Plastics Specific Test Instructions

Please submit **all** data entry forms using the online portal (http://www.cts-portal.com/). If you are not reporting data for a test or property, leave the data entry form blank.

General Testing Instructions

Please review this important information before beginning testing.

Specific Testing Instructions

Analysis	Analysis Name
704-708	Tensile Properties (ASTM)
710	Deflection Temperature Under Flexural Load 1.82 MPa (ASTM)
711	Deflection Temperature Under Flexural Load .455 MPa (ASTM)
712	Temperature of Deflection Under Load 1.80 MPa (ISO)
715-716	Vicat Softening Temperature
718	Specific Gravity
720-722	Flexural Properties (ASTM)
730-734	Tensile Properties (ISO)
736-738	Flexural Properties (ISO)
750	Flow Rates of Thermoplastics
755	Moisture Content of Plastics
757	Ash Content in Thermoplastics
758	Thermogravimetric Analysis (ASTM & ISO)
760	Differential Scanning Calorimetry (ISO)
765	Research Differential Scanning Calorimetry (ASTM)
770-776	Tensile Properties of Films
780-781	Coefficient of Friction
782	Tear Resistance of Films
785-786	Optical Properties of Films
790	Notched Izod Impact
791	Notched Izod Impact (ISO)
792	Notched Charpy Impact

General Testing Instructions

Please review the following information before testing.

- We suggest all test materials to be checked upon receipt. If any materials are missing, damaged or are not in good shape, please notify CTS and we will replace the samples. All requests for replacements must be received no later than two weeks before the data due date.

- Participants in a multiple property test will notice that the results for each property are reported with a separate data entry form. It is not required that participants report results for all properties in multiple property test.

- Use the same instrument and procedure throughout a test. If the instrument fails during a test, contact CTS as soon as possible for instructions on how to proceed.

- Report any variations.

- Verify that selected units on the data entry forms are correct. If not, select and indicate one of the valid units listed on the data entry form (psi is the default unit for strength and stress values). The same unit must be used for all samples in a given property.

- Please submit all data entry forms using the online CTS Portal. If you are not reporting data for a test or property, leave the data entry form blank.

- Data must be submitted to CTS in its entirety by the data due date in order to be included in the analyses.

- If the Portal submission is not feasible, results may be submitted by email of printed data entry forms to plastics@cts-interlab.com and you MUST state the number of sheets being submitted so that the Plastics Coordinator can confirm receipt of all of them.

Plastics Specific Test Instructions

Tensile Properties, ASTM Method

Analysis: 704 - 708
Pack: PT
Sample Code: F
Test Method: ASTM D638

Properties Measured: Tensile Stress at Yield, Tensile Stress at Break, Percent Elongation at Yield, and Modulus of Elasticity. Participants may choose which of these four properties to measure and report. **Yield Point is defined as per ASTM D638-10, A2.22 (Zero Slope).**

Test Parameters: *See Material section of data entry form for speed of testing.*

Sample Information: Seven specimens have been provided for each sample. Report test results for five specimens. Two specimens from each sample may be used for equipment set up or substitution if one of the five specimens appears flawed. Samples selected according to manufacturer specifications not to exceed 100% elongation. The elongation ranges are approximate.

Sample Preparation: Condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

How to Report Data: For the purposes of this interlaboratory testing program, please report test results with the precision listed below. Although participants may report stress and modulus data using other units (such as psi, ksi, MPa, kgf/mm^2), please report data with comparable precision.

Tensile Stress at Yield - To nearest whole number for psi
Tensile Stress at Break - To nearest whole number for psi
Percent Elongation at Yield - To nearest 0.01%
Modulus of Elasticity - To nearest 0.1 for ksi

Verify the selected units on the data entry forms are correct. If not, select and indicate one of the valid units listed on the data entry forms (psi is the default unit for Tensile Stress at Yield and Tensile Stress at Break values, percent is the default unit for Elongation at Yield values, ksi is the default unit for Modulus of Elasticity values).

Plastics Specific Test Instructions

Deflection Temperature - 1.82 MPa (264 psi) - ASTM Method

Analysis: 710
Pack: DT
Sample Code: E
Test Method: ASTM D648

Properties Measured: Deflection temperature under flexural load.

Test Parameters: 1.82 MPa (264 psi) maximum fiber stress. Specimen in edgewise position.

