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LAMPIRAN 1

- A. HASIL PENGUJIAN TARIK
- B. HASIL PENGUJIAN BENDING

Tabel Lampiran 1. Hasil Uji Tarik Komposit Tenunan Serat Rami.

LAMA PENJEM URAN	Le ba r (m m)	Te bal (m m)	Lua s (m m ²)	Luas (m ²)	Beb an (Kg)	Beb an (N)	Tegan gan (PA)	Tegan gan (Mpa)	Panj ang mula - mula (mm)	Perpa njanga n (ΔL) (mm)	Rega ngan (%)	Rega ngan (%)	Mod ulus Tari k (GPa)	STAN DAR DEVI ASI TEGA NGAN TARIK (Mpa)	STAN DAR DEVI ASI REGA NGAN TARIK (%)	STAN DAR DEVI ASI MOD ULUS TARIK (Gpa)
0	12. 87	3.6 3	46. 75	0.0000 468	162. 73	1595 .87	34150 692.38	34.15	50	3.00	0.06	6.00	0.58	0.55	0.87	0.07
2	12. 83	3.7 7	48. 33	0.0000 483	216. 04	2118 .63	43815 320.15	43.82	50	3.39	0.07	6.78	0.66	1.81	1.07	0.10
4	13. 33	3.5 7	47. 56	0.0000 476	212. 15	2080 .50	43761 267.65	43.76	50	3.47	0.07	6.95	0.63	2.14	0.32	0.01
6	13. 03	3.8 7	50. 41	0.0000 504	175. 81	1724 .07	34235 693.07	34.24	50	1.91	0.04	3.81	0.90	1.18	0.18	0.03
8	12. 77	4.1 3	52. 77	0.0000 528	139. 74	1370 .37	25964 085.39	25.96	50	1.38	0.03	2.76	0.94	1.04	0.23	0.10
10	13. 13	4.1 0	53. 84	0.0000 538	144. 98	1421 .80	26394 339.41	26.39	50	1.41	0.03	2.82	0.94	0.87	0.12	0.10
12	13. 00	4.0 3	52. 43	0.0000 524	138. 55	1358 .70	25906 839.04	25.91	50	1.43	0.03	2.87	0.90	2.05	0.21	0.01

Tabel Lampiran 2. Hasil Uji tarik Bending Komposit Tenunan Serat Rami.

Lama Penjemuran	Lebar (b=mm)	Tebal (mm)	Defleksi (D) mm	P (N)	σ_f (Mpa)	ϵ_f (mm/mm)	momen inersia (mm)	EB		Standar deviasi kekuatan bending (Mpa)	Standar deviasi regangan bending (mm/mm)	Modulus elastisitas bending (Gpa)
								(Mpa)	(Gpa)			
0	15.40	3.70	9.48	318.37	133.47	0.06	66.21	2305.48	2.31	18.16	0.0025	0.24
2	15.80	3.87	9.54	296.81	116.68	0.06	76.23	2060.14	2.06	3.24	0.0027	0.02
4	15.93	4.20	9.13	320.78	115.40	0.05	98.82	2143.30	2.14	10.97	0.0038	0.13
6	15.90	3.90	9.12	301.34	116.34	0.05	78.70	2156.05	2.16	14.42	0.0018	0.17
8	15.47	4.07	9.59	319.58	121.84	0.06	86.75	2096.00	2.10	4.22	0.0007	0.08
10	15.53	4.07	9.11	295.34	112.27	0.05	87.35	2040.69	2.04	4.85	0.0025	0.06
12	15.87	4.27	9.07	260.05	91.98	0.05	102.78	1713.40	1.71	15.21	0.0011	0.25

LAMPIRAN 2

- A. PANEL KOMPOSIT**
- B. SPESIMEN UJI TARIK**
- C. SPESIMEN UJI BENDING**

FOTO PANEL KOMPOSIT

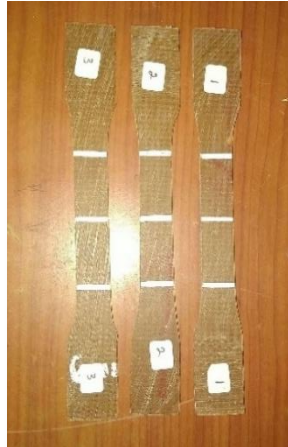
FOTO SPESIMEN UJI TARIK SEBELUM PENGUJIAN

FOTO SPESIMEN UJI TARIK SETELAH PENGUJIAN

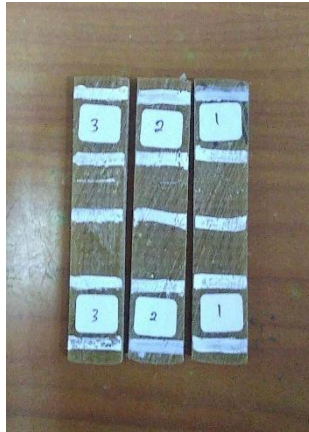
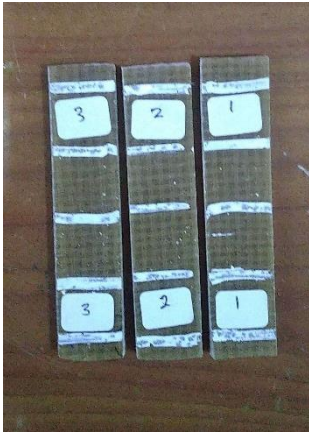
FOTO SPESIMEN UJI BENDING SEBELUM PENGUJIAN

FOTO SPESIMEN UJI BENDING SETELAH PENGUJIAN

LAMPIRAN 3**STANDAR ASTM D638 ASTM D790**

NOTICE: This standard has either been superseded and replaced by a new version or discontinued. Contact ASTM International (www.astm.org) for the latest information.



Designation: D 638 – 02a

Standard Test Method for Tensile Properties of Plastics¹

This standard is issued under the fixed designation D 638; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This test method covers the determination of the tensile properties of unreinforced and reinforced plastics in the form of standard dumbbell-shaped test specimens when tested under defined conditions of pretreatment, temperature, humidity, and testing machine speed.

1.2 This test method can be used for testing materials of any thickness up to 14 mm (0.55 in.). However, for testing specimens in the form of thin sheeting, including film less than 1.0 mm (0.04 in.) in thickness, Test Methods D 882 is the preferred test method. Materials with a thickness greater than 14 mm (0.55 in.) must be reduced by machining.

1.3 This test method includes the option of determining Poisson's ratio at room temperature.

NOTE 1—This test method and ISO 527-1 are technically equivalent.

NOTE 2—This test method is not intended to cover precise physical procedures. It is recognized that the constant rate of crosshead movement type of test leaves much to be desired from a theoretical standpoint, that wide differences may exist between rate of crosshead movement and rate of strain between gage marks on the specimen, and that the testing speeds specified disguise important effects characteristic of materials in the plastic state. Further, it is realized that variations in the thicknesses of test specimens, which are permitted by these procedures, produce variations in the surface-volume ratios of such specimens, and that these variations may influence the test results. Hence, where directly comparable results are desired, all samples should be of equal thickness. Special additional tests should be used where more precise physical data are needed.

NOTE 3—This test method may be used for testing phenolic molded resin or laminated materials. However, where these materials are used as electrical insulation, such materials should be tested in accordance with Test Methods D 229 and Test Method D 651.

NOTE 4—For tensile properties of resin-matrix composites reinforced with oriented continuous or discontinuous high modulus >20 -GPa ($>3.0 \times 10^6$ -psi) fibers, tests shall be made in accordance with Test Method D 3039/D 3039M.

1.4 Test data obtained by this test method are relevant and appropriate for use in engineering design.

1.5 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.6 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:

- D 229 Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation²
- D 412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension³
- D 618 Practice for Conditioning Plastics for Testing⁴
- D 651 Test Method for Tensile Strength of Molded Electrical Insulating Materials⁵
- D 882 Test Methods for Tensile Properties of Thin Plastic Sheet⁶
- D 883 Terminology Relating to Plastics⁴
- D 1822 Test Method for Tensile-Impact Energy to Break Plastics and Electrical Insulating Materials⁴
- D 3039/D 3039M Test Method for Tensile Properties of Polymer Matrix Composite Materials⁶
- D 4000 Classification System for Specifying Plastic Materials⁷
- D 4066 Classification System for Nylon Injection and Extrusion Materials⁷
- D 5947 Test Methods for Physical Dimensions of Solid Plastic Specimens⁸
- E 4 Practices for Force Verification of Testing Machines⁹
- E 83 Practice for Verification and Classification of Extensometer⁹
- E 132 Test Method for Poisson's Ratio at Room Temperature⁹
- E 691 Practice for Conducting an Interlaboratory Study to

² Annual Book of ASTM Standards, Vol 10.01.

³ Annual Book of ASTM Standards, Vol 09.01.

⁴ Annual Book of ASTM Standards, Vol 08.01.

⁵ Discontinued; see 1994 Annual Book of ASTM Standards, Vol 10.01.

⁶ Annual Book of ASTM Standards, Vol 15.03.

⁷ Annual Book of ASTM Standards, Vol 08.02.

⁸ Annual Book of ASTM Standards, Vol 08.03.

⁹ Annual Book of ASTM Standards, Vol 03.01.

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.10 on Mechanical Properties. Current edition approved November 10, 2002. Published January 2003. Originally approved in 1941. Last previous edition approved in 2002 as D 638 – 02.

*A Summary of Changes section appears at the end of this standard.



Designation: D 790 – 02

Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials¹

This standard is issued under the fixed designation D 790; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope *

1.1 These test methods cover the determination of flexural properties of unreinforced and reinforced plastics, including high-modulus composites and electrical insulating materials in the form of rectangular bars molded directly or cut from sheets, plates, or molded shapes. These test methods are generally applicable to both rigid and semirigid materials. However, flexural strength cannot be determined for those materials that do not break or that do not fail in the outer surface of the test specimen within the 5.0 % strain limit of these test methods. These test methods utilize a three-point loading system applied to a simply supported beam. A four-point loading system method can be found in Test Method D 6272.

1.1.1 *Procedure A*, designed principally for materials that break at comparatively small deflections.

1.1.2 *Procedure B*, designed particularly for those materials that undergo large deflections during testing.

1.1.3 Procedure A shall be used for measurement of flexural properties, particularly flexural modulus, unless the material specification states otherwise. Procedure B may be used for measurement of flexural strength only. Tangent modulus data obtained by Procedure A tends to exhibit lower standard deviations than comparable data obtained by means of Procedure B.

1.2 Comparative tests may be run in accordance with either procedure, provided that the procedure is found satisfactory for the material being tested.

1.3 The values stated in SI units are to be regarded as the standard. The values provided in parentheses are for information only.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—These test methods are not technically equivalent to ISO 178.

2. Referenced Documents

2.1 ASTM Standards:

- D 618 Practice for Conditioning Plastics for Testing²
- D 638 Test Method for Tensile Properties of Plastics²
- D 883 Terminology Relating to Plastics²
- D 4000 Classification System for Specifying Plastic Materials³
- D 5947 Test Methods for Physical Dimensions of Solid Plastic Specimens⁴
- D 6272 Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials by Four-Point Bending⁴
- E 4 Practices for Force Verification of Testing Machines⁵
- E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁶

3. Terminology

3.1 *Definitions*—Definitions of terms applying to these test methods appear in Terminology D 883 and Annex A1 of Test Method D 638.

4. Summary of Test Method

4.1 A bar of rectangular cross section rests on two supports and is loaded by means of a loading nose midway between the supports (see Fig. 1). A support span-to-depth ratio of 16:1 shall be used unless there is reason to suspect that a larger span-to-depth ratio may be required, as may be the case for certain laminated materials (see Section 7 and Note 8 for guidance).

4.2 The specimen is deflected until rupture occurs in the outer surface of the test specimen or until a maximum strain (see 12.7) of 5.0 % is reached, whichever occurs first.

4.3 Procedure A employs a strain rate of 0.01 mm/mm/min (0.01 in./in./min) and is the preferred procedure for this test method, while Procedure B employs a strain rate of 0.10 mm/mm/min (0.10 in./in./min).

¹ These test methods are under the jurisdiction of ASTM Committee D20 on Plastics and are the direct responsibility of Subcommittee D20.10 on Mechanical Properties.

Current edition approved April 10, 2002. Published June 2002. Originally published as D 790 – 70. Last previous edition D 790 – 00.

² Annual Book of ASTM Standards, Vol 08.01.

