

LAMPIRAN

Lampiran 1 Mill Certificate Round Bar AISI 1020



SeAH Besteel Corp.
1-6, SORYONG-DONG, KUNSAN,
CHEONGBUK, KOREA(573-711)

MILL CERTIFICATE

TEL : +82-(0)63-460-8572, 8318(0A)
+82-(0)63-460-8114(Repres.)
FAX : +82-(0)63-460-8423 Page(0/0)
Size (in) : 1.8
Length (mm) : 6000
Weight (kg) : 60
Quantity(pcs) : 1

Date : 2017-04-20
Cert. No. : 201704-207465
Customer :
Heat No. : 269824
Steel Grade : AISI 1020
Shape of Product : ROUND BAR
Delivery Condition : As Rolled

Inspection Items	Chemical Composition (wt. %)				
	C	SI	MN	P	S
	x 100	x 100	x 100	x 1000	x 1000
Spec.	Min.	20	0.85	0.016	0.021
	Max.	24	1.067		
	Result	20	24	1.067	0.025
Inspection Items	Product Hardness (HB)				
	SURFACE				

Mechanical Properties AISI 1020

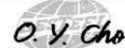
Mechanical Properties	Symbol	Steel
Yield strength (MPa)	S_y	245 - 300
Tensile strength (MPa)	S_t	420 - 440
Elongation (%)		27 - 30

<<Remarks>>

B/DS : 4

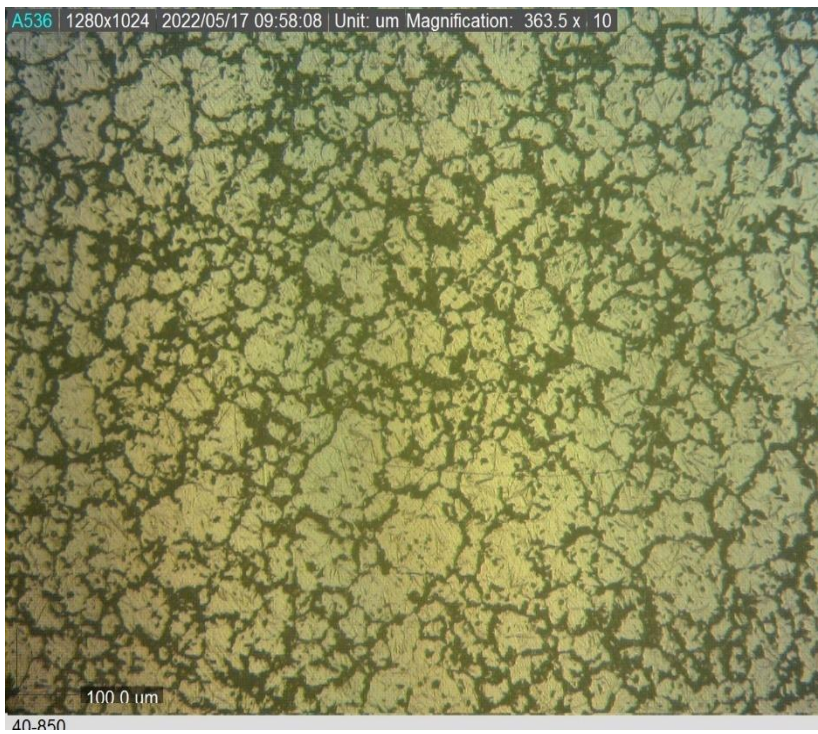
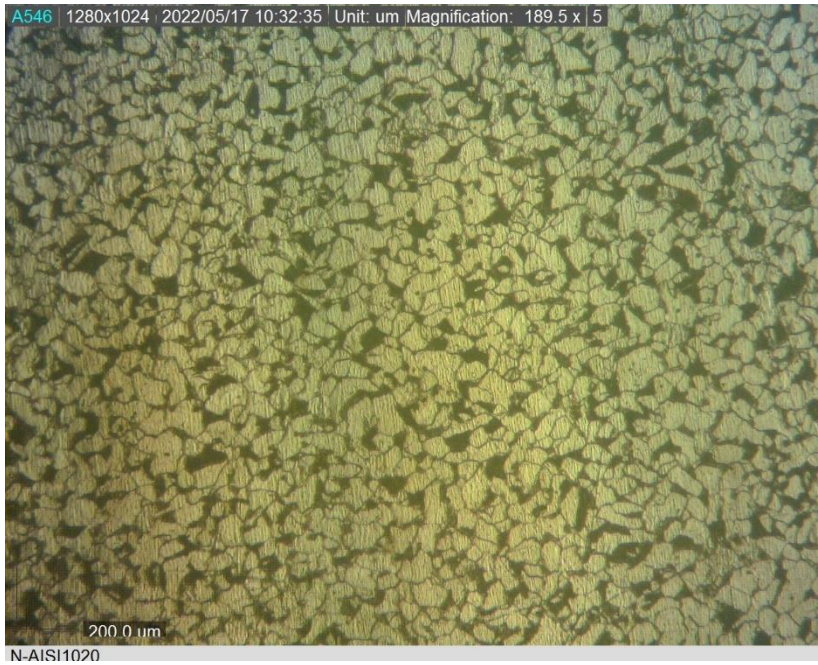
End of report