Sample Information: Five specimens have been provided for each sample. Sufficient number of specimens have been provided for four measurements per sample. One extra specimen from each sample may be used for equipment set up or substitution if one of the specimens appears flawed.

Sample Preparation: Condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

Special Requirements: Many laboratories have the capability to test several specimens simultaneously. If you test more than one bar at a time, use an equal number of specimens from each sample. Do not test all four specimens of one sample at one time.

How to Report Data: Report data in ***degrees Celsius*** to the first decimal place.

Additional Information to Report: Please indicate in space marked CONDITIONS at the bottom of the data entry form which method (A or B) was used. Method A requires a 101.6 mm (4 inch) span and Method B requires a 100 mm (3.937 inch) span. If you are uncertain which method/span your instrument complies with, contact the instrument manufacturer. If your instrument has adjustable supports, use the span length you normally use for ASTM D648 measurements.

Plastics Specific Test Instructions

Deflection Temperature - 0.455 MPa (66 psi) - ASTM Method

Analysis: 711
Pack: HD
Sample Code: G
Test Method: ASTM D648

Properties Measured: Deflection temperature under flexural load.

Test Parameters: 0.455 MPa (66 psi) maximum fiber stress.

Sample Information: Five specimens have been provided for each sample. Sufficient number of specimens have been provided for four measurements per sample. One extra specimen from each sample may be used for equipment set up or substitution if one of the specimens appears flawed.

Sample Preparation: Condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

Special Requirements: Many laboratories have the capability to test several specimens simultaneously. If you test more than one bar at a time, use an equal number of specimens from each sample. Do not test all four specimens of one sample at one time.

How to Report Data: Report data in ***degrees Celsius*** to the first decimal place.

Additional Information to Report: Please indicate in space marked CONDITIONS at the bottom of the data entry form which method (A or B) was used. Method A requires a 101.6 mm (4 inch) span and Method B requires a 100 mm (3.937 inch) span. If you are uncertain which method/span your instrument complies with, contact the instrument manufacturer. If your instrument has adjustable supports, use the span length you normally use for ASTM D648 measurements.

Plastics Specific Test Instructions

Temperature of Deflection Under Load - 1.80 MPa - ISO Method

Analysis: 712
Pack: HI
Sample Code: N
Test Method: ISO 75, Method A

Properties Measured: Temperature of deflection under load, in degrees Celsius

Test Parameters: 1.80 MPa maximum nominal surface stress. Specimen in flat position.

Sample Information: Five specimens have been provided for each sample. Sufficient number of specimens have been provided for four measurements per sample. One extra specimen from each sample may be used for equipment set up or substitution if one of the specimens appears flawed.

Sample Preparation: Condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

Special Requirements: Many laboratories have the capability to test several specimens simultaneously. If you test more than one bar at a time, use an equal number of specimens from each sample. Do not test all four specimens of one sample at one time.

How to Report Data: Report data in ***degrees Celsius*** to the first decimal place.

Plastics Specific Test Instructions

Vicat Softening Temperature

Analysis: 715 - 716
Pack: VH & VR
Sample Code: H, R
Test Method: ASTM D1525

Properties Measured: Vicat softening temperature Rate A and Rate B. Participants may report for one or both heating rates. A load of 10N is used with both heating rates.

Test Parameters: Use a 10 N load with **Heating Rate A** (50 ± 5°C/h) **for Pack VH.**
Use a 10 N load with **Heating Rate B** (120 ± 5°C/h) **for Pack VR.**

Sample Information: Four specimens have been provided for each sample. One extra specimen from each sample may be used for equipment set up or substitution if one of the specimens appears flawed.

Sample Preparation: Cut two test pieces from the center portion of each bar. Prepare a total of six test pieces per sample. Condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

Special Requirements: Many laboratories have the capability to test several specimens simultaneously. If you test more than one bar at a time, use an equal number of specimens from each sample. Do not test all four specimens of one sample at one time.

How to Report Data: Report data in ***degrees Celsius*** to the first decimal place.

Plastics Specific Test Instructions

Specific Gravity

Analysis: 718
Pack: SG
Sample Code: T
Test Method: ASTM D792, ASTM D1505, or ISO 1183

Properties Measured: Specific gravity 23/23°C

Sample Information: Report three determinations for each sample. Sufficient sample has been provided for at least three specimens.

