

## Tabel Perhitungan Data Uji Tarik

**Spesimen Alumunium seri 1xxx Ketebalan 2 mm Variasi Kecepatan Putar *Tool***

**pada *Friction Stir Welding***

Putaran Tool	$L_o$ (mm)	A (mm <sup>2</sup> )	$\Delta L$ (mm)	$F_{yield}$ (N)	$F_{max}$ (N)	$\sigma_y = F_{yield}/A$ (N/mm <sup>2</sup> )	$\sigma_s = F_{max}/A$ (N/mm <sup>2</sup> )	$\varepsilon = \Delta L / L_o$ (%)
980 rpm	32	10,2	0,694	968,68	968,7	94,96	94,97	2,1
	32	10,2	1,47	674,85	715,3	66,16	70,12	4,5
	32	10,2	0,76	786,50	786,5	77,1	77,11	2,3
Rata-rata						79,407	80,73	2,9
2300 rpm	32	10,2	5,526	615,66	741,5	60,35	72,69	17,2
	32	10,2	3,88	771,62	877,6	75,69	86,03	12,1
	32	10,2	4,238	674,15	788,0	66,09	76,27	13,2
Rata-rata						67,36	78,33	14,1
2700	32	10,2	3,307	696,47	764,2	68,28	74,92	10,3
	32	10,2	1,213	576,67	600,1	56,53	58,83	3,7
	32	10,2	1,327	700,73	739	68,69	72,45	4,1
Rata-rata						64,5	68,733	6
Raw Material	32	10,2	1,67	1035,67	1082,1	101,53	106,08	5,2

Keterangan :

$L_o$  : Panjang mula-mula (mm)

$\Delta L$  : Panjang spesimen setelah uji tarik (mm)

A : Luas Area (mm<sup>2</sup>)

$\varepsilon$  : Regangan (%)

$\sigma$  : Tegangan (N/mm<sup>2</sup>)

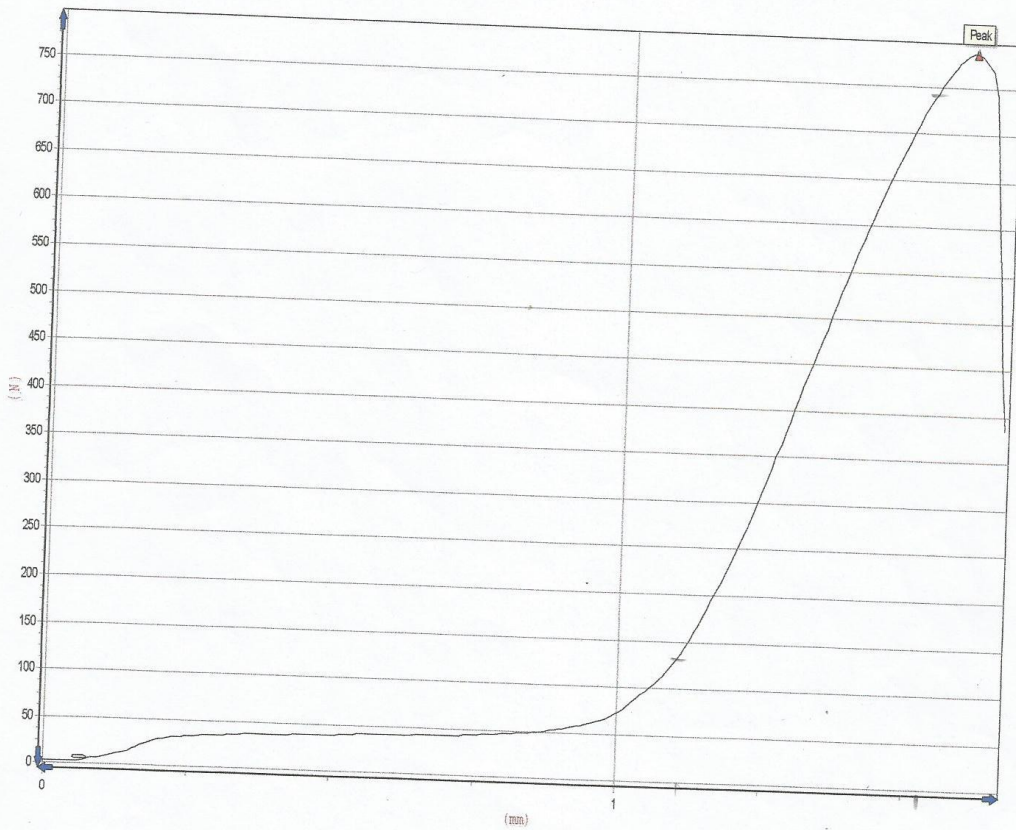
# LABORATORIUM MATERIAL JURUSAN TEKNIK MESIN FT UNS