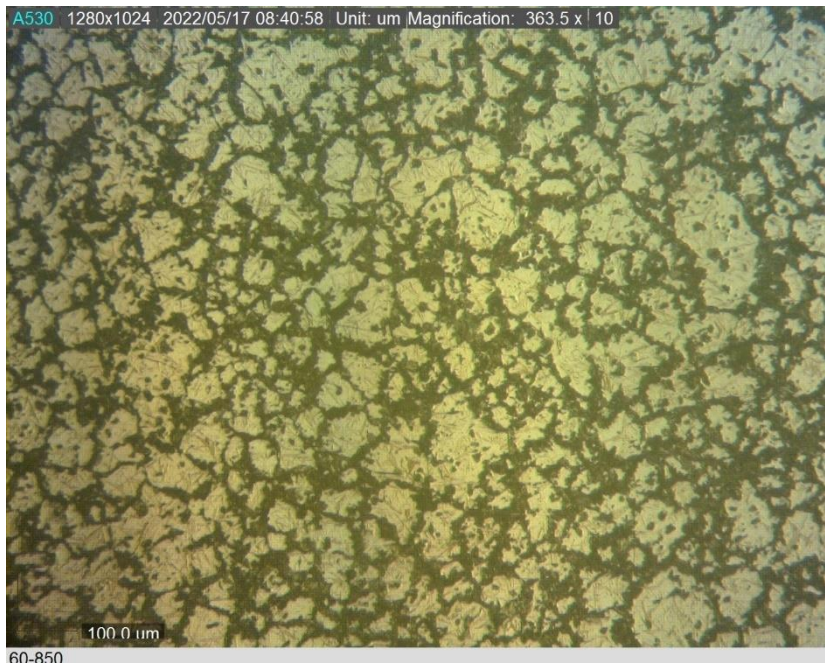
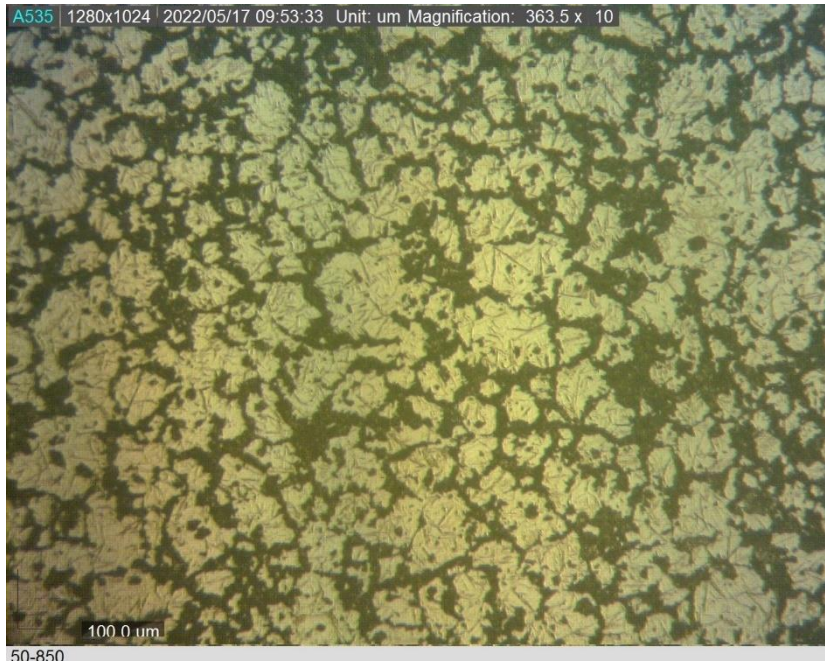
We hereby certify that the material described herein has been made in accordance with the rules of the contract.

