

Tabel Kekuatan Spesimen Tarik

Vf	Spes	W (mm)	T (mm)	L (mm)	A (mm <sup>2</sup> )	Δl (mm)	Fmax (N)	σ (MPa)	ε	
0%	1	6.65	3.6	126	23.94	6.06	928.63	38.790	0.0481	
	2	5.96	3.31	125	19.73	5.22	787.50	39.919	0.0418	
	3	6.08	3.42	126	20.79	5.55	830.22	39.927	0.0440	
	4	6.24	3.3	126	20.59	5.99	579.85	28.159	0.0475	
	5	6.18	3.11	126	19.22	4.5	430.58	22.403	0.0357	
	6	6.18	3.31	127	20.46	2	223.85	10.943	0.0157	
	Rata-rata							<b>630.11</b>	<b>30.023</b>	<b>0.0388</b>
	Standar Deviasi							<b>268.82</b>	<b>11.819</b>	<b>0.0122</b>
	Max							<b>928.63</b>	<b>39.927</b>	<b>0.0481</b>
	Min							<b>223.85</b>	<b>10.943</b>	<b>0.0157</b>
9.3%	1	6.5	3.55	129	23.08	4.83	1063.4	46.085	0.0374	
	2	6.55	3.48	126	22.79	4.93	1186.9	52.071	0.0391	
	3	6.56	3.39	127	22.24	3.9	794.0	35.704	0.0307	
	4	5.54	3.34	127	18.50	4.55	844.1	45.618	0.0358	
	5	6.13	3.38	124	20.72	3.61	661.9	31.945	0.0291	
	6	5.82	3.49	123	20.31	3.4	659.3	32.460	0.0276	
	Rata-rata							<b>868.27</b>	<b>40.647</b>	<b>0.0333</b>
	Standar Deviasi							<b>215.39</b>	<b>8.390</b>	<b>0.0048</b>
	Max							<b>1186.90</b>	<b>52.071</b>	<b>0.0391</b>
	Min							<b>659.32</b>	<b>31.945</b>	<b>0.0276</b>
16.5%	1	6.19	3.56	127	22.036	4.57	986.67	44.775	0.0360	
	2	6.47	3.65	124	23.616	3.54	664.27	28.129	0.0285	
	3	6.74	3.59	125	24.197	4.16	1004.96	41.533	0.0333	
	4	6.65	3.79	126	25.204	5.18	1203.10	47.735	0.0411	
	5	6.44	3.55	124	22.862	4.06	886.84	38.791	0.0327	
	Rata-rata							<b>949.17</b>	<b>40.193</b>	<b>0.0343</b>
	Standar Deviasi							<b>196.24</b>	<b>7.536</b>	<b>0.0046</b>
	Max							<b>1203.10</b>	<b>47.735</b>	<b>0.0411</b>
	Min							<b>664.27</b>	<b>28.129</b>	<b>0.0285</b>
24.7%	1	6.38	4.48	123	28.582	5.15	1433.5	50.153	0.0419	
	2	6.38	4.7	124	29.986	4.25	1061.6	35.403	0.0343	
	3	6.59	4.88	123	32.159	4.85	1256.7	39.077	0.0394	
	4	6.81	4.65	121	31.667	4.94	1302.6	41.136	0.0408	
	5	6.43	4.61	122	29.642	6	1433.4	48.357	0.0492	
	Rata-rata							<b>1297.6</b>	<b>42.825</b>	<b>0.0411</b>
	Standar Deviasi							<b>153.6</b>	<b>6.251</b>	<b>0.0054</b>
	Max							<b>1433.5</b>	<b>50.153</b>	<b>0.0492</b>
	Min							<b>1061.6</b>	<b>35.403</b>	<b>0.0343</b>

29.01%	1	6.56	4.86	123	31.882	4.71	1136.5	35.648	0.0383	
	2	5.91	4.3	124	25.413	4.1	1064.9	41.904	0.0331	
	3	6.09	4.5	122	27.405	4.12	1105.4	40.335	0.0338	
	4	6.22	4.3	123	26.746	5.41	1498.5	56.027	0.0440	
	5	6.72	4.41	124	29.635	4	1046.1	35.301	0.0323	
	6	6.11	4.34	124	26.517	4.4	1157.1	43.637	0.0355	
	Rata-rata							<b>1168.1</b>	<b>42.142</b>	<b>0.0361</b>
	Standar Deviasi							<b>167.2</b>	<b>7.581</b>	<b>0.0044</b>
	Max							<b>1498.5</b>	<b>56.027</b>	<b>0.0440</b>
	Min							<b>1046.1</b>	<b>35.301</b>	<b>0.0323</b>

Tabel Modulus Elastisitas Tarik

Vf	No	$\Delta F$ (N)	A (mm <sup>2</sup> )	$\Delta L$	L0 (mm)	$\Delta \epsilon$	$\Delta \sigma$ (Mpa)	E (Mpa)	
0%	1	200	23.94	1.5	126	0.011905	8.354219	701.7544	
	2	200	19.7276	1.5	125	0.012	10.13808	844.8401	
	3	200	20.7936	2	126	0.015873	9.618344	605.9557	
	4	300	20.592	3	126	0.02381	14.56876	611.8881	
	5	100	19.2198	1	126	0.007937	5.202968	655.5739	
	<b>Rata-rata</b>								<b>684.0024</b>
	<b>max</b>								<b>844.8401</b>
<b>min</b>								<b>605.9557</b>	
9.3%	1	270	23.075	1	129	0.007752	11.70098	1509.426	
	2	300	22.2384	1.3	127	0.010236	13.49018	1317.887	
	3	400	18.5036	1.35	127	0.01063	21.61741	2033.638	
	4	200	20.3118	0.9	123	0.007317	9.846493	1345.687	
	<b>Rata-rata</b>								<b>1551.66</b>
	<b>max</b>								<b>2033.638</b>
<b>min</b>								<b>1317.887</b>	
16.5%	1	300	22.0364	1	127	0.007874	13.61384	1728.958	
	2	200	24.1966	0.6	125	0.0048	8.265624	1722.005	
	3	200	22.862	0.8	124	0.006452	8.748141	1355.962	
	<b>Rata-rata</b>								<b>1602.308</b>
	<b>max</b>								<b>1728.958</b>
<b>min</b>								<b>1355.962</b>	
24.7%	1	200	32.1592	0.7	123	0.005691	6.21906	1092.778	
	2	400	31.6665	1.2	121	0.009917	12.63165	1273.691	
	3	500	29.6423	1.4	122	0.011475	16.86779	1469.907	
	<b>Rata-rata</b>								<b>1278.792</b>
	<b>max</b>								<b>1469.907</b>
<b>min</b>								<b>1092.778</b>	
29.01%	1	400	25.413	1	124	0.008065	15.73998	1951.757	
	2	400	26.5174	1	124	0.008065	15.08444	1870.47	
	3	400	27.405	1.2	122	0.009836	14.59588	1483.914	
	<b>Rata-rata</b>								<b>1768.714</b>
	<b>max</b>								<b>1951.757</b>
<b>min</b>								<b>1483.914</b>	

Tabel Kekuatan Spesimen Tekan

Variasi	No	w (mm)	t (mm)	l (mm)	A (mm <sup>2</sup> )	Fmax (N)	$\Delta l$ (mm)	$\sigma$ (MPa)	$\epsilon$	
0%	1	10.6	4.52	159	47.912	2165.945	5.6	45.20673	0.03522	
	2	9.7	3.94	139	38.218	1332.026	5.1	34.85337	0.036691	
	3	10.68	4.2	148	44.856	1877.564	5.6	41.85759	0.037838	
	4	9.72	3.94	147	38.2968	1433.749	4.6	37.43783	0.031293	
	5	9.62	4.3	157	41.366	2006.877	5.3	48.51513	0.033758	
	<b>Rata-rata</b>								<b>41.57413</b>	<b>0.03496</b>
	<b>Standar Deviasi</b>								<b>5.561729</b>	<b>0.002561</b>
	<b>Max</b>								<b>48.51513</b>	<b>0.037838</b>
	<b>Min</b>								<b>34.85337</b>	<b>0.031293</b>
7.64%	1	10.4	3.62	148	37.648	1391.903	5.8	36.9715	0.039189	
	2	10.88	4.84	147	52.6592	1700.572	6.4	32.29392	0.043537	
	3	11.24	4.22	149	47.4328	1829.427	5.8	38.56882	0.038926	
	4	10.8	3.68	149	39.744	1469.788	5	36.98138	0.033557	
	5	10.56	3.6	148	38.016	1517.463	5.3	39.91643	0.035811	
	<b>Rata-rata</b>								<b>36.94641</b>	<b>0.038204</b>
	<b>Standar Deviasi</b>								<b>2.876662</b>	<b>0.003783</b>
	<b>Max</b>								<b>39.91643</b>	<b>0.043537</b>
	<b>Min</b>								<b>32.29392</b>	<b>0.033557</b>
16.75%	1	9.1	3.68	149	33.488	1219.13	4.4	36.40498	0.02953	
	2	10.9	3.64	148	39.676	1600.807	5.6	40.34699	0.037838	
	3	10.8	3.5	149	37.8	1700.835	5.3	44.99563	0.03557	
	4	9.24	3.1	150	28.644	752.771	2.6	26.28023	0.017333	
	5	10.1	3.3	147	33.33	802.073	4.5	24.0646	0.030612	
	6	10.7	3.5	150	37.45	1183.219	5.6	31.59463	0.037333	
	<b>Rata-rata</b>								<b>33.94784</b>	<b>0.03137</b>
	<b>Standar Deviasi</b>								<b>8.136936</b>	<b>0.007694</b>
	<b>Max</b>								<b>44.99563</b>	<b>0.037838</b>
<b>Min</b>								<b>24.0646</b>	<b>0.017333</b>	
25.73%	1	9.54	3.82	150	36.4428	1183.408	4.8	32.47303	0.032	
	2	9.68	4.82	147	46.6576	1616.764	5.6	34.65168	0.038095	
	3	10.56	4	120	42.24	1717.733	5.4	40.66603	0.045	
	4	10.34	3.64	124	37.6376	1469.038	6	39.03113	0.048387	
	5	10.52	4	120	42.08	1447.269	4.8	34.39327	0.04	
	<b>Rata-rata</b>								<b>36.24303</b>	<b>0.040696</b>
	<b>Standar Deviasi</b>								<b>3.446133</b>	<b>0.006335</b>
	<b>Max</b>								<b>40.66603</b>	<b>0.048387</b>
	<b>Min</b>								<b>32.47303</b>	<b>0.032</b>

31.07%	1	10.46	4.76	148	49.7896	1783.185	6	35.81441	0.040541	
	2	10.7	3.8	148	40.66	1415.182	5.2	34.80526	0.035135	
	3	10.12	3.8	150	38.456	1323.307	5.3	34.41094	0.035333	
	4	10.6	4.72	150	50.032	1763.864	5.5	35.25472	0.036667	
	<b>Rata-rata</b>								<b>35.07133</b>	<b>0.036919</b>
	<b>Standar Deviasi</b>								<b>0.603519</b>	<b>0.002508</b>
	<b>Max</b>								<b>35.81441</b>	<b>0.040541</b>
	<b>Min</b>								<b>34.41094</b>	<b>0.035135</b>

Tabel Modulus Elastisitas Tekan







Variasi	No	$\Delta F$ (N)	A (mm <sup>2</sup> )	$\Delta L$	L0 (mm)	$\Delta \epsilon$	$\sigma$ (Mpa)	E (Mpa)	
0%	1	300	47.912	0.6	159	0.003774	6.261479	1659.292	
	2	200	44.856	0.4	148	0.002703	4.458712	1649.724	
	3	360	38.2968	1	147	0.006803	9.400263	1381.839	
	<b>Rata-rata</b>								<b>1563.618</b>
	<b>Standar Deviasi</b>								<b>157.4983</b>
	<b>Max</b>								<b>1659.292</b>
	<b>Min</b>								<b>1381.839</b>
7.64%	1	320	37.648	1	148	0.006757	8.499788	1257.969	
	2	330	47.4328	1	149	0.006711	6.957211	1036.624	
	3	160	39.744	0.4	149	0.002685	4.025765	1499.597	
	<b>Rata-rata</b>								<b>1264.73</b>
	<b>Standar Deviasi</b>								<b>231.5605</b>
	<b>Max</b>								<b>1499.597</b>
	<b>Min</b>								<b>1036.624</b>
16.75%	1	400	33.488	1	149	0.006711	11.94458	1779.742	
	2	400	39.676	1.1	148	0.007432	10.08166	1356.442	
	3	320	37.45	1	150	0.006667	8.544726	1281.709	
	<b>Rata-rata</b>								<b>1472.631</b>
	<b>Standar Deviasi</b>								<b>268.5781</b>
	<b>Max</b>								<b>1779.742</b>
	<b>Min</b>								<b>1281.709</b>
25.73%	1	400	46.6576	1.1	147	0.007483	8.573094	1145.677	
	2	200	37.6376	0.7	124	0.005645	5.313835	941.3079	
	3	360	42.08	0.9	120	0.0075	8.555133	1140.684	
	<b>Rata-rata</b>								<b>1075.89</b>
	<b>Standar Deviasi</b>								<b>116.5781</b>
	<b>Max</b>								<b>1145.677</b>
	<b>Min</b>								<b>941.3079</b>
31.07%	1	200	49.7896	0.7	148	0.00473	4.016903	849.2881	
	2	260	40.66	0.9	148	0.006081	6.394491	1051.539	
	3	320	38.456	1.2	150	0.008	8.321198	1040.15	
	4	400	50.032	1	150	0.006667	7.994883	1199.232	
	<b>Rata-rata</b>								<b>980.3255</b>
	<b>Standar Deviasi</b>								<b>143.482</b>
	<b>Max</b>								<b>1199.232</b>
	<b>Min</b>								<b>849.2881</b>

