



SGP TESTING

VIA J. RESEL, 2/5/A - 34018 SAN DORLIGO DELLA VALLE - TRIESTE - ITALY
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**RAPPORTO ESAMI
ULTRASUONI**

ULTRASONIC EXAMINATION REPORT

UT nr. 120/22 pag. 001 di 006
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cliente MARINA MONFALCONE
customer

commessa
project

LEOPARD 45 -

materiale esaminato #20 hull PS & SBD internal laminate --> grid check + spot
examined material #19 deck bow laminate PS --> spot check
#30 #31 deck bow laminate PS & SBD --> grid check + spot where practicable

referimenti rif. doc. Pietro Carlet Liger Report - 9 Jun 2022
reference

tipo di costruzione GFRP single-skin and sandwich laminate
type of construction

<u>processo costruttivo</u> type of molding	infusion molding	<u>piano di laminazione</u> lamination plan	not available
<u>stato superficiale</u> surface condition	gel-coat / antifouling	<u>mezzo di accoppiamento:</u> coupling medium	gel
<u>procedura d'esame</u> examination procedure	SGP-FRP-UT-001 rev.1 - UNI EN 14127 testina grid Δ 100-150 mm	<u>limiti di accettazione</u> acceptance criteria	reference spectra

<u>apparecchiatura</u> equipment	<input type="checkbox"/> Olympus 38 DL Plus ID 120486408	<input type="checkbox"/> Olympus 45 MG ID 201594606	<input type="checkbox"/> Olympus Epoch 600 ID 130530605	<input type="checkbox"/> Crawler Gekko ID 017SGPDFC01	<input type="checkbox"/> Testo 883 ID 63215906-63160344
	<input type="checkbox"/> Olympus OMNI-MX2 ID 102691-2681	<input checked="" type="checkbox"/> Olympus Epoch 600 ID 120459312	<input type="checkbox"/> Olympus Epoch 600 ID 120240601	<input type="checkbox"/> Pipe Scanner PRO ID 021PNDT01	<input type="checkbox"/> Encoder Olympus ENC1-2.5-DE ID U8780197

sonda transducer	N. identificazione identification number	propagazione onda propagation waves	angolo angle	frequenza MHZ frequency	element type single/dual/array	other delay line/wheel probe
Panametrics M2008 - Φ 25 mm	807358	longitudinal	0°	0.5	single	delay line
Karl Deusch S24HB0,1E	21079	longitudinal	0°	0.1	single	-
Karl Deusch S24HB0,1S	21077	longitudinal	0°	0.1	single	-

<u>blocchi di taratura</u> reference blocks	-TYPE C/A/H/J/D -RIF. 4/6/8/10/20/30 mm	<u>metodo di taratura</u> calibration mode	according to procedure	<u>metodo combinato UT-TT (SI/NO)</u> combined UT-TT method (yes/not)	Not.
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<u>piano di controllo</u> NDT plan	Pietro Carlet Liger Report - 9 Jun 2022 #19 #20 #30 #31	<u>area esaminata</u> examined area	900x600+1300x150 mm #20 PS 900x600+2800x150 mm #20 SBD 2X 600X350 mm #30 #31 PS & SBD + spot #19	<u>forme d'onda analizzate</u> waveforms analyzed (quantity)	50 80 120 20
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esito dell'esame
examination result

We have analyzed about 300 ultrasonic waveforms detected in the suspect areas #19 #20 #30 #31 where practicable /accessible. The most significant spectra were recorded and saved as a database structure.

#19:

From outer US inspection, no significant delamination or air inclusions have been detected; the visible indication is due to a surface mechanical damage probably caused during the final polishing of the hull; see picture 5.

#20 PS:

From outer US inspection, two major significant anomalies have been detected inside the thickness of the single skin outer hull laminate near the bridge connection (depth of the interlaminar discontinuities 2 mm, dimensions 250x100 and 300x100 mm); see picture 3 and US matrix at page 5.

#20 SBD:

From outer US inspection, two major significant anomalies have been detected inside the thickness of the single skin outer hull laminate near the bridge connection (depth of the interlaminar discontinuities 2-3 mm, dimensions 250x100 and 800x(40/150) mm); see picture 4 and US matrix at page 5.

#30 SBD:

From outer US inspection, various spreaded interlaminar discontinuities at deep 2-3 mm have been detected inside the thickness of the single skin outer laminate around the transverse beam support box; see picture 6 and US matrix at page 6.