Sample Preparation: If bars need to be cut into smaller pieces before testing, use the center portion of the bar. Do not use the ends of the bars. Condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

Special Requirements: Do not report density.

How to Report Data: Report data in ***sp gr 23/23°C*** to the fourth decimal place.

Plastics Specific Test Instructions

Flexural Properties - ASTM Method

Analysis: 720 – 722
Pack: FM
Sample Code: J
Test Method: ASTM D790, Procedure A

Properties Measured: Flexural Modulus, Flexural Stress at Yield and Flexural Stress at 5% Strain. Participants may choose which of these three properties to measure and report.

Test Parameters: Support span of 2 inches (50.8 mm)
Rate of crosshead motion of 0.05 in/min (1.27 mm/min)
(Please note that this is the actual crosshead speed, not a strain rate.)

Sample Information: Six specimens have been provided for each sample. Report test results for five specimens per sample. One specimen from each sample may be used for equipment set up or substitution if one of the specimens appears flawed.

Sample Preparation: Condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

How to Report Data: For the purposes of this interlaboratory testing program, please report test results with the precision listed below. For units other than those listed below, report data with comparable precision.

Flexural Modulus - To nearest 0.1 for ksi
Flexural Stress at 5% Strain - To nearest whole number for psi
Flexural Stress at Yield - To nearest whole number for psi

Verify the selected units on the data entry form are correct. If not, select and indicate one of the valid units listed on the data entry forms *(**ksi** is the default unit for Flexural Modulus, **psi** is the default unit for Flexural Stress at 5% Strain and Flexural Stress at Yield).*

Plastics Specific Test Instructions

Tensile Properties - ISO Method

Analysis: 730 – 734
Pack: TI
Sample Code: C
Test Method: ISO 527

Properties Measured: Tensile Stress at Yield, Tensile Stress at Break, Percent Strain at Yield, and Modulus of Elasticity. Participants may choose which of these four properties to measure and report. Please note that name of Percent Elongation at Yield has been changed to Percent Strain at Yield to be consistent with the terminology in ISO 527.

Test Parameters: *See Material section of data entry forms for speed of testing*

Sample Information: Fourteen specimens have been provided for each sample. Sufficient number of specimens have been provided to measure modulus of elasticity using separate specimens at 1 mm/min. Report test results for five specimens for each property. Four specimens from each sample may be used for equipment set up or substitution if one of the specimens appears flawed. Samples selected according to manufacturer specifications not to exceed 100% elongation. The elongation ranges are approximate.

Sample Preparation: Condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

How to Report Data: For the purposes of this interlaboratory testing program, please report test results with the precision listed below. For units other than those listed below report data with comparable precision. Use metric units only.

Tensile Stress at Yield - To nearest 0.01 for MPa
Tensile Stress at Break - To nearest 0.01 for MPa
Percent Strain at Yield - To nearest 0.01%
Modulus of Elasticity - To nearest whole number for MPa

Verify the selected units on the data entry forms are correct. If not, select and indicate one of the valid units listed on the data entry forms *(**MPa** is the default unit for Tensile Stress at Yield and Tensile Stress at Break values, **percent** is the default unit for Percent Strain at Yield values, **MPa** is the default unit for Modulus of Elasticity values)*.

Plastics Specific Test Instructions

Flexural Properties - ISO Method

Analysis: 736 – 738
Pack: BP
Sample Code: K
Test Method: ISO 178

Properties Measured: Flexural Modulus, Flexural Stress at Yield and Flexural Stress at 3.5% Strain. Participants may choose which of these three properties to measure and report.

Test Parameters: Speed of testing 2 mm/min. Support span of 64 mm.

Sample Information: Six specimens have been provided for each sample. Report test results for five specimens per sample. One specimen from each sample may be used for equipment set up or substitution if one of the specimens appears flawed.

Sample Preparation: Condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

How to Report Data: For the purposes of this interlaboratory testing program, please report test results with the precision listed below.

Flexural Modulus - To nearest whole number for MPa
Flexural Stress at 3.5% Strain - To nearest 0.01 for MPa
Flexural Stress at Yield - To nearest 0.01 for MPa

Verify the selected units on the data entry forms are correct. If not, select and indicate one of the valid units listed on the data entry forms *(MPa is the default unit for Flexural Modulus, Flexural Stress at 3.5% Strain and Flexural Stress at Yield values)*.