# KUAT TARIK

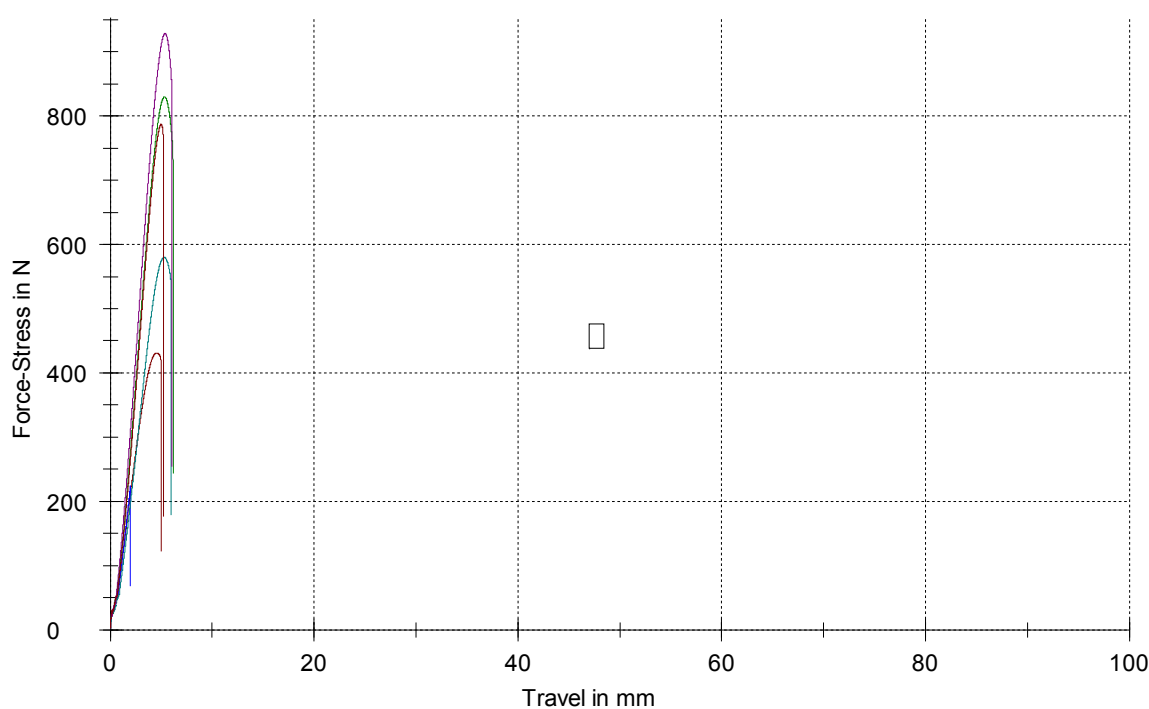
## Parameter table:

Headline : KUAT TARIK  
 Customer : 1766/VII/17  
 Tester : APRIAL  
 Material : KOMPOSIT EPOKSI + IJUK 0%  
 Test standard : ASTM D 638  
 Evaluat. method : M (Automatic A, B or C)  
 Specimen holders:  
 Extensometer :  
 Load cell :

## Results:

Legends	Nr	Fmax Lm kgf	Measurement travel end mm
	1	43,892	4,50
	2	84,630	5,55
	3	22,819	2,00
	4	59,108	5,99
	5	94,662	6,06
	6	80,275	5,22

## Series graph:



**Statistics:**

Series n = 6	Fmax Lm kgf	Measurement travel end mm
$\bar{x}$	64,231	4,89
s	27,403	1,52
v	42,66	31,17









# KUAT TARIK

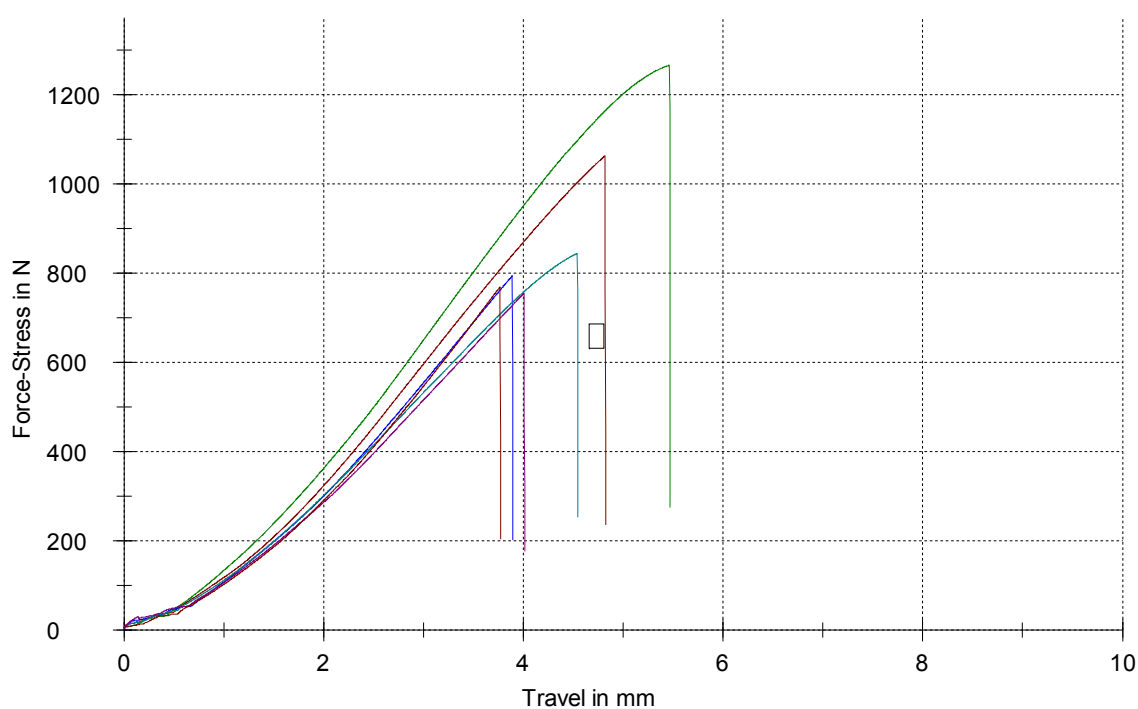
## Parameter table:

Headline : KUAT TARIK  
 Customer : 1767/VII/17  
 Tester : APRIAL  
 Material : KOMPOSIT EPOKSI + IJUK 10%  
 Test standard : ASTM D 638  
 Evaluat. method : M (Automatic A, B or C)  
 Specimen holders:  
 Extensometer :  
 Load cell :

## Results:

Legends	Nr	Fmax Lm kgf	Measurement travel end mm
	1	108,401	4,83
	2	120,989	4,93
	3	80,937	3,90
	4	86,044	4,55
	5	67,469	3,61
	6	67,209	3,40

## Series graph:



**Statistics:**






Series n = 6	Fmax Lm kgf	Measurement travel end mm
$\bar{x}$	88,508	4,20
s	21,956	0,65
v	24,81	15,51

# KUAT TARIK

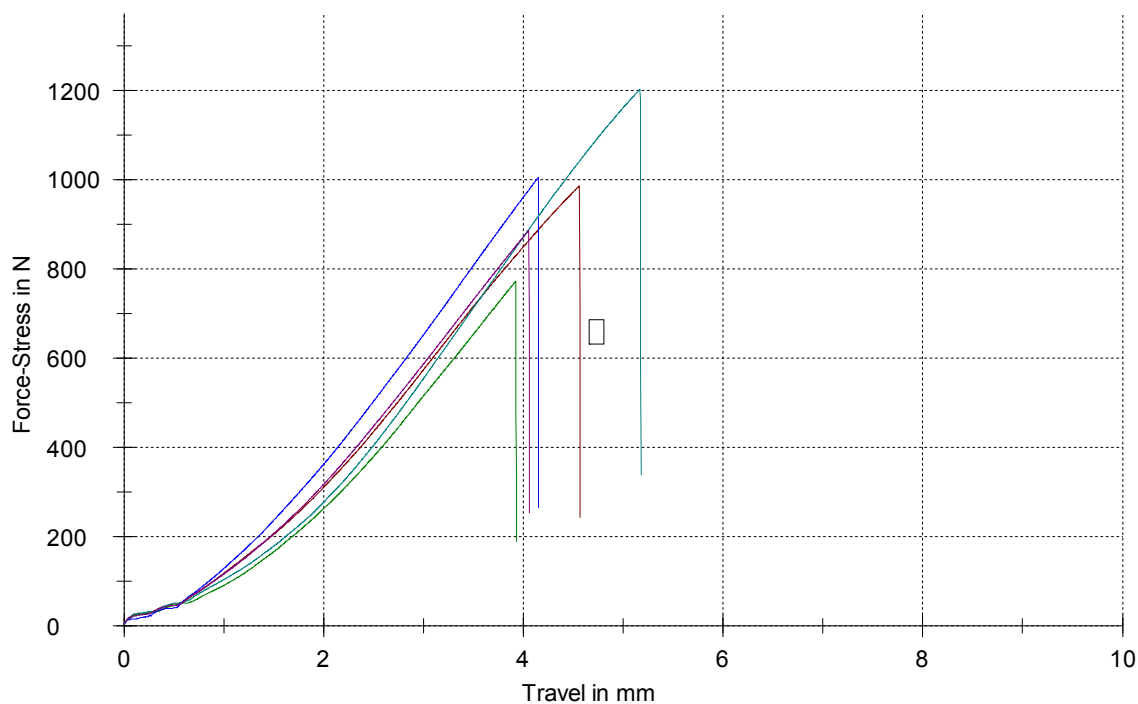
## Parameter table:

Headline : KUAT TARIK  
 Customer : 1766/VII/17  
 Tester : APRIAL  
 Material : KOMPOSIT EPOKSI + IJUK 20%  
 Test standard : ASTM D 638  
 Evaluat. method : M (Automatic A, B or C)  
 Specimen holders:  
 Extensometer :  
 Load cell :

## Results:

Legends	Nr	Fmax Lm kgf	Measurement travel end mm
	1	100,578	4,57
	2	67,714	3,54
	3	102,442	4,16
	4	122,640	5,18
	5	90,402	4,06

## Series graph:



**Statistics:**






Series n = 5	Fmax Lm kgf	Measurement travel end mm
$\bar{x}$	96,755	4,30
s	20,004	0,61
v	20,68	14,24

# KUAT TARIK

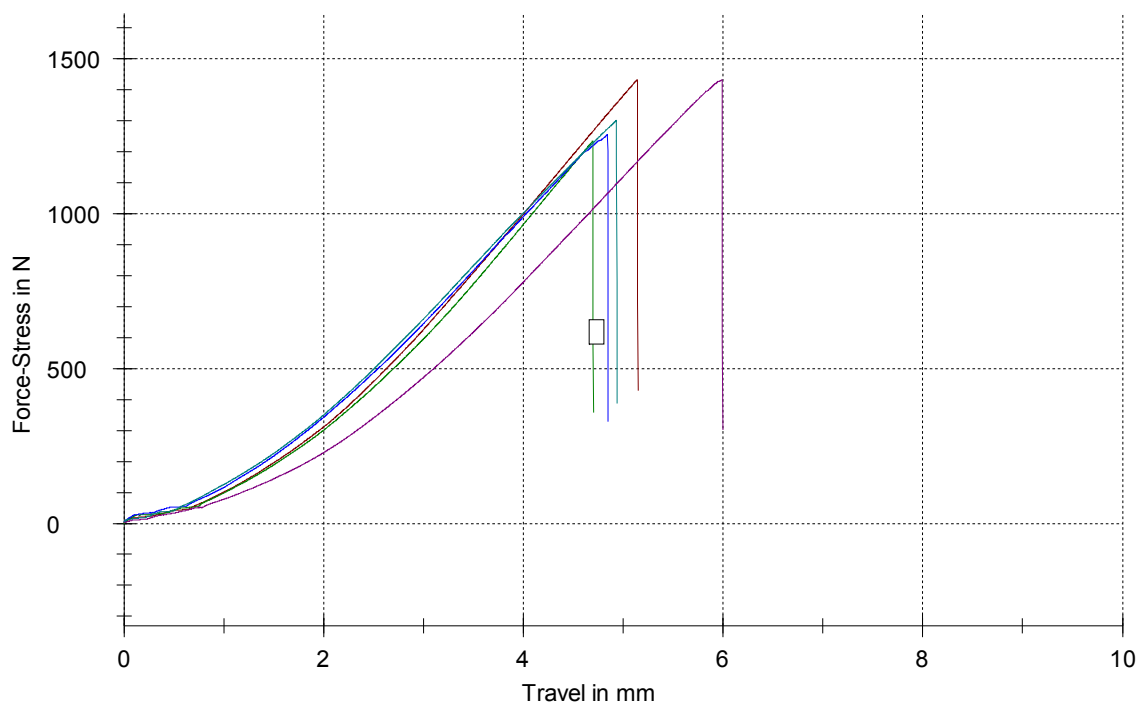
## Parameter table:

Headline : KUAT TARIK  
 Customer : 1769/VII/17  
 Tester : APRIAL  
 Material : KOMPOSIT EPOKSI + IJUK 30%  
 Test standard : ASTM D 638  
 Evaluat. method : M (Automatic A, B or C)  
 Specimen holders:  
 Extensometer :  
 Load cell :

## Results:

Legends	Nr	Fmax Lm kgf	Measurement travel end mm
	7	146,126	5,15
	8	108,216	4,25
	9	128,101	4,85
	11	132,785	4,94
	13	146,118	6,00

## Series graph:



**Statistics:**






Series n = 5	Fmax Lm kgf	Measurement travel end mm
$\bar{x}$	132,269	5,04
s	15,653	0,63
v	11,83	12,56

# KUAT TARIK

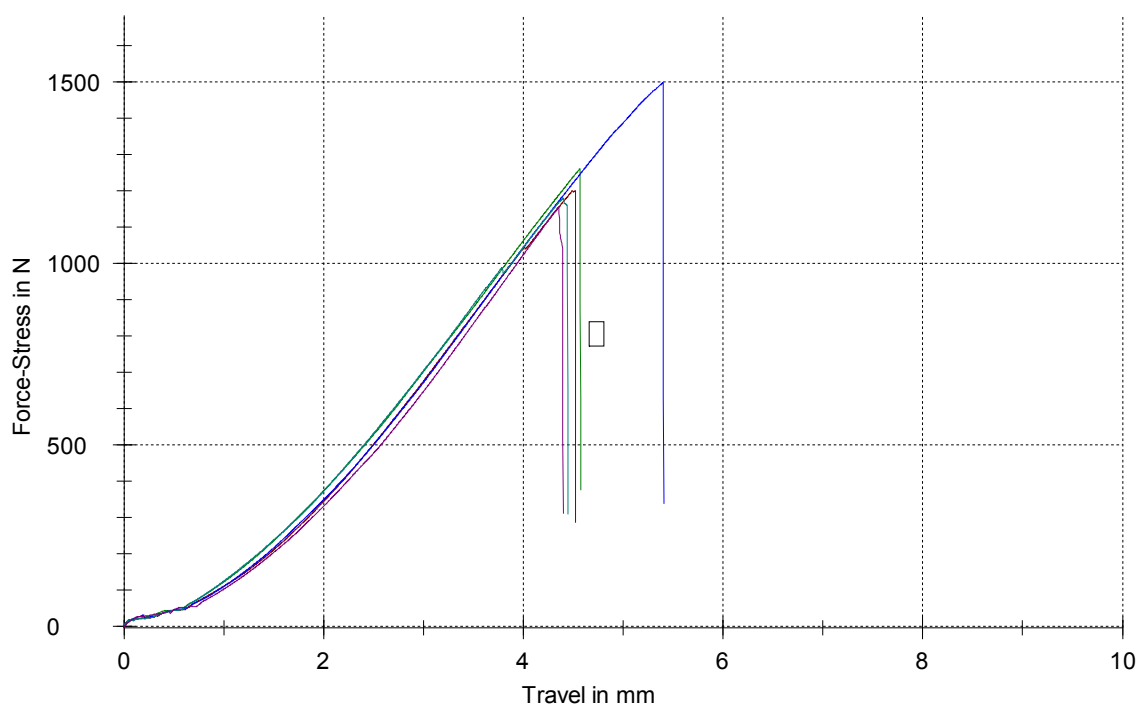
## Parameter table:

