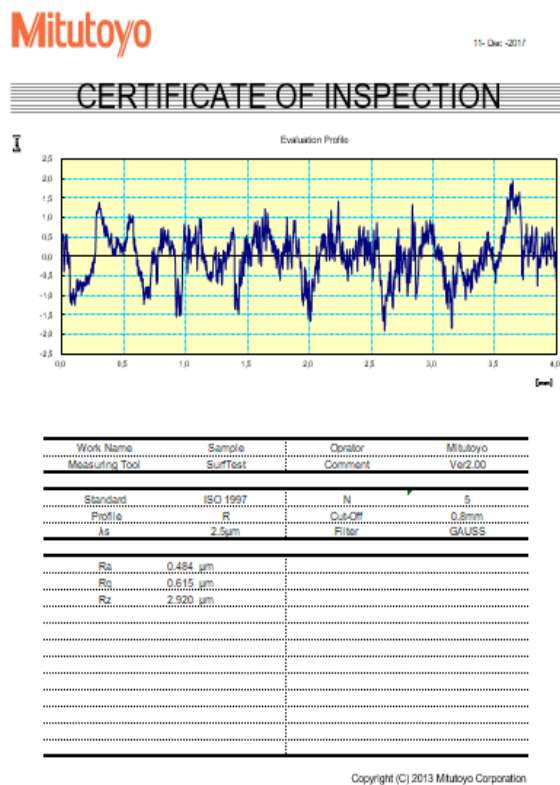
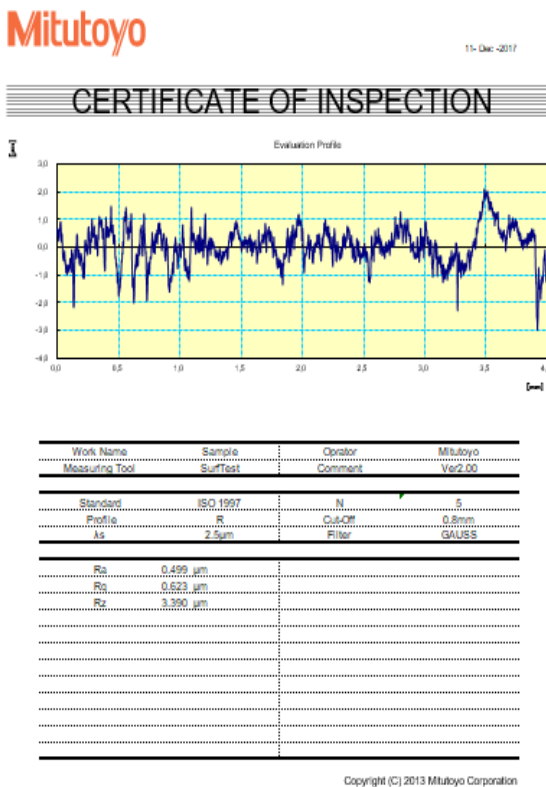
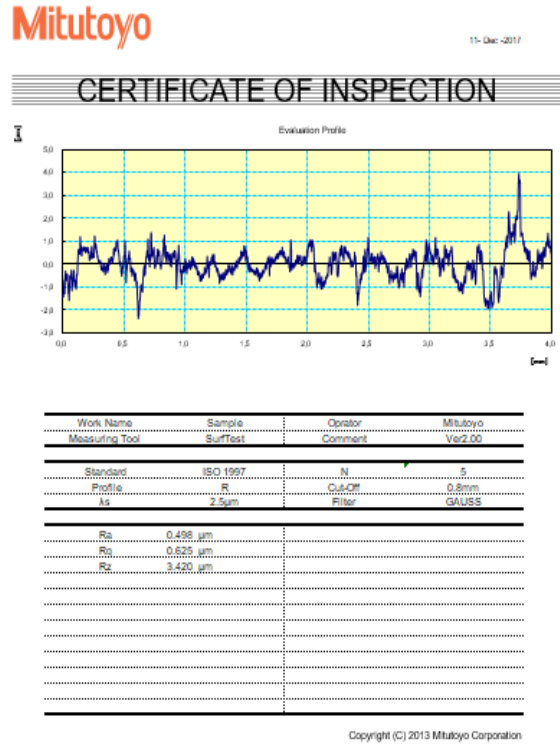
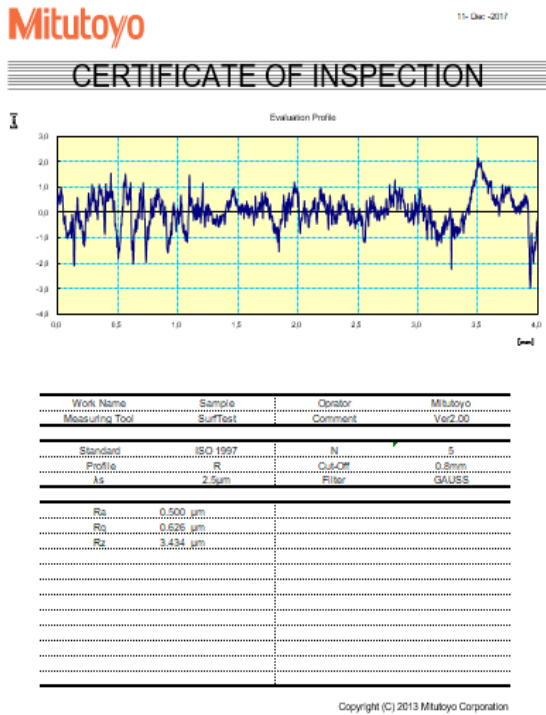


Lampiran 1

Data Hasil Kekasaran Permukaan pada *Spindle Speed* 700 rpm pada Proses *End Milling* Tanpa Menggunakan Magnet



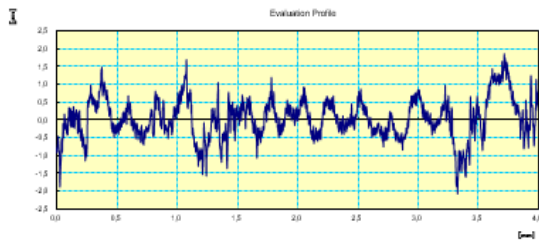
Lampiran 2

Data Hasil Kekasaran Permukaan pada *Spindle Speed* 900 rpm pada Proses *End Milling* Tanpa Menggunakan Magnet