From inner US spot inspection, some delaminations at deep 2-3 mm have been detected near the singleskin-sandwich transition aft the beam support box; see picture 8 and US matrix at page 6.

A single skin hull total thickness of 7-8 mm have been measured near the transverse beam support box.

#31 PS:

From outer US inspection, various spreaded interlaminar discontinuities at deep 2-3 mm have been detected inside the thickness of the single skin outer laminate around the transverse beam support box; see picture 10 and US matrix at page 6.

From inner US spot inspection, no delaminations have been detected; see picture 11 and US matrix at page 6.

A single skin hull total thickness of 7-8 mm have been measured near the transverse beam support box.

The detailed results and photo documents are shown in the following pages.

Inspector	QA/QC	Third Party	Client
Name: ing. Stefano Grasso 3rd Level SNT-TC-1A no.cert.RINA 19VE00516PN5 ing. Stefano Grasso SNT-TC-1A 3rd level ISO9712 2nd level IWTCSWIP 3.1 Signature: Place/Date: Monfalcone, 06/07/2022	Name: Signature: Date:	Name: Signature: Date:	Name: Signature: Date:



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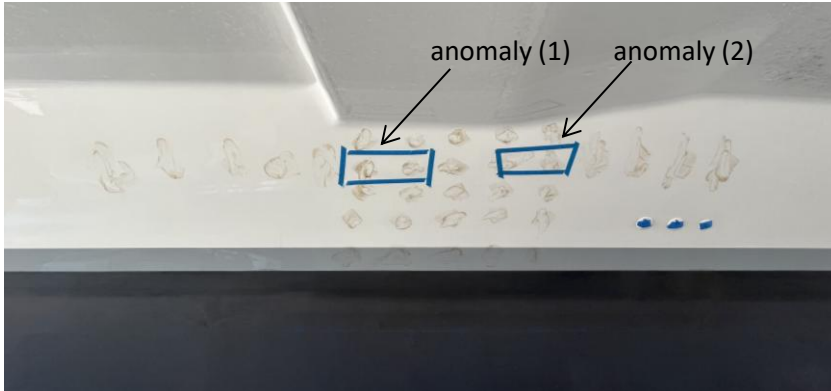
esito dell'esame
examination result



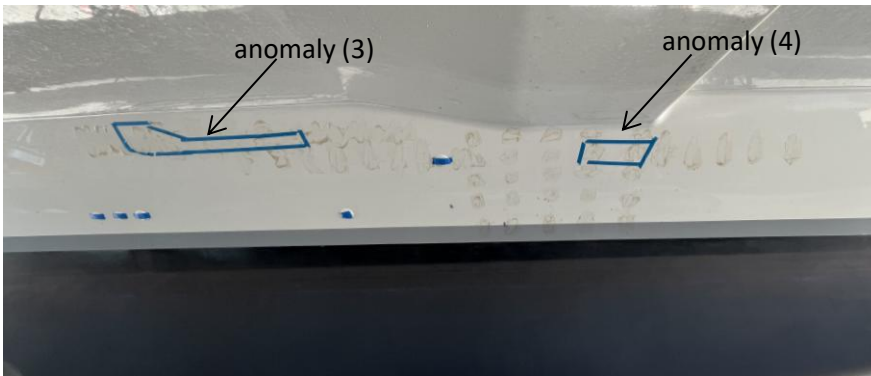
Picture 1 - overall view



Picture 2 - ref.



Picture 3 - US map #20 PS



Picture 4 - US map #20 SBD

Inspector	QA/QC	Third Party	Client
Name: ing. Stefano Grasso SNT-TC-1A 3rd level ISO9712 2nd level IWI CSWIP 3.1 	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Place/Date: Monfalcone, 06/07/2022	Date:	Date:	Date:



