



HARDOX® wear plate vs Aluminium

One of the key considerations in developing a trailer that stands out from the crowd is body material. Manufacturers and transport fleet owners spend a lot of time comparing the different materials and their production methods. Robert Marquis, Regional Sales Manager from **SSAB Swedish Steel**, tells TBB how **HARDOX®** can answer any body builder's problem.

The design of new truck and trailer equipment has, in the past years, developed immensely. Today it is becoming more of a technical challenge for designers since they not only have strength and function to consider, but also legislation, total weight, service life, production costs and the overall value to the end customer.

Metal Comparison

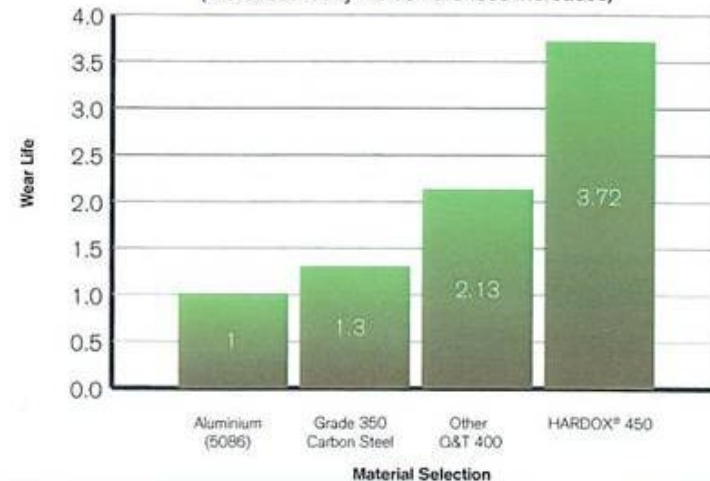
When it comes to building a trailer body, several different metal properties are important. Of critical concern is hardness to resist wear, density in weight and strength in material to reduce weight in the body and take the load. Tipper bodies, for example, and in particular, their floors, are subject to abrasion during loading and unloading. It is during these processes that hardness is of critical importance. The impact abrasion during loading and the sliding abrasion during unloading show the true performance of the materials selected. Even the hardest aluminium has lower hardness and therefore lower wear resistance than steel. As an example, **HARDOX® 450**, according to SSAB software calculations, has approximately 3-4 times longer service life than aluminium 5454 when handling sliding granite,

which means a 3.2mm **HARDOX® 450** body has a service life equivalent to that of a 10mm aluminium 5454 body. Aluminium has three times less density than steel, meaning that a 10mm aluminium plate weighs three times less than a 10mm steel plate with the same length and width. Through design changes and utilising the **HARDOX®** material properties, the difference in body weight can be eliminated. Also important is strength. Important not

only from a structural view, but it also has a great impact on the service life. The higher the yield strength is, the less deformed the body will become when loading heavy material. When heavier materials, such as rock or demolition waste, are transported the low yield strength of aluminium and grade 350 limits the usage. Loading heavy rocks or boulders will result in cracks or a deformed body. For these purposes a **HARDOX®** wear plate is a

Relative Wear Life transporting Granite

(Increased body life as hardness increases)



HARDOX®
ONLY BY SSAB OXELÖSUND

much better choice. However, when handling non-heavy material, like grain or sand, aluminium has been an attractive alternative to wear resistant steel.

Body Design

Historically, when lower strength steels were used, designs had to be reinforced to resist the impact. Using aluminium with a similar design made the unit lighter. For this reason, aluminium was a far more economical choice than low strength steels when weight was a major concern. The trade off, of course, was higher material and production costs. As long as steel bodies remained heavily reinforced, weight made aluminium an economical choice for lighter materials. The introduction of the half pipe design made of **HARDOX®** wear plate has changed the economical balance, allowing low weight to be combined with high

metal strength. In the half pipe design, the impact force is distributed throughout a large portion of the structure. For example, as **HARDOX® 450** is more than six times stronger than aluminium 5454, theoretically a 20mm thick plate of aluminium would be needed in order to gain the same tensile strength as 3.2mm **HARDOX® 450**. However, the usual thickness for aluminium is around 8mm. Considering this, a body using **HARDOX® 450** in 3.2mm will be more than twice as strong but just slightly heavier than an aluminium body if they had the same constructional design. Only the high and even yield strength properties of **HARDOX®** are capable of allowing the half pipe design to work. **HARDOX® 450** can also be used in the traditional "square box" tipper, with cost and performance benefits to the end user.

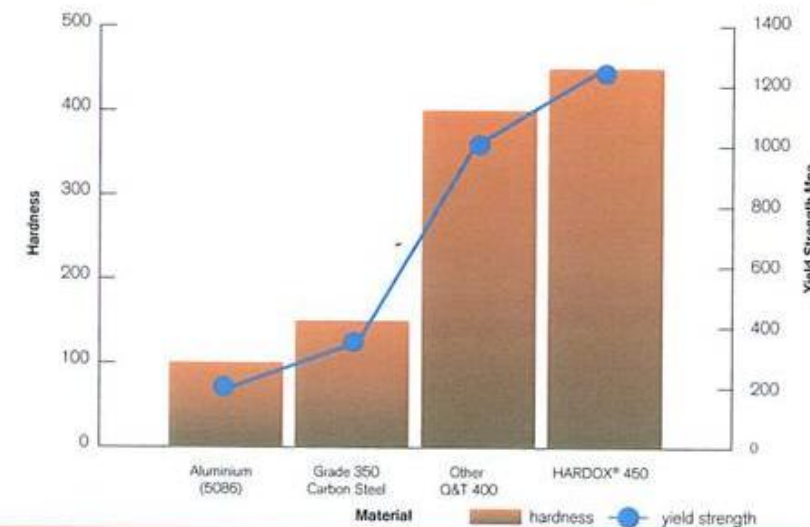
In the workshop

Workshop and repair qualities of materials should never be underestimated. **HARDOX®** wear plates can be cut with all common methods. Aluminium, on the other hand, can only be cut by plasma, laser or water-jet. Welding aluminium is also more difficult than welding **HARDOX®** for several reasons. The surface has to be prepared in a special way, the equipment is more expensive and manual methods are difficult to use, whilst welders have to be specially trained, hence adding significant ongoing costs to your fleet.

The Future

While there are segments where aluminium has an advantage, for example as a material resistant to corrosion, what is certain is that materials like **HARDOX®**, which have superior hardness and strength and can deliver real cost savings, will become the material of choice into the future. **TBB**

Hardness & Yield Strength Comparisons



Contact:
SSAB Swedish Steel
National Toll Free number: 1300 136 566
Email: australia@ssabox.com

Brisbane
Shane Gleeson
P.O. Box 8074
Woolloongabba QLD 4102

Perth
Glen Hooper
P.O. Box 1443
Booragoon, WA 6954

Melbourne
Robert Marquis
P.O. Box 654
Berwick VIC 3806