Mitutoyo

11-Dec-2017

CERTIFICATE OF INSPECTION



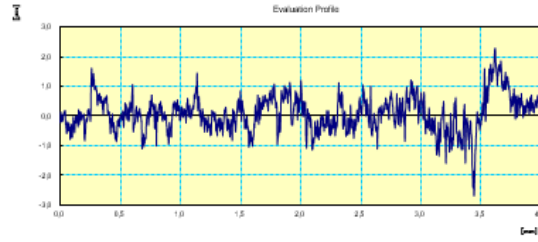
Work Name	Sample	Operator	Mitutoyo
Measuring Tool	SurfTest	Comment	Ver2.00
Standard	ISO 1997	N	S
Profile	R	Cut-Off	0.8mm
As	2.5μm	Filter	GAUSS
Ra	0.439 μm		
Rq	0.536 μm		
Rz	2.904 μm		

Copyright (C) 2013 Mitutoyo Corporation

Mitutoyo

11-Dec-2017

CERTIFICATE OF INSPECTION



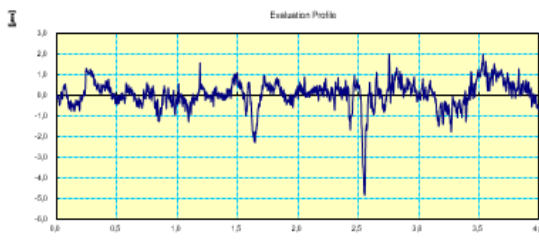
Work Name	Sample	Operator	Mitutoyo
Measuring Tool	SurfTest	Comment	Ver2.00
Standard	ISO 1997	N	S
Profile	R	Cut-Off	0.8mm
As	2.5μm	Filter	GAUSS
Ra	0.447 μm		
Rq	0.555 μm		
Rz	3.019 μm		

Copyright (C) 2013 Mitutoyo Corporation

Mitutoyo

11-Dec-2017

CERTIFICATE OF INSPECTION



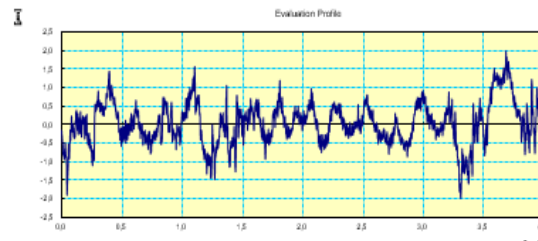
Work Name	Sample	Operator	Mitutoyo
Measuring Tool	SurfTest	Comment	Ver2.00
Standard	ISO 1997	N	S
Profile	R	Cut-Off	0.8mm
As	2.5μm	Filter	GAUSS
Ra	0.465 μm		
Rq	0.638 μm		
Rz	3.766 μm		

Copyright (C) 2013 Mitutoyo Corporation

Mitutoyo

11-Dec-2017

CERTIFICATE OF INSPECTION

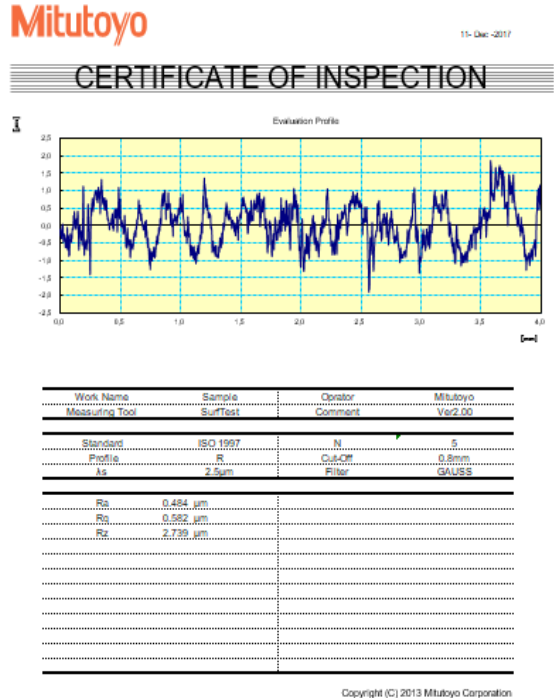
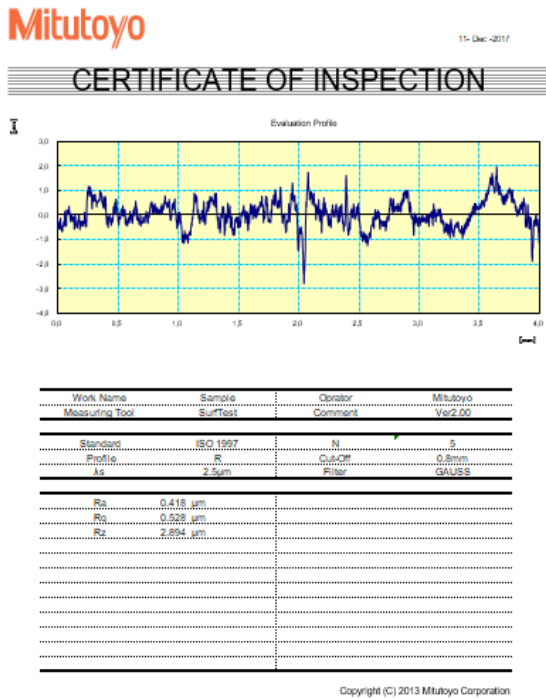
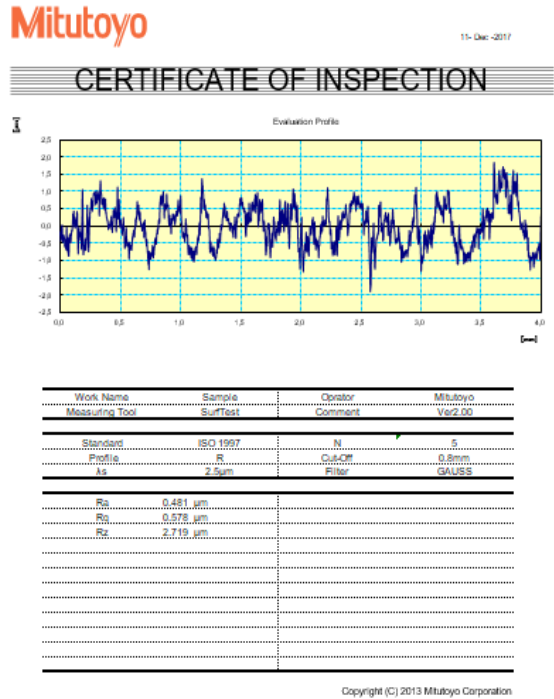
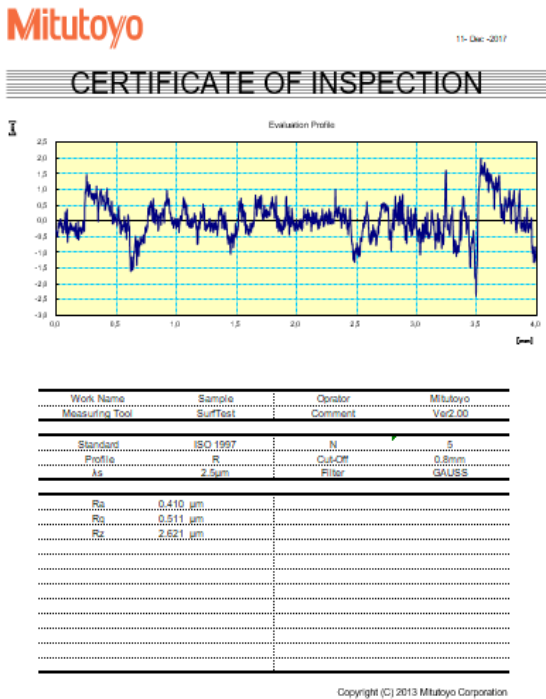