Plastics Specific Test Instructions

Flow Rates of Thermoplastics

Analysis: 750
Pack: R1 (190°C testing temperature) or R2 (230°C testing temperature)
Sample Code: X
Test Method: ASTM D1238 or ISO 1133, Procedure A or B

Properties Measured: Melt mass flow rate (MFR)

Test Parameters: *See data entry form for temperature and load. If using ISO 1133 Procedure B, adjust the travel arm distance to 6.35 mm (± 0.25 mm).*

Sample Information: Sufficient material has been provided to complete at least two measurements per sample. Participants may use the extra material for retests or determining melt densities for Procedure B.

Sample Preparation: Drying of the samples is not needed.

Special Requirements: All participants must report results in grams per 10 minutes. Do not report melt volume flow rate (MVR). Laboratories using Procedure B must determine the melt densities for the samples by measuring the mass of a known volume of extruded resin. Melt densities are not provided by CTS.

How to Report Data: Report data in ***g/10 min*** to the first decimal place.

Plastics Specific Test Instructions

Moisture Content of Plastics

Analysis: 755
Pack: MC
Sample Code: Y
Test Method: ASTM D6869/ISO 15512 Method B, ASTM D6980, ASTM D7191

Properties Measured: % Moisture

Determine the "as received" moisture of the samples; do not condition the samples prior to testing.

Test Parameters:

The resin for this analysis is listed on the data entry form. For ASTM D6869 and ISO 15512, Method B (Karl Fischer reaction) assume that the expected moisture content (w) is *> 1.0% for Polyamides, < 0.1% for HIPS, and between 0.1% and 0.5% for all other resins.*

Participants using ASTM D6869 should refer to section 10.9 of the test method to determine the optimum heating temperature. Participants using ASTM D6980 (weight loss technique) should refer to the annex of the test method for the suggested test conditions for this resin.

Sample Information: Participants receive two 60-gram samples of pellets.

Three spaces are provided on the data entry form to report maximum of 3 readings per sample. However, if your lab's procedure is to provide only fewer readings, you may report according to your laboratory's normal procedures.

Sample Preparation: To prevent moisture pick-up before testing, test the samples immediately after removing them from the sealed packet.

How to Report Data: Report data in % Moisture to the third decimal place (nearest 0.001%)

Verify the selected units on the data entry forms are correct. If not, select and indicate one of the valid units listed on the data entry form *(**% (percent)** is the default unit for Moisture Content)*.

Plastics Specific Test Instructions

Ash Content in Thermoplastics

Analysis: 757
Pack: AS
Sample Code: L
Test Method: ASTM D5630

Properties Measured: Ash Content as % of mass

Test Parameters: *See data entry form for the sample resin; assume all resins will exceed 10% Ash Content. Use the resin type to determine the sample size (grams), furnace temperature (℃) and ashing duration (mins.) from the test method for the procedure employed.*

Sample Information: Please report two determinations for each sample. Sufficient material has been provided to complete at least two measurements per sample; additional material may be used for procedure setup or additional testing.

Sample Preparation: Drying of the samples is not needed.

How to Report Data: Report data in ***Percent of mass*** to the second decimal place (nearest 0.01%).

Plastics Specific Test Instructions

Thermogravimetric Analysis

Analysis: 758
Pack: TA
Sample Code: A
Test Method: ASTM D3850 or ISO 11358-1

Properties Measured: % mass loss

Test Parameters: Prepare test specimens in accordance to method selection.

It is recommended that PBT samples be tested using air/oxygen as the purge gas, since PBT will not fully decompose under nitrogen atmosphere.

PP samples can be tested with either air or nitrogen as the purge gas.

Sample Information: Please report two determinations for each sample. Sufficient material has been provided to complete at least two measurements per sample; additional material may be used for procedure setup or additional testing.

Sample Preparation: Drying of the samples is not needed.

How to Report Data: Report data in ***Percent mass loss*** to the second decimal place (nearest 0.01%).

