



SHIPYARD IMPROVEMENT POSSIBILITIES

➤ MARIUS DANIEL CALMUC



LASER TECHNOLOGY

■ Current shipyard challenges:

- Deformations on panels of thin plates
- Demands of high quality but also of high productivity to be competitive on the market

■ Why Laser (or hybrid laser) ?!

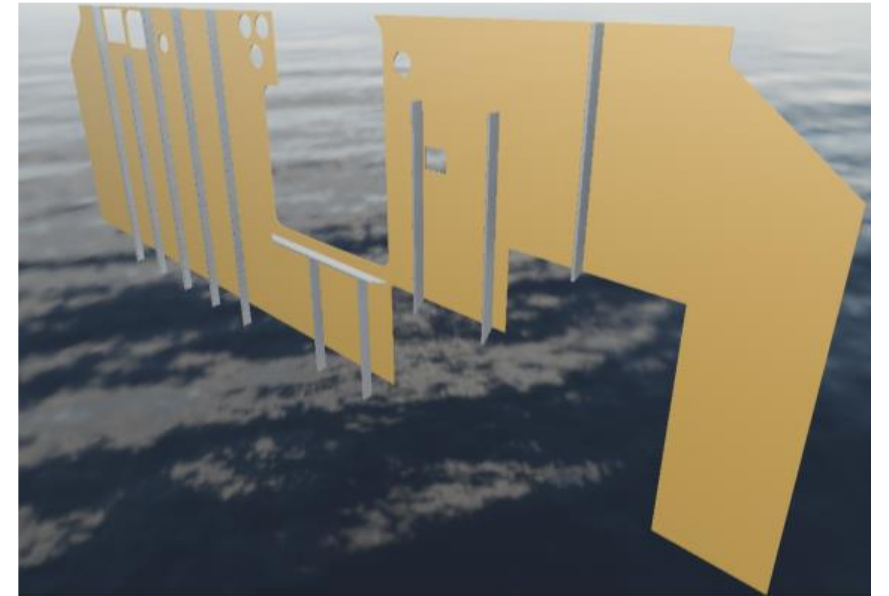
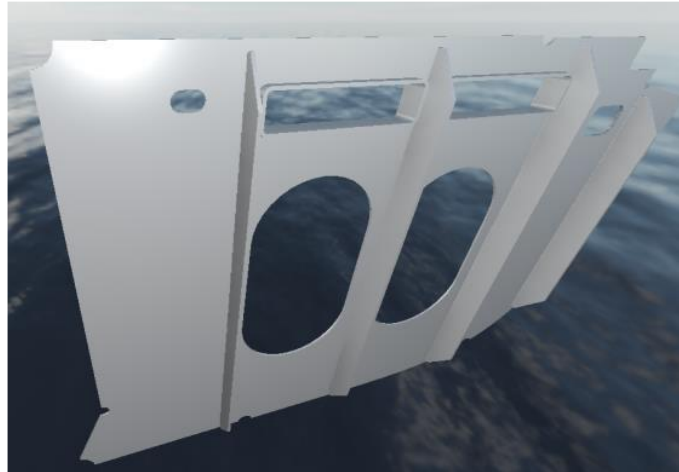
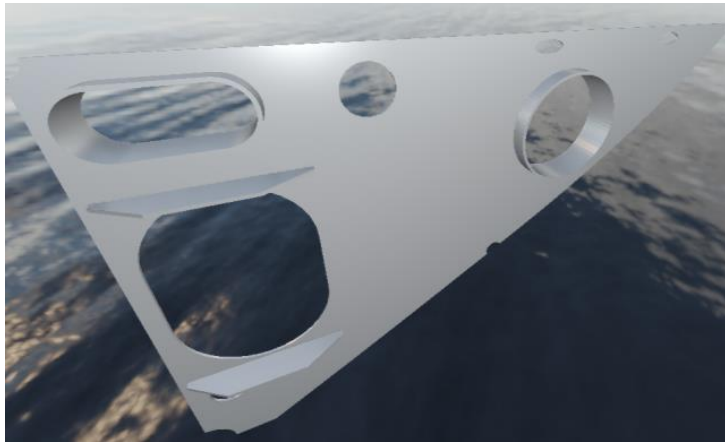
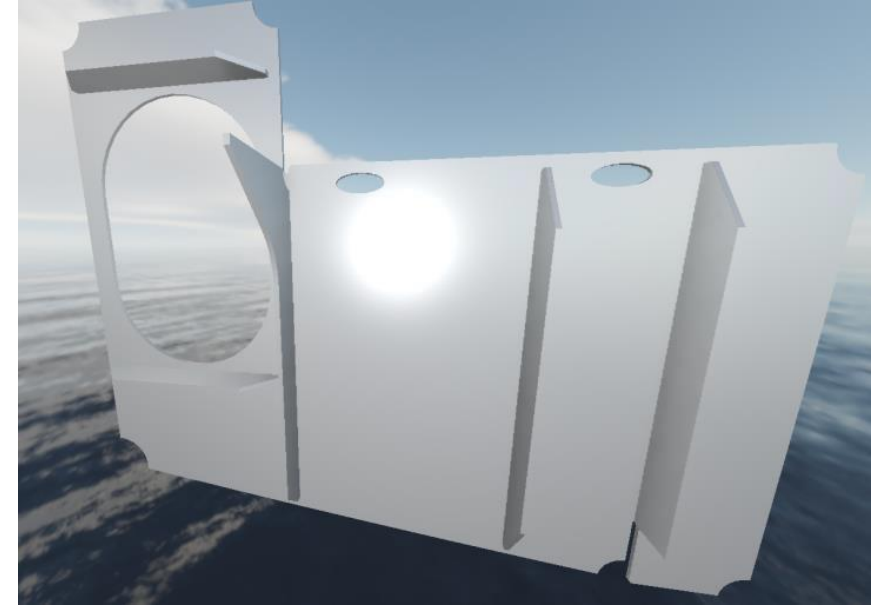
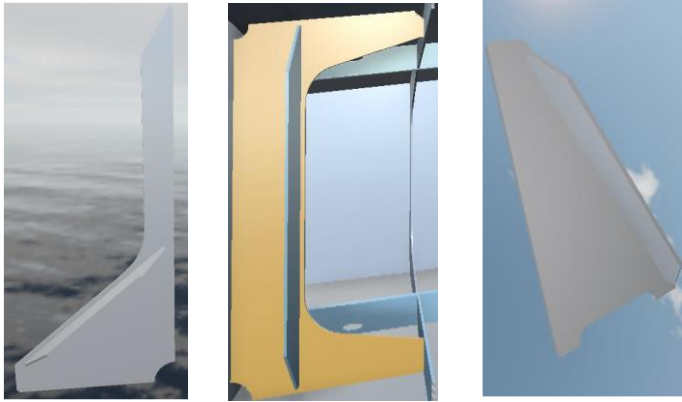
- High speed process -> High productivity
- Good quality -> good visual appearance, acceptable weld mechanical properties