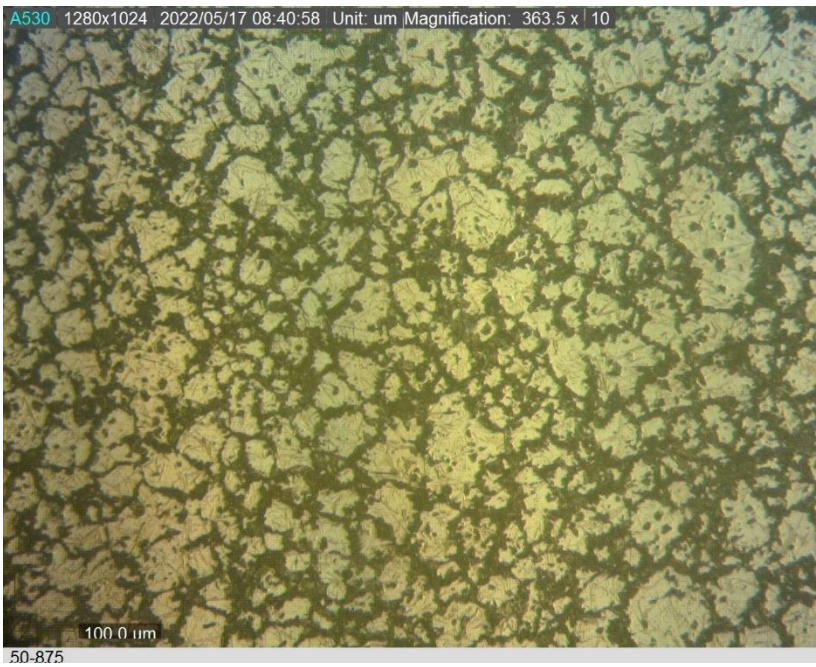
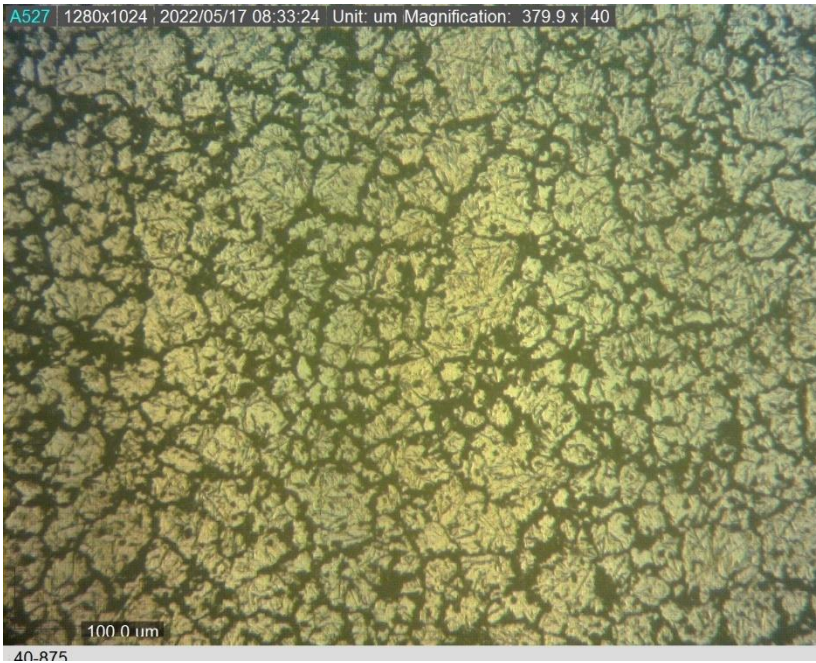
Certified by 
Manager of Quality Assurance Dept

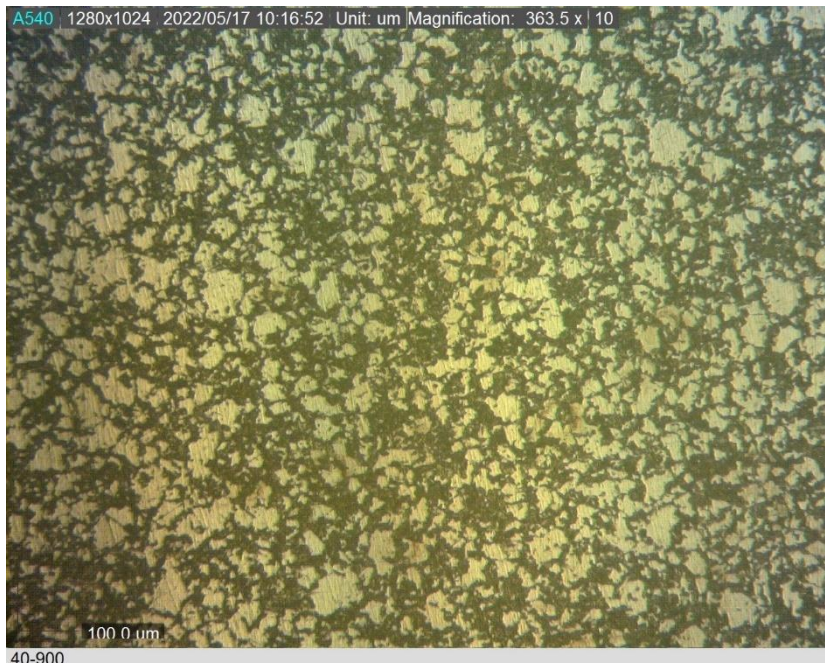
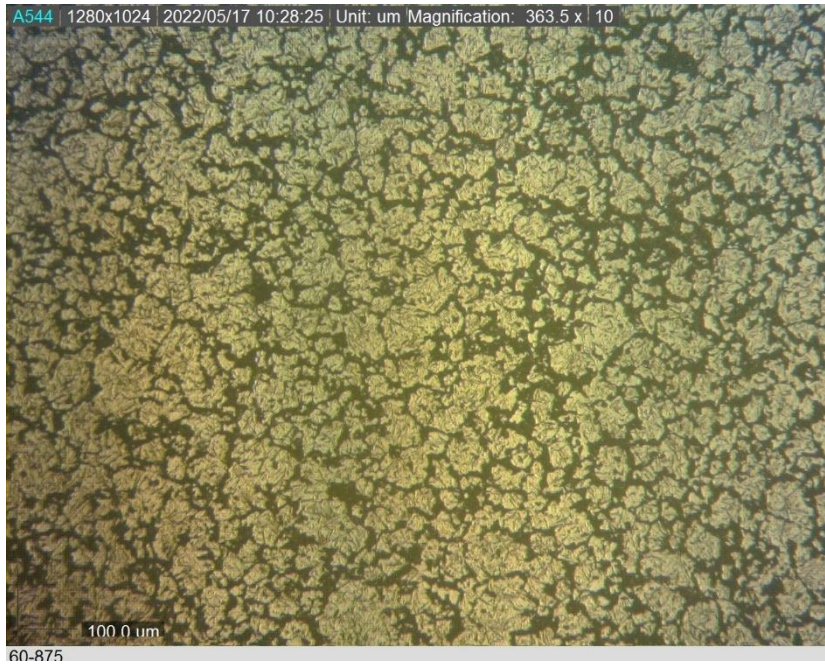
Lampiran 2