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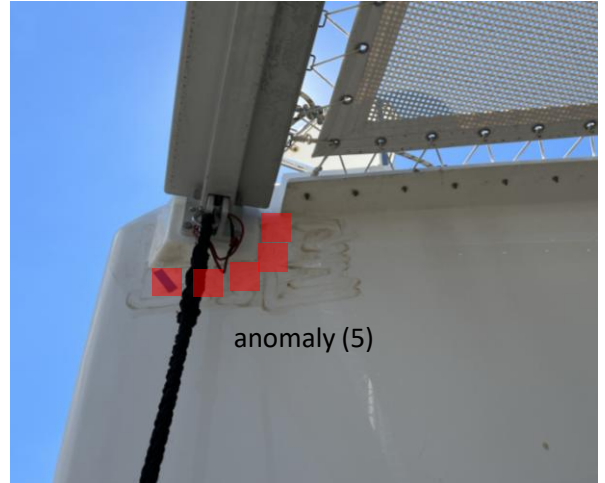
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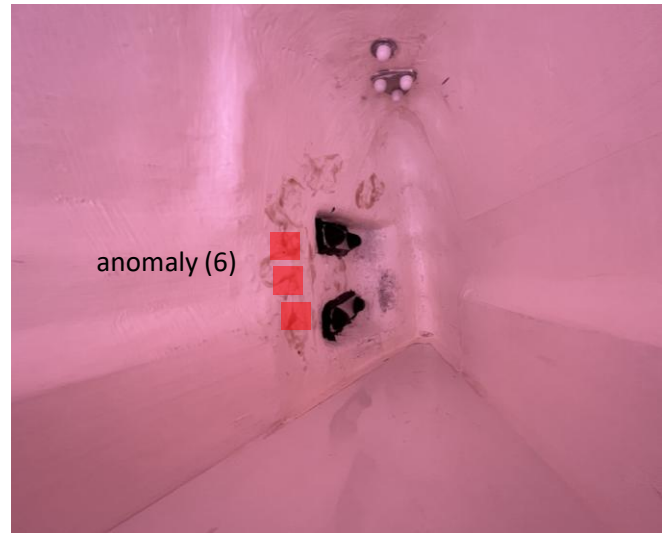
Picture 5 - detail #19



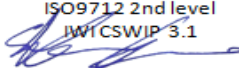
Picture 6 - US map #30 SBD



Picture 7 - US map #30 SBD



Picture 8 - US map #30 SBD

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Name: ing. Stefano Grasso SNT-TC-1A 3rd level ISO9712 2nd level IWI CSWIP 3.1 	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Place/Date: Monfalcone, 06/07/2022	Date:	Date:	Date:



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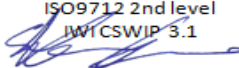
Picture 9 - US map #31 PS



Picture 10 - US map #31 PS



Picture 11 - US map #31 PS

Inspector	QA/QC	Third Party	Client
Name: ing. Stefano Grasso SNT-TC-1A 3rd level ISO9712 2nd level IWI/CSWIP 3.1 	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Place/Date: Monfalcone, 06/07/2022	Date:	Date:	Date:



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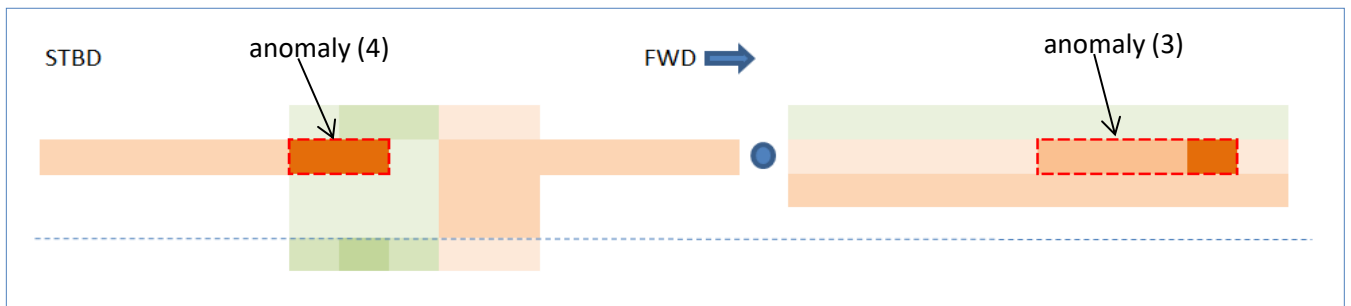
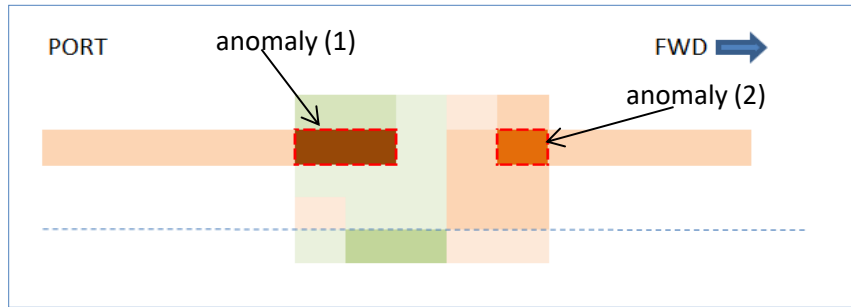
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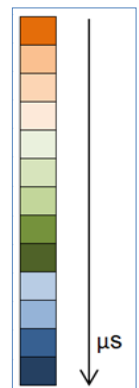


 : anomaly

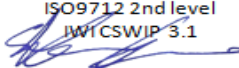
 : depth 1-2 mm

 : depth 2 mm

 : depth 2-3 mm



Acoustic matrix - hull PS & SBD internal laminate #20

Inspector	QA/QC	Third Party	Client
Name: ing. Stefano Grasso SNT-TC-1A 3rd level ISO9712 2nd level IWI CSWIP 3.1 	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Place/Date: Monfalcone, 06/07/2022	Date:	Date:	Date:



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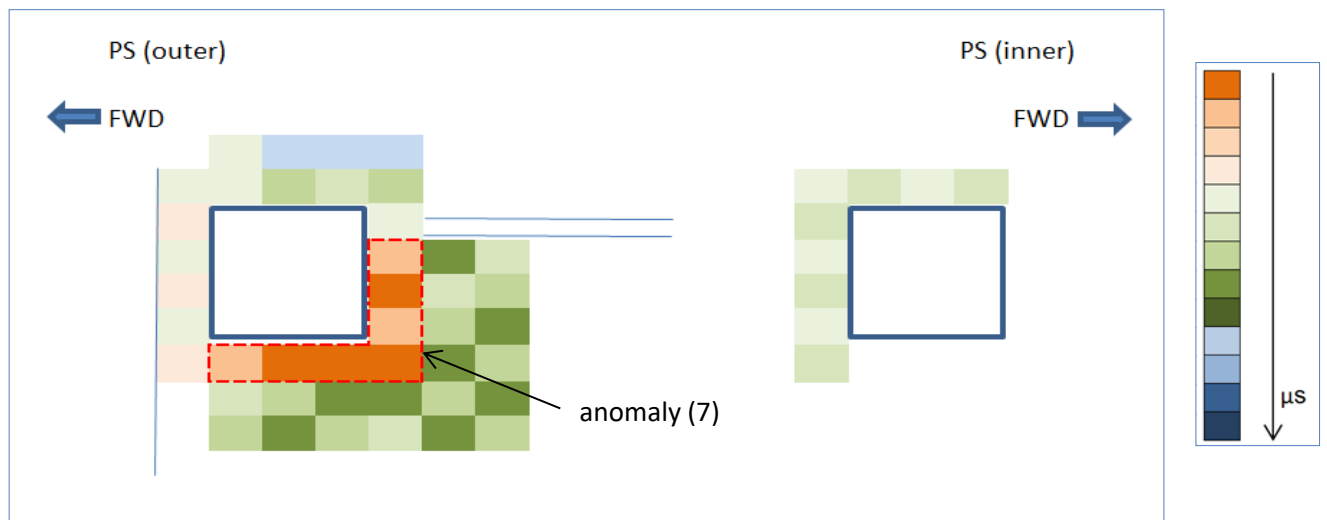
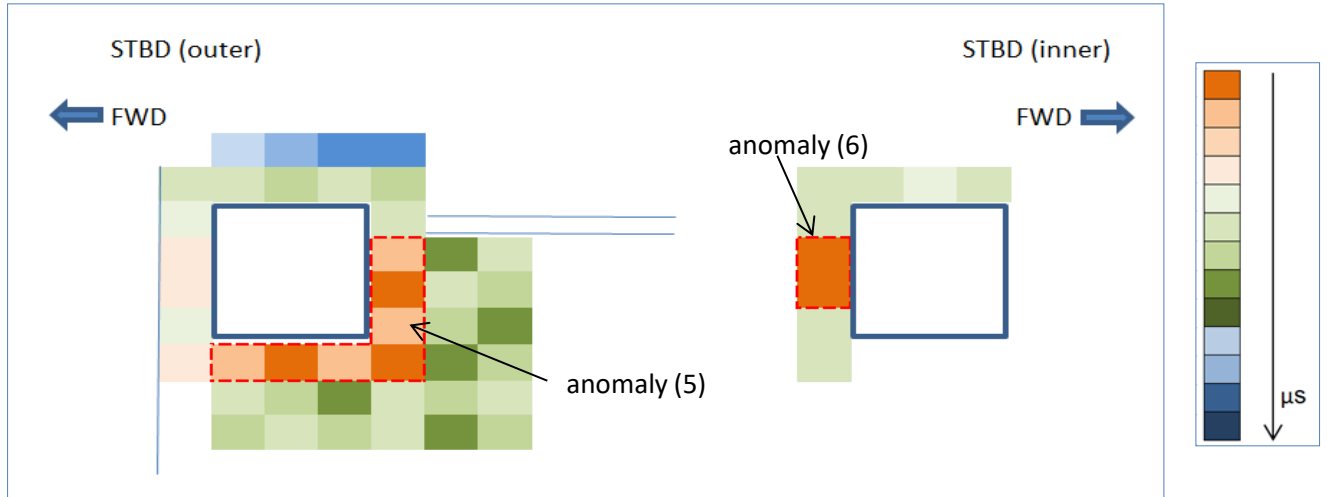
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- : anomaly
- : depth 2 mm
- : depth 2-3 mm