Headline : KUAT TARIK  
 Customer : 1770/VII/17  
 Tester : APRIAL  
 Material : KOMPOSIT EPOKSI + IJUK 40%  
 Test standard : ASTM D 638  
 Evaluat. method : M (Automatic A, B or C)  
 Specimen holders:  
 Extensometer :  
 Load cell :

## Results:

Legends	Nr	Fmax Lm kgf	Measurement travel end mm
	1	108,553	4,10
	2	112,679	4,12
	3	152,752	5,41
	4	106,640	4,00
	5	117,956	4,40

## Series graph:



**Statistics:**

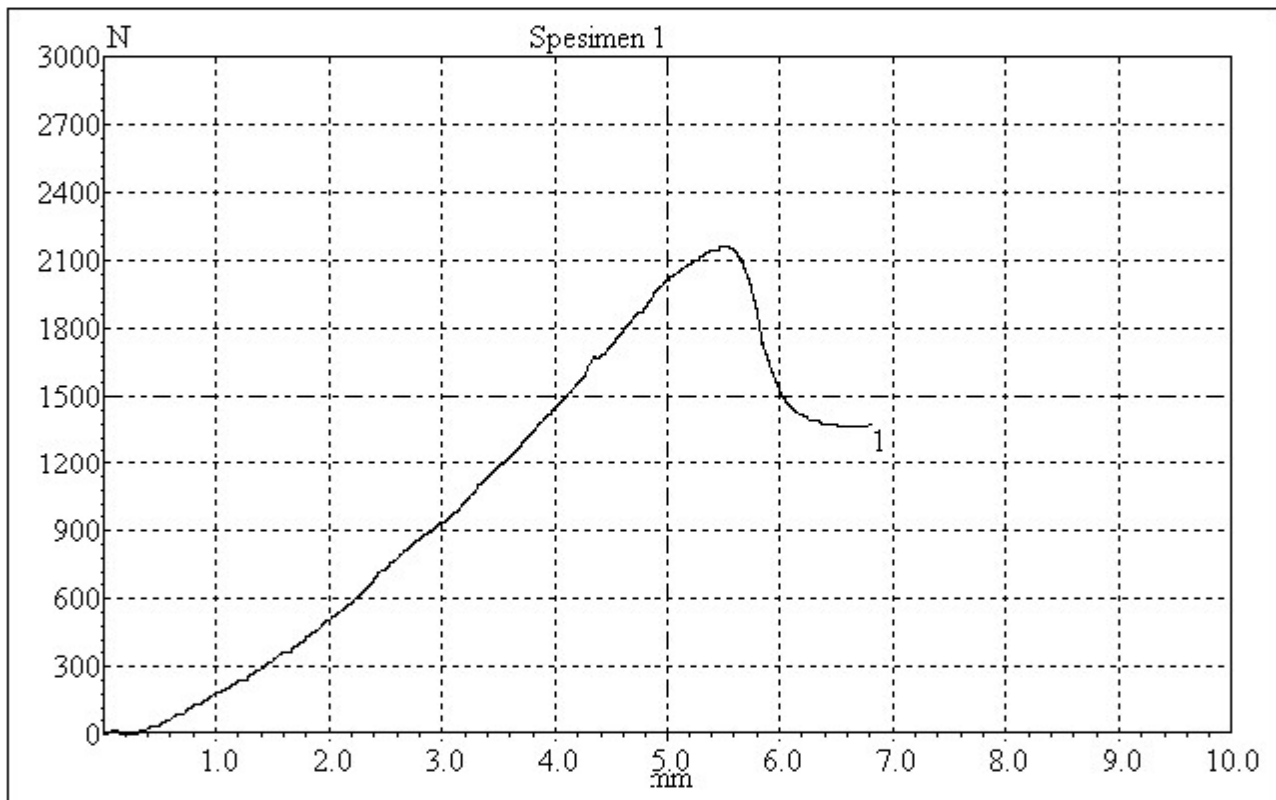
Series n = 5	Fmax Lm kgf	Measurement travel end mm
$\bar{x}$	119,716	4,40
s	18,971	0,58
v	15,85	13,15



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M Arief Catur P  
Epoxy 0 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	30.000	1101.310	2165.945	1383.53



Yogyakarta, 29 Juli 2017

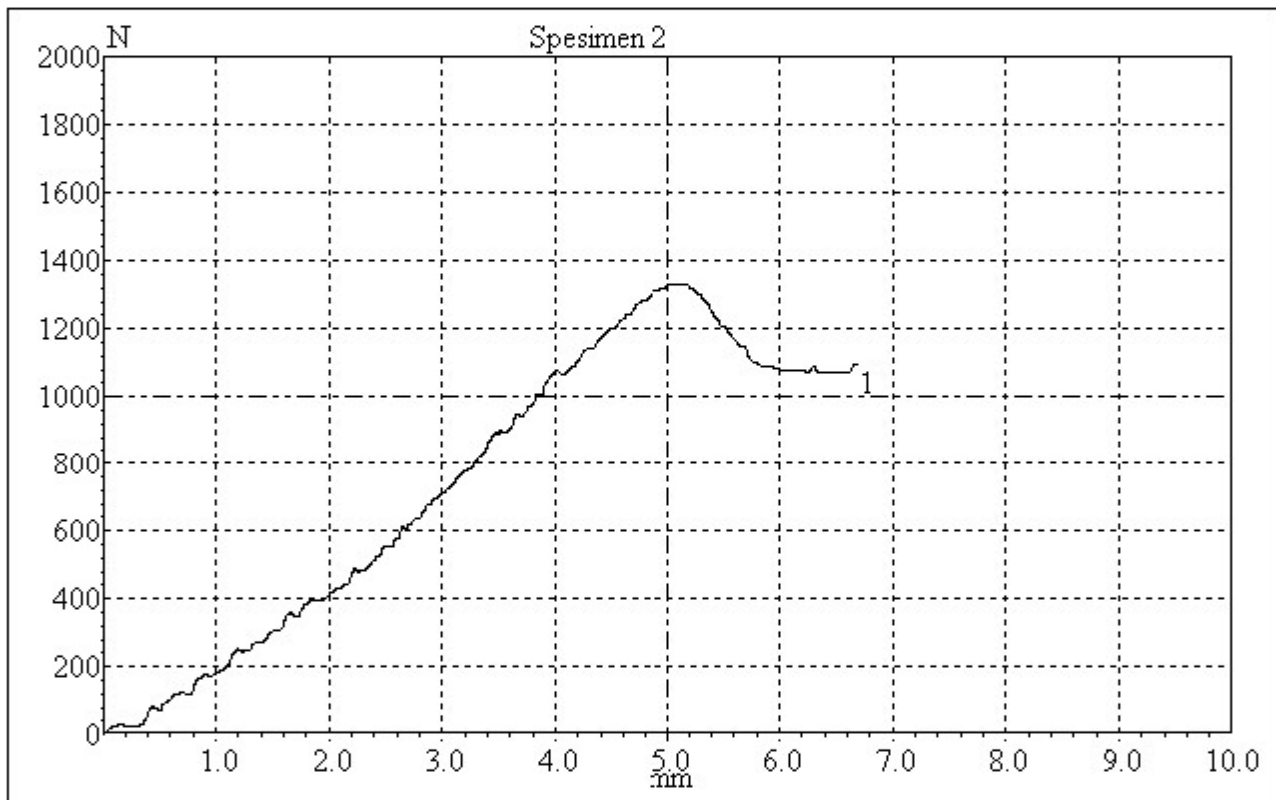
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 0 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	30.000	675.916	1332.026	1093.51



Yogyakarta, 29 Juli 2017

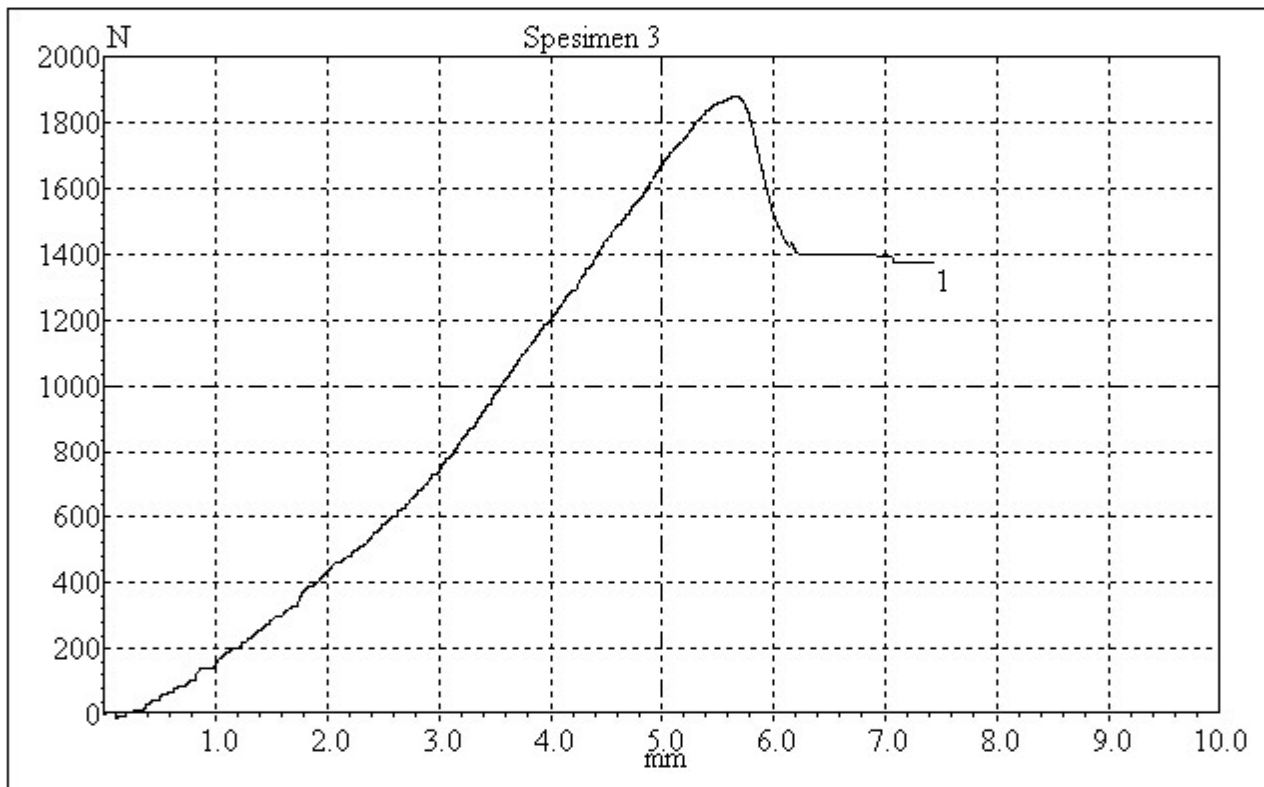
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 0 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	945.475	1877.564	1376.93



Yogyakarta, 29 Juli 2017

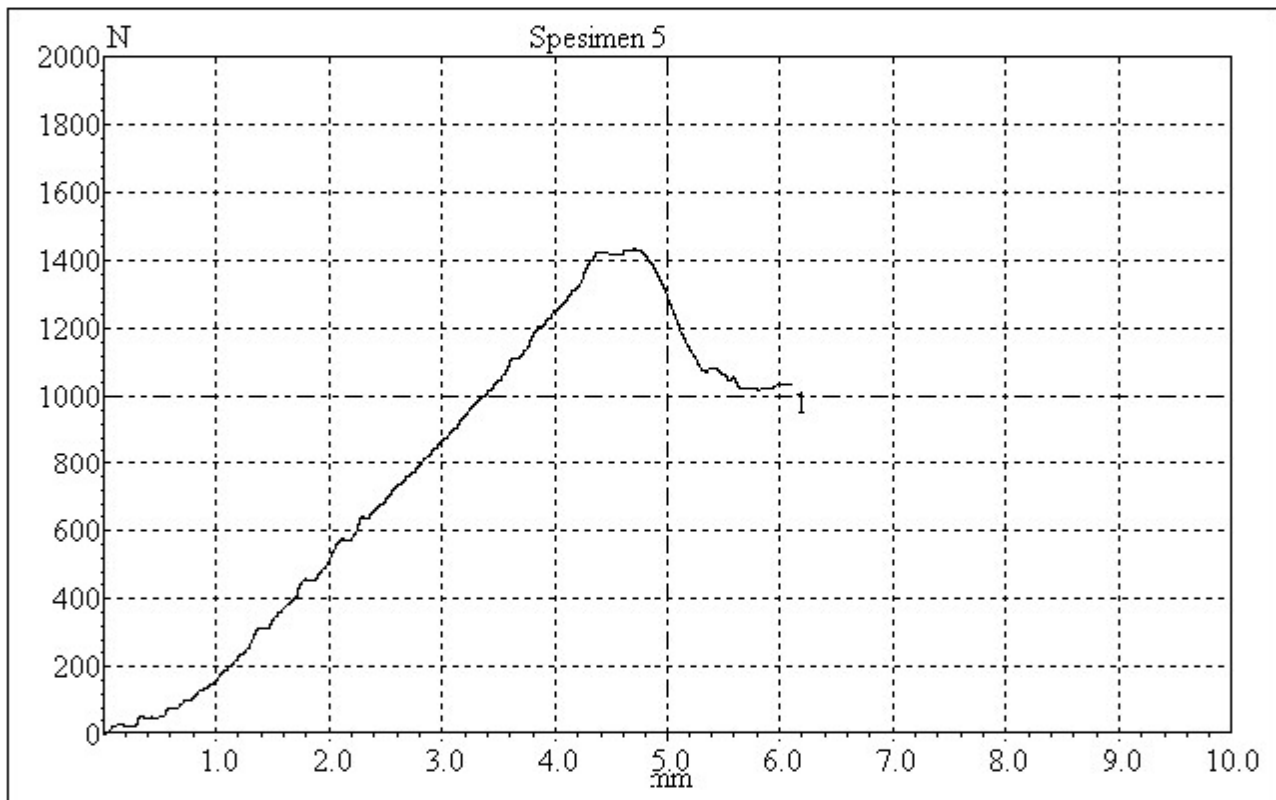
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 0 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	736.127	1433.749	1035.27



