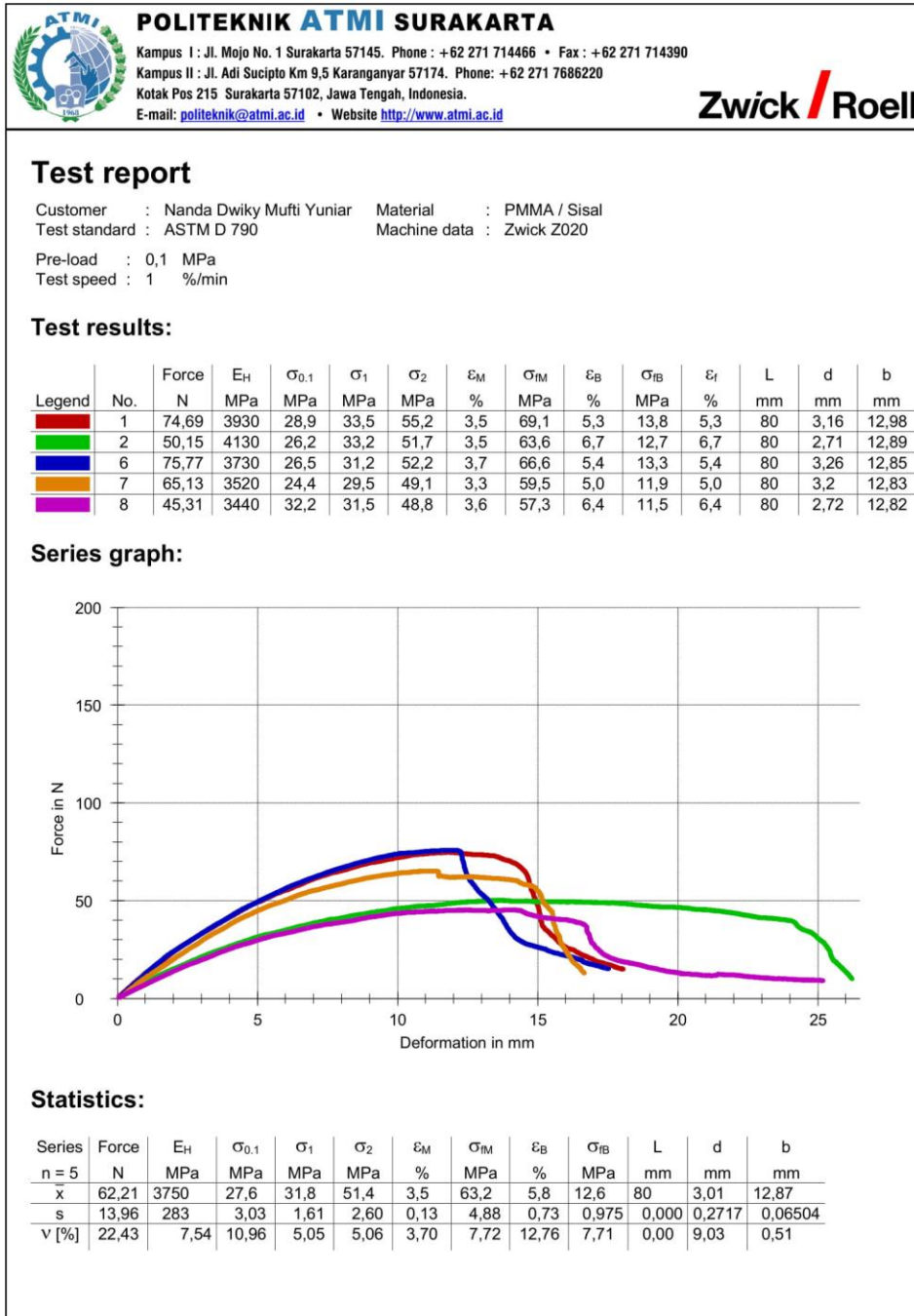