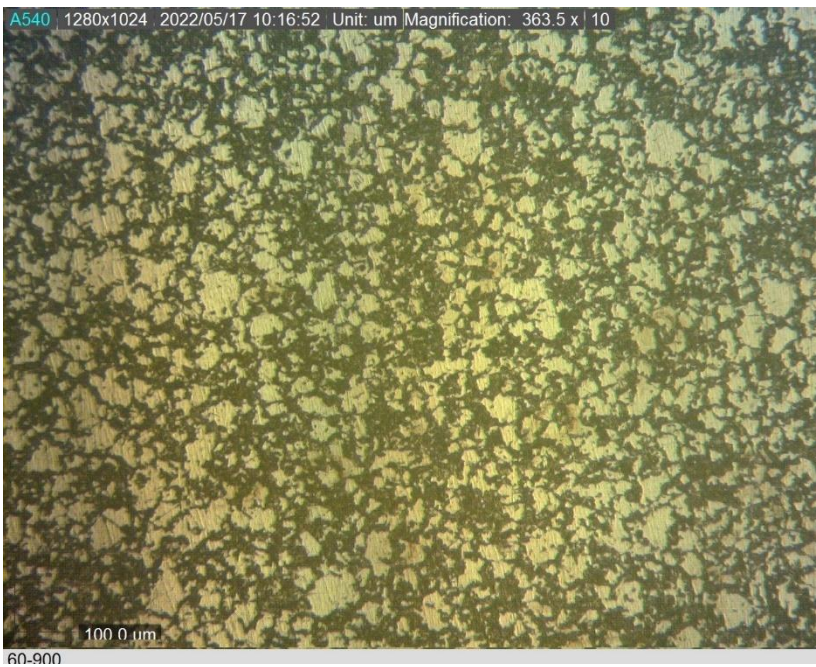
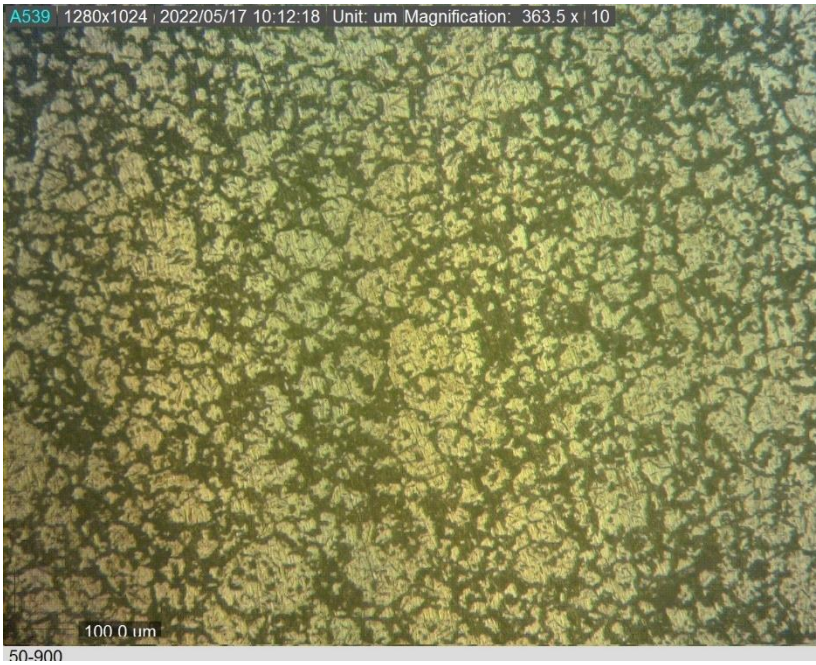
Hasil Analisa Struktur mikro menggunakan mikroskop