Yogyakarta, 07 Agustus 2017

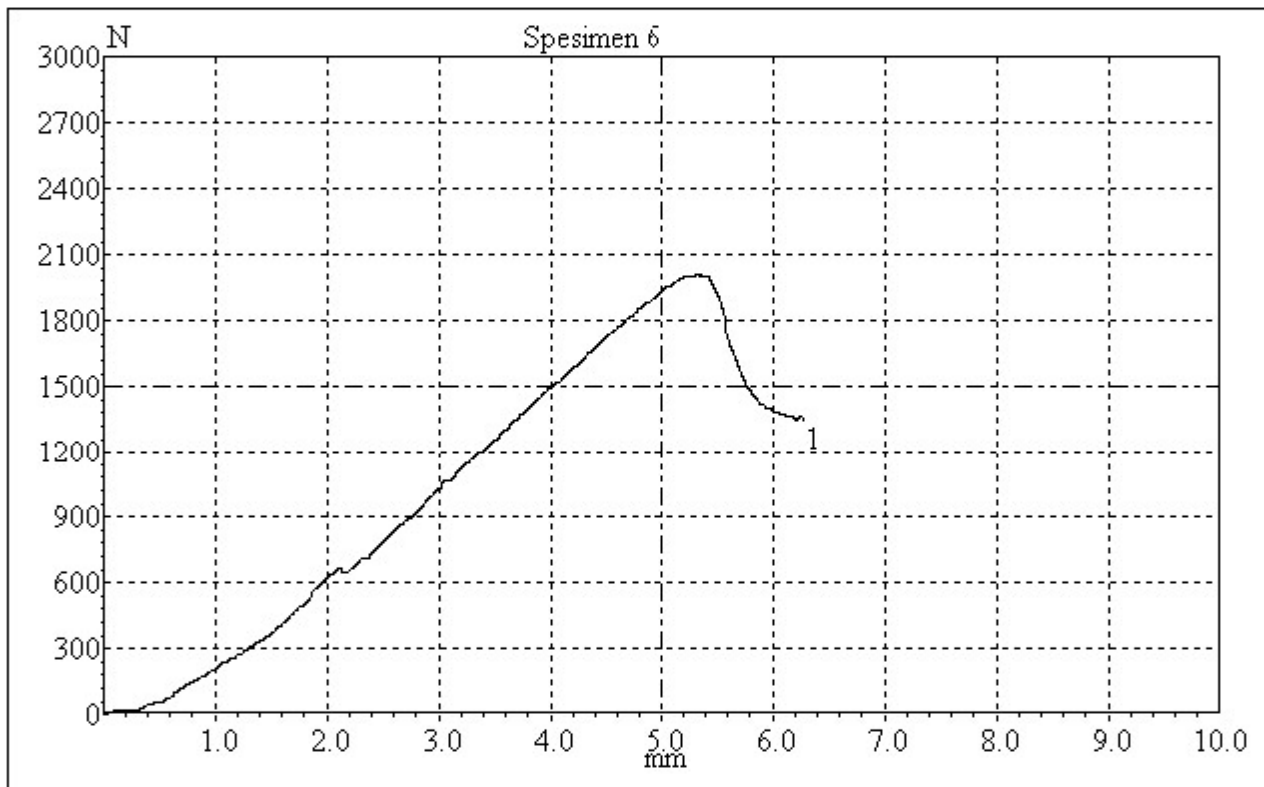
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 0 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	1062.838	2006.877	1347.91



Yogyakarta, 07 Agustus 2017

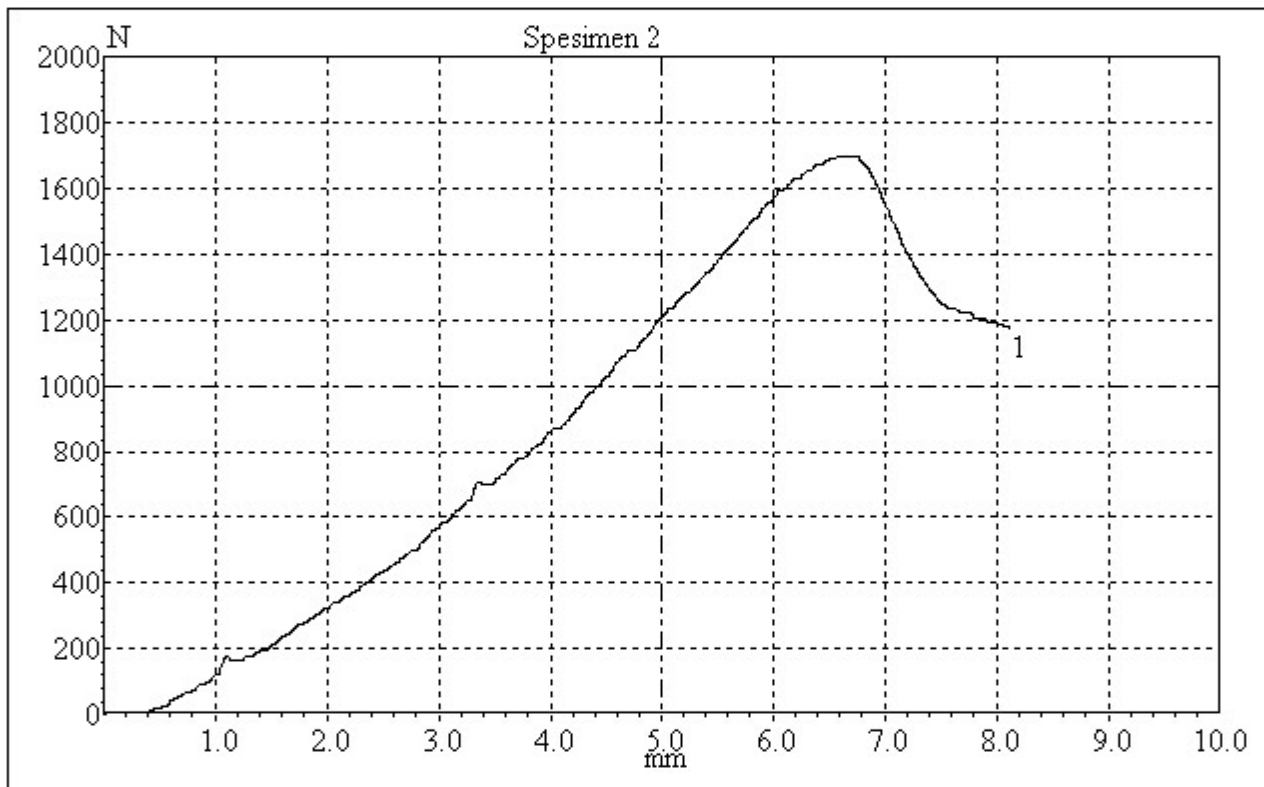
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 10 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	874.204	1700.572	1176.12



Yogyakarta, 07 Agustus 2017

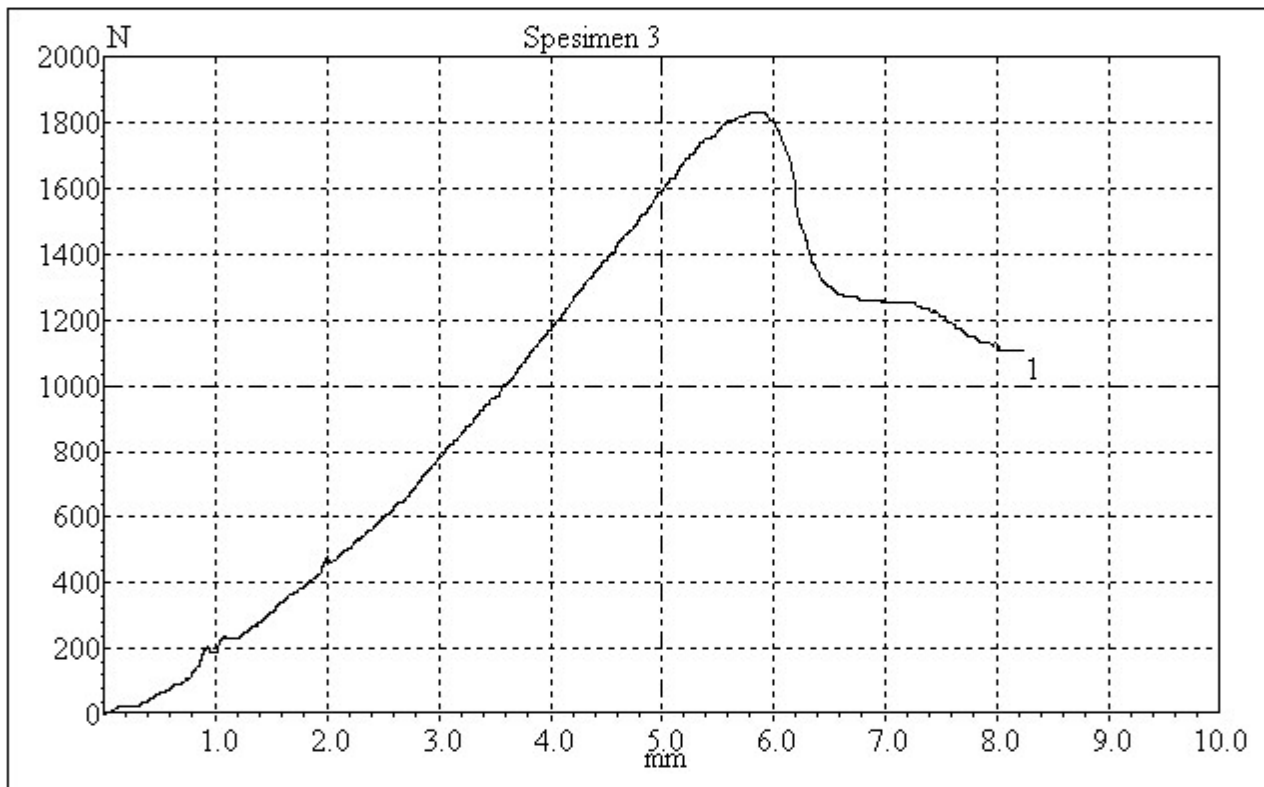
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 10 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	929.134	1829.427	1109.58



Yogyakarta, 07 Agustus 2017

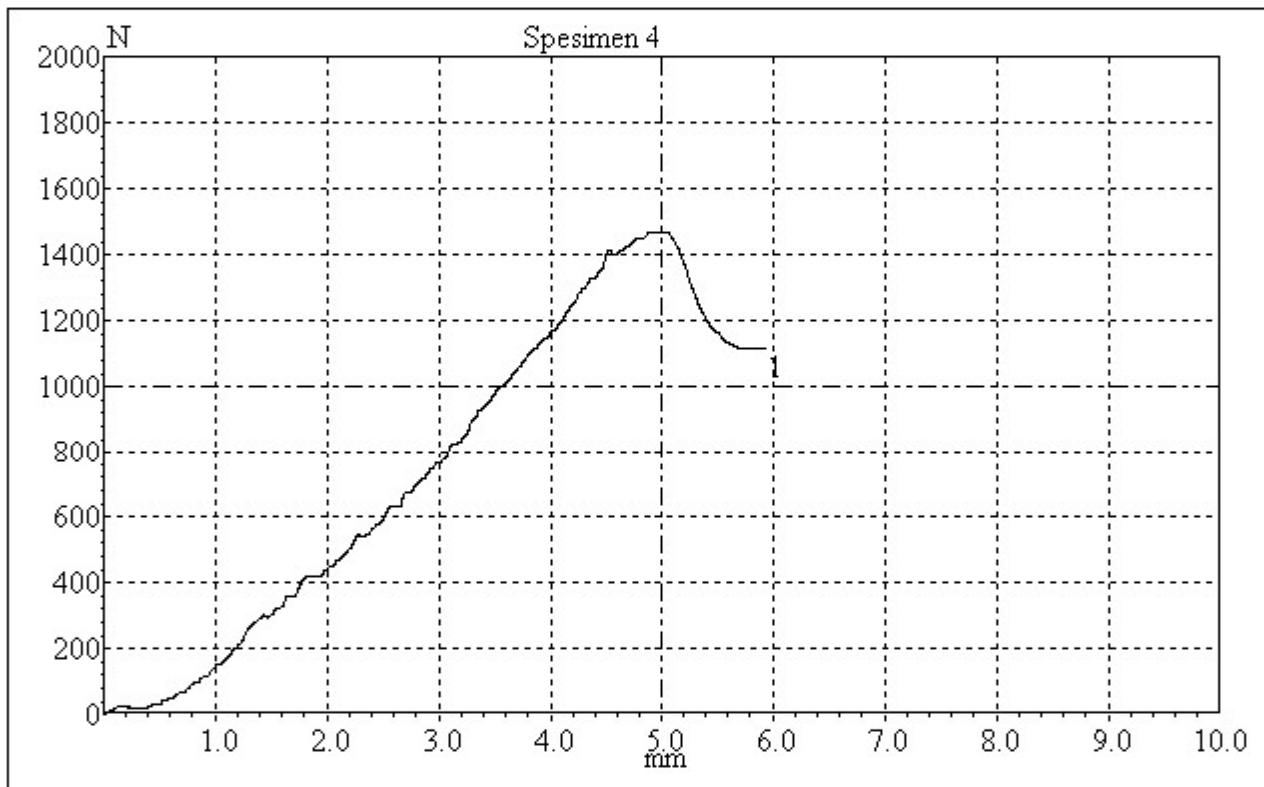
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 10 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	735.608	1469.788	1115.82