Work Name	Sample	Operator	Mitutoyo
Measuring Tool	SurfTest	Comment	Ver2.00
Standard	ISO 1997	N	S
Profile	R	Cut-Off	0.8mm
As	2.5μm	Filter	GAUSS
Ra	0.444 μm		
Rq	0.541 μm		
Rz	2.866 μm		

Copyright (C) 2013 Mitutoyo Corporation

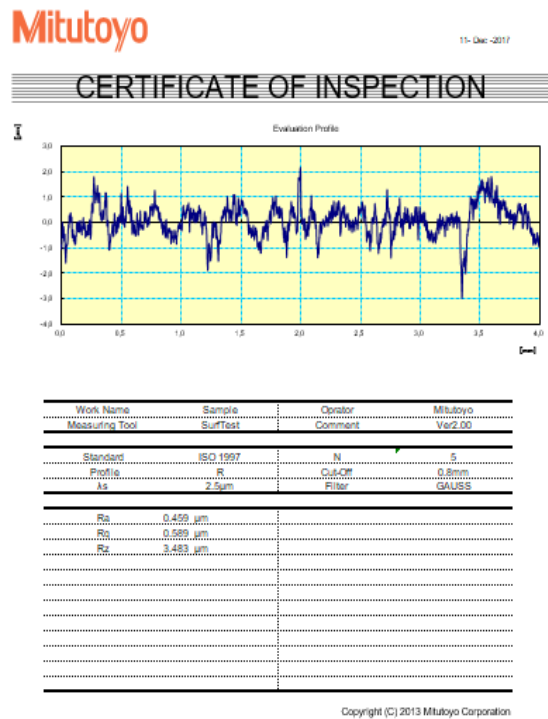
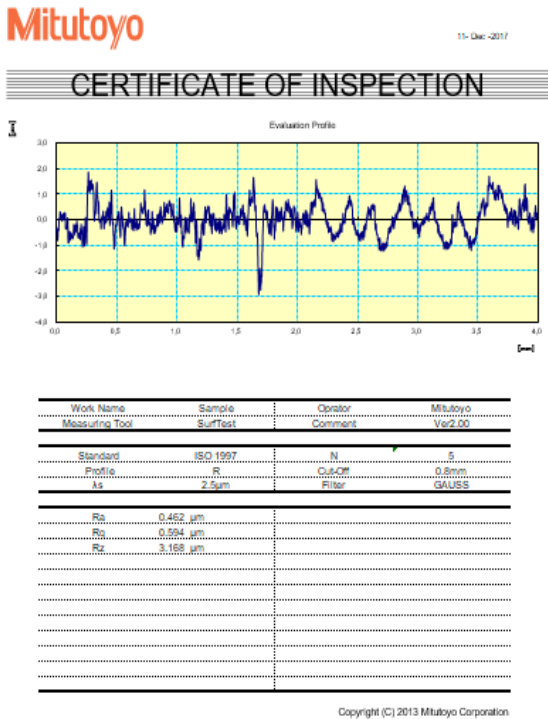
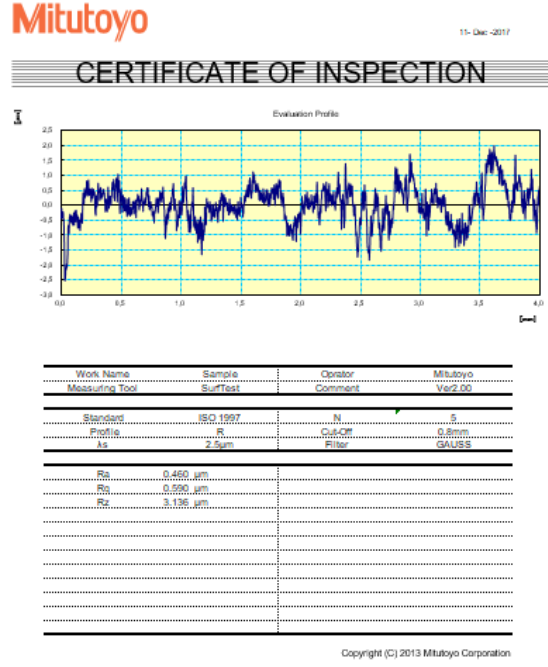
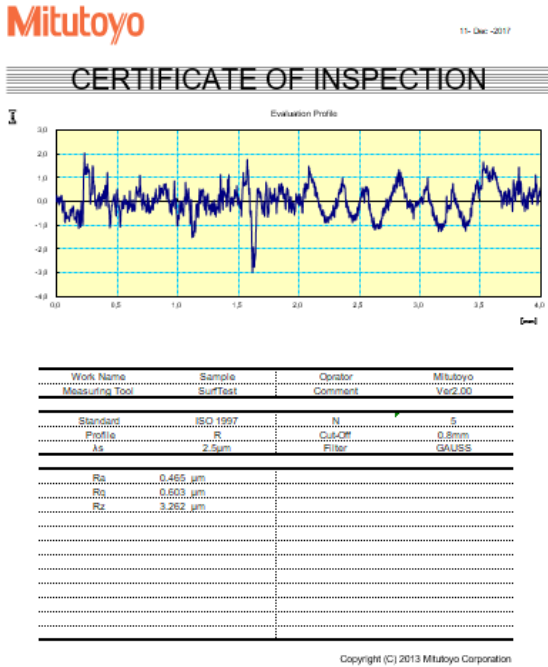
Lampiran 3

Data Hasil Kekasaran Permukaan pada *Spindle Speed* 1100 rpm pada Proses *End Milling* Tanpa Menggunakan Magnet



Lampiran 4

Data Hasil Kekasaran Permukaan pada *Spindle Speed* 700 rpm pada Proses *End Milling* Dengan Menggunakan Magnet



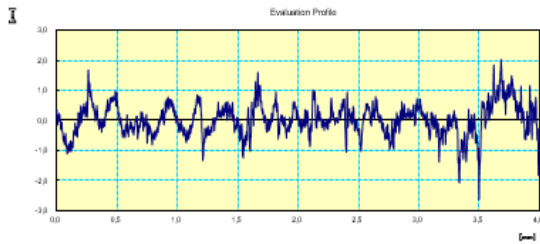
Lampiran 5

Data Hasil Kekasaran Permukaan pada *Spindle Speed* 900 rpm pada Proses *End Milling* Dengan Menggunakan Magnet

Mitutoyo

11- Dec -2017

CERTIFICATE OF INSPECTION



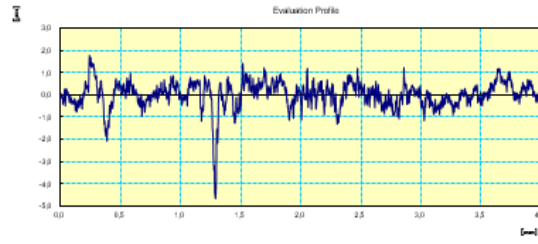
Work Name	Sample	Operator	Mitutoyo
Measuring Tool	SurfTest	Comment	Ver2.00
Standard	ISO 1997	N	S
Profile	R	Cut-Off	0.8mm
As	2.5µm	Filter	GAUSS
Ra	0.398 µm		
Rq	0.504 µm		
Rz	2.928 µm		

Copyright (C) 2013 Mitutoyo Corporation

Mitutoyo

11- Dec -2017

CERTIFICATE OF INSPECTION



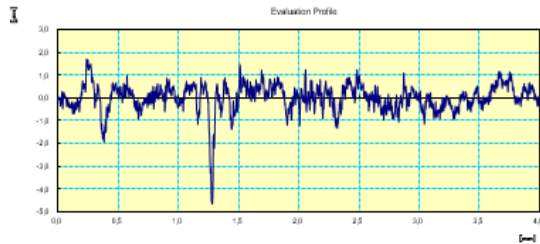
Work Name	Sample	Operator	Mitutoyo
Measuring Tool	SurfTest	Comment	Ver2.00
Standard	ISO 1997	N	S
Profile	R	Cut-Off	0.8mm
As	2.5µm	Filter	GAUSS
Ra	0.422 µm		
Rq	0.577 µm		
Rz	3.395 µm		

Copyright (C) 2013 Mitutoyo Corporation

Mitutoyo

11- Dec -2017

CERTIFICATE OF INSPECTION



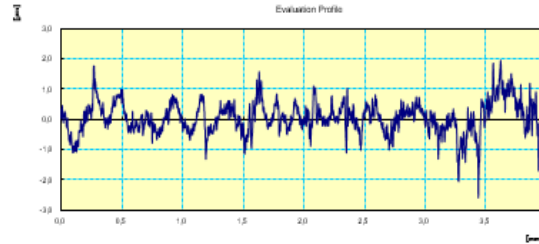
Work Name	Sample	Operator	Mitutoyo
Measuring Tool	SurfTest	Comment	Ver2.00
Standard	ISO 1997	N	S
Profile	R	Cut-Off	0.8mm
As	2.5µm	Filter	GAUSS
Ra	0.432 µm		
Rq	0.588 µm		
Rz	3.370 µm		

Copyright (C) 2013 Mitutoyo Corporation

Mitutoyo

11- Dec -2017

CERTIFICATE OF INSPECTION

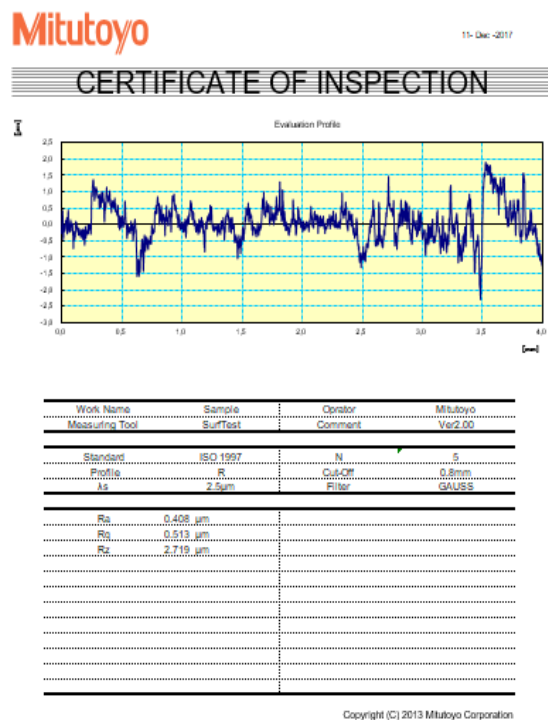
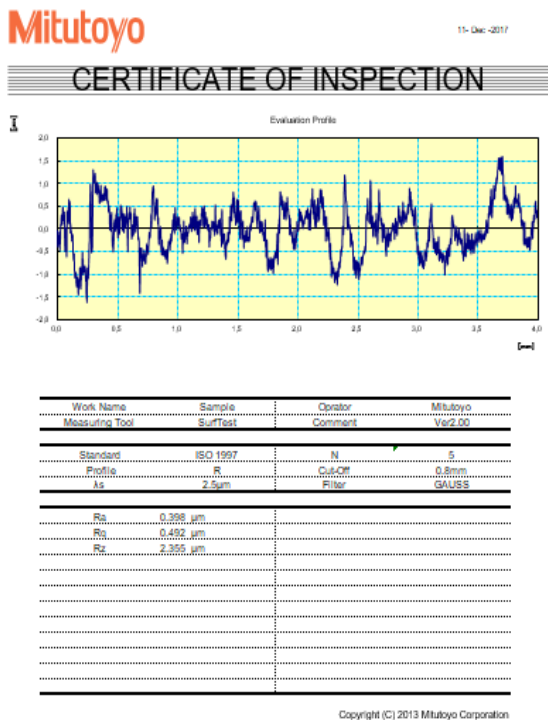
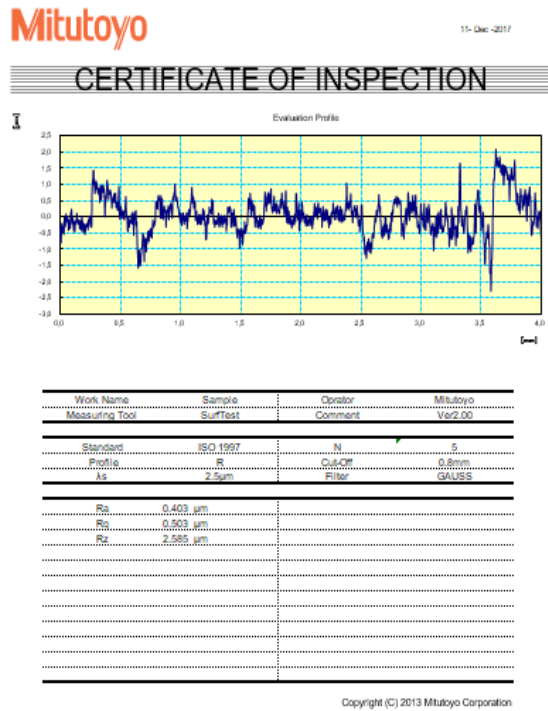
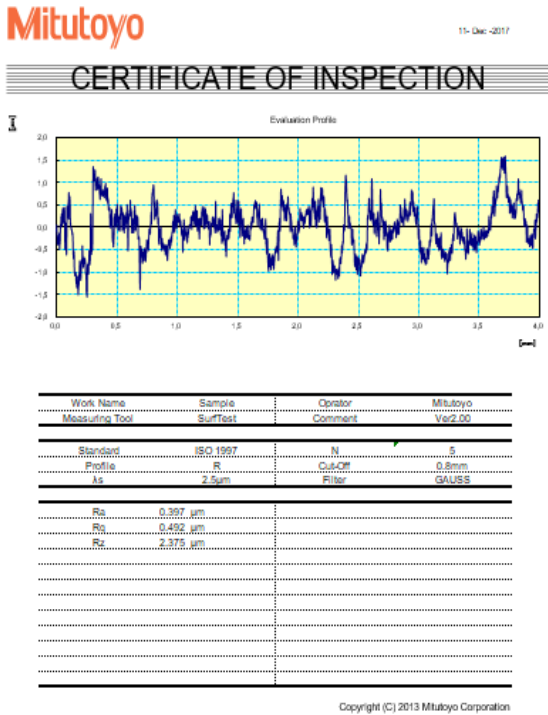


Work Name	Sample	Operator	Mitutoyo
Measuring Tool	SurfTest	Comment	Ver2.00
Standard	ISO 1997	N	S
Profile	R	Cut-Off	0.8mm
As	2.5µm	Filter	GAUSS
Ra	0.399 µm		
Rq	0.505 µm		
Rz	2.874 µm		

Copyright (C) 2013 Mitutoyo Corporation

Lampiran 6

Data Hasil Kekasaran Permukaan pada *Spindle Speed* 1100 rpm pada Proses *End Milling* Dengan Menggunakan Magnet



Lampiran 7

Sampel Data Simpangan Getaran pada *Spindle Speed* 700 rpm

Waktu	Tanpa Magnet	Dengan Magnet
00.40,2	-0,00033789	-0,00033789
00.40,2	0,00088281	0,00088281
00.40,2	0,00088281	-0,00033789
00.40,3	0,00088281	0,00088281
00.40,3	0,00454492	-0,00033789
00.40,4	0,00454492	-0,00033789
00.40,5	0,00454492	0,00088281
00.40,5	0,00454492	-0,00033789
00.40,5	0,00454492	-0,00033789
00.40,6	0,00454492	0,00088281
00.40,7	0,00332422	0,00088281
00.40,7	0,00332422	-0,00033789
00.40,8	0,00332422	0,00088281
00.40,8	0,00576562	0,00088281
00.40,9	0,00576562	-0,00033789
00.40,9	0,00576562	0,00454492
00.41,0	0,00576562	-0,00033789
00.41,0	0,00332422	0,00088281
00.41,1	0,00332422	-0,00033789
00.41,1	0,00332422	-0,00033789
00.41,1	-0,00033789	-0,00033789
00.41,2	0,00332422	-0,00033789
00.41,3	0,00332422	0,00088281
00.41,3	0,00332422	-0,00033789
00.41,3	0,00332422	-0,00033789
00.41,4	0,00210352	-0,00033789
00.41,5	0,00210352	0,00088281

00.41,5	0,00210352	-0,00033789
00.41,6	0,00210352	-0,00033789
00.41,6	0,00210352	0,00088281
00.41,6	0,00210352	0,00088281
00.41,7	0,00210352	-0,00033789
00.41,7	0,00088281	0,00088281
00.41,8	0,00210352	0,00088281
00.41,8	0,00210352	0,00088281
00.41,9	0,00210352	-0,00033789
00.42,0	0,00088281	0,00332422
00.42,0	0,00210352	-0,00644141
00.42,1	0,00210352	0,00088281
00.42,1	0,00210352	-0,0027793
00.42,1	0,00210352	0,00088281
00.42,2	0,00332422	-0,00033789
00.42,3	0,00332422	-0,00033789
00.42,3	0,00332422	0,00088281
00.42,3	0,00210352	0,00088281
00.42,4	0,00210352	-0,00033789
00.42,5	0,00454492	-0,00033789
00.42,5	0,00454492	-0,00033789
00.42,5	0,00210352	-0,00033789
00.42,6	0,00210352	0,00088281
00.42,7	-0,01254492	-0,00033789
00.42,7	0,00454492	0,00088281
00.42,8	0,00210352	-0,00033789
00.42,8	0,00210352	-0,00033789
00.42,9	0,00088281	0,00088281

00.42,9	0,00210352	-0,00033789
00.43,0	0,00210352	-0,00033789
00.43,0	0,00088281	0,00088281
00.43,0	0,00210352	-0,00033789
00.43,1	0,00210352	0,00088281
00.43,1	0,00210352	0,00088281
00.43,2	0,00088281	-0,00033789
00.43,2	-0,00033789	-0,0027793
00.43,3	0,00088281	-0,0027793
00.43,4	0,00088281	-0,0027793
00.43,4	0,00088281	0,00088281
00.43,5	0,00088281	-0,00033789
00.43,5	0,00210352	0,00088281
00.43,6	0,00210352	0,00088281
00.43,6	0,00210352	-0,00033789
00.43,6	0,00210352	0,00088281
00.43,7	0,00088281	-0,00033789
00.43,7	0,00088281	0,00088281
00.43,8	0,00088281	-0,00033789
00.43,8	0,00332422	0,00088281
00.43,9	0,00332422	-0,00033789
00.44,0	0,00210352	0,00088281
00.44,0	0,00210352	0,00088281
00.44,0	0,00332422	0,00088281
00.44,1	0,00332422	0,00088281
00.44,1	0,00332422	-0,00033789
00.44,2	-0,00033789	-0,00033789
00.44,2	0,00332422	0,00088281
00.44,3	0,00332422	-0,00033789
00.44,3	0,00210352	0,00088281
00.44,4	0,00210352	-0,00033789

