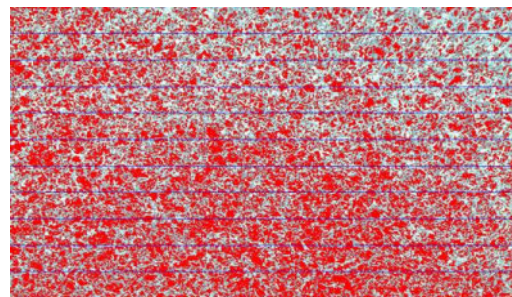


GPH ispat Ltd



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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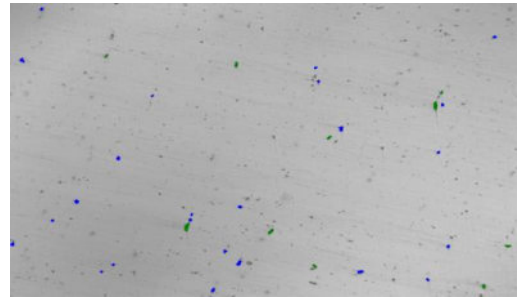
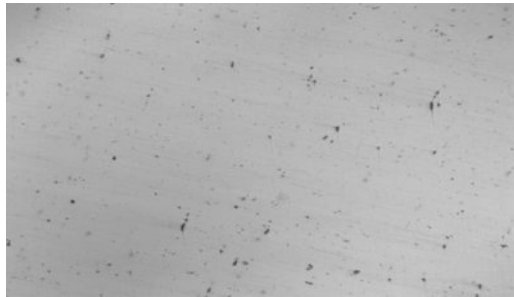
Seal and Signature

GPH ispat Ltd

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

YOU
LOG

Customer:			Mag: 100			Calibration: 1.61 $\mu\text{m}/\text{pixel}$		
Date: 18-02-21			Area: 1.24 sq mm			No of Fields: 1		
Unit: microns			Specimen Id:			Supplier:		
Specimen Name:								



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

--

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 (mm ²)	Actual Diameter (mm)	Actual Mass Per Unit Length (kg/m)	Mechanical Properties								Chemical Properties (Product Analysis)						Quality	
						Yield or Proof Load (KN)	Yield or Proof Strength (YS) (MPa)	Tensile Load (KN)	Tensile Strength (TS) (MPa)	TS/YS	%Elongation at Maximum Force, A _{gt} (GL=200 mm)	%Elongation After Fracture, A (GL=5D)	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]

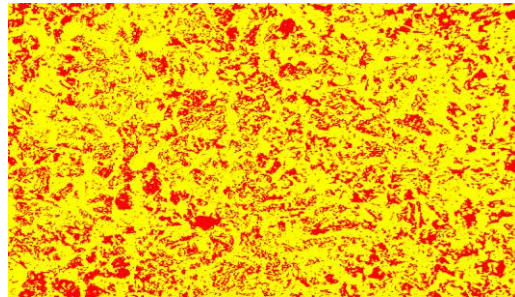
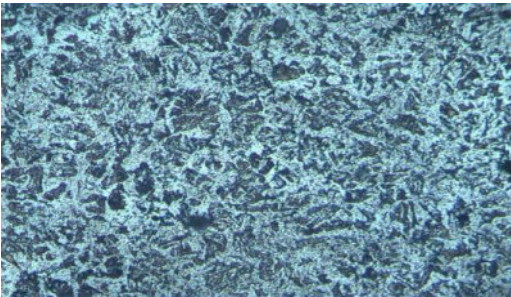
Sr. Manager (QC)
GPH ispat Ltd.

GPH ispat Ltd

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

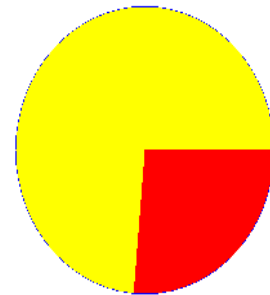


Customer:					
Date:	23-12-21	Mag:	500	Calibration:	.33 µm/pixel
Unit:	microns	Area:	50763	No of Fields:	1
Specimen Name:		Specimen Id:		Supplier:	



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

■ Pearlite - 26.4 %
■ Ferrite - 73.6 %



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

Operator:

Manager: