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Standard Guide for Reporting Properties for Plastics and Thermoplastic Elastomers[1]

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1. Scope *

1.1 This guide provides recommendations for reporting the results of property values for plastics and thermoplastic elastomers in published literature, data sheets, presentations, comparative analysis, and so forth. It is intended to minimize confusion when comparing the data from several sources.

1.2 This standard is not intended to replace recommendations within the test methods for reporting data. Refer to the test method or use other guidance to determine the number of significant figures for reporting laboratory test results.

NOTE 1—There is no similar or equivalent ISO standard.

2. Referenced Documents

2.1 Due to the large number of ASTM test methods referenced in this guide, they will not be identified individually in this section.

2.2 *ASTM Standards* (other than test methods):

D 883 Terminology Relating to Plastics[2]

D 1600 Terminology for Abbreviated Terms Relating to Plastics[2]

IEEE/ ASTM SI-10 Standard for Use of the International System of Units (SI): The Modern Metric System[3]

2.3 *NFPA Standard:*

NFPA 99 Standard for Health Care Facilities[4]

3. Terminology

3.1 *Definitions*—The terminology used in this guide is in accordance with Terminologies D 883, D 1600, and IEEE/ ASTM SI-10.

4. Significance and Use

4.1 This guide is intended to provide ready access to the recommended property name, test method reference, maximum number of significant digits,[5] and appropriate units for commonly used plastics and thermoplastic elastomer tests.

4.2 It is particularly useful for those involved in the writing and proofreading of documents containing data for a large number of tests since the need to go to each individual test method should be greatly minimized.

4.3 SI units are to be regarded as the standard. U.S. Customary units and conversion factors are provided to accommodate those situations where it is necessary to report both. U.S. Customary refers to units commonly used in the United States and is not always the same as inch-pound units.

5. Procedure

5.1 Refer to Table 1 for the recommended nomenclature and units for physical properties and the recommended number of significant digits for test data associated with each property.

5.2 Abbreviations not shown in Table 1 that may be necessary to further clarify the conditions of testing, such as MHz and kHz for electrical tests, can be found in IEEE/ASTM SI–10.

6. Keywords

6.1 conversion factors; decimal places; properties reporting; reporting guide; significant figures

[1] This guide is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.94 on Government/Industry Standards.

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[2] *Annual Book of ASTM Standards*, Vol 08.01.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

[4] Available from National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269–9101.

[5] The recommended maximum number of significant digits is based on experience of experts in the plastics industry.

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

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TABLE 1 Reference Guide for Properties Reported

Property Reported	Units, SI (U.S. Customary)	ASTM Test Method	Maximum Number of Significant Digits	Conversion Factor (CV) (SI × CV = U.S. Customary)
Arc Resistance	s (s)	D 495	2	1
Bulk Density	kg/m^3(lb/ft^3)	D 1895	3	0.06242797
Coefficient of Friction	—	D 1894	2	—
Coefficient of Linear Thermal Expansion	mm/mm × °C (in./in. × °F)	D 696	2 (expressed in scientific notation)	0.5555556
Color, CIE, L*, a*, b*	—	E 308	3	—
Crystalline Peak Melting Point (T_m) 2nd Heating Cycle	°C (°F)	D 3418	3	(°C × 1.8) + 32
Dart Impact	g (g)	D 1709	2 (1 if value is <100)	1
Deflection Temperature @ 1.82 MPa (264 psi) @ 0.455 MPa (66 psi)	°C (°F)	D 648	3	(°C × 1.8) + 32
Density	kg/m^3(g/cm^3) g/cm^3(g/cm^3) g/cm^3(g/cm^3)	D 792 D 1505 D 4883	3 3 3	0.001 1 1
Dielectric Strength (Specify Method Used)	V/mm (V/mil)	D 149	3	0.0254
Dissipation Factor (Specify Test Frequency)	—	D 150	2	—
Durometer Hardness Shore A Shore D	—	D 2240	2	—
Elmendorf Tear Resistance	N (gf)	D 1922	3	101.9716
Elongation @ Break	% (%)	D 638 D 882 D 412	2 2 2	1 1 1
Elongation @ Yield	% (%)	D 638 D 882 D 412	2 2 2	1 1 1
Flammability	cm/min (in./min)	D 635	2	0.394
Flexural Modulus	MPa (10^5 psi)	D 790	3	0.001450377
Flexural Modulus, ___% Secant	MPa (10^5 psi)	D 790	3	0.001450377
Flexural Strength	MPa (psi)	D 790	3	145.0377
Flexural Yield Strength	MPa (psi)	D 790	3	145.0377
Flow Rate, Condition ___°C/___kg	g/10 min (g/10 min)	D 1238	2	1
Gardner Impact Strength @ F_{50}	J (in. × lbf)	D 5420	2	8.8507452
Gas Permeability, CO_2	cm^3× mm/m^2× 24 h × atm (cm^3× mil/100 in.^{2}× 24 h × atm)	D 1434	2	2.54
Gas Permeability, O_2	cm^3× mm/m^2× 24 h × atm (cm^3× mil/100 in.^{2}× 24 h × atm)	D 3985	2	2.54
Gas Transmission Rate, CO_2	cm^3/m^2× 24 h × atm (cm^3/100 in.^{2}× 24 h × atm)	D 1434	2	0.064516128
Gas Transmission Rate, O_2	cm^3/m^2× 24 h × atm (cm^3/100 in.^{2}× 24 h × atm)	D 3985	2	0.064516128

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