Acoustic matrix - hull PS & SBD laminate near beam support box #30 #31

Inspector	QA/QC	Third Party	Client
Name: ing. Stefano Grasso SNT-TC-1A 3rd level ISO9712 2nd level IWI CSWIP 3.1 	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Place/Date: Monfalcone, 06/07/2022	Date:	Date:	Date:



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RAPPORTO ESAME LIQUIDI PENETRANTI PENETRANT LIQUID EXAMINATION REPORT

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cliente MARINA MONFALCONE commessa LEOPARD 45 -
customer project
materiale esaminato #28 deck bow - cross beam support welds
examined material

riferimenti rif. doc. Pietro Carlet Liger Report - 9 Jun 2022 particolare 100% welds
reference item

procedura d'esame UNI EN ISO 3452-1 limiti di accettazione UNI EN ISO 23277 ed.2015 Level 2x
examination procedure examination procedure UNI EN ISO 10042 ed.2018 Level C

stato superficiale saldato molato lav. di macchina forgiato
surface condition welded ground machined forged
temperatura: 20-30 °C fuso sabbiato
test temperature casting sandblasted

tipo di liquido solubile in acqua rimovibili con solvente post emulsionabili
liquid type water-washable solvent-removable post-emulsifiable
metodo di rivelazione contrasto di colore luce di Wood
detection method colour contrast Wood light
 caratteristiche chimiche in accordo con : ASME sez. V art. 6 appendix II ediz. 2019
chemical analysis in compliance with

sgrassante Bio. Remover Solvente BC1 essiccazione
remover drying
penetrante C.G.M. Rotvel Avio B tempo 10'
penetrant time
solvente Bio. Remover Solvente BC1 tempo essiccazione/drying
cleaner time
rivelatore C.G.M. Rotrivel tempo 20'
developer time

esito dell'esame
examination result

#28:
nr. 3 (three) indications of cracks 3-4mm length at the weld seams end, have been detected.
The welding ends has not been closed correctly.
Not acceptable as per specification.

The detailed results and photo documents are shown in the following pages.

note
remarks

NDT Operator	QA/QC	Third Party	Client
Name: ing. Stefano Grasso SNT-TC-1A 3rd level ISO9712 2nd level IWTC SWIP 3.1 	Name:	Name:	Name:
Signature:	Signature:	Signature:	Signature:
Place/Date: Monfalcone, 06/07/2022	Date:	Date:	Date:



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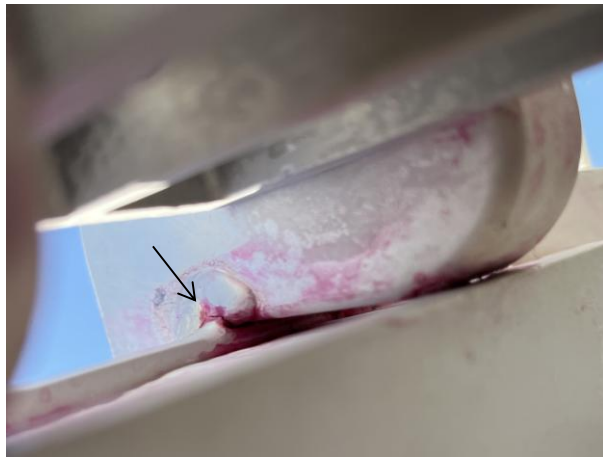
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esito dell'esame examination result



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Place/Date: Monfalcone, 06/07/2022	Date:	Date:	Date: