TEST REPORT

No. : QDIN2203001584ML
Date : Apr 06, 2022

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QDIN2203001584ML

CUSTOMER NAME: SHANGHAI G&T INDUSTRY CO., LTD

ADDRESS: ROOM 1005, NO.95 WEST BEIJING ROAD HUANGPU DISTRICT SHANGHAI CHINA

Sample Name	:	HEX BOLT/HEX NUT/WASHER ASTM F468 NI625
Product Specification	:	M33*220
Heat No.	:	Bolt: 221-0083 Nut: 221-0083 Washer: 221-0094
Manufacturer	:	SHANGHAI G& T INDUSTRY CO., LTD
Buyer	:	Dragages Hong Kong Limited

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

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Date of Receipt	:	Mar 31, 2022
Testing Start Date	:	Mar 31, 2022
Testing End Date	:	Apr 06, 2022
Test result(s)	:	For further details, please refer to the following page(s) (Unless otherwise stated the results shown in this test report refer only to the sample(s) tested)

Signed for
SGS-CSTC Standards Technical Services (Qingdao) Co., Ltd.

Rose wang

Rose wang
Authorized signatory

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1.Chemical composition analysis:

Test method: OES

Element	C	S	P	Al	Co	Fe	Mn
Req., wt%	≤0.10	≤0.015	≤0.015	≤0.40	≤1.00	≤5.0	≤0.50
Result-1-1, wt%	0.04	0.001	0.002	0.03	0.01	4.2	0.34
Result-2-1, wt%	0.04	0.001	0.002	0.04	0.02	4.2	0.34
Result-3-1, wt%	0.04	0.001	0.002	0.04	0.02	3.2	0.36
Result-1-2, wt%	0.05	0.001	0.002	0.03	0.02	3.5	0.34
Result-2-2, wt%	0.04	0.001	0.002	0.04	0.02	4.2	0.35
Result-3-2, wt%	0.03	0.001	0.002	0.05	0.03	2.3	0.21
Result-1-3, wt%	0.04	0.001	0.002	0.03	0.04	3.1	0.30
Result-2-3, wt%	0.05	0.001	0.002	0.04	0.03	3.1	0.26
Result-3-3, wt%	0.03	0.001	0.002	0.05	0.02	2.3	0.19
Result-1-4, wt%	0.07	0.001	0.002	0.03	0.02	4.5	0.35
Result-2-4, wt%	0.06	0.001	0.002	0.02	0.02	4.6	0.31
Result-3-4, wt%	0.06	0.001	0.002	0.02	0.02	4.6	0.32

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Element	Cr	Ti	Mo	Nb	Ni	Si	Con.
Req., wt%	20.0~23.0	≤0.40	8.0~10.0	3.2~4.2	≥58.0	≤0.50	-
Result-1-1, wt%	23.0	0.17	9.2	3.7	58.7	0.13	Pass
Result-2-1, wt%	23.0	0.17	9.2	3.7	58.8	0.15	Pass
Result-3-1, wt%	21.9	0.12	8.8	3.5	61.5	0.19	Pass
Result-1-2, wt%	22.2	0.11	8.9	3.4	60.9	0.22	Pass
Result-2-2, wt%	23.0	0.16	9.1	3.7	58.8	0.15	Pass
Result-3-2, wt%	21.6	0.13	8.9	3.4	62.9	0.15	Pass
Result-1-3, wt%	22.2	0.14	8.9	3.5	61.3	0.16	Pass
Result-2-3, wt%	22.0	0.11	9.1	3.6	61.3	0.17	Pass
Result-3-3, wt%	21.9	0.14	8.9	3.6	62.5	0.16	Pass

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Element	Cr	Ti	Mo	Nb+Ti	Ni	Si	Con.
Req., wt%	20.0~23.0	≤0.40	8.0~10.0	3.15~4.15	≥58.0	≤0.50	-
Result-1-4, wt%	21.9	0.08	8.6	3.6	60.5	0.16	Pass
Result-2-4, wt%	21.8	0.07	8.6	3.5	60.7	0.14	Pass
Result-3-4, wt%	21.8	0.07	8.6	3.5	60.7	0.13	Pass

Note: The results-1-1,2-1,3-1, comply with the requirement of ASTM F468M-06(2018) Alloy 625, the results-1-2,2-2,3-2,1-3,2-3,3-3 comply with the requirement of ASTM F467M-06a (2018) Alloy 625, the results-1-4,2-4, 3-4 comply with the requirement of ASTM B443-19 N06625.

2. Tensile Test:

Test Method: ASTM E8/E8M-21

Test item	Specimen type	Tensile strength (MPa)	Yield strength (0.2% offset) (MPa)	Elongation after fracture (%) *G*=4*D*	Con.
Req.	-	≥825	≥415	≥30	-
Result-1-1	Round specimen	870	440	54	Pass
Result-2-1		890	450	51	Pass
Result-3-1		860	425	55	Pass

Note: The results comply with the requirement of ASTM F468M-06(2018) Alloy Ni625.

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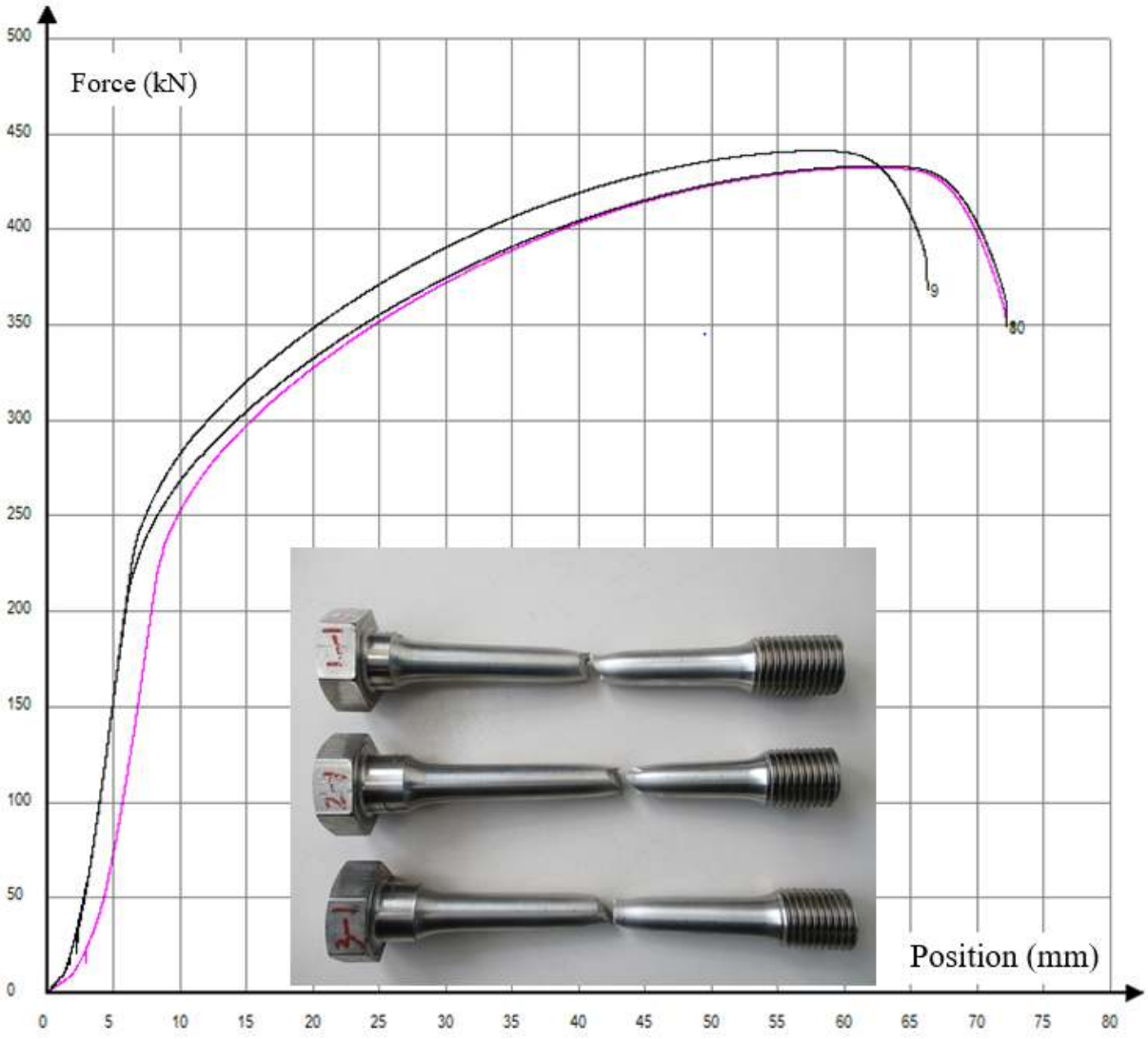