00.44,5	0,00210352	0,00210352
00.44,5	0,00210352	-0,00033789
00.44,5	0,00210352	0,00088281
00.44,6	0,00210352	-0,00033789
00.44,7	-0,00033789	-0,00033789
00.44,7	0,00088281	0,00088281
00.44,8	0,00210352	0,00088281
00.44,8	0,00210352	0,00088281
00.44,8	0,00088281	-0,00033789
00.44,9	-0,00033789	0,00088281
00.45,0	-0,00033789	-0,00033789
00.45,0	0,00088281	0,00088281
00.45,0	0,00088281	0,00088281
00.45,1	0,00088281	0,00088281
00.45,2	0,00088281	0,00088281

Lampiran 8

Sampel Data Simpangan Getaran pada *Spindle Speed* 900 rpm

Waktu	Tanpa Magnet	Dengan Magnet
01.49,4	-0,00033789	0,00332422
01.49,4	-0,00033789	0,00088281
01.49,5	-0,0052207	0,00576562
01.49,5	-0,00155859	0,00210352
01.49,6	0,00210352	0,00332422
01.49,6	0,00210352	-0,00033789
01.49,7	-0,00155859	-0,00033789
01.49,7	0,00210352	-0,00033789
01.49,8	-0,0027793	-0,0027793
01.49,8	-0,0027793	0,00210352
01.49,9	0,00454492	-0,0027793
01.49,9	-0,00766211	-0,00033789
01.50,0	0,00454492	-0,0027793
01.50,0	-0,00155859	0,00088281
01.50,0	0,00210352	-0,0027793
01.50,1	0,00454492	0,00332422
01.50,2	0,00332422	0,0069863
01.50,2	0,0069863	0,00088281
01.50,3	0,00576562	0,00454492
01.50,3	0,00088281	-0,00033789
01.50,4	0,00454492	0,00332422
01.50,4	0,00576562	-0,0027793
01.50,5	-0,00033789	0,00332422
01.50,5	-0,00155859	-0,0027793
01.50,6	-0,00155859	0,00088281
01.50,6	0,00454492	-0,0027793
01.50,7	-0,0027793	0,00088281

01.50,7	-0,00155859	-0,0027793
01.50,7	-0,00033789	0,00210352
01.50,8	-0,0027793	-0,004
01.50,9	-0,0027793	0,00088281
01.50,9	-0,00155859	-0,00033789
01.51,0	0,00210352	0,00210352
01.51,0	0,00088281	0,00088281
01.51,1	-0,00033789	0,00332422
01.51,1	-0,0052207	0,00332422
01.51,1	0,00088281	0,00332422
01.51,2	-0,00155859	0,00210352
01.51,3	0,00210352	0,00210352
01.51,3	-0,00033789	0,00088281
01.51,4	0,00210352	-0,00033789
01.51,4	-0,0027793	0,00088281
01.51,4	0,0069863	-0,0027793
01.51,5	0,00576562	-0,00155859
01.51,5	-0,0027793	-0,0027793
01.51,6	0,00576562	0,00088281
01.51,7	-0,0027793	-0,0027793
01.51,7	0,00088281	-0,00033789
01.51,8	-0,00155859	-0,0052207
01.51,8	0,00332422	0,00332422
01.51,9	-0,0149863	-0,00155859
01.51,9	0,00088281	0,0069863
01.52,0	0,00210352	0,00088281
01.52,0	-0,0027793	0,0069863
01.52,1	-0,0027793	0,0069863

01.52,1	0,00088281	0,0069863
01.52,1	0,00332422	-0,00033789
01.52,2	0,00454492	0,00332422
01.52,3	0,0106484	-0,00155859
01.52,3	0,00454492	0,00210352
01.52,4	0,00088281	-0,0027793
01.52,4	0,00332422	0,00088281
01.52,5	0,00576562	-0,004
01.52,5	0,00454492	0,00088281
01.52,6	-0,00155859	-0,0027793
01.52,6	-0,00155859	0,00088281
01.52,7	-0,00033789	-0,00155859
01.52,7	-0,00033789	-0,00155859
01.52,7	-0,0052207	-0,00033789
01.52,8	0,00210352	0,00088281
01.52,9	-0,00155859	-0,00033789
01.52,9	-0,00033789	-0,00033789
01.53,0	-0,00033789	-0,00033789
01.53,0	-0,00033789	-0,00033789
01.53,1	0,00332422	0,00332422
01.53,1	0,0069863	-0,0027793
01.53,1	-0,00155859	-0,00155859
01.53,2	0,00088281	0,00088281
01.53,2	0,00210352	-0,0052207

01.53,3	0,0069863	-0,00033789
01.53,4	0,00210352	-0,00155859
01.53,4	-0,00155859	-0,00155859
01.53,5	0,00454492	-0,00033789
01.53,5	-0,00155859	0,0069863
01.53,6	-0,0027793	0,0069863
01.53,6	-0,00033789	0,0069863
01.53,7	-0,00644141	0,0069863
01.53,7	0,0069863	0,0069863
01.53,8	-0,0027793	0,0069863
01.53,8	-0,00155859	0,00088281
01.53,9	0,00210352	0,00088281
01.53,9	-0,00155859	-0,00033789
01.54,0	0,00210352	0,00088281
01.54,0	0,00210352	-0,00766211
01.54,1	0,00088281	0,0069863
01.54,1	0,00088281	-0,004
01.54,2	0,00088281	0,00088281
01.54,2	0,00210352	-0,004
01.54,3	0,00210352	0,00210352
01.54,3	0,00576562	-0,00033789
01.54,4	0,00088281	-0,00155859

