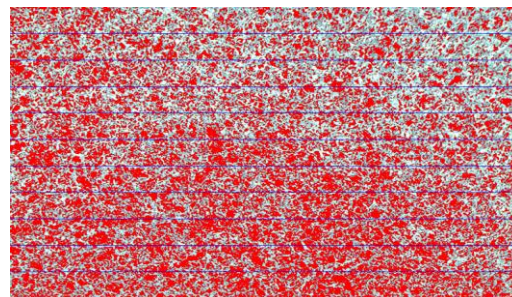


GPH ispat Ltd



Masjiddah, Kumira, Sitakunda, Chattogram, ,
Grain Size (Hayn Intercept) Analysis

Customer:		Mag: 100	Calibration: 1.61 $\mu\text{m}/\text{pixel}$
Date: 29-01-22		Area: 1236702	No of Fields: 1
Unit: microns			Supplier:
Specimen Name:	Specimen Id:		



ASTM Standard	E112
Avg Grain Size	9
Total Line Length(mm)	12.84
No. of Intercepts	872.5

Remarks

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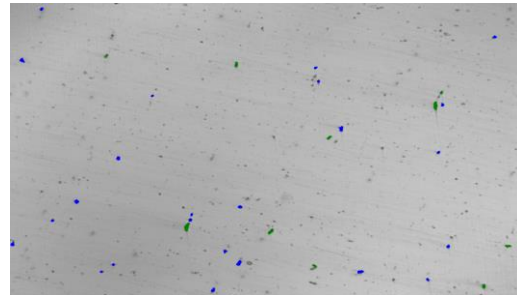
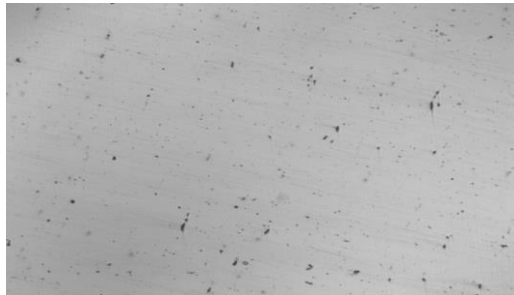
Seal and Signature

GPH ispat Ltd

Masjiddah, Kumira, Sitakunda, Chattogram, , , ,
Inclusion Analysis Report

YOU
LOG

Customer:					
Date:	18-02-21	Mag:	100	Calibration:	1.61 µm/pixel
Unit:	microns	Area:	1.24 sq mm	No of Fields:	1
Specimen Name:	Specimen Id:		Supplier:		



ASTM Standard		E45
Type	Thin	Thick
Type A	0	0
Type B	0	0
Type C	0	0.5
Type D	1	0.5

Over Sized Inclusions					
Type	Wid	Len	Type	Wid	Len

Remarks

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Seal and Signature

GPH ispat Ltd.

Masjiddah, Kumira, Sitakunda, Chattogram, Bangladesh

Quality Control Department

Manufacturer Test Certificate (MTC)



Party Name: Sarna Kutir Developers (Pvt.) Ltd.

Delivery Address: Bhuiyan Heritage, Panpatti, Cumilla.

Delivery No.: 8100023026

Ref No.: GPH-ISPAT/NP/QC/2022/SKDL/A-03

Transport No.: CM-DHA-81-3222

Tension, Bend, Re-Bend & Chemical Test of MS Deformed Bars

Frog Mark: GPH QUANTUM / B500CWR 10,16

Date: 10-02-2022

SL. No.	Heat No.	Nominal Bar Diameter, D	Nominal Cross-Sectional Area Under Test	Actual Diameter	Actual Mass Per Unit Length	Mechanical Properties								Chemical Properties (Product Analysis)						Quality	
						Yield or Proof Load	Yield or Proof Strength (YS)	Tensile Load	Tensile Strength (TS)	TS/YS	%Elongation at Maximum Force, A _{gt}	%Elongation After Fracture, A	Bend Test	Re-Bend Test	C	Si	Mn	P	S		CE
		(mm)	(mm ²)	(mm)	(kg/m)	(KN)	(MPa)	(KN)	(MPa)		(GL=200 mm)	(GL=5D)			%	%	%	%	%	%	
Requirement as per Standard: BDS ISO 6935-2:2016							500 min.		-	1.15 min.	7.0 min.	14.0 min.			0.24 max.	0.65 max.	1.66 max.	0.058 max.	0.058 max.	0.55 max.	
1	Q22E100763	10	78.54	9.91	0.605	42	540	50	641	1.19	9.6	23.5	Satisfactory	Satisfactory	0.21	0.31	1.05	0.025	0.041	0.45	OK
2	Q22E100776	10	78.54	9.86	0.599	46	580	53	675	1.16	9.0	23.5	Satisfactory	Satisfactory	0.21	0.28	1.04	0.024	0.040	0.45	OK
3	Q22E100776	10	78.54	9.81	0.593	44	561	51	654	1.17			Satisfactory	Satisfactory							OK
4	Q22E100776	10	78.54	9.84	0.596	45	570	52	664	1.16			Satisfactory	Satisfactory							OK
5	Q21E105750	16	201.06	15.90	1.557	115	572	135	672	1.17	8.7	21.0	Satisfactory	Satisfactory	0.20	0.25	0.87	0.021	0.031	0.41	OK
6	Q21E105750	16	201.06	15.88	1.553	113	561	134	667	1.19			Satisfactory	Satisfactory							OK
7	Q21E105750	16	201.06	15.88	1.554	112	555	133	660	1.19			Satisfactory	Satisfactory							OK

This is to certify that Tensile properties, Bend, Re-Bend & Chemical Test results of above mentioned Rebars conform to the requirements of BDS ISO 6935-2:2016 (Grade B500CWR).

Strength is based on nominal cross-sectional area.

Conversion factor : 1 N/mm² = 1 Mpa= 145 psi = 10.197 kg/cm²

CE = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15

Manufacturing Route: QEAF → LRF → CCM → DHR → QST

BDS ISO 6935-2:2016 Standard (Tables - 2,8,9: Mass per Unit Length, Permissible Deviations & Mandrel Diameters used for Bend and Re-bend Test)										
Nominal Dia, D (mm)	8	10	12	16	20	25	28	32	40	50
Nominal Mass per Unit Length, (kg/m)	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86	15.42
Tolerance (%)	±8	±6	±6	±5	±5	±4	±4	±4	±4	±4
Mandrel Dia, (mm) for Bend Test	3D	3D	3D	3D	6D	6D	6D	6D	7D	7D
Mandrel Dia, (mm) for Re-Bend Test	5D	5D	5D	5D	8D	8D	10D	10D	10D	10D

[Signature]

Shift In-Charge (QC)
GPH ispat Ltd.

Quality Control Department
GPH Ispat Limited
Masjiddah, Kumira, Shitakunda
Chattogram.

[Signature]

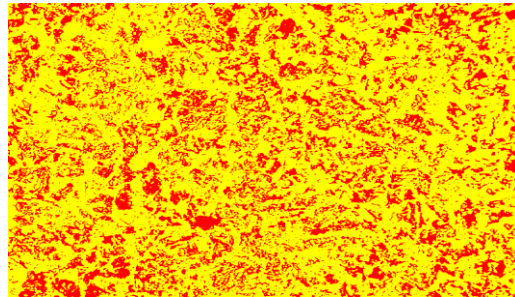
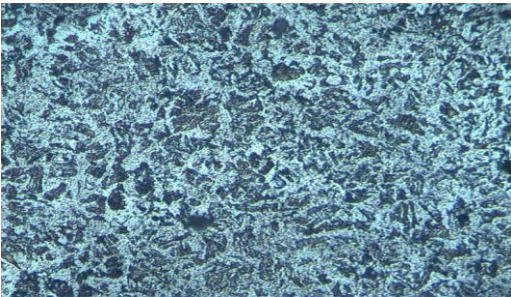
Sr. Manager (QC)
GPH ispat Ltd.

GPH ispat Ltd

Masjiddah, Kumira, Sitakunda, Chattogram, ,
Phases Microstructure Analysis Report

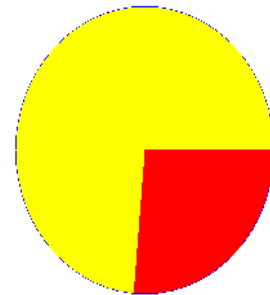


Customer:					
Date:	23-12-21	Mag:	500	Calibration:	.33 µm/pixel
Unit:	microns	Area:	50763	No of Fields:	1
Specimen Name:	Specimen Id:		Supplier:		



Phase data		
Element	Area	Area%
Pearlite	13399	26.4
Ferrite	37364	73.6

■ Pearlite - 26.4 %
■ Ferrite - 73.6 %



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Seal and Signature



Rib Measurement Test Report

Heat No. Q22E100127 Operator Md. Shimul Testing date: 01/14/2022
 Sample No 19 EN ISO 15630-1:2019 / Simpson formula

Row	Diameter		Rib Height			Rib dist. c (mm)	Inclination		Row dist. e (mm)	Head width (mm)	Rib length (mm)	Long.rib. Height (mm)	Relative rib area f _R
	Nom. (mm)	Real (mm)	Center (mm)	1/4 Pnts (mm)	3/4 Pnts (mm)		Alpha (°)	Beta (°)					
1	20.0	20.15	1.71	1.34	1.37	11.1	71	69	2.40	1.70	31.1	0.72	0.099
2			1.71	1.34	1.35	11.0	58	68	2.35	1.80	31.3	0.72	
Mean			1.71	1.34	1.36	11.1	64.5	69	Σ: 4.75	1.75	RL.W	0.72	+76.8 %

Europe: EN ISO 15630-1:2019

Rod material

$$f_R = \left(2a_{1/4} + a_m + 2a_{3/4} \right) \left(\pi d - \Sigma e \right) \frac{1}{6 \pi d c}$$

Where:

f_R Relative rib area
 a_{1/4} Height of the rib at 1/4 point
 a_m Centre height of the rib
 a_{3/4} Height of the rib at 3/4 point

e Ribless spacing between two rib rows
 d Nominal diameter
 c Centre to centre spacing of two ribs

Characteristic relative rib area - sheduled values:

Nominal bar size, d (mm)	Relative rib area
5 ≤ d ≤ 6	0.035
6 < d ≤ 12	0.040
d > 12	0.056