Plastics Specific Test Instructions

Differential Scanning Calorimetry (DSC) Testing (ISO method)

Analysis: 760-764
Pack: GT & DS
Sample Code: V, W
Test Method: ISO 11357

Properties Measured: Glass Transition Temperature (Tg), Crystallization Temperature (Tc), Melt Temperature (Tm), Enthalpy of Fusion (Hm) and Enthalpy of Crystallization (Hc). Participants may choose which of these five properties to measure and report.

Test Parameters: Use a ramp/heat rate of 20°C/min. Please run a minimum of two heat cycles and record properties from the second cycle. Crystallization Properties should come from the cooling cycle between the two cycles.

Sample Information: Use pack GT for Glass transition temperature and pack DS for remaining properties. Sufficient material has been provided to complete at least three measurements per sample. Please use 4 to 10 milligrams of material per sample test. Participants may use the extra material for retests.

Sample Preparation: To prevent moisture pick-up before testing, test the samples immediately after removing them from the sealed packet.

Special Requirements: Please report glass transition temperature using the midpoint (half-step height) of the slope from baseline. For melt and crystallization temperature please report peak temperatures.

How to Report Data: For Tg, Tc and Tm report data in ***Degrees Celsius*** to the first decimal place. For Hm and Hc report in ***Joules/Gram*** to the second decimal place. Please report the instrument used and the instrument type (power compensated or heat flux).

Plastics Specific Test Instructions

Research Differential Scanning Calorimetry (DSC) Testing (ASTM method)

Analysis: 765-769
Pack: GT & DS
Sample Code: V, W
Test Method: ASTM D3418

Properties Measured: Glass Transition Temperature (Tg), Crystallization Temperature (Tc), Melt Temperature (Tm), Enthalpy of Fusion (Hm) and Enthalpy of Crystallization (Hc). Participants may choose which of these five properties to measure and report.

Test Parameters: Use a ramp/heat rate of 20°C/min. Please run a minimum of two heat cycles and record properties from the second cycle. Crystallization Properties should come from the cooling cycle between the two cycles.

Sample Information: Use pack GT for Glass transition temperature and pack DS for remaining properties. Sufficient material has been provided to complete at least three measurements per sample. Please use 4 to 10 milligrams of material per sample test. Participants may use the extra material for retests.

Sample Preparation: To prevent moisture pick-up before testing, test the samples immediately after removing them from the sealed packet.

Special Requirements: Please report glass transition temperature using the midpoint (half-step height) of the slope from baseline. For melt and crystallization temperature please report peak temperatures.

How to Report Data: For Tg, Tc and Tm report data in ***Degrees Celsius*** to the first decimal place. For Hm and Hc report in ***Joules/Gram*** to the second decimal place. Please report the instrument used and the instrument type (power compensated or heat flux).

Plastics Specific Test Instructions

Tensile Properties of Films

If you are testing for Secant Modulus (Tests 775-776), please refer to the following page for sample preparation instructions before cutting samples for testing.

Analysis: 770 – 774
Pack: FB
Sample Code: B
Test Method: ASTM D882

Properties Measured: Tensile Stress at Yield, Tensile Stress at Break, Percent Elongation at Yield, and Percent Elongation at Break. Participants may choose which of these four tensile properties to measure and report. Additionally, participants are asked to report Thickness of Film Tensile Specimens.

Test Parameters: Initial Grip Separation of 2 inches (50 mm).
Rate of grip Separation 20 in/min (500 mm/min).
Specimen Width 1 inch (25 mm).

Sample Information: Each sample pack should contain 7 folded sheets per sample. The top and bottom specimens are provided as cover and may be discarded or used for instrument setup. The cover sheet in each sample is labeled with the sample code for this round. Please mark them with this code. Sufficient material is supplied for 10 determinations per sample. This test uses the same sample pack as Secant Modulus (Tests 775-776); labs reporting for both properties should leave sufficient material to provide the additional samples needed for that test.

Sample Preparation: Separate and condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test. Cut all test pieces with the long direction parallel to the **folded edge** of the specimen.

How to Report Data: For the purposes of this inter-laboratory testing program, please report test results to the following precision. For units other than those listed (such as MPa) report data with a comparable precision.