Lampiran 9

Sampel Data Simpangan Getaran pada *Spindle Speed* 1100 rpm

Waktu	Tanpa Magnet	Dengan Magnet
02.34,9	0,00088281	0,00088281
02.35,0	0,00088281	0,00088281
02.35,0	-0,00033789	0,00210352
02.35,0	-0,00033789	-0,00033789
02.35,1	0,00088281	0,00088281
02.35,2	0,00088281	0,00088281
02.35,2	0,00088281	0,00088281
02.35,3	0,00088281	-0,00033789
02.35,3	0,00088281	0,00088281
02.35,4	0,00088281	0,00088281
02.35,4	-0,00033789	0,00088281
02.35,5	0,00088281	0,00088281
02.35,5	0,00088281	0,00088281
02.35,5	0,00088281	0,00088281
02.35,5	0,00088281	0,00088281
02.35,6	0,00088281	0,00088281
02.35,7	0,00088281	-0,00033789
02.35,7	0,00332422	0,00088281
02.35,7	-0,00033789	-0,00033789
02.35,8	0,00088281	0,00088281
02.35,8	0,00088281	0,00088281
02.35,9	0,00088281	0,00088281
02.36,0	-0,00033789	0,00088281
02.36,0	-0,00033789	-0,00033789
02.36,0	0,00088281	0,00088281
02.36,1	-0,00033789	0,00088281
02.36,2	0,00088281	0,00088281
02.36,2	-0,00033789	0,00088281

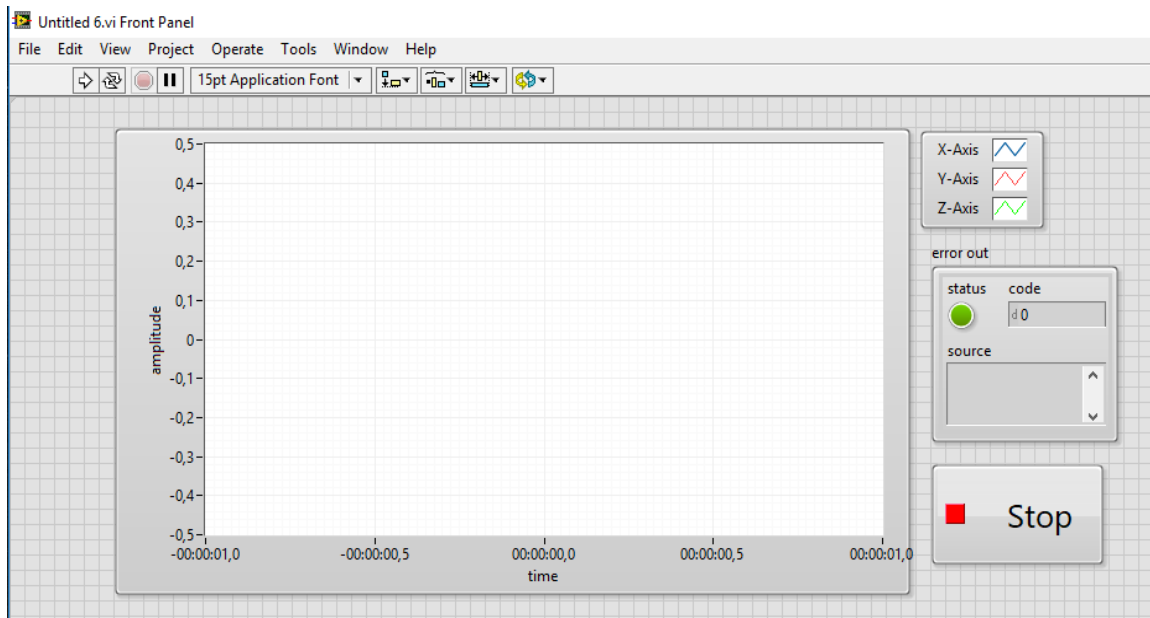
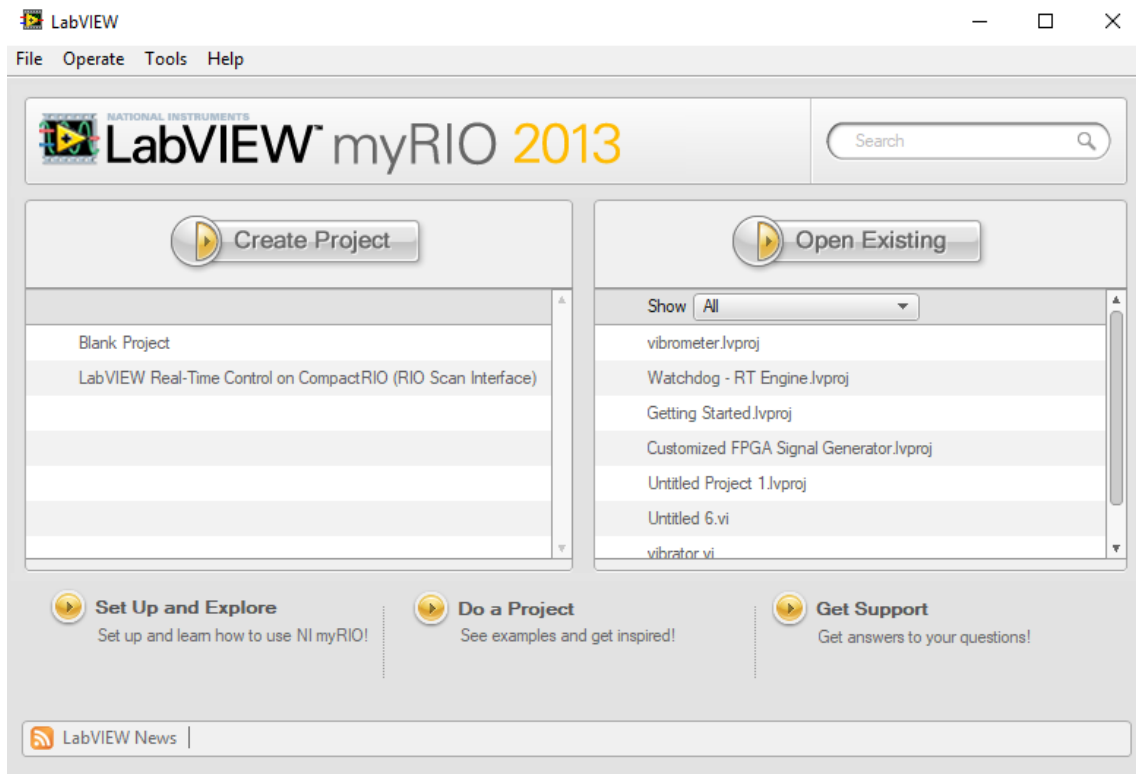
02.36,3	0,00088281	0,00088281
02.36,3	0,00088281	-0,0052207
02.36,4	0,00088281	0,00210352
02.36,4	0,00088281	-0,004
02.36,5	-0,00033789	0,00332422
02.36,5	0,00088281	-0,0052207
02.36,6	-0,00033789	0,00088281
02.36,6	-0,00033789	-0,0052207
02.36,6	-0,00033789	0,00454492
02.36,7	0,00210352	-0,0027793
02.36,7	0,00088281	0,00454492
02.36,8	-0,0052207	-0,00033789
02.36,9	0,00088281	0,00088281
02.36,9	-0,00033789	0,00088281
02.36,9	-0,00033789	0,00088281
02.37,0	0,00088281	0,00088281
02.37,1	0,00088281	0,00088281
02.37,1	0,00088281	0,00088281
02.37,2	-0,00033789	0,00088281
02.37,2	0,00088281	0,00088281
02.37,2	0,00088281	0,00088281
02.37,3	0,00088281	0,00088281
02.37,3	-0,00033789	0,00088281
02.37,4	0,00088281	0,00088281
02.37,4	-0,01254492	0,00088281
02.37,5	-0,00033789	-0,00033789
02.37,5	0,00266211	-0,00033789
02.37,6	0,00088281	0,00088281
02.37,6	0,00088281	0,00088281