Jl. Ir. Sutami no.36 A Surakarta, Jawa Tengah

## TEST REPORT

Test NO. : kharis umy-3

Speciment	Area mm <sup>2</sup>	Max Force N	Tensile Strenght N/mm <sup>2</sup>	Yield Load N	Yield Strenght N/mm <sup>2</sup>	Break Force N	Elong. %
Tarik AL	8.000	786.5	98.31	786.50	89.94	385.99	1.66



Q.C. Dept. : \_\_\_\_\_

Tester : \_\_\_\_\_

# LABORATORIUM MATERIAL JURUSAN TEKNIK MESIN FT UNS

Jl. Ir. Sutami no.36 A Surakarta, Jawa Tengah

## TEST REPORT

Test NO. : kharis umy-6

:

Speciment	Area mm <sup>2</sup>	Max Force N	Tensile Strenght N/mm <sup>2</sup>	Yield Load N	Yield Strenght N/mm <sup>2</sup>	Break Force N	Elong. %
Tarik AL	8.000	778.0	97.25	674.15	60.08	378.54	8.16



Q.C. Dept. : \_\_\_\_\_

Tester : \_\_\_\_\_

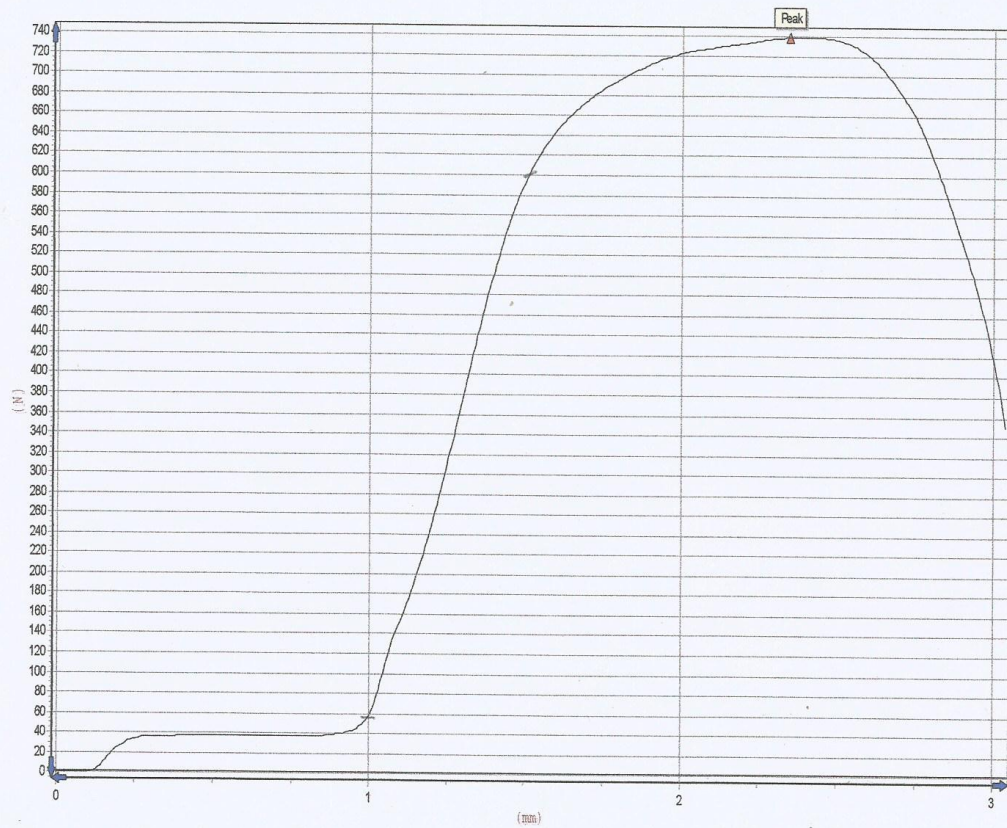
# LABORATORIUM MATERIAL JURUSAN TEKNIK MESIN FT UNS