Tensile Stress at Yield - To nearest whole number for psi
Tensile Stress at Break - To nearest whole number for psi
Percent Elongation at Yield - To nearest 0.1%
Percent Elongation at Break - To nearest whole number
Thickness of Film - To nearest 0.01 for mils

Verify the selected units on the data entry forms are correct. If not, select and indicate one of the valid units listed on the data entry form *(**psi** is the default unit for Tensile Stress at Yield and Tensile Stress at Break values, **percent** is the default unit for Percent Elongation at Yield and Percent Elongation at Break values and **mil** is the default unit for Thickness of Film).*

Plastics Specific Test Instructions

Tensile Properties of Films (Secant Modulus)

Analysis: 775 – 776
Pack: FB
Sample Code: B
Test Method: ASTM D882

Properties Measured: Secant Modulus at 1% Strain, Secant Modulus at 2% Strain. Participants may choose which of these properties to measure and report.

Recommended Test Parameters: Initial Grip Separation of 10 inches (250 mm).
Rate of grip Separation 1 in/min (25 mm/min).
Specimen Width 1 inch (25 mm).

The above parameters are recommended by Collaborative Testing Services. If your lab cannot test for these parameters, please contact CTS for further instruction.

Sample Information: Each sample pack should contain 7 folded sheets per sample. The top and bottom specimens are provided as cover and may be discarded or used for instrument setup. The cover sheet in each sample is labeled with the sample code for this round. Please mark them with this code. Sufficient material is supplied for 10 determinations per sample. This test uses the same sample pack as Tensile Properties (Tests 770-774); labs reporting for both properties should leave sufficient material to provide the additional samples needed for that test.

Sample Preparation: Separate and condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test. Cut all test pieces with the long direction parallel to the **folded edge** of the specimen.

How to Report Data: For the purposes of this inter-laboratory testing program, please report Secant Modulus to the nearest whole number for psi. For units other than those listed (such as MPa) report data with a comparable precision.

Verify the selected units on the data entry forms are correct. If not, select and indicate one of the valid units listed on the data entry form *(**psi** is the default unit for, Secant Modulus at 1% and 2% strain values,).*

Plastics Specific Test Instructions

Coefficient of Friction

Analysis: 780 – 781
Pack: FP
Sample Code: P
Test Method: ASTM D1894

Properties Measured: Static coefficient of friction and kinetic coefficient of friction. Film to film COF is measured. Participants may report for either or both types of COF.

Test Parameters: 200 gram sled. Sled/Plane speed 150 mm/min.

Sample Information: Each sample pack should contain 7 folded sheets per sample. The top and bottom specimens are provided as cover and may be discarded or used for instrument setup. The cover sheet in each sample is labeled with the sample code for this round. Please mark them with this code. Sufficient material is supplied for at least 5 determinations per sample.

Sample Preparation: Unfold, separate, and condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test. For each determination, cut the sled test piece from one side of an unfolded specimen and the base test piece from the other side of the same specimen. The inside surfaces of the specimens are to be tested so be careful to maintain test piece orientation. Cut all test pieces with the test direction parallel to the **folded edge** of the sample.

Special Requirements: Wait 30 seconds after placing the sled on the plane before starting the test.

How to Report Data: Report ***COF*** data to the nearest 0.001

Plastics Specific Test Instructions

Tear Resistance of Films

Analysis: 782
Pack: FQ
Sample Code: Q
Test Method: ASTM D1922

Properties Measured: Tearing force per ply.

Test Parameters: Use constant radius specimen only.

Sample Information: Each sample pack should contain 7 folded specimens per sample. The top and bottom specimens are provided as cover and may be discarded or used for instrument setup. The cover sheet in each sample is labeled with the sample code for this round. Please mark them with this code. Report 10 determinations for each sample. Sufficient material is supplied for up to 30 test pieces per sample.

Sample Preparation: Unfold, separate, and condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

Cut the constant radius specimens with the slit parallel to the **folded edge** of the sample, to produce specimen tearing in the machine direction. Transverse direction tear resistance is not measured.

Special Requirements: Test using one ply. Choose a pendulum so that the scale reading is between 20 and 60 percent of full scale. If your instrument does not satisfy these requirements, contact CTS before testing the samples.

How to Report Data: Report data to the nearest whole number for gf/ply. For other units, use comparable precision.

Verify the selected units on the data entry form are correct. If not, select and indicate one of the valid units listed on the data entry form ***(gf (per ply)*** *is the default unit for Tearing Force per Ply)*.

