenance rate of the cast-iron wheels, chassis and bearings, and less electric power is needed to move the cages.



Chain conveyor systems

The conveyor floor, chain and the chain base plate have to battle corrosive wear and will gain a longer service life when made in Hardox® HiAce.



Bucket elevators

Bucket elevators in Hardox® HiAce have the advantage of a longer service life and more energy-efficient operation.



Screw conveyors

Screw conveyors become more power efficient and last longer when using thinner plates of Hardox® HiAce compared to mild steel.



Cake breaker conveyors

they have to deal with corrosive wear from nuts and fiber. By using Hardox® HiAce, the thickness of the screw flight and cover liner can be reduced to make them lighter yet stronger and lead to a significant lifetime increase and lower electric power consumption.



Digesters

Digesters in Hardox® HiAce stand up against corrosive wear and have a price and performance advantage compared to stainless steel.



Nut grading screens

Nut grading screens in Hardox® HiAce can be made lighter, will last significantly longer and reduce the load on the drive motor.



Nut polishing drums

Nut polishing drums in Hardox® HiAce offer a significant increase in service life at a lower lifetime cost. The drums can be made in a thinner steel to make them lighter and reduce electric power needed for operation.



Elbow pipes

Elbow pipes in Hardox® HiAce or Hardox® 500 Tuf are highly resistant to abrasive wear and significantly boost service life and reduce lifetime costs.



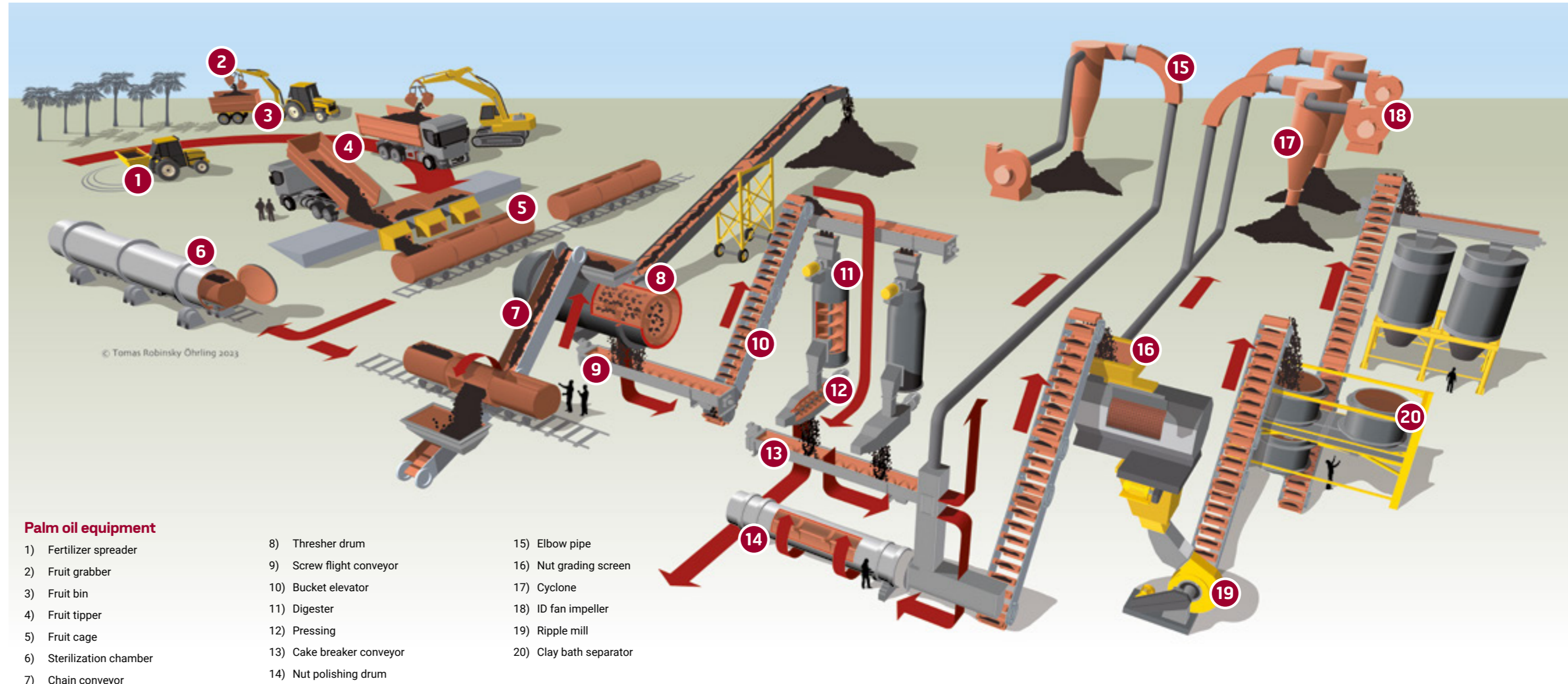
Ripple mills

When upgrading the rotor discs in ripple mills from mild steel to Hardox® HiAce or Hardox® 500 Tuf, they will gain extended service life and reduced lifetime costs. Rotor discs can also be made thinner to decrease electric power consumption.



Cyclones

Cyclones experience both sliding and impact wear in dry and wet conditions. With Hardox® HiAce or Hardox® 500 Tuf, you can significantly reduce these challenges.



Palm oil equipment

- | | | |
|--------------------------|---------------------------|-------------------------|
| 1) Fertilizer spreader | 8) Thresher drum | 15) Elbow pipe |
| 2) Fruit grabber | 9) Screw flight conveyor | 16) Nut grading screen |
| 3) Fruit bin | 10) Bucket elevator | 17) Cyclone |
| 4) Fruit tipper | 11) Digester | 18) ID fan impeller |
| 5) Fruit cage | 12) Pressing | 19) Ripple mill |
| 6) Sterilization chamber | 13) Cake breaker conveyor | 20) Clay bath separator |
| 7) Chain conveyor | 14) Nut polishing drum | |