Yogyakarta, 07 Agustus 2017

Asisten Laboratorium  
Material Teknik

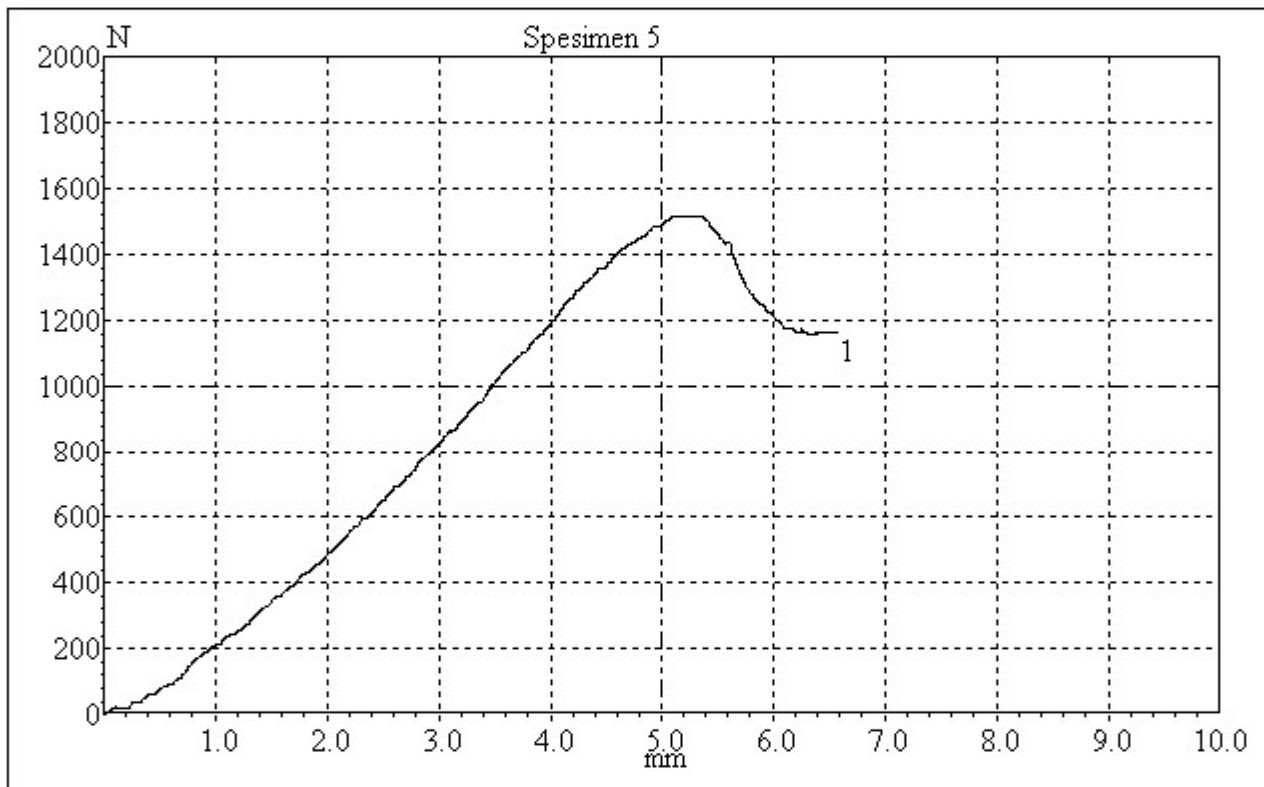
(Bambang Surono S.T)



LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 10 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	865.033	1517.463	1162.95



Yogyakarta, 07 Agustus 2017

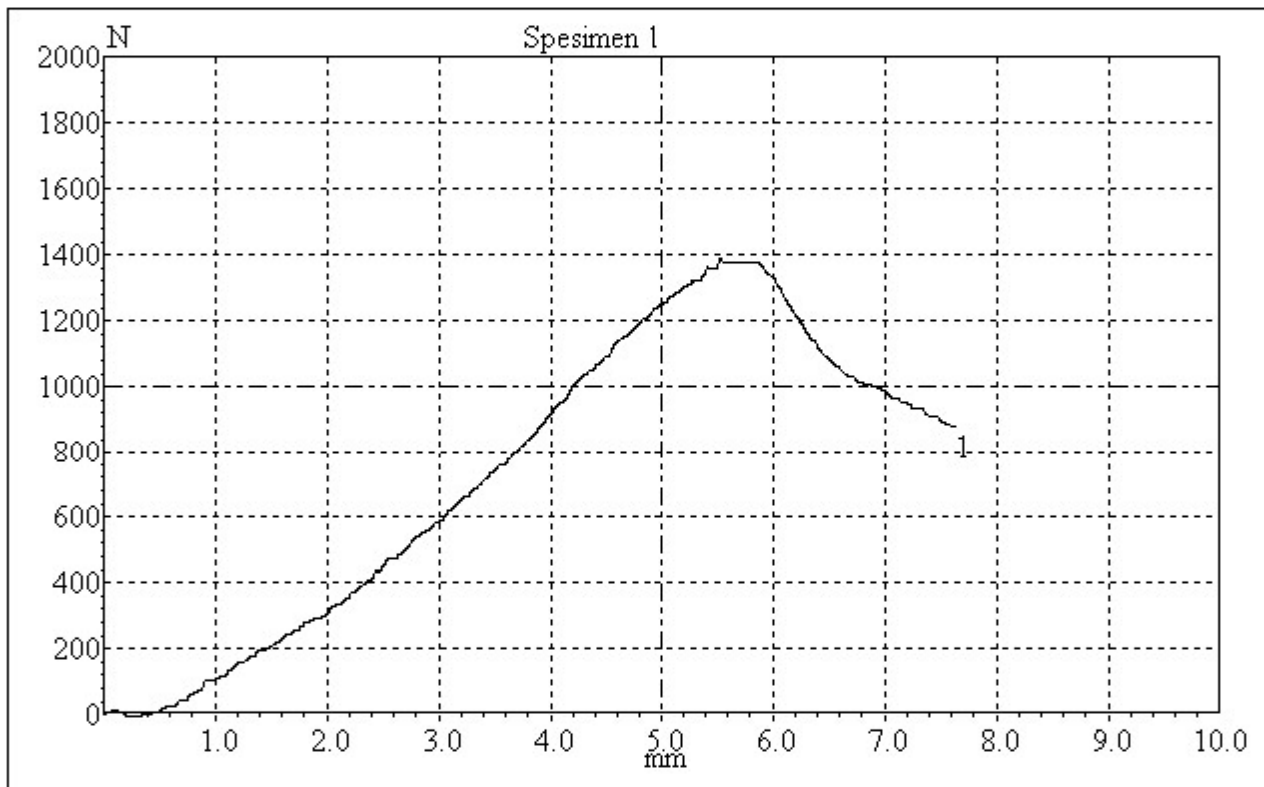
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 10 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	699.573	1391.903	875.53



Yogyakarta, 07 Agustus 2017

Asisten Laboratorium  
Material Teknik

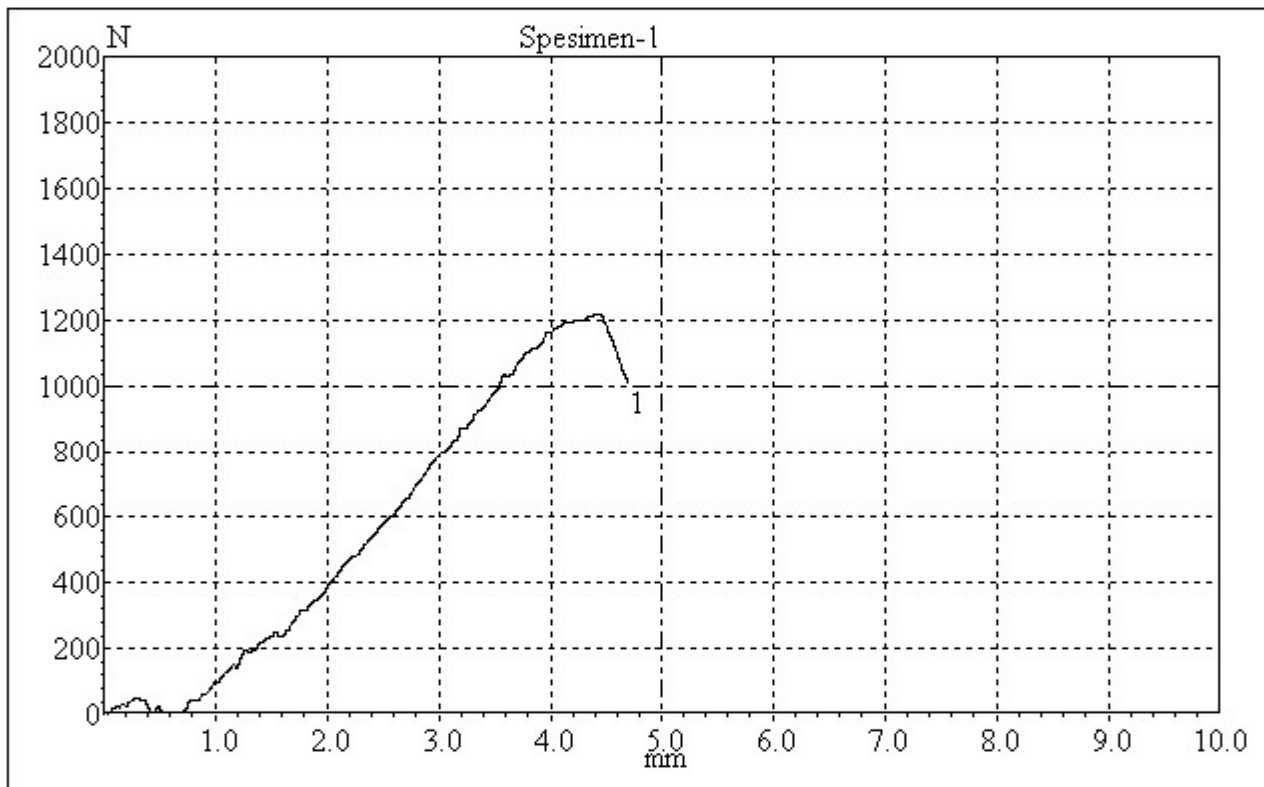
(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 20 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	78.540	872.358	1219.130	1004.696



Yogyakarta, 29 Juli 2017

Asisten Laboran

Material Teknik

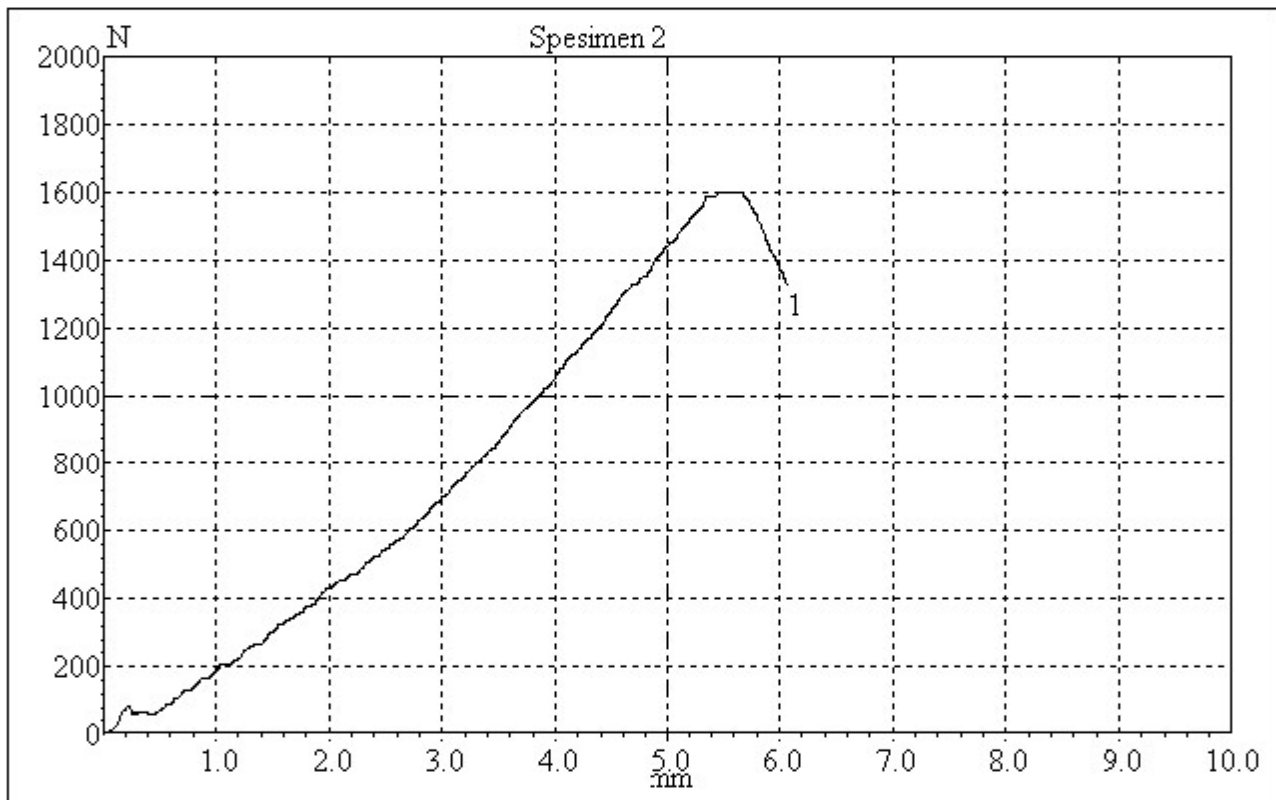
(Bambang Suroño S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 20%

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	78.540	807.948	1600.807	1323.689



