Efficient trailer production with LDX 2101

When Queensland-based Noosa Cat looked for an alternative to galvanized steel for its catamaran trailers they decided to try lean duplex instead. The cost savings and simplified manufacturing process have more than justified their choice.

Stainless steel has established its position as a material for structural hollow sections due to its excellent corrosion resistance properties, long-term durability, strength, toughness and weldability. Traditionally, stainless steel has been considered an expensive material for structural applications. However the life cycle costs of the material are low because no maintenance is required, while savings are also achieved in the manufacturing stage as expensive surface treatments are not needed. Stainless steel is also an environmentally friendly material.

Cost effective alternative

The increasing use of stainless steel hollow sections in load bearing structures has created a demand for more high strength stainless steels. Duplex stainless steels have an excellent combination of strength and corrosion resistance, while its austenitic-ferritic microstructure gives it good mechanical properties. Lean Duplex, LDX 2101, is also a cost effective Duplex grade due to its lean alloyment.

By using structural hollow sections manufactured in the high strength LDX 2101 it is possible to reduce the wall thickness compared to using a standard stainless steel. Even with thinner walls, the load bearing capacity is the same and significant weight savings are achieved. This material is suitable for many applications where excellent corrosion resistance, high strength and fatigue strength is required. The material is now widely used in the transport industry where lower fuel costs are an essential competitive advantage.

Noosa Cat decided to change the trailer material from mild steel to Lean Duplex 2101. The LDX 2101 stainless steel hollow sections were manufactured and delivered by Stalatube Oy in Finland.

Simplified production

Noosa Cat is a catamaran manufacturer in Queensland, Australia, which also makes the trailers on which their catamarans can be transported. The company used to manufacture its trailers from a mild steel grade with yield strength 350, which needed to be hot dip galvanized. Five trailers had to be produced at once to minimize the galvanizing costs. In addition they had to drill holes for zinc to drain from and organize transport to and from the galvanizer. On return they had to clean spurs, assemble axles and finally complete the trailer. There were simply too many people involved in the production process, explained Director and Owner of Noosa Cat, Wayne Hennig.

To improve the manufacturing process and the product properties, Noosa Cat decided to change the trailer material
from mild steel to Lean Duplex 2101. The LDX 2101 stainless steel hollow sections were manufactured and delivered by Stalatube Oy in Finland. Stalatube Oy is a worldwide recognized manufacturer of square and rectangular stainless steel hollow sections, exporting to over forty-five countries. The production facilities are situated in Lahti, Finland, and it has sales units in the Netherlands and the USA. With dimensions ranging from 25 x 25 mm to 300 x 300 mm the company offers the widest range of square and rectangular stainless steel hollow sections in the world. In addition to standard hollow sections, Stalatube also makes hollow sections from special materials and ready-to-assemble components according to customer needs.

The LDX 2101 stainless steel hollow sections were delivered to OneSteel Stainless in Australia, which delivered them to Noosa Cat. OneSteel is a fully integrated, global manufacturer and distributor of steel and finished steel products, self-sufficient in both iron ore and scrap metal, with revenues in excess of AUS 6 billion. OneSteel services more than 30,000 customers, offers more than 40,000 products globally and employs over 11,500 people. Together with OneSteel, Stalatube Oy developed the selection of LDX hollow sections to fill the needs of the transport industry. By using LDX 2101 the trailer production process was simplified. The number of manufactured items is no longer an issue as it is competitive to produce just one item instead of five, so the company carries less stock. Fewer steps are required to finish the trailer. The manufacturing process is flexible so any changes can be done easily. In addition the base material is corrosion resistance, so it can be stored if necessary.

Today Noosa Cat has total control over the manufacturing of its trailers and therefore requires less account administration, making production more efficient. The final product is lighter and more convenient to tow. The weight saving was significant, over 23% (see Table 1), and an important factor for customers is that the trailers look better.

**Table 1. Weight saving in trailer construction**

<table>
<thead>
<tr>
<th>Dimension mild steel tube</th>
<th>Weight mild steel tube</th>
<th>Dimension Lean Duplex tube</th>
<th>Weight Lean Duplex tube</th>
<th>Qty</th>
<th>Total weight Mild steel tube</th>
<th>Total weight Lean Duplex tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>kg/m</td>
<td>mm</td>
<td>kg/m</td>
<td>m</td>
<td>kg</td>
<td>kg</td>
</tr>
<tr>
<td>75 x 50 x 3</td>
<td>5,42</td>
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<td>4,51</td>
<td>31,5</td>
<td>170,73</td>
<td>142,07</td>
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<tr>
<td>100 x 50 x 3</td>
<td>6,60</td>
<td>100 x 50 x 2,5</td>
<td>5,69</td>
<td>12</td>
<td>79,20</td>
<td>68,28</td>
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<tr>
<td>50 x 50 x 3</td>
<td>4,25</td>
<td>50 x 50 x 2,5</td>
<td>3,73</td>
<td>13</td>
<td>55,25</td>
<td>48,49</td>
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<tr>
<td>40 x 40 x 2</td>
<td>2,31</td>
<td>40 x 40 x 1,5</td>
<td>1,81</td>
<td>44,6</td>
<td>103,03</td>
<td>80,73</td>
</tr>
</tbody>
</table>

Additional weigh for Hot dip galvanizing + 8%

Total weight 443,70

Weight difference -104,10

A boat-loaded on a 6-meter Noosa Cat trailer and ready for the owner to set off for that weekend trip.

LDX 2101® is a registered trade-mark of Outokumpu Stainless Oy