Fig.1 Force-Position curve

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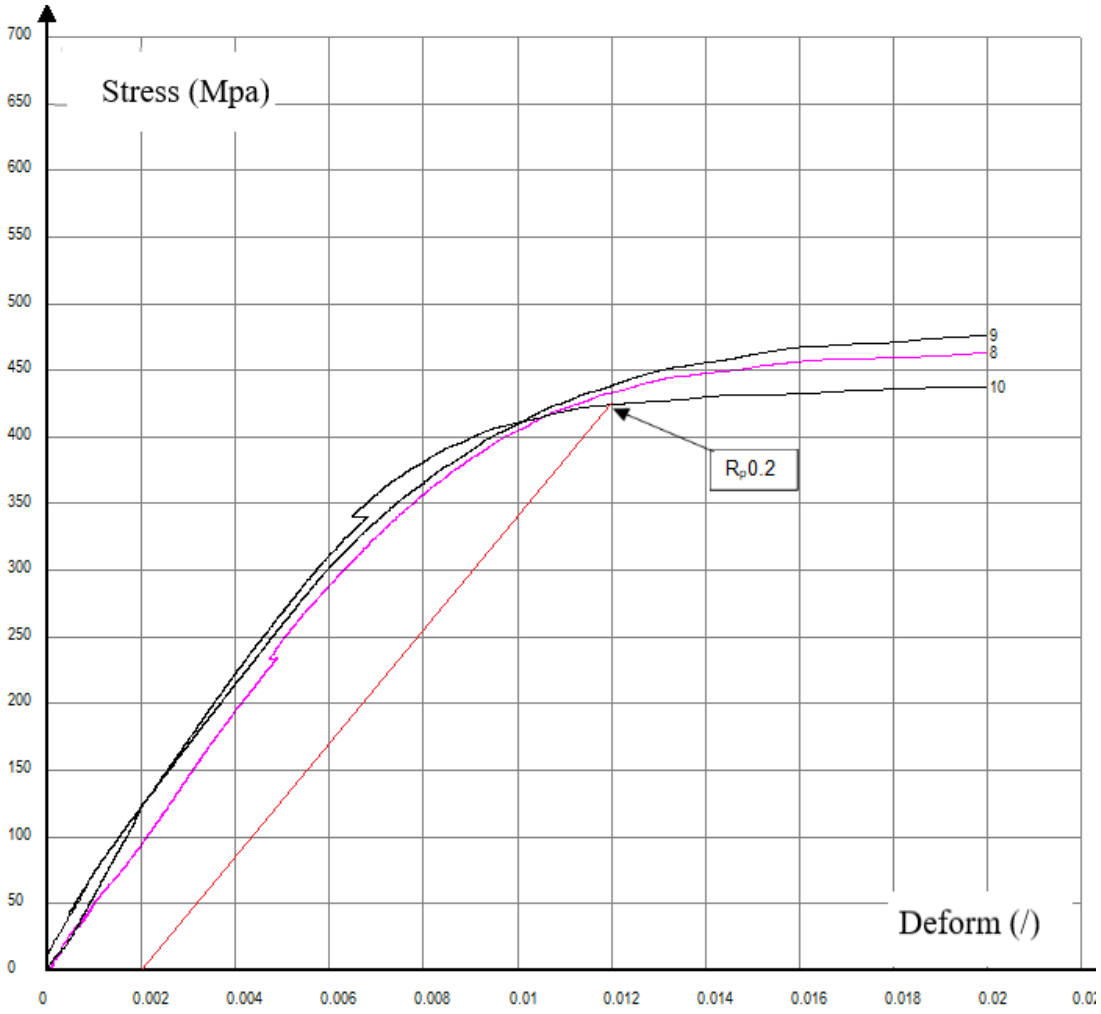

Fig.2 Stress-Deform $R_{p0.2}$ curve

TEST REPORT

3. Rockwell Hardness Test:

Test Method: ASTM E18-20

Test item	Sample	Test position	Result				Average	Average requirement	Con.
HRBW	Nut -1-2	Surface	97.5	97.6	97.4	97.1	97.4	85HRB~ 35HRC	Pass
HRBW	Nut -2-2		98.3	97.7	97.4	98.6	98.0		Pass
HRBW	Nut -3-2		96.0	94.8	95.6	94.4	95.2		Pass
HRC	Nut -1-3		26.1	28.0	27.5	27.6	27.3		Pass
HRBW	Nut -2-3		98.9	98.1	99.0	98.9	98.7		Pass
HRC	Nut -3-3		27.7	28.3	28.9	26.5	27.8		Pass

Note: The results- Nut comply with the requirement of ASTM F467M-06a (2018) Alloy Ni 625.

Test Method: ASTM E18-20

Test item	Sample	Test position	Result			Req.	Con.
HRBW	Bolt -1-1	R/2	94.2	94.2	93.8	85HRB~ 35HRC	Pass
	Bolt -2-1		90.4	91.8	93.9		Pass
	Bolt -3-1		90.5	92.5	92.9		Pass

Note: The results- Bolt comply with the requirement of ASTM F468M-06(2018) Alloy Ni 625.

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Test Method: ASTM E18-20

Test item	Sample	Test position	Result			Req.	Con.
HRC	Washer- 1-4	Surface	23.4	23.9	23.4	85HRB~ 35HRC	Pass
	Washer-2-4		22.8	23.0	22.4		Pass
HRBW	Washer-3-4		98.0	98.8	99.1		Pass

Note: The results- Washer comply with the client's requirement.

4. Proof Load Test:

Test Method: ASTM F606/F606M-21

Test requirements: Assemble the nut on a threaded test mandrel. Apply a specified axial proof load to the nut and hold for 15 s. The nut shall resist this load without failure by stripping or rupture, and shall be removable from the test bolt by the fingers after the load is released. It is restricted to one half turn if using a manual wrench to remove the nut.

Sample	specifications	Proof stress (Mpa)	Result	Con.
1-2	M33	415	Removable by the fingers	Pass
2-2	M33	415	Removable by the fingers	Pass
3-2	M33	415	Removable by the fingers	Pass
1-3	M33	415	Removable by the fingers	Pass
2-3	M33	415	Removable by the fingers	Pass
3-3	M33	415	Removable by the fingers	Pass

Note: The results comply with the requirement of ASTM F467M-06a (2018) Alloy Ni 625.

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Sample photo

********End of report********

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