Plastics Specific Test Instructions

Optical Properties of Films

Analysis: 785 – 786
Pack: FD
Sample Code: D
Test Method: ASTM D1003

Properties Measured: Percent haze and total luminous transmittance. Participants may report for either or both properties.

Test Parameters: Place specimen at the entrance port of the integrating sphere.

Sample Information: Each sample pack should contain 6 folded sheets per sample. The top and bottom specimens are provided as cover and may be discarded or used for instrument setup. The cover sheet in each sample is labeled with the sample code for this round. Please mark them with this code. Material is supplied for at least 8 determinations per sample.

Supplied specimens are folded. Please ensure that the butterfly is opened prior to testing. A blade may be used in opening butterfly; avoid any damaged sections when measuring.

Sample Preparation: Unfold, separate, and condition specimens for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test. Cut one test piece from each side of the unfolded specimen.

Special Requirements: Indicate on the data entry form in the "Conditions" section which procedure (A or B) of ASTM D1003 was used and whether CIE Illuminant C or A was used.

How to Report Data: Report data to the nearest 0.1% for Transmittance and 0.01 % for Haze.

Please ensure that you have not transposed data between % Transmittance and % Haze.

Plastics Specific Test Instructions

Notched Izod Impact - ASTM Method

Analysis: 790
Pack: IZ
Sample Code: S
Test Method: ASTM D256, Method A

Properties Measured: Izod impact resistance of notched specimens.

Sample Information: Seven specimens have been provided for each sample. Report test results for five specimens. The additional specimens from each sample may be used for equipment set up or substitution if one of the specimens appears flawed.

Sample Preparation: DO NOT CUT BARS IN HALF. Cut one specimen from the center of each bar. You will create 5 or 6 specimens per sample. Notch all specimens and condition for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

Special Requirements: In the space provided on the data entry form, indicate all break types observed for the two samples by circling the appropriate codes (C, H, P, NB). It is not necessary to indicate the break type for each specimen.

How to Report Data: Report data to the nearest 0.01 for ft.lbf./in or whole number for J/M.

Verify the selected units on the data entry form are correct. If not, select and indicate one of the valid units listed on the data entry form ***(ft.lbf/in*** *is the default unit for Izod Impact Resistance)*.

Plastics Specific Test Instructions

Notched Izod Impact - ISO Method

Analysis: 791
Pack: IT
Sample Code: Z
Test Method: ISO 180, Method A

Properties Measured: Izod impact resistance of notched specimens.

Sample Information: Seven specimens have been provided for each sample. Report test results for five specimens. The additional specimens from each sample may be used for equipment set up or substitution if one of the specimens appears flawed.

Sample Preparation: DO NOT CUT BARS IN HALF. Cut one specimen from the center of each bar. You will create 5 or 6 specimens per sample. Notch all specimens and condition for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

Special Requirements: In the space provided on the data entry form, indicate all break types observed for the two samples by circling the appropriate codes (C, H, P, NB). It is not necessary to indicate the break type for each specimen.

How to Report Data: Report data to the nearest 0.01 kJ/m^2.

Verify the selected units on the data entry form are correct. If not, select and indicate one of the valid units listed on the data entry form ***(kJ/m^2** is the default unit for Izod Impact Resistance)*.

Plastics Specific Test Instructions

Notched Charpy Impact - ISO Method

Analysis: 792
Pack: CH
Sample Code: M
Test Method: ISO 179

Properties Measured: Charpy impact strength of notched specimens.

Test Parameters: Test specimens edgewise using notch type A.

Sample Information: Seven specimens have been provided for each sample. Report test results for five specimens. Two specimens from each sample may be used for equipment set up or substitution if one of the specimens appears flawed.

Sample Preparation: DO NOT CUT BARS IN HALF. Cut one specimen from the center of each bar. You will create 5 - 7 specimens per sample. Notch all specimens and condition for at least 40 hours at a temperature of 23 ± 2°C and 50 ± 10% relative humidity prior to performing the test.

Special Requirements: In the space provided on the data entry form, indicate all break types observed for the two samples by circling the appropriate codes (C, H, P, NB). It is not necessary to indicate the break type for each specimen.

How to Report Data: Report data to the nearest 0.01 kJ/m^2

Verify the selected units on the data entry form are correct. If not, select and indicate one of the valid units listed on the data entry form *(**kJ/m^2** is the default unit for Charpy Impact Strength)*.