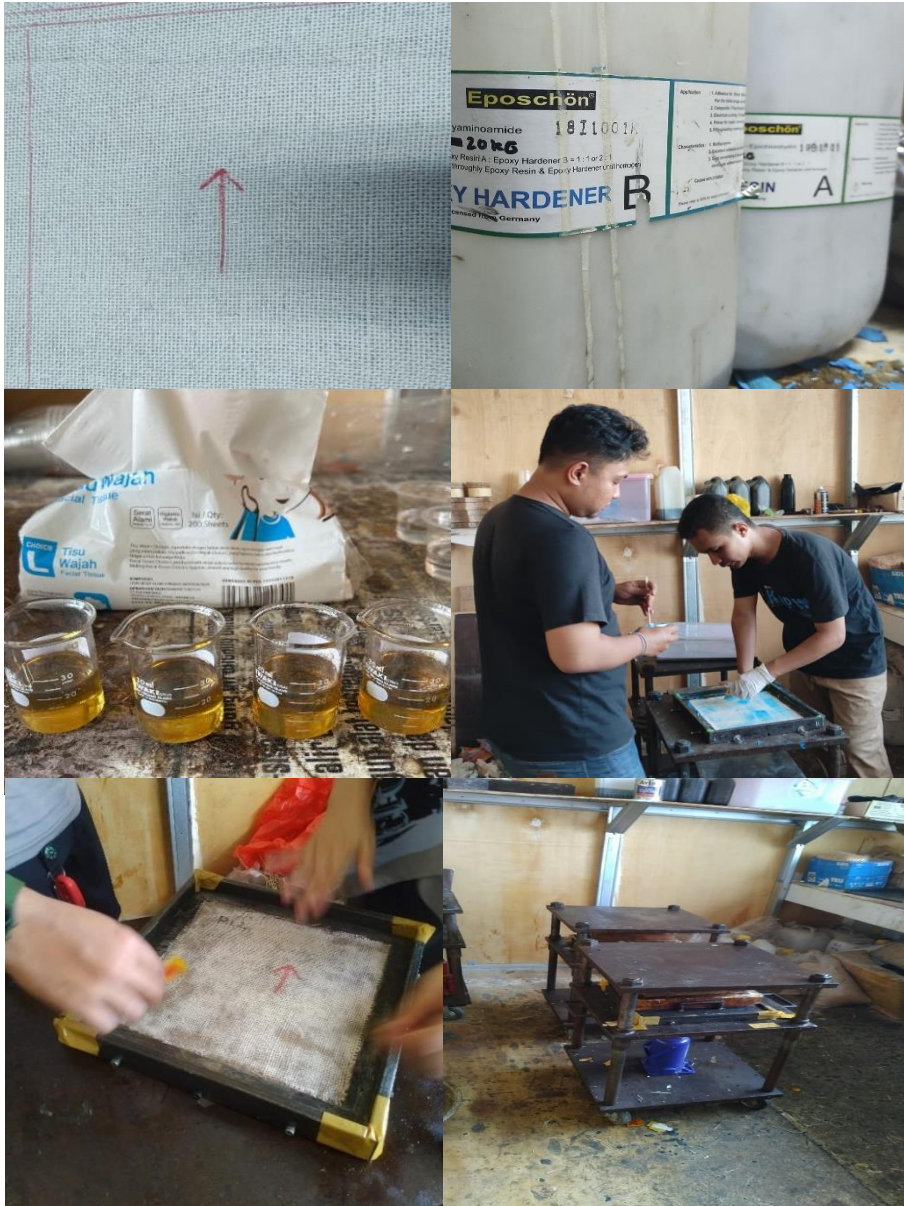
³ Annual Book of ASTM Standards, Vol 08.02.

⁴ Annual Book of ASTM Standards, Vol 08.03.

⁵ Annual Book of ASTM Standards, Vol 03.01.

⁶ Annual Book of ASTM Standards, Vol 14.02.

*A Summary of Changes section appears at the end of this standard.

LAMPIRAN 4**A. FOTO KEGIATAN PENELITIAN****1. Proses pembuatan panel sampel uji komposit**

2. Proses penjemuran panel sampel uji komposit

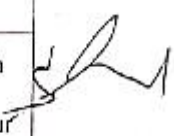




4. Proses Pengujian



KOMENTAR DAN KOREKSI

Dosen Penguji	Pertanyaan	Jawaban	Paraf
Prof. Dr. Ir. H. Ilyas Renreng, MT	Apa itu TSRT?	TSRT adalah singkatan dari nama sampel spesimen. Lebih detail dapat dilihat pada halaman 36.	
	Apa itu MPa?	MPa adalah satuan dari Mega Pascal.	
	Mengapa nilai kekuatan bending pada minggu ke 2 menurun pada minggu ke 4?	Karna terjadi pengikisan oleh sinar ultraviolet (matahari) setelah dijemur selama 2 minggu	
Dr. Ir. Nasruddin Azis, M.Si	Kenapa waktu penjemuran hanya sampai 12 minggu?	Karna waktu penelitian yang ditentukan dilaksanakan selama 3 bulan	
	Apa Fungsi Error bars pada grafik?	Error bars berfungsi untuk menunjukkan standar deviasi yang menunjukkan nilai tertinggi dan terendah.	