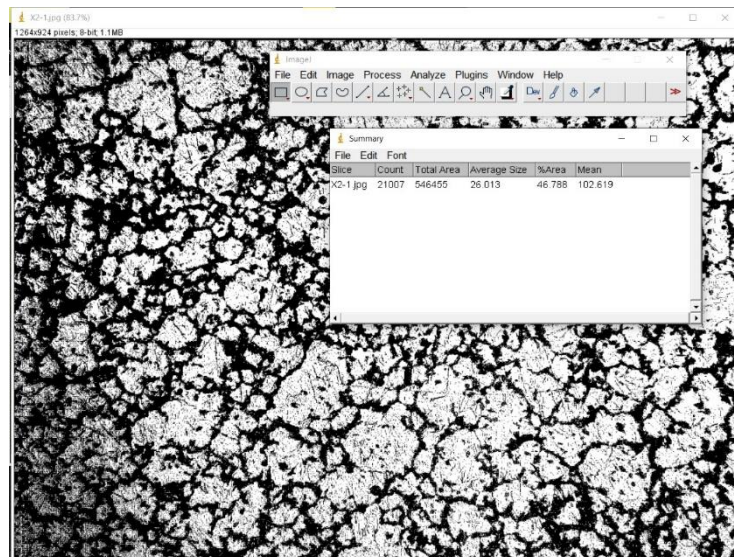
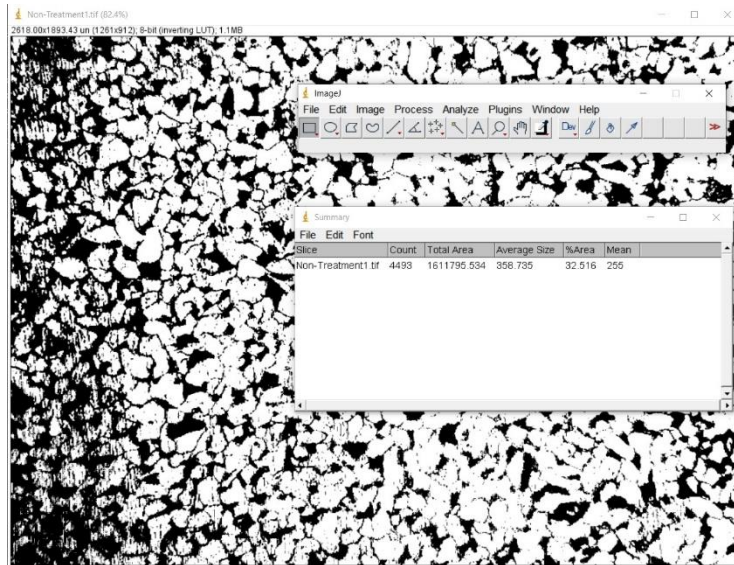


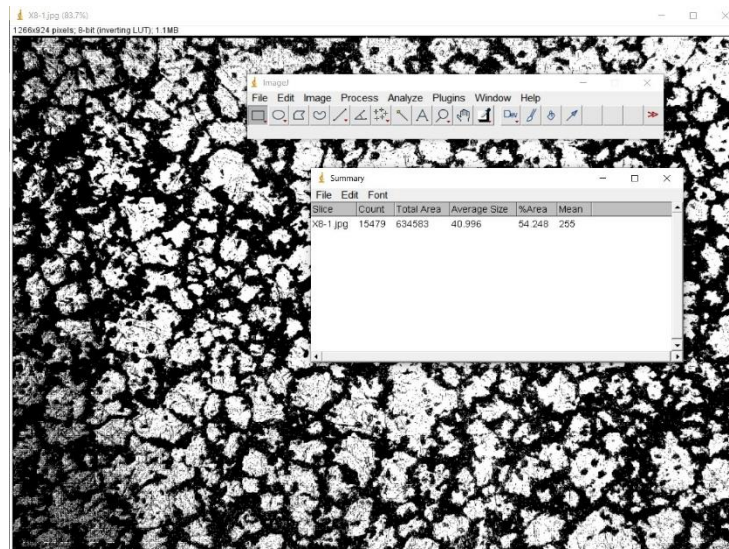
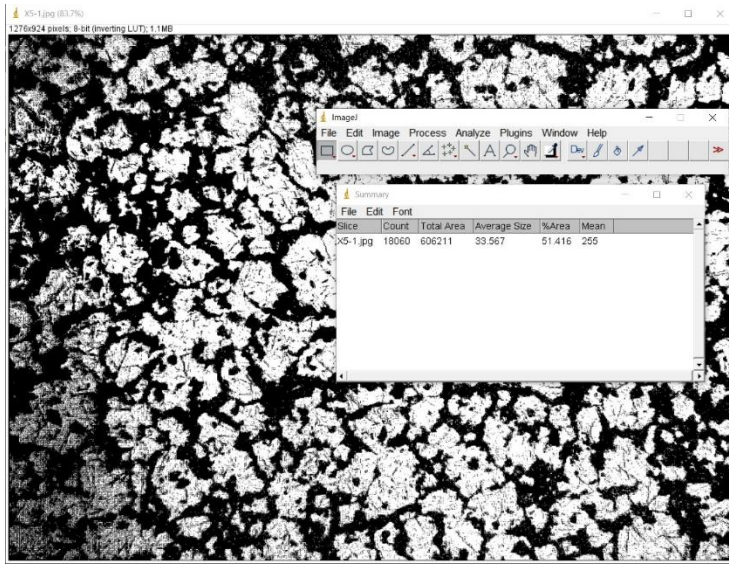