Yogyakarta, 29 Juli 2017

Asisten Laboran

Material Teknik

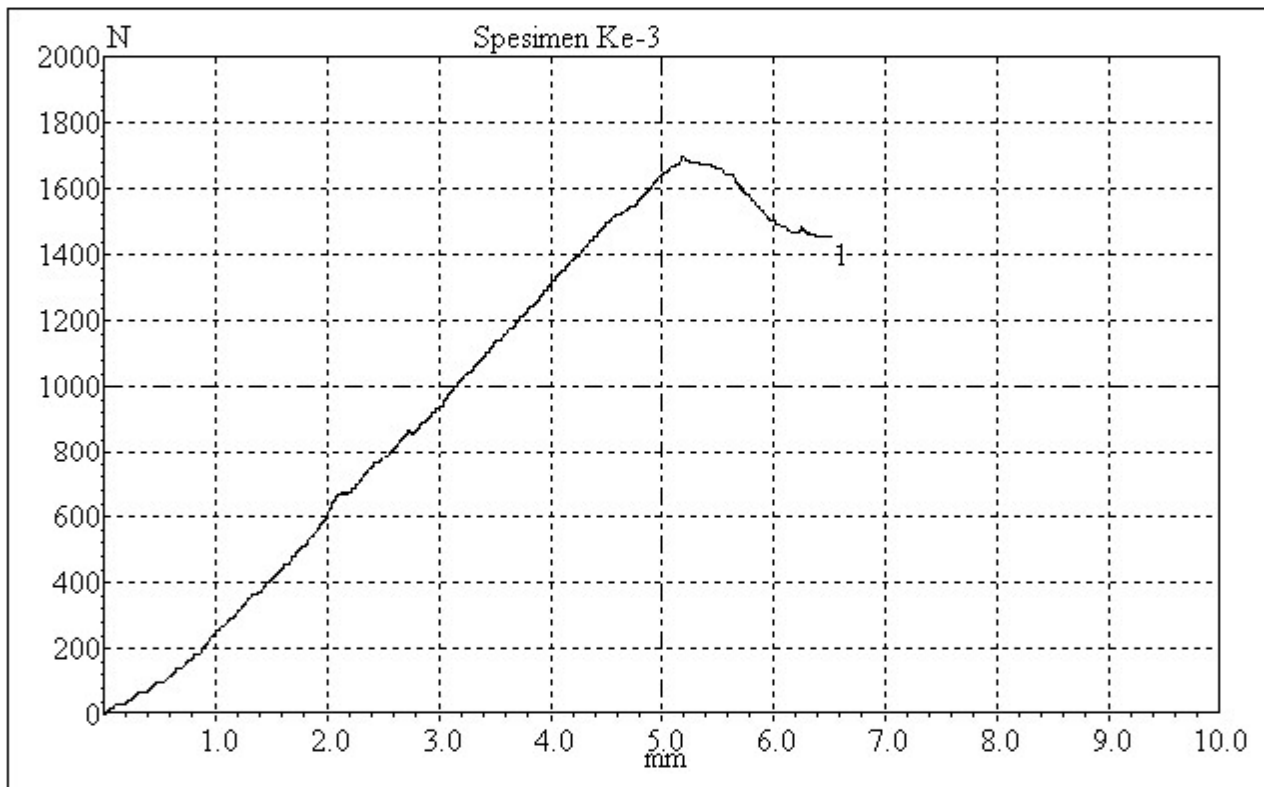
(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 20 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	851.583	1700.835	1454.220



Yogyakarta, 31 Juli 2017

Kepala Laboratorium  
Material Teknik

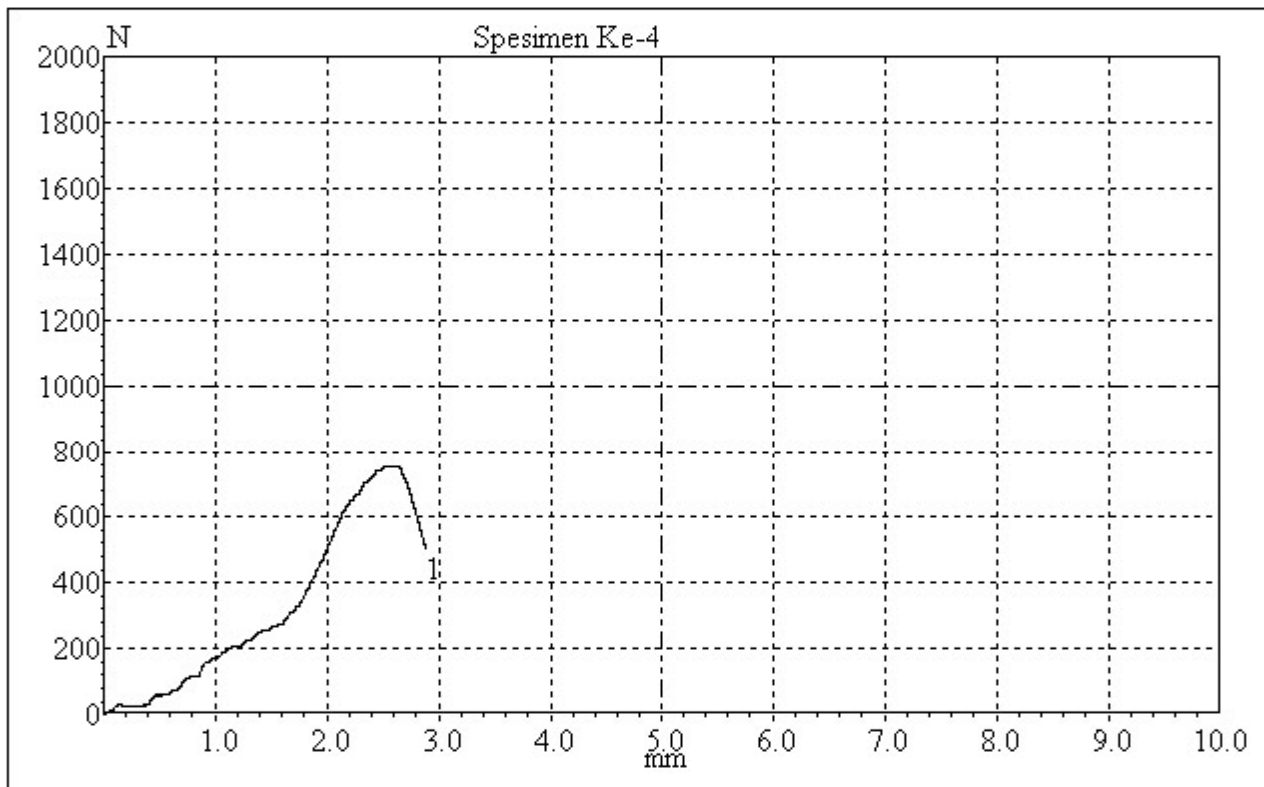
Drs. Sudarisman ,Mech.,Ph.D

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 20 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	463.689	752.771	500.347



Yogyakarta, 31 Juli 2017

Kepala Laboratorium  
Material Teknik

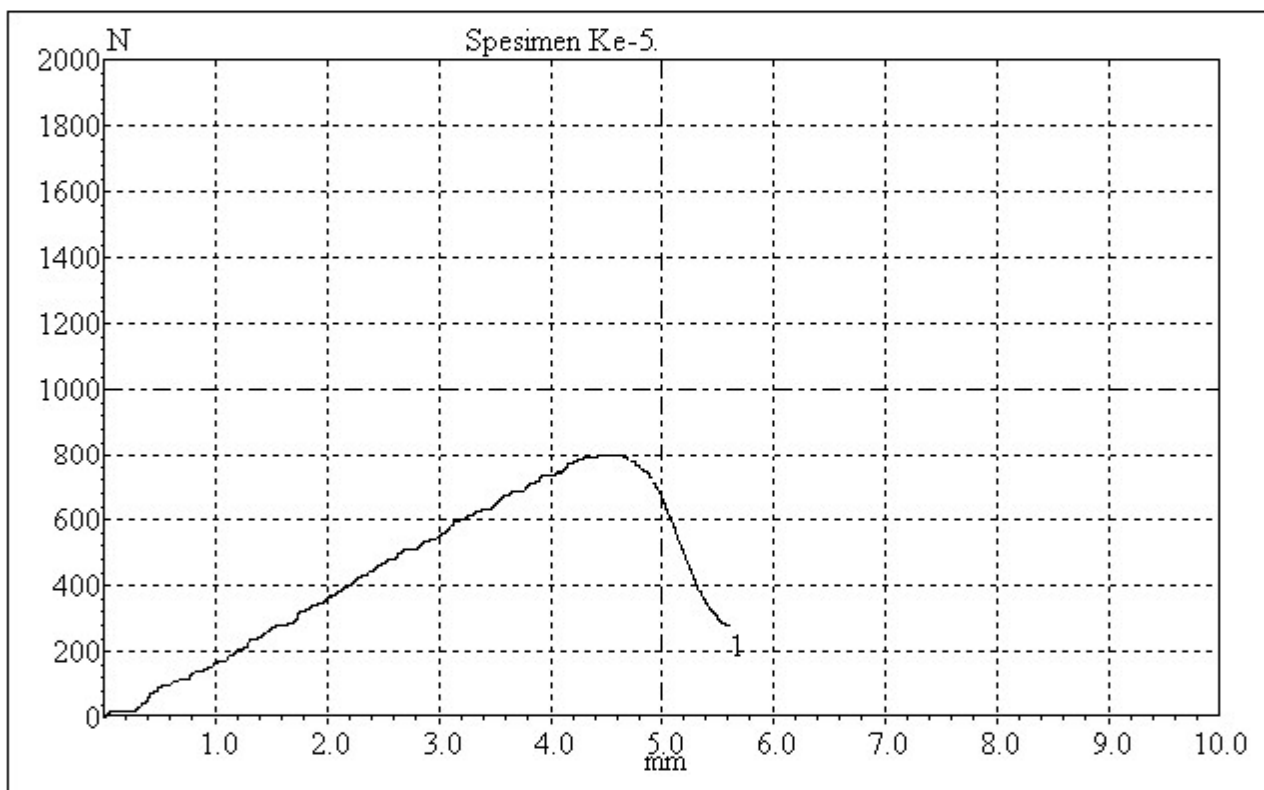
Drs. Sudarisman ,Mech.,Ph.D

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 20 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	425.568	802.073	274.658



Yogyakarta, 31 Juli 2017

Kepala Laboratorium  
Material Teknik

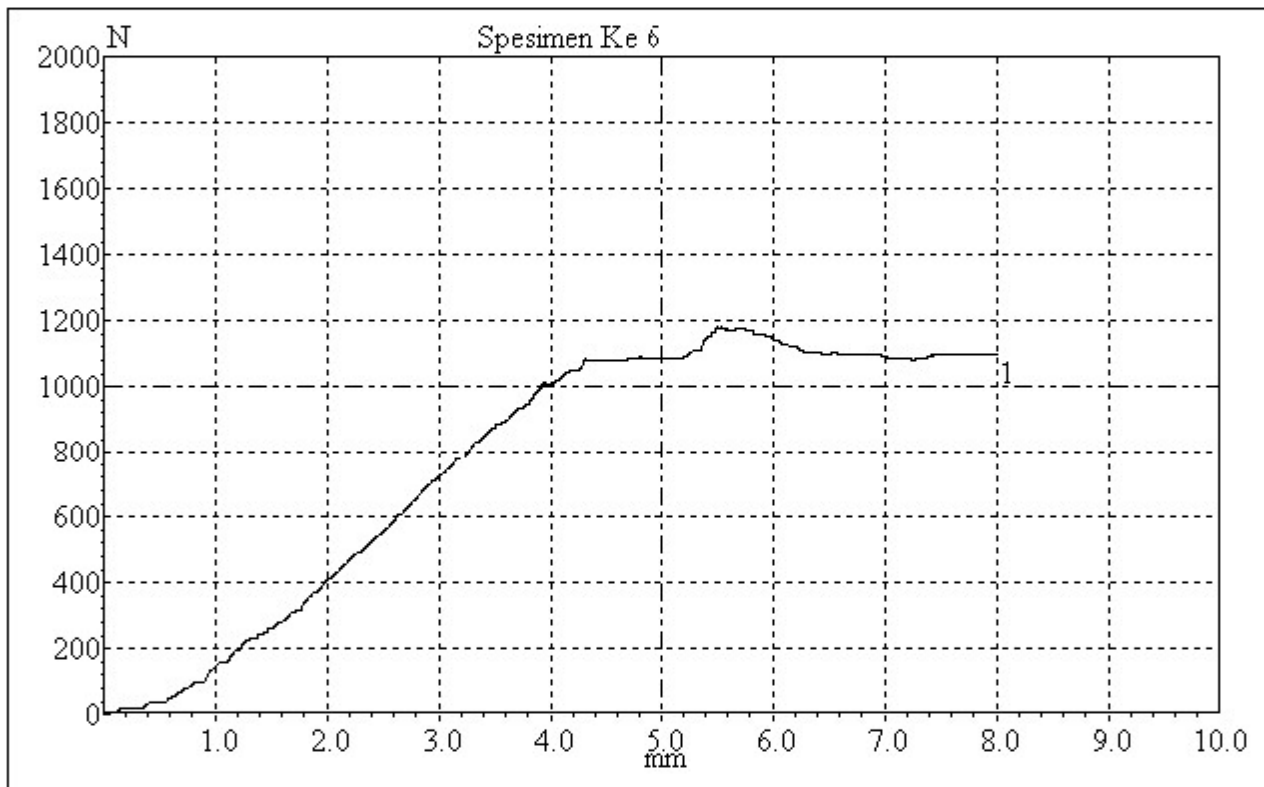
Drs. Sudarisman ,Mech.,Ph.D

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 20 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	605.992	1183.219	1095.862



Yogyakarta, 31 Juli 2017

Kepala Laboratorium  
Material Teknik

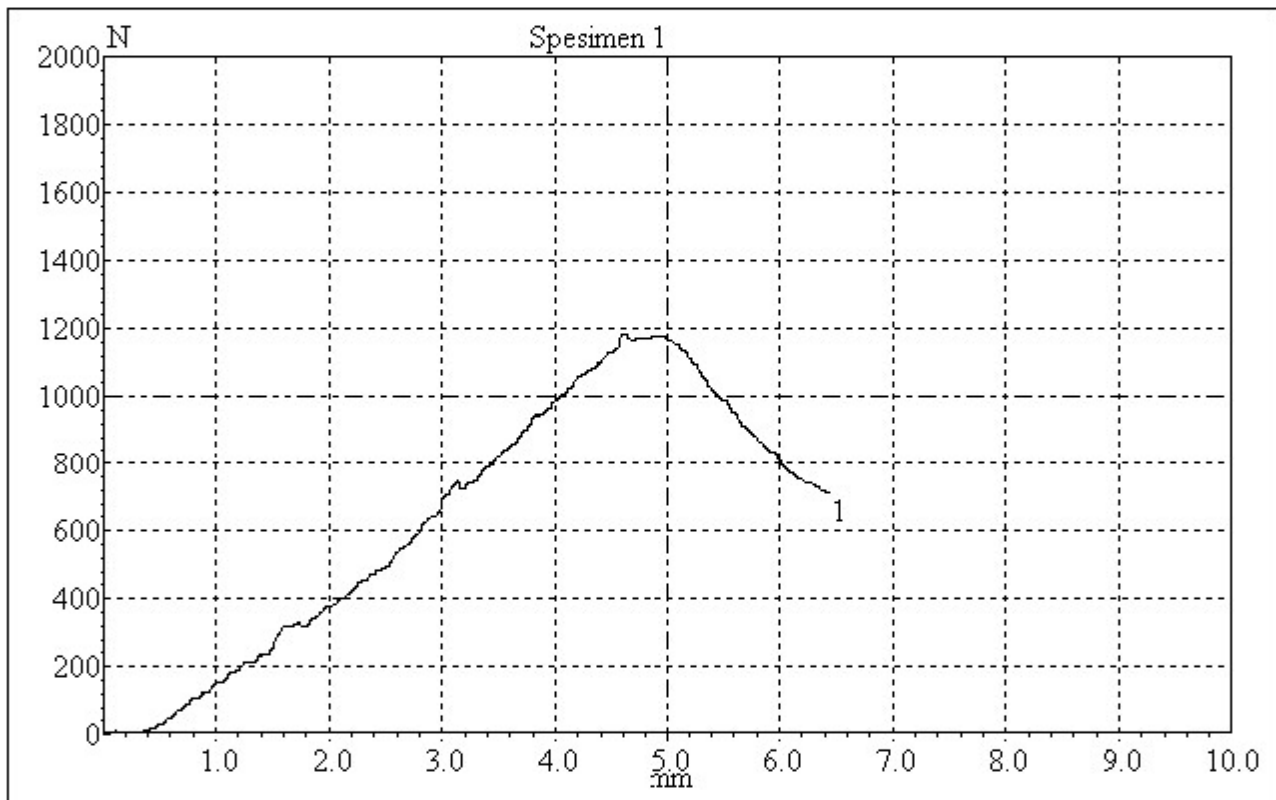
Drs. Sudarisman ,Mech, Ph.D



LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 30%

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	40.000	641.364	1183.408	713.82