02.37,7	0,00088281	0,00088281
02.37,7	-0,00033789	-0,00033789
02.37,7	0,00088281	0,00088281
02.37,8	-0,00033789	0,00088281
02.37,9	0,00088281	0,00088281
02.37,9	0,00332422	0,00088281
02.38,0	0,00088281	0,00088281
02.38,0	0,00088281	-0,0052207
02.38,0	0,00088281	-0,00033789
02.38,1	-0,00033789	0,00088281
02.38,2	-0,00033789	-0,00033789
02.38,2	0,00088281	-0,00033789
02.38,3	-0,00033789	0,00088281
02.38,3	-0,00033789	0,00088281
02.38,3	-0,00155859	0,00088281
02.38,4	0,00088281	-0,00033789
02.38,5	0,00088281	0,00088281
02.38,5	0,00088281	0,00088281
02.38,6	0,00088281	0,00088281
02.38,6	-0,00033789	0,00088281
02.38,7	0,00088281	0,00088281
02.38,7	-0,00033789	0,00088281
02.38,8	0,00088281	0,00088281
02.38,8	-0,00033789	0,00088281

02.38,9	0,00088281	-0,00033789
02.38,9	0,00088281	0,00454492
02.39,0	0,00088281	-0,00155859
02.39,0	0,00088281	0,00088281
02.39,1	-0,00033789	-0,00155859
02.39,1	0,00088281	0,00088281
02.39,2	0,00088281	-0,00033789
02.39,2	-0,00033789	0,00088281
02.39,3	0,00088281	0,00088281
02.39,3	-0,00033789	-0,00033789
02.39,4	0,00088281	0,00088281
02.39,4	-0,00033789	-0,00033789
02.39,4	0,00210352	0,00088281
02.39,5	0,00088281	0,00088281
02.39,6	-0,00033789	0,00088281
02.39,6	0,00088281	0,00088281
02.39,6	0,00088281	-0,00033789
02.39,7	0,00088281	0,00088281
02.39,8	-0,004	-0,00033789
02.39,8	0,00210352	0,00088281
02.39,9	-0,00033789	0,00088281
02.39,9	0,00088281	0,00088281

Lampiran 10

Tampilan Software Labview 2013



Lampiran 11

Gambar Benda Kerja Hasil Proses *End Milling*



Gambar Benda Kerja Hasil Proses *End Milling* Dengan Variasi *Spindle Speed* 700 rpm



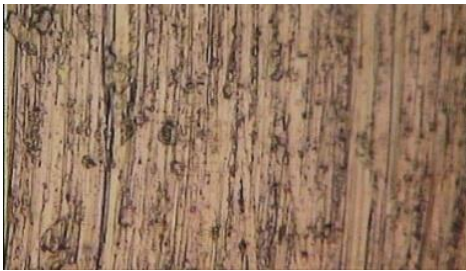
Gambar Benda Kerja Hasil Proses *End Milling* Dengan Variasi *Spindle Speed* 900 rpm



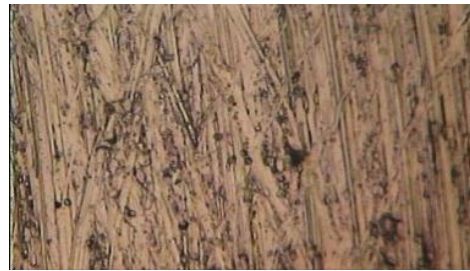
Gambar Benda Kerja Hasil Proses *End Milling* Dengan Variasi *Spindle Speed* 1100 rpm

Lampiran 12

Foto Mikro Hasil Proses *End Milling*



(a)



(b)

Foto mikro hasil proses *end milling* pada *spindle speed* 700 rpm (a) tanpa magnet (b) dengan magnet



(a)



(b)

Foto mikro hasil proses *end milling* pada *spindle speed* 900 rpm (a) tanpa magnet (b) dengan magnet



(a)



(b)

Foto mikro hasil proses *end milling* pada *spindle speed* 1100 rpm (a) tanpa magnet (b) dengan magnet

Lampiran 13

Uji Besar Medan Magnet



KEMENTERIAN RISET, TEKNOLOGI DAN PENDIDIKAN TINGGI
UNIVERSITAS BRAWIJAYA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Jl. Veteran. Malang, 65145, Jawa Timur, Indonesia
Telp. : +62-341-554403, 551611; Fax : +62-341-554403
<http://mipa.ub.ac.id> E-mail : mipa@ub.ac.id

Yang bertanda tangan dibawah ini menerangkan dengan sesungguhnya bahwa mahasiswa:

Nama : Sadat
Nim : 125060202111006
Instansi : Universitas Brawijaya
Program Studi : Teknik Mesin

Benar-benar telah melakukan penelitian dan pengambilan data pengujian kekuatan magnet menggunakan alat Tesla meter di Laboratorium Fisika Lanjutan Fakultas MIPA Universitas Brawijaya Malang pada tanggal 14 September 2017, guna keperluan penyusunan skripsi dengan judul :

"Pengaruh *Spindle Speed* Terhadap Kekasaran Permukaan Alumunium 6061 Pada Proses *End Milling* Dengan Peredaman Magnet Permanen"

Hasil Pengujian

No.	Jenis Magnet	Kekuatan (mT)
1	Neodymium N35 (Magnet 1)	1430
2	Neodymium N35 (Magnet 2)	1430

Mengetahui,
Kepala laboratorium Fisika Lanjutan,

Drs. Unggul Pundjung Juswono, M.Sc
NIP 19650111 199002 1002