■ Why not Laser (or hybrid laser) ?!

- High demands for joint preparation tolerance -> process changes o production applications
- Highly priced compared to conventional welding or cutting process
- Risk for high hardness values of the heat affected zone of higher strength material

LASER TECHNOLOGY

■ Panel types and shapes

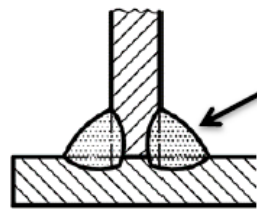


LASER TECHNOLOGY

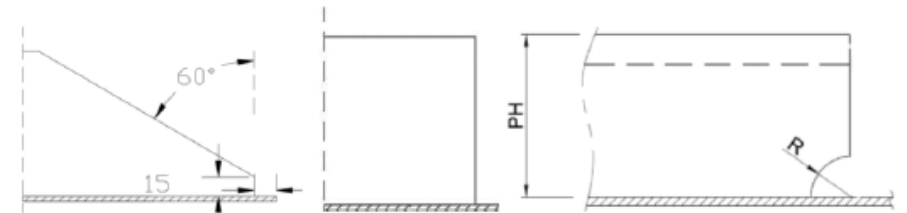
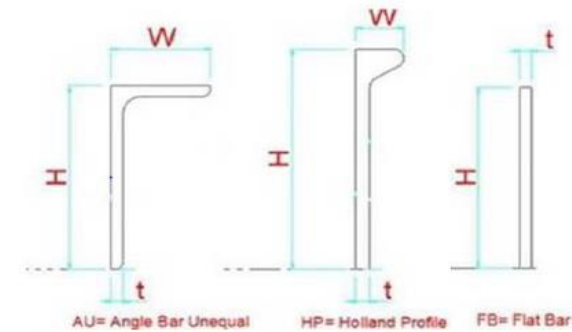
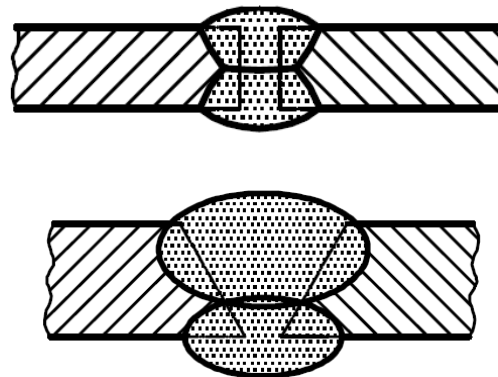
■ Welding / Cutting

- Thin plates (in shipbuilding 4 – 8mm, up to 30mm)
- Different material grades (A – EH36)
- Material type and dimensions
 - Plates , 4x200x400(and smaller) to plates of 15x3000x12000 (and bigger)
 - Profiles AU, HP, FB of different end shape,
- Weld Types : FW and / or BW
- Welding process used: 121, 136, 135, 138, 141, 111.
- Cutting process: Oxi-gas, plasma.

T-join fillet weld



Throat thickness
a: 2.5mm to 4.5mm



SHIPYARD IMPROVEMENT POSSIBILITIES

Process	Robot type	Applied in shipbuilding	Control software		
Part fabrication	Profile cutting robot	Yes	Offline	😊	
	Plate tapering robot	Yes	Offline with sensors	😊	
	Plate grinding robot	No	-	😊	
	Part sorting / palettizing robot	Yes	?	😊	
	Plate forming robot	Yes	Offline with sensors	😊	
Micro panel line	Robot welding gantry	Yes	Offline, Automated	😊	
Main panel line	Webs/T-beam welding gantry	Yes	Offline	😊	
Section building	Open sections	Robot welding gantry	Yes	Offline	😞
	Closed sections	Robot on rail system	Yes	Automated	😞
Hull assembly	Robot on rail system	Yes	Automated	😞	
Pipe workshop	Pipe welding robot	Yes	Offline	😊	
	Pipe flange mount and weld	Yes	Offline	😊	
Small steelwork shop	Robot welding cell	Yes	Online, automated	😊	
Painting	Painting robot	No	Online	😞	