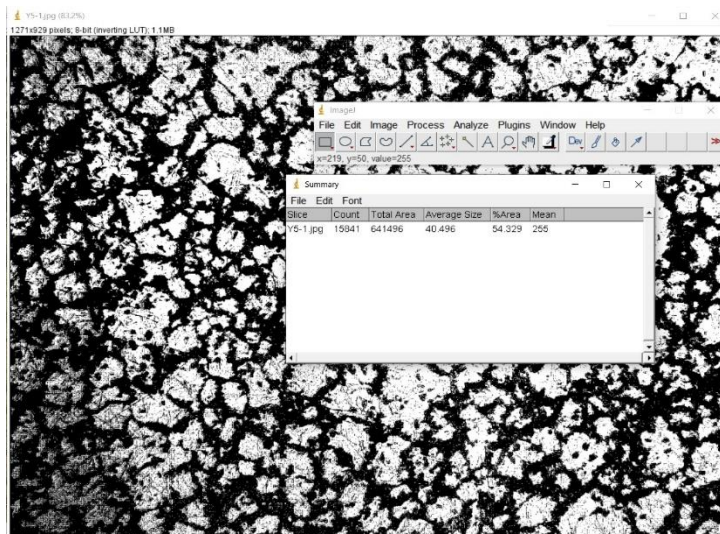
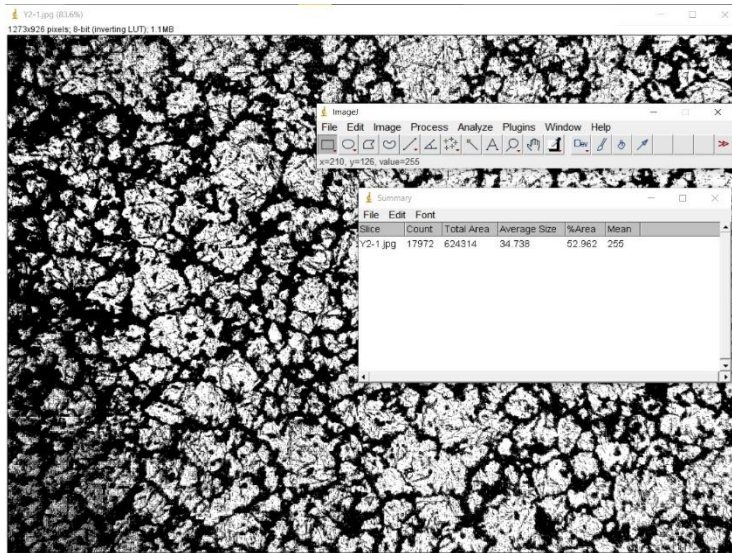