Jl. Ir. Sutami no.36 A Surakarta, Jawa Tengah

## TEST REPORT

Test NO. : kharis umy-9

Speciment	Area mm <sup>2</sup>	Max Force N	Tensile Strenght N/mm <sup>2</sup>	Yield Load N	Yield Strenght N/mm <sup>2</sup>	Break Force N	Elong. %
Tarik AL	8.000	739.0	92.38	700.73	69.38	349.83	3.04



Q.C. Dept. : \_\_\_\_\_

Tester : \_\_\_\_\_

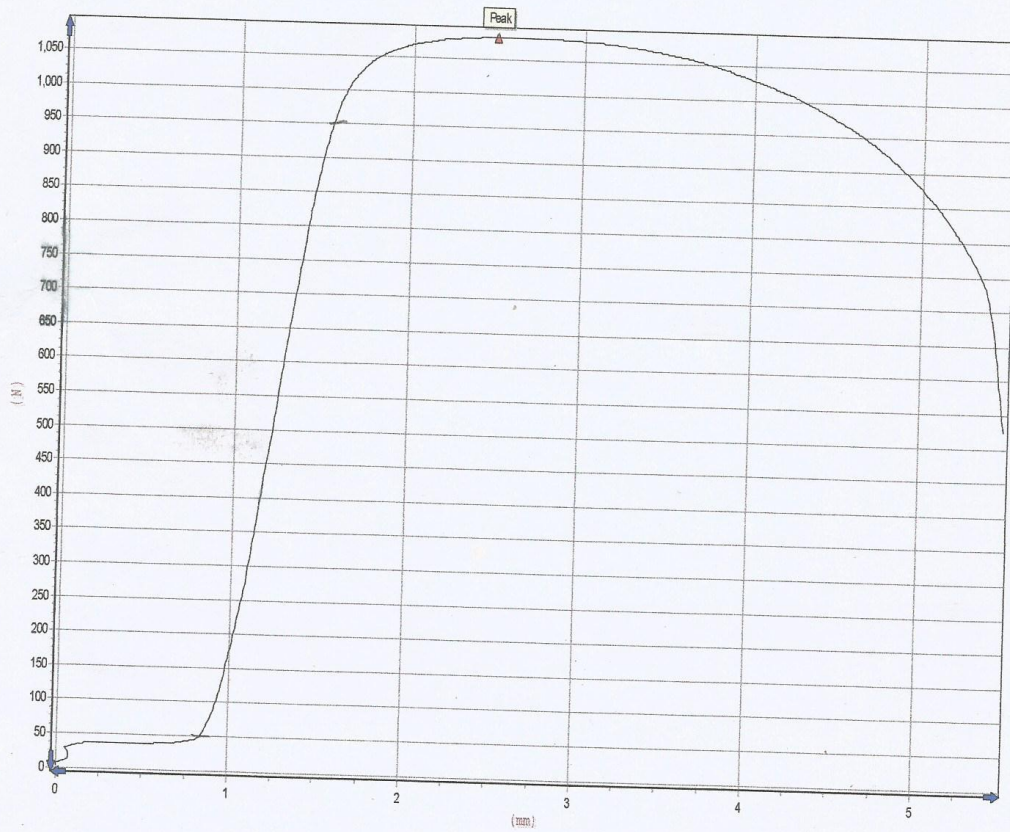
# LABORATORIUM MATERIAL JURUSAN TEKNIK MESIN FT UNS

Jl. Ir. Sutami no.36 A Surakarta, Jawa Tengah

## TEST REPORT

Test NO. : kharis umy-10

Speciment	Area mm <sup>2</sup>	Max Force N	Tensile Strenght N/mm <sup>2</sup>	Yield Load N	Yield Strenght N/mm <sup>2</sup>	Break Force N	Elong. %
Tarik AL	8.000	1082.1	135.26	1035.67	101.55	524.93	5.50



Q.C. Dept. : \_\_\_\_\_

Tester : \_\_\_\_\_



**LABORATORIUM BAHAN TEKNIK**  
**DEPARTEMEN TEKNIK MESIN SEKOLAH VOKASI**  
**UNIVERSITAS GADJAH MADA**

**HASIL PENGUJIAN KEKERASAN**

No. 122 / P.Kkr / BT.DTM / 2016

**Spesimen Aluminium (*friction welding*), Variasi Kecepatan Putar**

No	Kode	Posisi titik uji	d <sub>1</sub> ( $\mu\text{m}$ )	d <sub>2</sub> (mm) ( $\mu\text{m}$ )	d <sub>rata-rata</sub> ( $\mu\text{m}$ )	Kekerasan (VHN)	
1	980	Kanan	8.0 mm	67.5	67.0	67.25	41.0
			6.0 mm	65.0	70.0	67.50	40.7
			4.0 mm	70.0	66.5	68.25	39.8
			2.0 mm	69.0	68.0	68.50	39.5
		LAS	0.0 mm	55.5	56.5	56.00	59.1
		Kiri	2.0 mm	70.0	69.5	69.75	38.1
			4.0 mm	69.0	66.0	67.50	40.7
			6.0 mm	66.0	67.0	66.50	41.9
			8.0 mm	67.0	69.0	68.00	40.1
		2	2300	Kanan	Base metal	71.5	68.0
	71.0				69.0	70.00	37.8
Kanan	8.0 mm			74.5	74.0	74.25	33.6
	6.0 mm			77.0	76.0	76.50	31.7
	4.0 mm			77.0	76.0	76.50	31.7
	2.0 mm			77.0	76.0	76.50	31.7
LAS	0.0 mm			74.0	75.0	74.50	33.4
Kiri	2.0 mm			78.0	77.5	77.75	30.7
	4.0 mm			77.0	77.0	77.00	31.3
	6.0 mm			78.0	77.0	77.50	30.9
	8.0 mm	77.0	74.0	75.50	32.5		
Kiri	Base metal	68.0	68.0	68.00	40.1		
		68.5	69.0	68.75	39.2		

Lembar asli, tidak untuk digandakan

Lembar 1 dari 2



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No	Kode	Posisi titik uji	d <sub>1</sub> ( $\mu$ m)	d <sub>2</sub> (mm) ( $\mu$ m)	d <sub>rata-rata</sub> ( $\mu$ m)	Kekerasan (VHN)	
3	2700	Kanan	8.0 mm	79.0	76.0	77.50	30.9
			6.0 mm	79.0	76.0	77.50	30.9
			4.0 mm	76.0	74.0	75.00	33.0
			2.0 mm	76.0	75.0	75.50	32.5
		LAS	0.0 mm	74.0	74.0	74.00	33.9
		Kiri	2.0 mm	78.0	76.0	77.00	31.3
			4.0 mm	78.0	76.0	77.00	31.3
			6.0 mm	77.0	77.0	77.00	31.3
			8.0 mm	78.0	76.0	77.00	31.3

Lembar asli, tidak untuk digandakan

**Keterangan :**

1. Menggunakan metode uji Vickers dengan pembebanan 100 gf
2. Satuan pengukuran diagonal jejak indenter dalam mm
3. Pengujian dilakukan pada tanggal 16 September 2016

Yogyakarta, 16 September 2016

SST Laboratorium Bahan Teknik



Puji Priyana SST

NIP. 196704101999031002

Lembar 2 dari 2