Yogyakarta, 31 Juli 2017

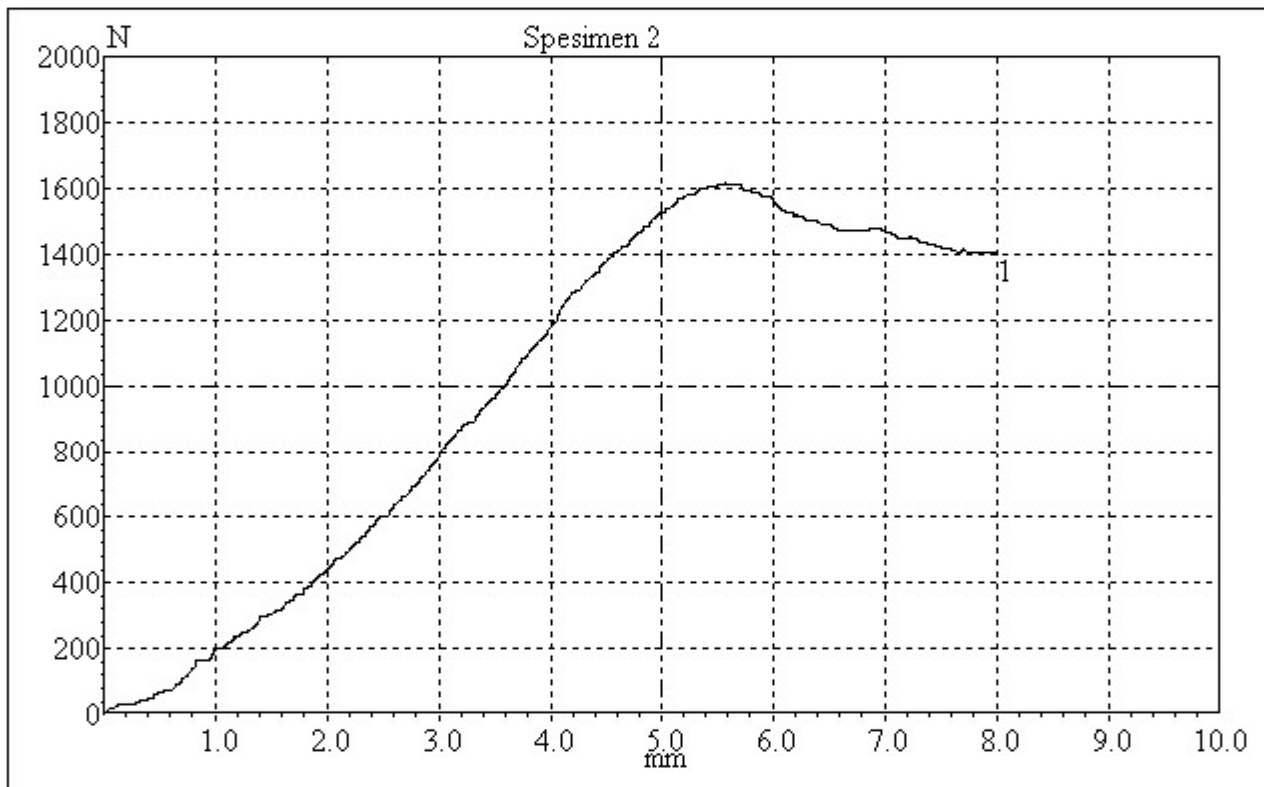
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 30%

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	40.000	812.651	1616.764	1405.14



Yogyakarta, 31 Juli 2017

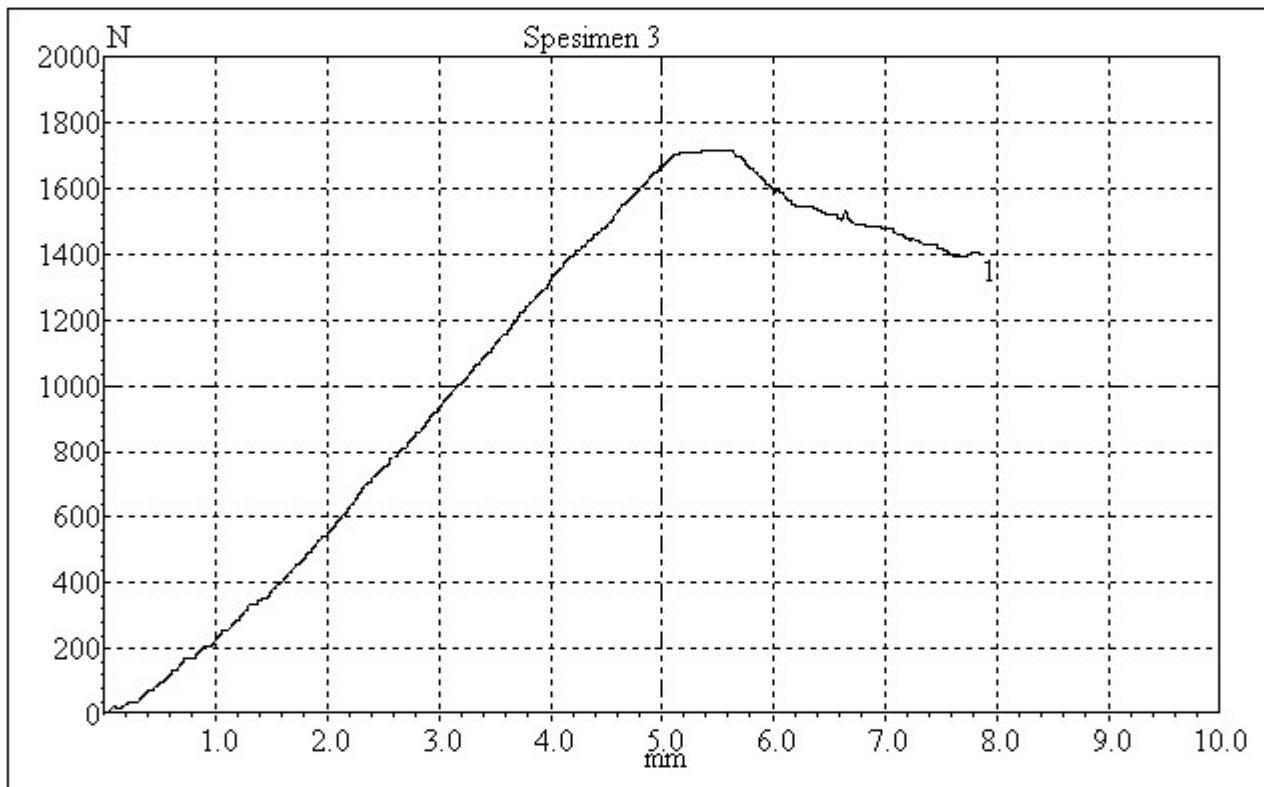
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 30%

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	862.640	1717.733	1407.41



Yogyakarta, 31 Juli 2017

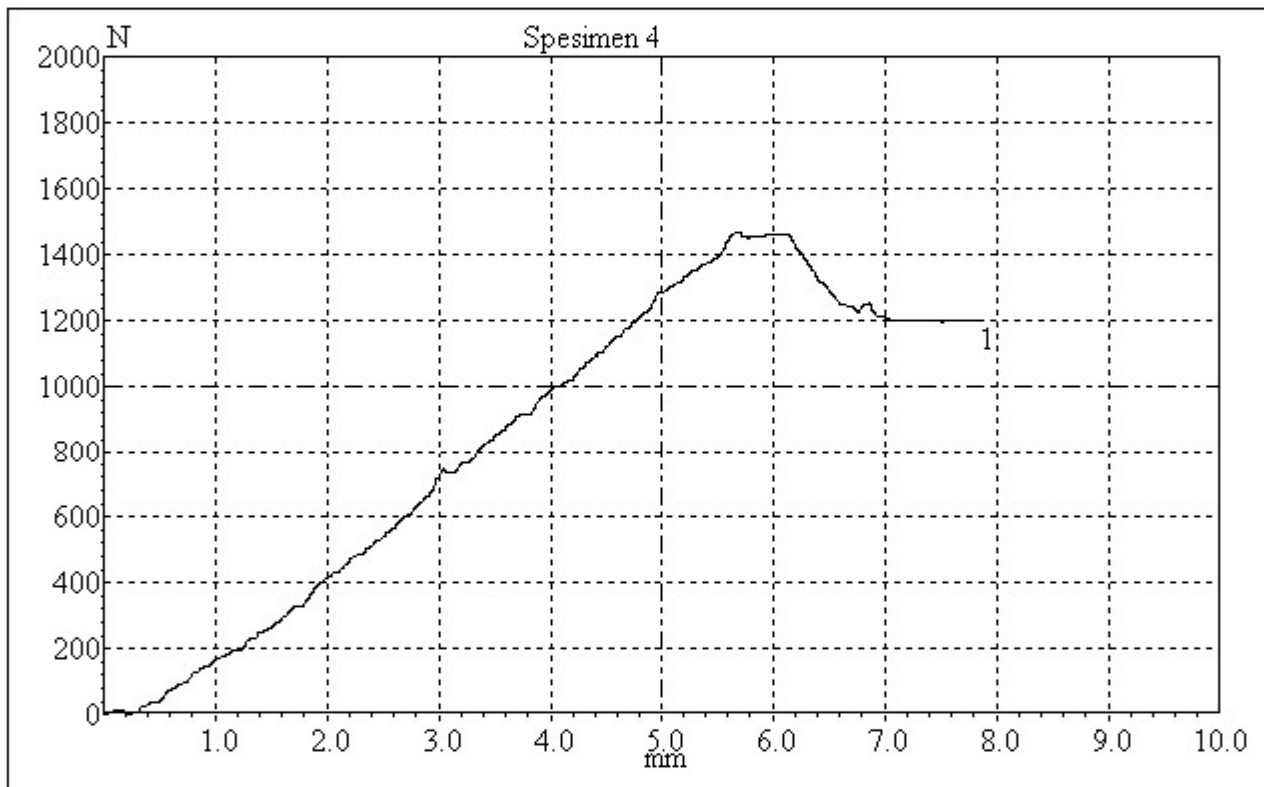
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 30%

