

Hot rolled steel plates and coils

Processing of material

Thin wide plates made by laser-hybrid welding

Laser-hybrid welding (LHW) is a type of welding process that combines the benefits of laser welding and gas metal arc welding. These two processes are used concurrently. LHW gives a lot of advantages compared to conventional welding methods, such as high strength, uniform weld quality with minimal deformation and a narrow heat affected zone.

Applications

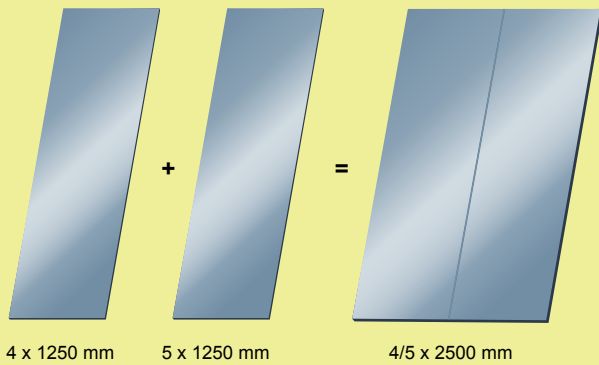
- Thin and wide steel structures
- Tipper bodies
- Floor constructions
- Containers

Ruukki is a metal expert you can rely on all the way, whenever you need metal based materials, components, systems or total solutions. We constantly develop our product range and operating models to match your needs.

Thin wide plates are produced by laser-hybrid welding (LHW) of two separate hot rolled steel sheets. LHW combines the benefits of laser welding and gas metal arc welding (GMAW) and these two processes are used concurrently. The laser beam is used to ensure a full penetration, whereas GMAW is responsible for bringing filler material and extra heat. The heat input is low; much lower than that of traditional GMAW. The width of the LHW seam is only about 50% of the width of a GMAW seam. Therefore this method ensures high quality weld.

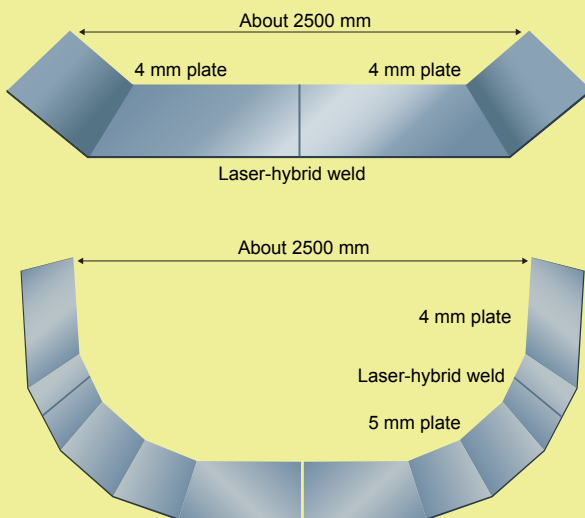
• **Laser-hybrid welded plates**

Figure 1



• **Application example**

Figure 2



• **Benefits**

- Thin and very wide plates are available for many applications.
- Excellent properties of extra high strength and wear-resistant steel grades can be utilized.
- Possibility to combine different steel grades and dimensions.
- Welding and other expensive fabrication work can be reduced at customer's workshop.
- The customer resources can be used more effectively by focusing on core competence.

• **Dimensions**

- Thickness: 2 to 8 mm.
- Width: 3000 mm maximum.
- Length: 8000 mm maximum.

See also dimensional ranges for base material on the relevant data sheets.

Based on separate agreement the following dimensions may be available:

- Two different thicknesses, e.g. 2 + 3, 3 + 4, 3 + 5, 4 + 5 and 4 + 6 mm.
- Two different widths, e.g. 1000 + 1250, 1000 + 1500 and 1250 + 1500 mm.

• **Steel grades**

The most common base material of thin wide plates is Raex. Raex steels are wear-resistant hot rolled special steels developed to resist abrasive wear and high surface pressure. The delivery of other steel grades can be agreed upon separately with the customer. The properties of the relevant steel grade are presented on the steel-specific materials data sheet.

• **Delivery condition**

Thin wide plates are produced by laser-hybrid welding. The delivery condition of the base plate material depends on the steel grade, see separate materials data sheet.

• **Inspection document**

Inspection document in accordance with EN 10204.

• **Welding and fabrication**

Fabrication properties such as suitability for welding and cutting depend on the steel grade of the wide plate. The customer is advised to become acquainted with the relevant instructions given in the steel-specific materials data sheets, as well as in the data sheets for processing of materials.

- **To be taken into consideration when using laser-hybrid welded thin wide plates**

- The weld seam has to be taken into account if the laser-hybrid welded thin plate is intended for bending or roll-forming. It is not recommended that the weld area becomes exposed to bending operations, if hardened steels are used as base material.
- The weld seam and the material adjacent to it are usually a little softer, and may wear a bit faster, than the actual plate. The softening effect is restricted to a very narrow zone, and it is a typical phenomenon for all high strength steel grades.
- The weld seam may remain visible. Shot-blasting and painting make the weld seam hardly visible.

- **Order instructions**

The minimum delivery consists of LHW thin wide plates of at least one hot rolled coil, i.e. 10 to 20 tonnes.

- **Work safety**

Hardened steels have to be handled with special care during workshop processing, such as cutting and bending. The instructions given by the steel supplier and good quality of the engineering workshop practice form an essential part of work safety.

- **Further information**

The following data sheets are related to the subject: Raex, Optim MC and Optim QC. Additionally, the separate data sheets for the processing of materials like Welding, Thermal Cutting and Mechanical Cutting may be also useful.

- **Our Customer Service is happy to give you further information**

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