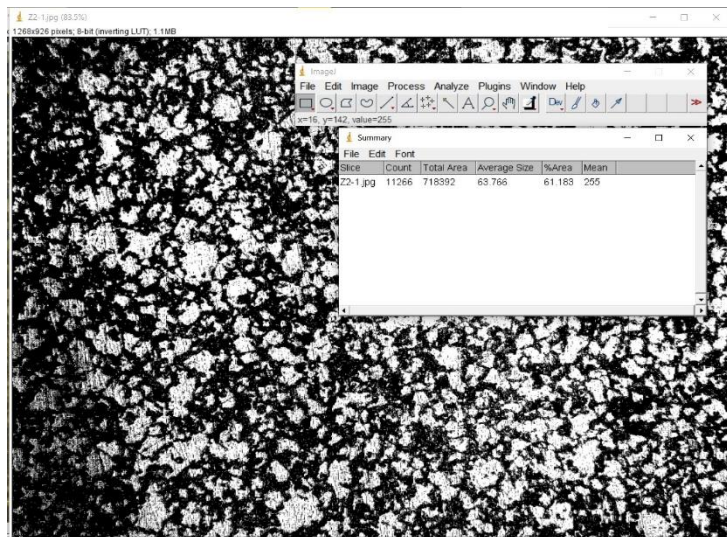
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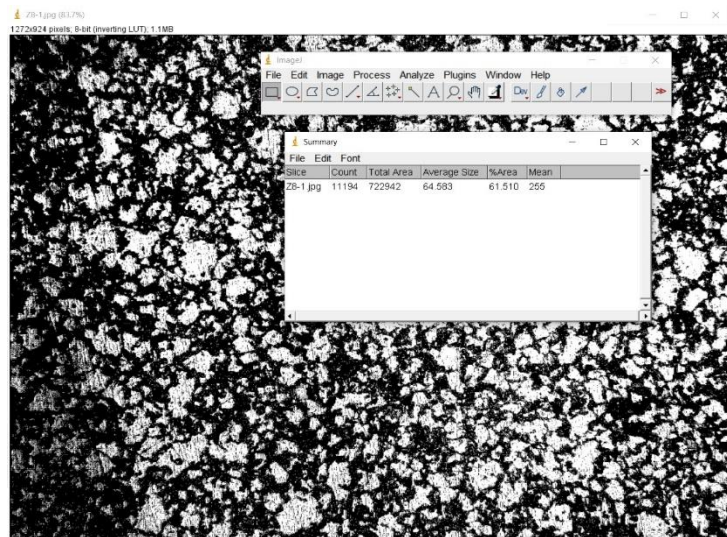
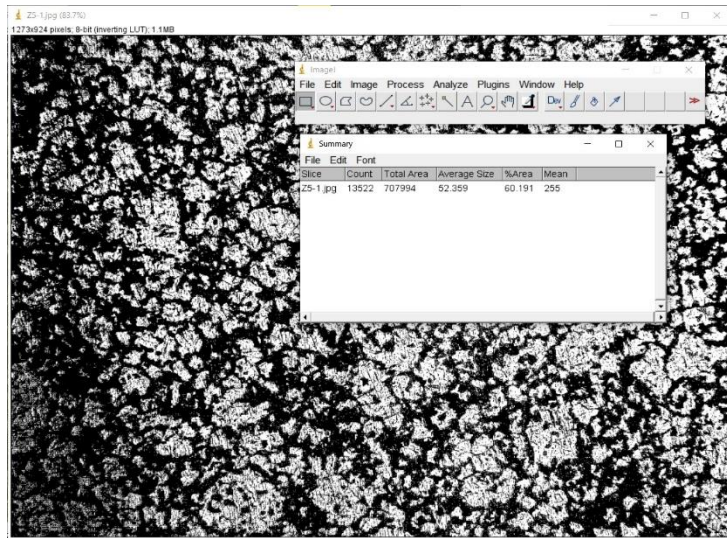
Hasil Analisa struktur mikro menggunakan ImageJ











Lampiran 4

Tabel hasil uji kekerasan HRC di lab UNESA

	Laboratorium Pengujian Bahan & Pelapisan Logam
	Jurusan Teknik Mesin - Fakultas Teknik
	Universitas Negeri Surabaya
Pengujian Kekerasan	
HRC (Hardness Rockwell C)	

SURAT KETERANGAN

Surabaya, 23 Mei 2022

Yth. Ketua Program Studi Teknik Mesin
Universitas 17 Agustus 1945 Surabaya
Di tempat

Dengan hormat,

Yang bersangkutan di bawah ini:

NO	NAMA	NBI
1	Addie Restu F.	1421600013
2	Septian Chandra P	1421600024

Telah melakukan Pengujian Kekerasan Rockwell C (HRC) di Laboratorium Pengujian Bahan Jurusan Teknik Mesin Universitas Negeri Surabaya.

Demikian surat keterangan ini. Atas perhatiannya, kami ucapkan terima kasih.

Surabaya, 23 Mei 2022

KaSubLab.

Pengujian Bahan & Pelapisan Logam


(Tri Hartutuk Ningsih)



	Laboratorium Pengujian Bahan & Pelapisan Logam Jurusan Teknik Mesin - Fakultas Teknik Universitas Negeri Surabaya
	Pengujian Kekerasan HRC (Hardness Rockwell C)

TABEL PENGUJIAN KEKERASAN (HRC)

Spesimen	Nilai kekerasan dan rata-rata (HRC)			
	Titik 1	Rata-rata	Titik 2	Rata-rata
O	29,1		29,4	
X1	33,4		38,4	
X2	33,25	33,35	37,1	37,9
X3	33,4		38,2	
X4	35,15		41,25	
X5	34,65	35,05	41,2	41,25
X6	35,35		41,3	
X7	35,44		42,2	
X8	35,25	35,29	42	42,01
X9	35,19		41,85	
Y1	34,25		42,6	
Y2	34,22	34,19	42,45	42,58
Y3	34,12		42,7	
Y4	35,15		43,2	
Y5	35,15	35,16	43,35	43,38
Y6	35,2		43,6	
Y7	42,62		43,85	
Y8	42,35	42,47	44,5	43,78
Y9	42,44		43	
Z1	41,35		53,2	
Z2	41,2	41,27	54	53,66
Z3	41,26		53,8	
Z4	41,18		53,65	
Z5	41,26	41,26	52,85	53,26
Z6	41,35		53,28	
Z7	42,16		54	
Z8	42,35	42,35	54,15	54,21
Z9	42,55		54,5	

Surabaya, 23 Mei 2022

KaSubLab.