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	743.716	1469.038	1201.44



Yogyakarta, 31 Juli 2017

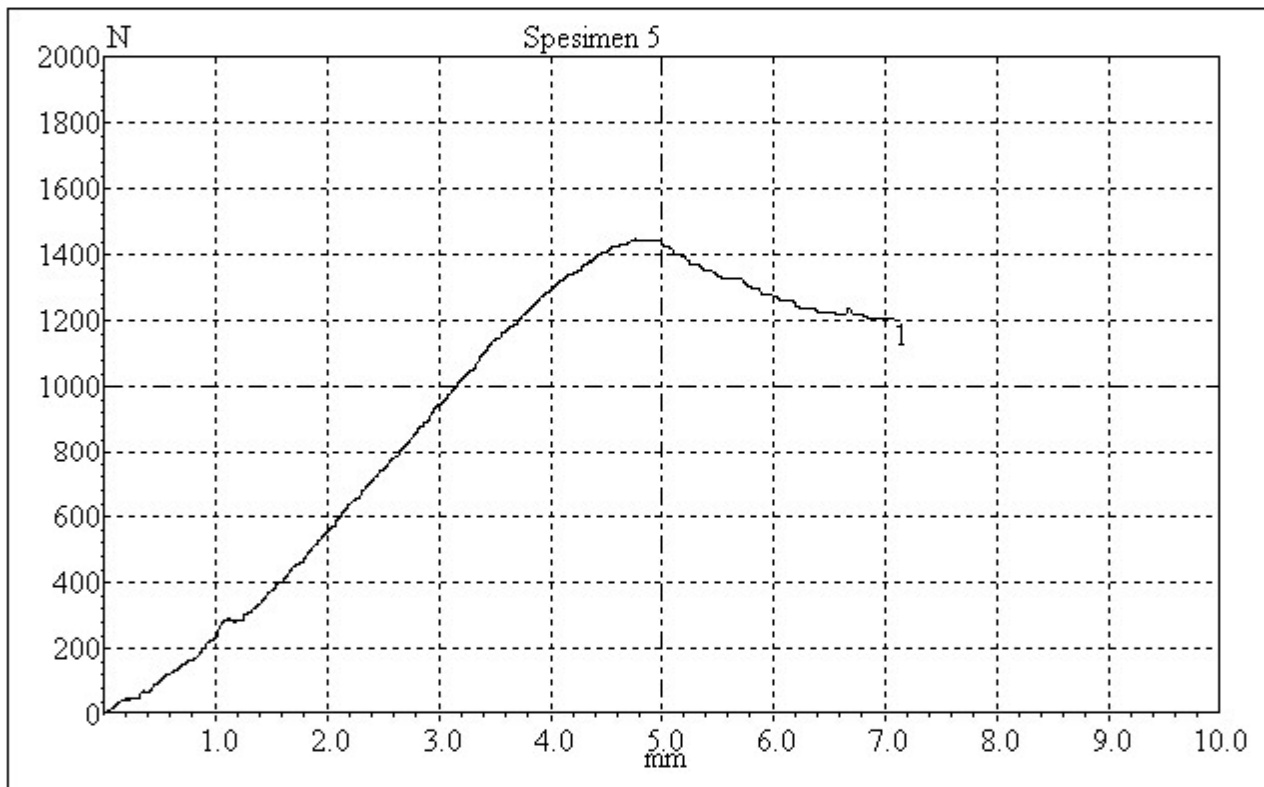
Asisten Laboratorium  
Material Teknik

(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief Catur P  
Epoxy 30%

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	739.027	1447.269	1211.03



Yogyakarta, 31 Juli 2017

Asisten Laboratorium  
Material Teknik

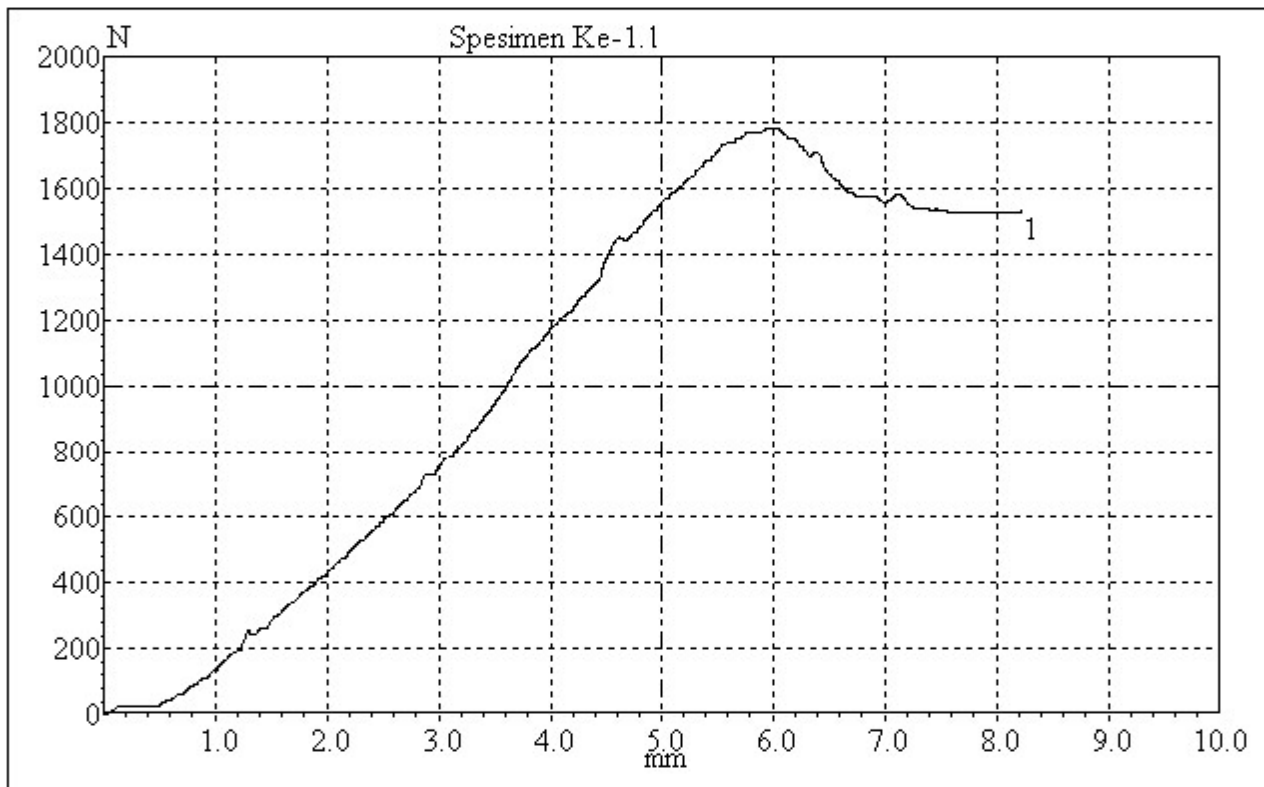
(Bambang Surono S.T)

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 40 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	1140.839	1783.185	1532.422



Yogyakarta, 31 Juli 2017

Kepala Laboratorium  
Material Teknik

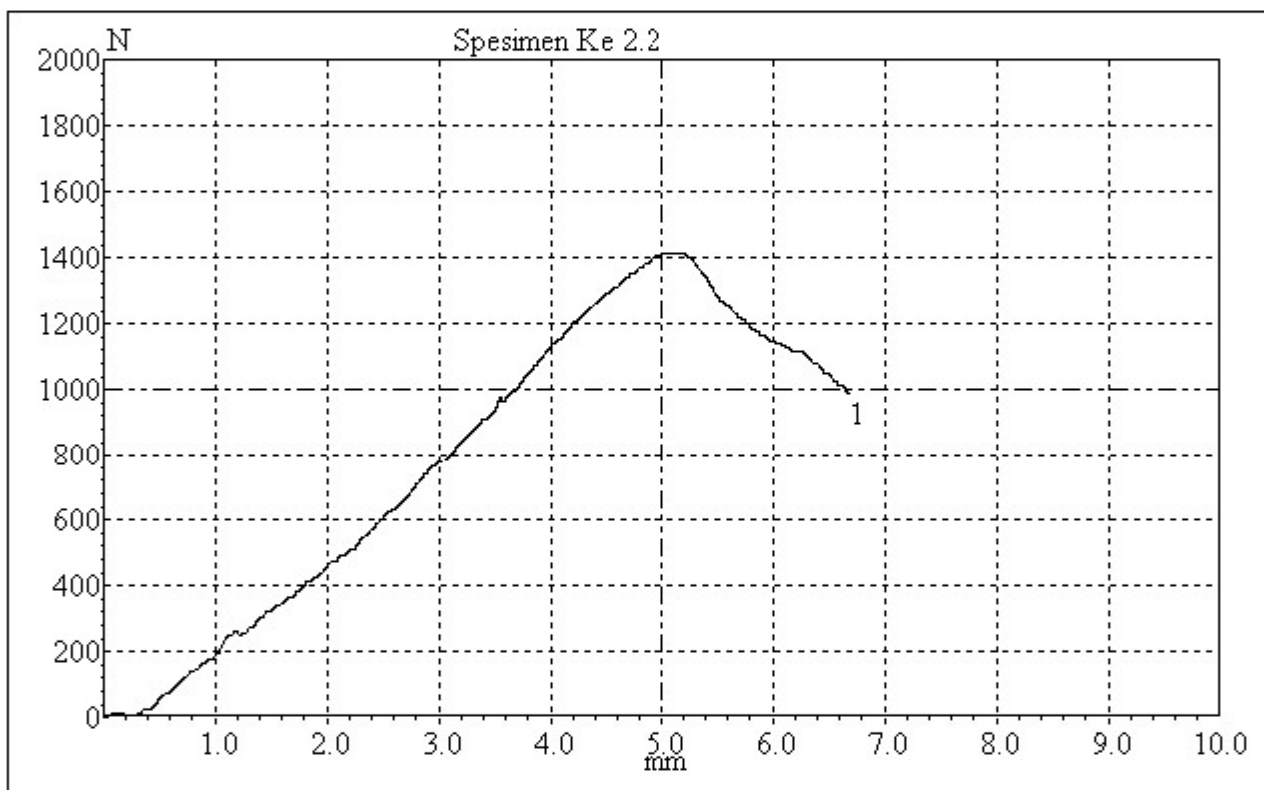
Drs. Sudarisman ,Mech.,Ph.D

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 40 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	975.034	1415.182	983.118



Yogyakarta, 31 Juli 2017

Kepala Laboratorium  
Material Teknik

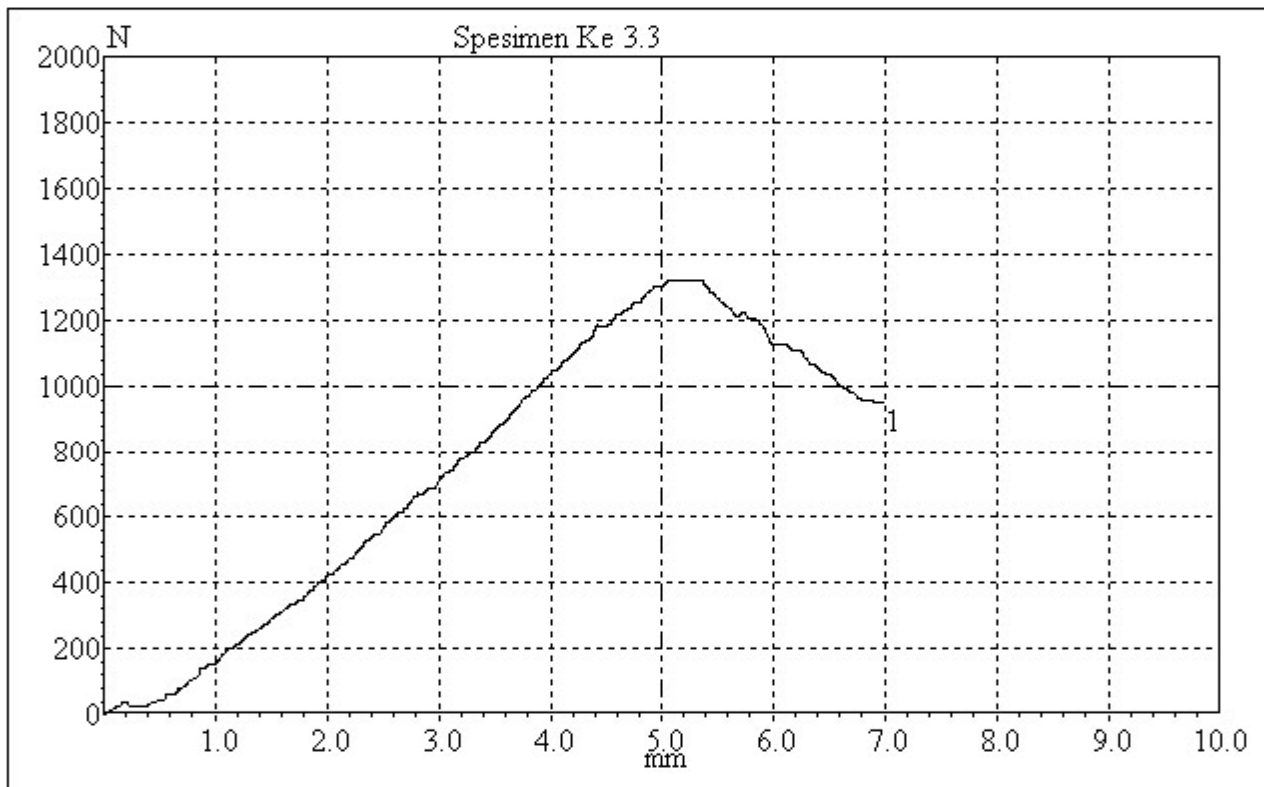
Drs. Sudarisman ,Mech, Ph.D

LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 40 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	672.370	1323.307	950.115



Yogyakarta, 31 Juli 2017

Kepala Laboratorium  
Material Teknik

Drs. Sudarisman ,Mech, Ph.D

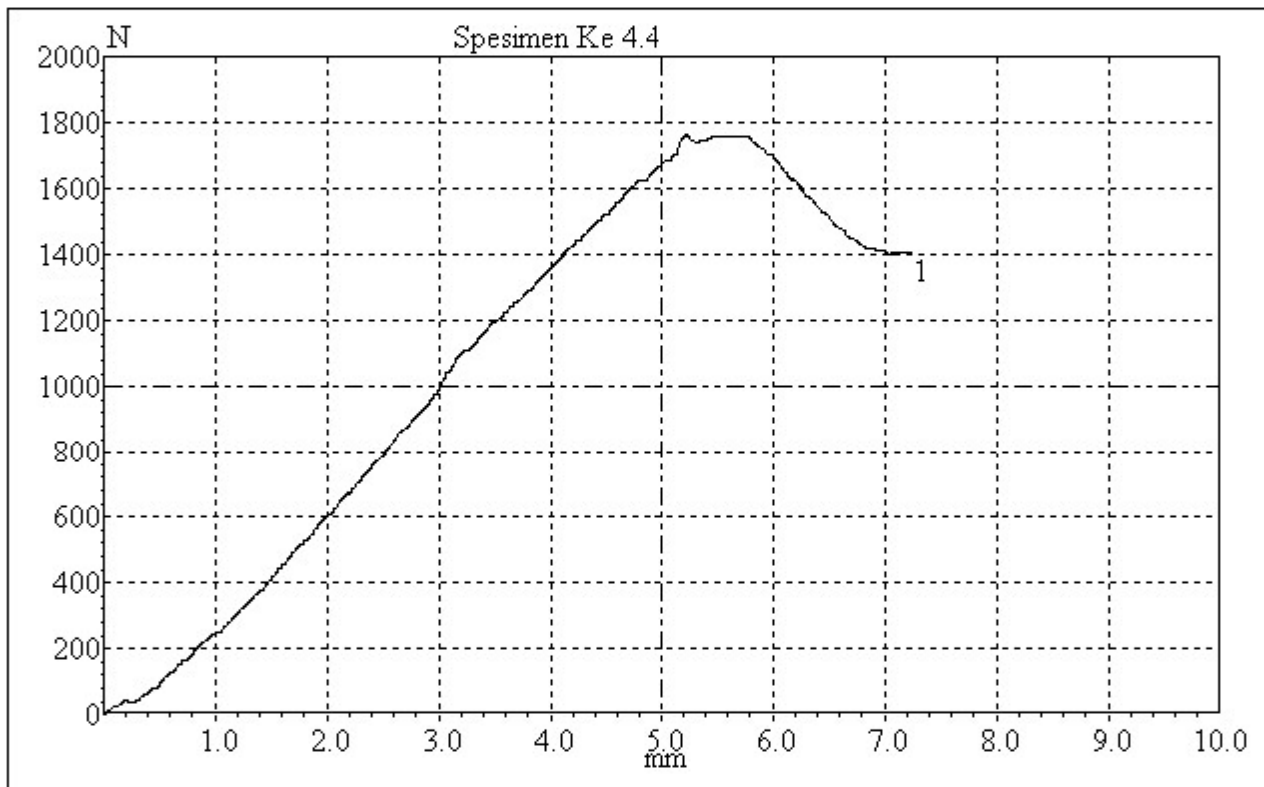


LABORATORIUM JURUSAN TEKNIK MESIN  
UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

M Arief C P

Epoxy 40 %

Test date	Area mm <sup>2</sup>	Yield point N	Max. Load N	Break N
2007-01	10.000	924.164	1763.864	1405.619



Yogyakarta, 31 Juli 2017

Kepala Laboratorium  
Material Teknik

Drs. Sudarisman ,Mech, Ph.D