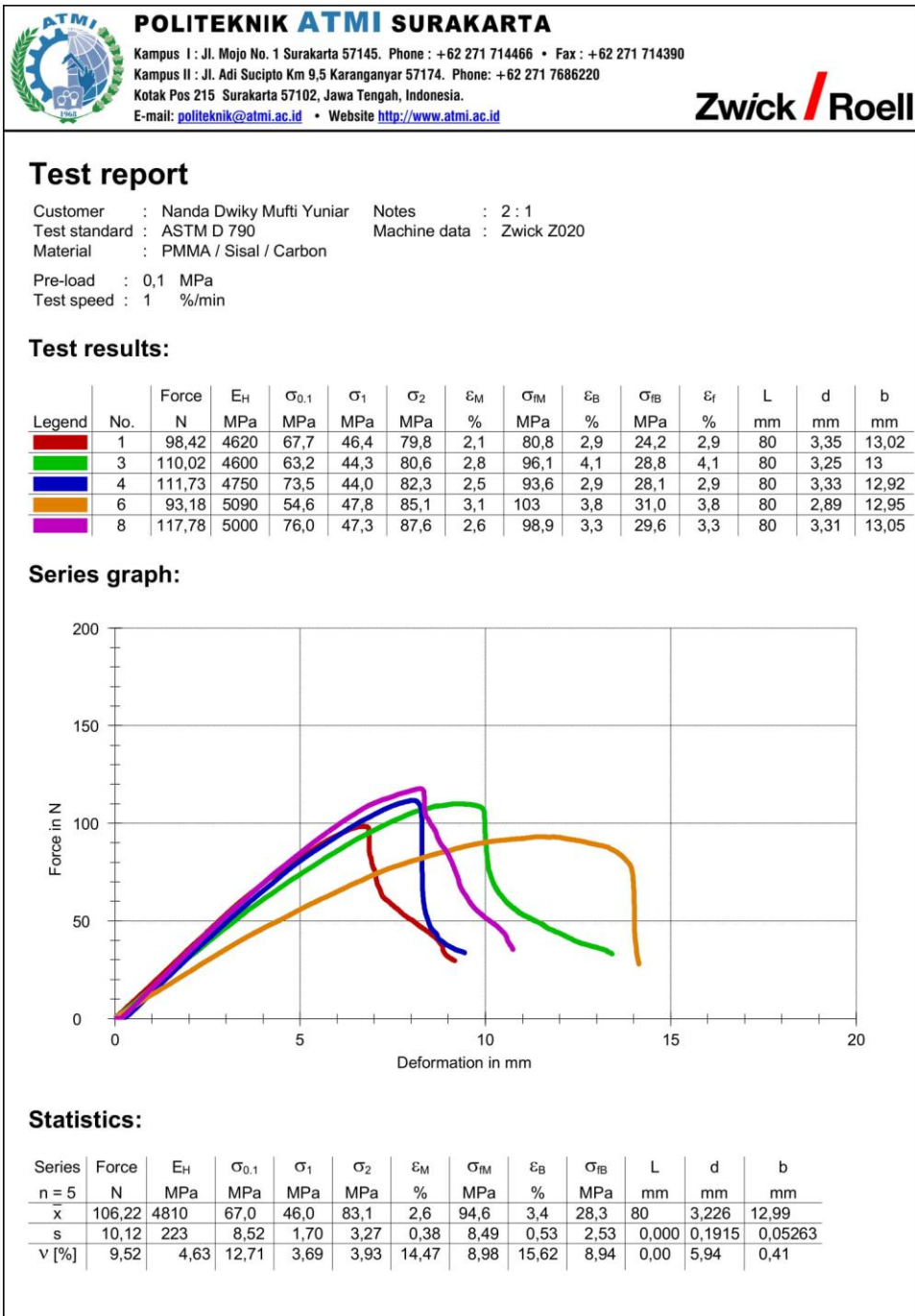
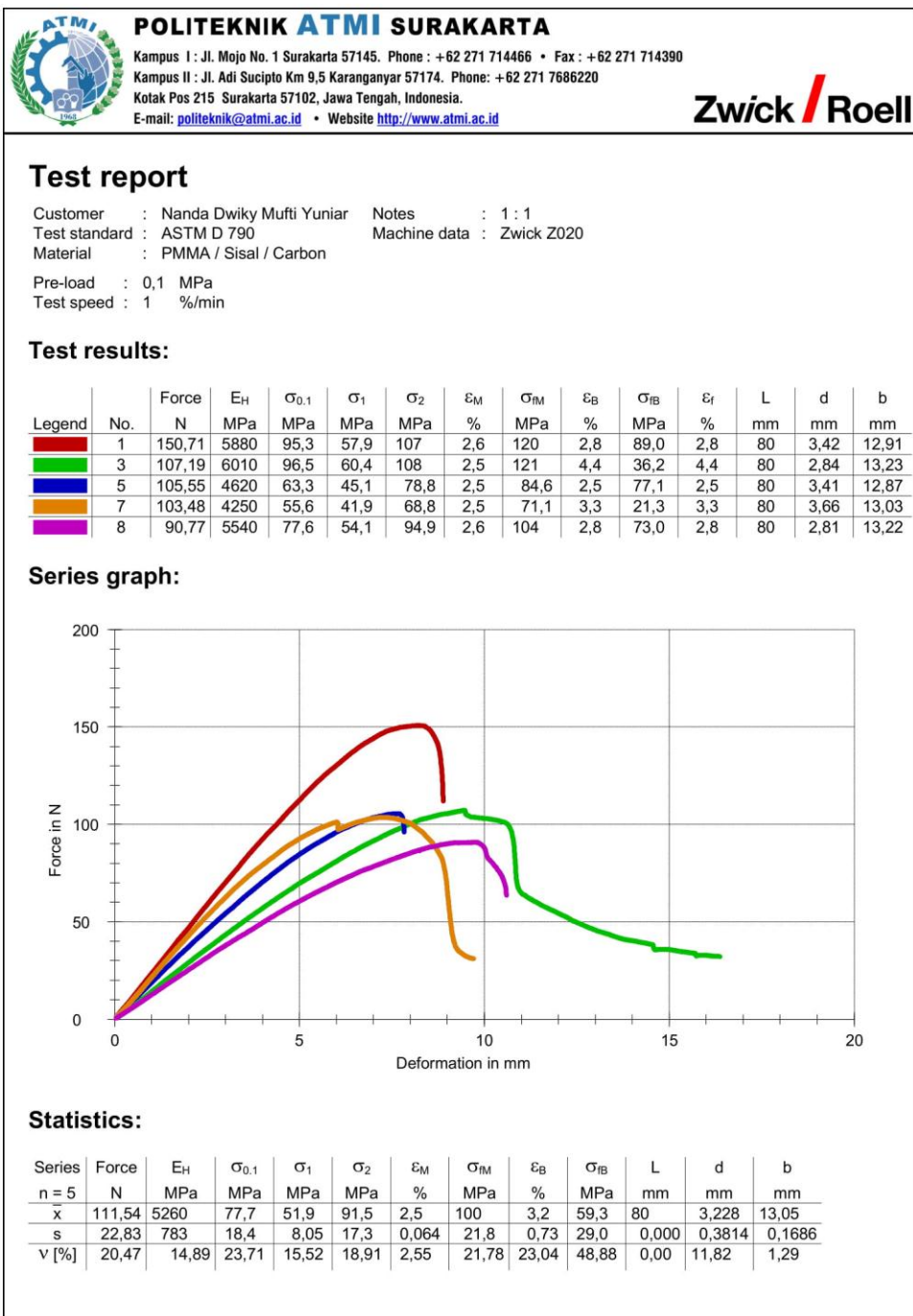
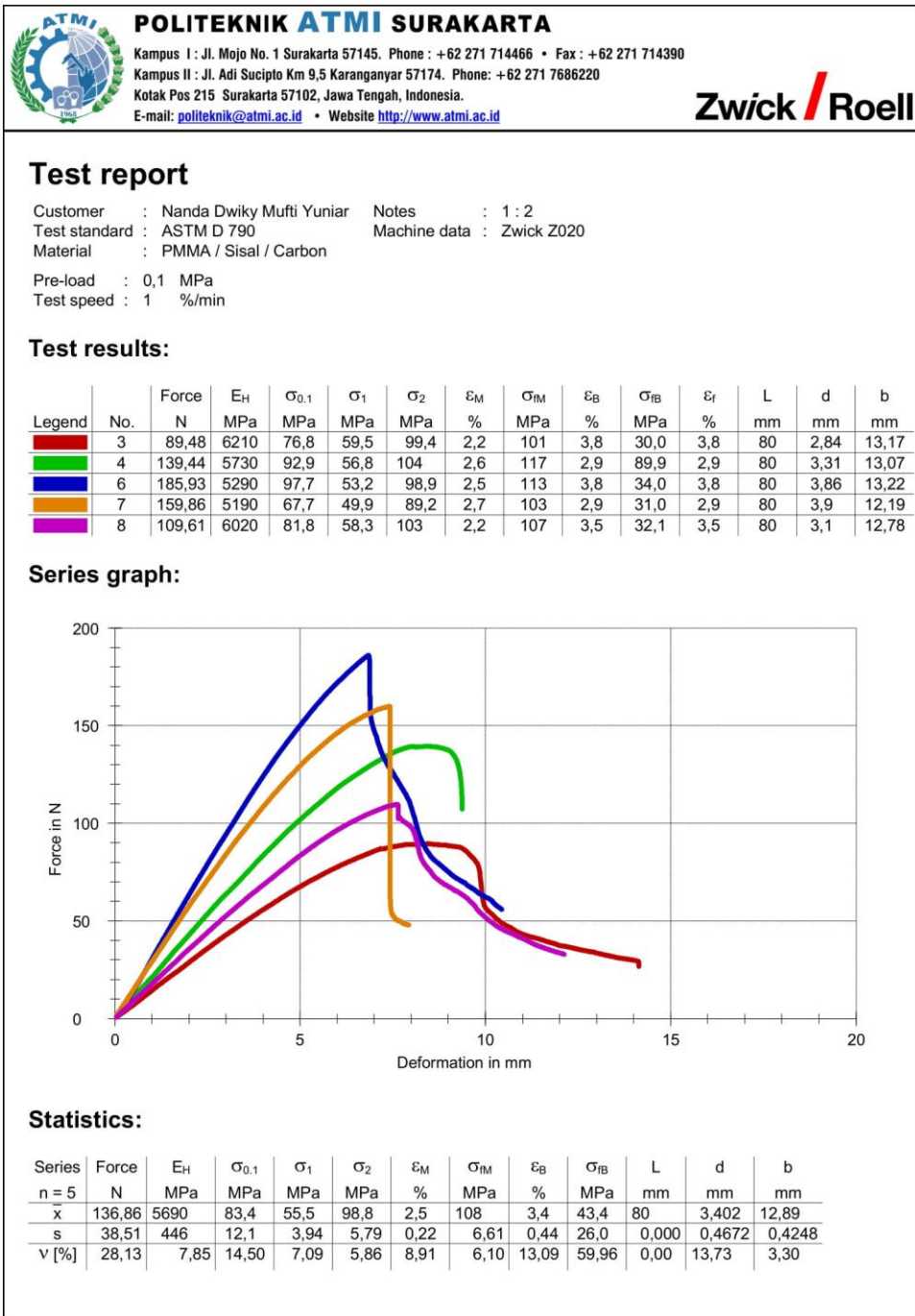


LAMPIRAN









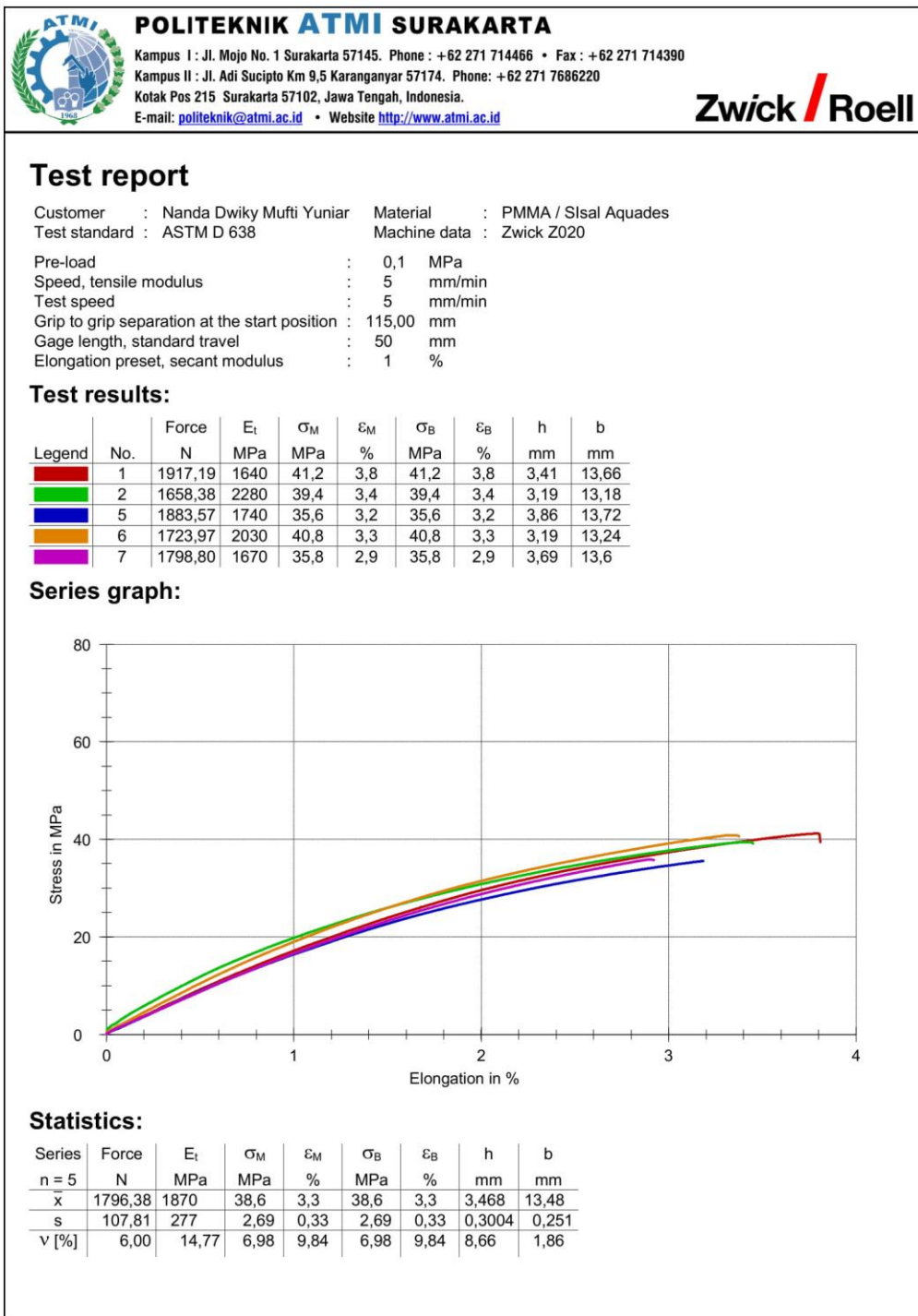
Tabel hasil uji bending

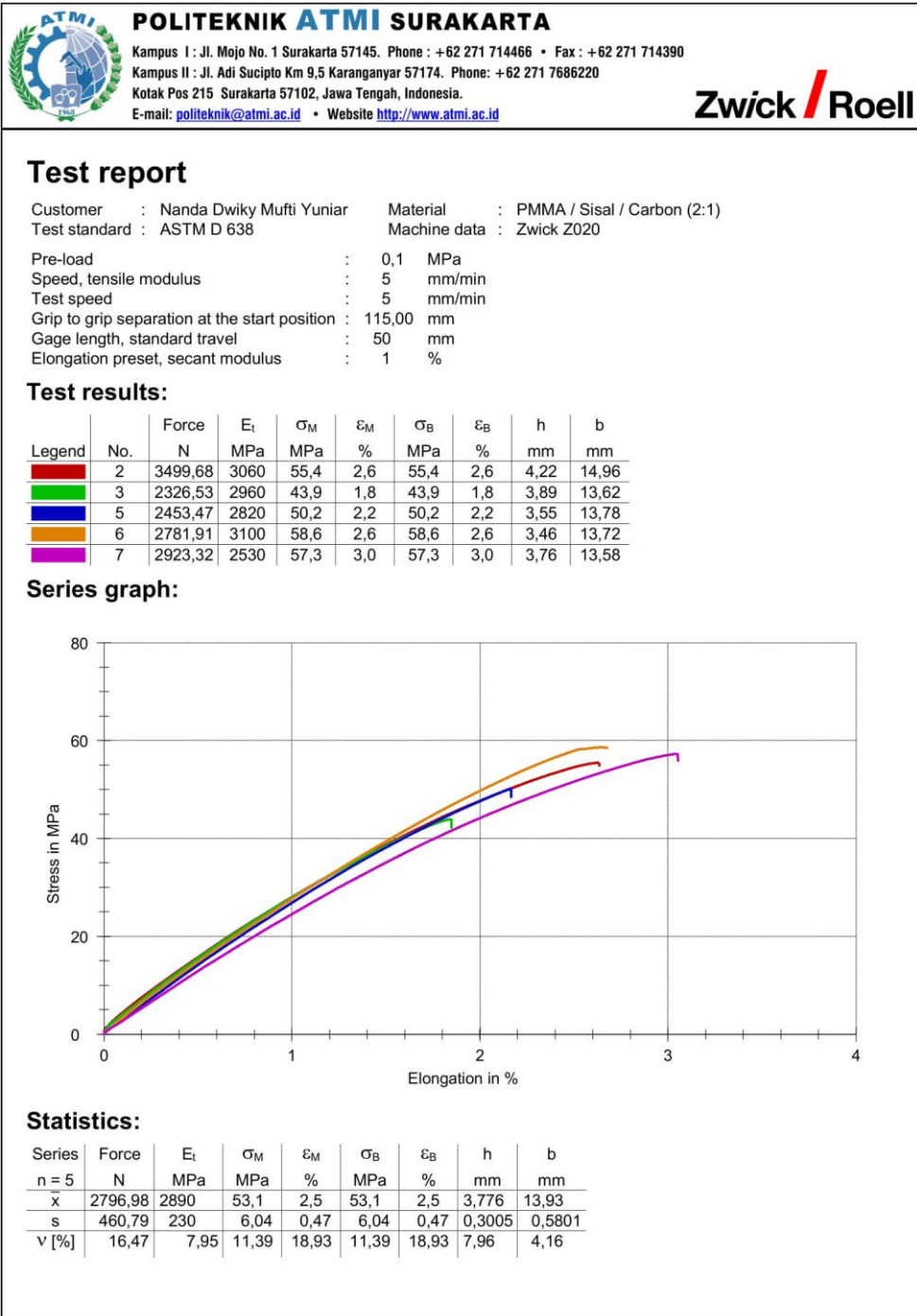
No. Sps	Var.	L (mm)	d (mm)	b (mm)	F (N)	D (mm)	m (N/mm)	σ (MPa)	ε (%)	E (GPa)
1	US	80	3,16	12,98	74,69	11,81	12,57	76,5	3,500	3,93
2		80	2,71	12,89	50,15	13,77	8,74	73,42	3,500	4,13
3		80	3,26	12,85	75,77	12,1	12,97	74,09	3,700	3,73
4		80	3,2	12,83	65,13	11	11,56	64,94	3,300	3,52
5		80	2,72	12,82	45,31	14,11	6,93	66,62	3,600	3,44
Min								64,94	3,300	3,440
Max								76,50	3,700	4,130
Rata-rata								71,11	3,520	3,750
Standar Deviasi								5,04	0,148	0,286

No. Sps	Var.	L (mm)	d (mm)	b (mm)	F (N)	D (mm)	m (N/mm)	σ (MPa)	ε (%)	E (GPa)
1	US/C (2:1)	80	3,35	13,02	98,42	6,68	17,66	83,05	2,100	4,62
2		80	3,25	13	110,02	9,18	16,03	101,9	2,800	4,6
3		80	3,33	12,92	111,73	8	17,7	97,65	2,500	4,75
4		80	2,89	12,95	93,18	11,44	12,42	113,42	3,100	5,09
5		80	3,31	13,05	117,78	8,37	18,48	103,68	2,600	5
Min								83,05	3,100	4,600
Max								113,42	2,500	5,090
Rata-rata								99,94	2,620	4,812
Standar Deviasi								7,96	0,141	0,223

No. Sps	Var.	L (mm)	d (mm)	b (mm)	F (N)	D (mm)	m (N/mm)	σ (MPa)	ε (%)	E (GPa)
1	US/C (1:1)	80	3,42	12,91	150,71	8,1	23,72	125	2,600	5,88
2		80	2,84	13,23	107,19	9,38	14,22	128,96	2,500	6,01
3		80	3,41	12,87	105,55	7,82	18,41	88,04	2,500	4,62
4		80	3,66	13,03	103,48	7,28	21,21	73,44	2,500	4,25
5		80	2,81	13,22	90,77	9,86	12,69	111,67	2,600	5,54
Min								73,44	2,500	4,250
Max								128,96	2,500	6,010
Rata-rata								105,42	2,540	5,260
Standar Deviasi								2,80	0,055	0,262

No. Sps	Var.	L (mm)	d (mm)	b (mm)	F (N)	D (mm)	m (N/mm)	σ (MPa)	ε (%)	E (GPa)
1	US/C (1:2)	80	2,84	13,17	89,48	8,26	14,63	105,97	2,200	6,21
2		80	3,31	13,07	139,44	8,37	21,21	122,65	2,600	5,73
3		80	3,86	13,22	185,93	6,9	31,42	116,16	2,500	5,29
4		80	3,9	12,19	159,86	7,38	29,31	106,4	2,700	5,19
5		80	3,1	12,78	109,61	7,56	17,9	111,16	2,200	6,02
Min								105,97	2,700	5,190
Max								122,65	2,500	6,210
Rata-rata								112,47	2,440	5,688
Standar Deviasi								3,37	0,141	0,287







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Zwick / Roell

Test report

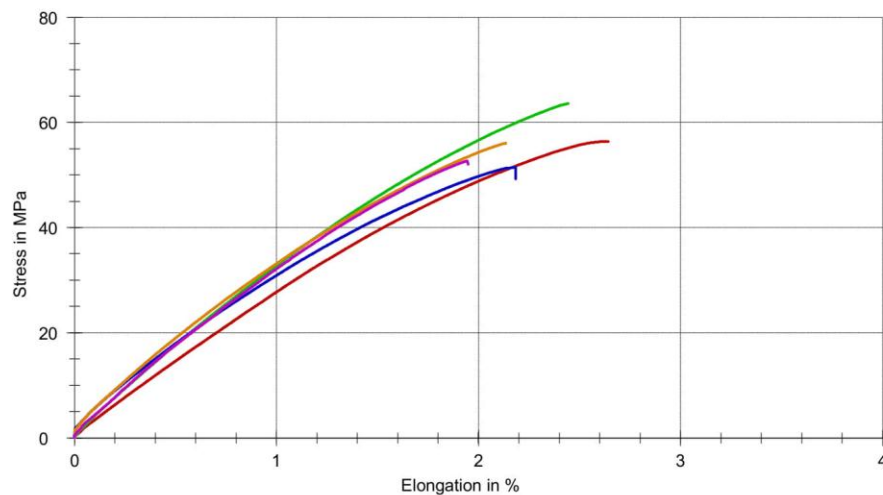
Customer : Nanda Dwiky Mufti Yuniar Material : PMMA / Sisal / Carbon (1:1)
 Test standard : ASTM D 638 Machine data : Zwick Z020

Pre-load : 0,1 MPa
 Speed, tensile modulus : 5 mm/min
 Test speed : 5 mm/min
 Grip to grip separation at the start position : 115,00 mm
 Gage length, standard travel : 50 mm
 Elongation preset, secant modulus : 1 %

Test results:

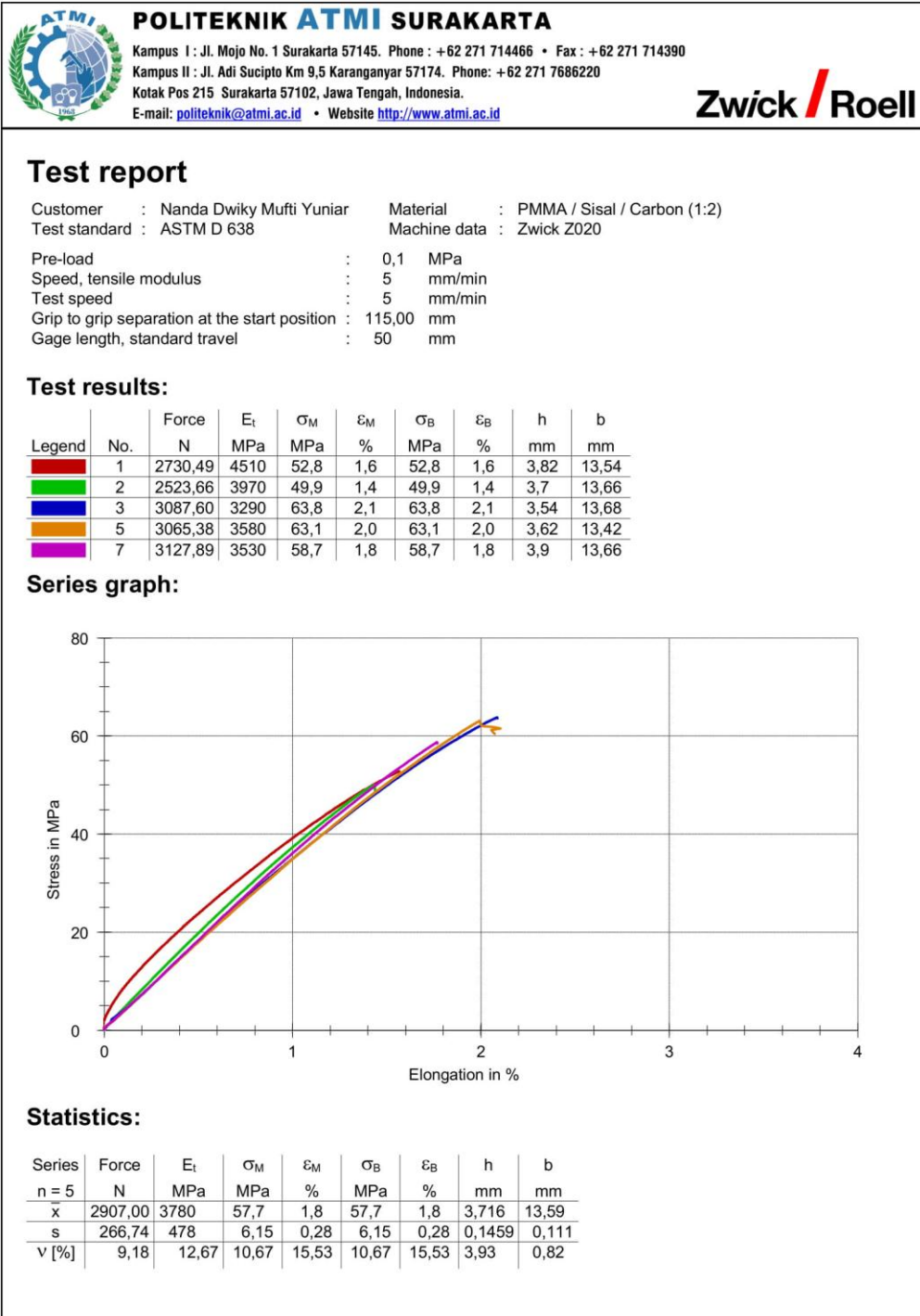
Legend	No.	Force N	E_t MPa	σ_M MPa	ϵ_M %	σ_B MPa	ϵ_B %	h mm	b mm
Red	1	2897,25	2880	56,4	2,6	56,4	2,6	3,72	13,82
Green	2	2930,30	3520	63,6	2,4	63,6	2,4	3,31	13,92
Blue	3	2754,53	3380	51,5	2,2	51,5	2,2	3,85	13,9
Orange	6	2780,48	3530	56,0	2,1	56,0	2,1	3,59	13,82
Purple	7	2634,51	3370	52,7	1,9	52,7	1,9	3,64	13,74

Series graph:



Statistics:

Series	Force N	E_t MPa	σ_M MPa	ϵ_M %	σ_B MPa	ϵ_B %	h mm	b mm
n = 5								
\bar{x}	2799,42	3340	56,0	2,3	56,0	2,3	3,622	13,84
s	118,61	267	4,73	0,27	4,73	0,27	0,2002	0,07211
v [%]	4,24	8,01	8,44	11,83	8,44	11,83	5,53	0,52



Tabel hasil uji tarik

No. Sps	Var.	h (mm)	b (mm)	F (N)	ΔL (mm)	σ (MPa)	ε (%)	E (GPa)
1	US	3,41	13,66	1917,19	1,9	41,20	3,800	1,64
2		3,19	13,18	1658,38	1,7	39,40	3,400	2,28
3		3,86	13,72	1883,57	1,6	35,60	3,200	1,74
4		3,19	13,24	1723,97	1,65	40,80	3,300	2,03
5		3,69	13,6	1798,8	1,45	35,80	2,900	1,67
Min						35,60	2,900	1,640
Max						41,20	3,800	2,280
Rata-rata						38,56	3,320	1,872
Standar Deviasi						2,70	0,100	0,275

No. Sps	Var.	h (mm)	b (mm)	F (N)	ΔL (mm)	σ (MPa)	ε (%)	E (GPa)
1	US/C (2:1)	4,22	14,96	3499,68	1,3	55,40	2,600	3,06
2		3,89	13,62	2326,53	0,9	43,90	1,800	2,96
3		3,55	13,78	2453,47	1,1	50,20	2,200	2,82
4		3,46	13,72	2781,91	1,3	58,60	2,600	3,1
5		3,76	13,58	2923,32	1,5	57,30	3,000	2,53
Min						43,90	3,000	2,530
Max						58,60	2,600	3,100
Rata-rata						53,08	2,440	2,894
Standar Deviasi						4,52	0,283	0,230

No. Sps	Var.	h (mm)	b (mm)	F (N)	ΔL (mm)	σ (MPa)	ε (%)	E (GPa)
1	US/C (1:1)	3,72	13,82	2897,25	1,3	56,40	2,600	2,88
2		3,31	13,92	2930,3	1,2	63,60	2,400	3,52
3		3,85	13,9	2754,53	1,1	51,50	2,200	3,38
4		3,59	13,82	2780,48	1,05	56,00	2,100	3,53
5		3,64	13,74	2634,51	0,95	52,70	1,900	3,37
Min						51,50	1,900	2,880
Max						63,60	2,600	3,530
Rata-rata						56,04	2,240	3,336
Standar Deviasi						4,72	0,270	0,266

No. Sps	Var.	h (mm)	b (mm)	F (N)	ΔL (mm)	σ (MPa)	ε (%)	E (GPa)
1	US/C (1:2)	3,82	13,54	2730,49	0,8	52,80	1,600	4,51
2		3,7	13,66	2523,66	0,7	49,90	1,400	3,97
3		3,54	13,68	3087,6	1,05	63,80	2,100	3,29
4		3,62	13,42	3065,38	1	63,10	2,000	3,58
5		3,9	13,66	3127,89	0,9	58,70	1,800	3,53
Min						52,80	1,400	3,290
Max						63,80	2,100	4,510
Rata-rata						57,66	1,780	3,776
Standar Deviasi						2,76	0,141	0,155