31 Pengujian Bahan & Pelapisan Logam



 (Tri Hartutuk Ningsih, S.T., M.T.)

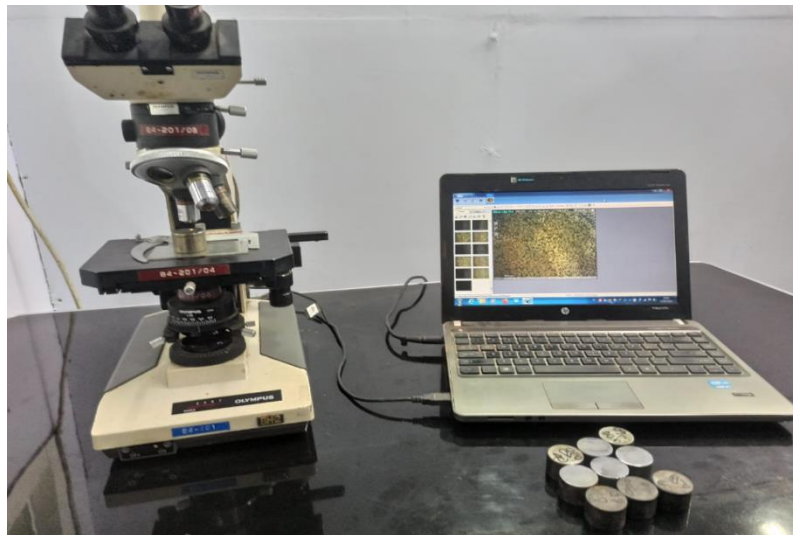
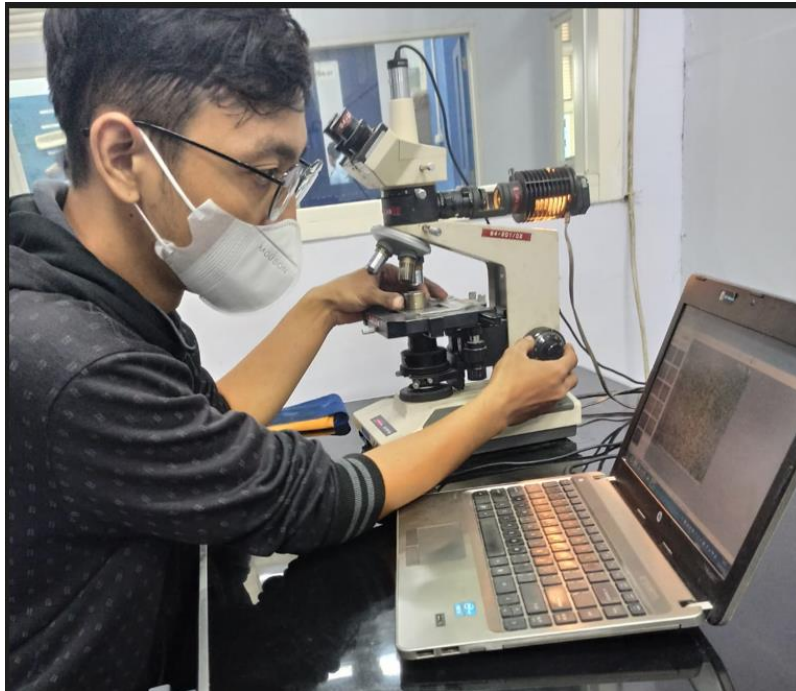
Lampiran 5
Foto Proses Pack Carburizing







Lampiran 6
Proses Pengamatan Struktur Mikro dan *case depth*



Lampiran 7
Proses Pengujian Kekerasan HRC



ANALISA PROSES PACK
CARBURIZING PADA RAW
MATERIAL AISI 1020 TERHADAP
KEKERASAN PERMUKAAN DAN
STRUKTUR MIKRO DENGAN
VARIASI TEMPERATUR DAN
HOLDING TIME
MENGUNAKAN MEDIA

Submission date: 03-Jul-2022 10:46PM (UTC+0700)

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Word count: 2900 by Addie Restu Firmansyah Septian Chandra Putra

Character count: 17242

PENDINGIN OLI

ANALISA PROSES PACK CARBURIZING PADA RAW MATERIAL AISI 1020 TERHADAP KEKERASAN PERMUKAAN DAN STRUKTUR MIKRO DENGAN VARIASI TEMPERATUR DAN HOLDING TIME MENGGUNAKAN MEDIA PENDINGIN OLI

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