

Cross-Reference of European Coil Coating Test Methods (EN 13523) and ASTM Guides, Practices and Test Methods

This tool kit cross-references a list of European Coil Coating test methods found in EN 13523 against their counterpart ASTM Guides, Practices and Test Methods, described below as:

- Guide—a compendium of information or series of options that does not recommend a specific course of action.
- Practice—a definitive set of instructions for performing one or more specific operations that does not produce a test result.
- Test method—a definitive procedure that produces a test result

In many cases, a single EN test method will have more than one applicable ASTM practice or test method associated with it. There are two EN test methods for which no ASTM alternate exists at this time. (See the bottom of the attached list.)

NOTE: ASTM D3794 is a guide for testing coil coatings. It includes all the ASTM standards shown below, but also has an additional 50+ standards referenced.

Also, historical references are also shown for NCCA test methods Pre-1996 and NCCA test methods 1996-2003. After 2003, ASTM standards replaced all NCCA test methods.

This Tool Kit is part of a series of educational aids developed by the members of the National Coil Coating Association. NCCA is a trade association of coil coaters and suppliers of raw materials and equipment used in the coil coating process. The association concentrates its efforts on providing educational resources and assisting its members in providing superior products and services to their customers. NCCA Tool Kits are information tools and should not be used as substitutes for instructions from individual manufacturers. Always consult with individual manufacturers for specific instructions regarding their products and equipment.

**Cross-Reference of European Coil Coating Test Methods (EN 13523)
and
ASTM Guides, Practices and Test Methods**

General Requirements

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-0 General introduction and list of test methods	ASTM D3794 Standard Guide for Testing Coil Coatings	IV-2, X-1, IV-3	1.1.1, 1.1.2

Film Thickness

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-1:2009 FILM THICKNESS • Method A Magnetic Induction	ASTM D7091 - 21 Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals	II-15	4.2.3
EN 13523-1:2009 FILM THICKNESS • Method B Eddy Current	ASTM D7091 - 21 Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals	II-14	4.2.2
EN 13523-1:2009 FILM THICKNESS • Method C Micrometer	ASTM D1005 Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers	II-4	4.2.1
EN 13523-1:2009 FILM THICKNESS • Method D Optical	ASTM D5796-20 Standard Test Method for Measurement of Dry Film Thickness of Thin-Film Coil-Coated Systems by Destructive Means Using a Boring Device	--	--

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
	ASTM D4138-07a(2017) Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means	II-13	4.2.4
--	ASTM D8331-20 Standard Test Method for Measurement of Film Thickness of Thin-Film Coatings by Non-Destructive Means Using Ruggedized Optical Interference	--	--

Specular Reflectance (gloss)

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-2:2001 SPECULAR GLOSS	ASTM D523-14(2018) Standard Test Method for Specular Gloss	--	6.1.6

Color, Establishing Color & Gloss Tolerances

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-3:2001 COLOUR DIFFERENCE	D3134 Standard Practice for Establishing Color and Gloss Tolerances D5531 Standard Guide for Preparation, Maintenance, and Distribution of Physical Product Standards for Color and Geometric Appearance of Coatings	I-2, I-7	6.1.2, 6.1.3, 6.1.4
	ASTM E308-18 Standard Practice for Computing the Colors of Objects by Using the CIE System	--	6.1.5
	ASTM D2244-21 Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates	I-1	6.1.1, 6.1.5
EN 13523-15:2002 METAMERISM	ASTM D4086-18 Standard Practice for Visual Evaluation of Metamerism	--	6.1.4

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-22:2010 COLOUR DIFFERENCE; VISUAL COMPARISON	ASTM D1729-16 Standard Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials	--	6.1.4

Pencil Hardness

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-4:2001 PENCIL HARDNESS	ASTM D3363-20 Standard Test Method for Film Hardness by Pencil Test	II-12	4.2.5

Impact Resistance, T-bend Testing, Cupping Test, Cross-Hatch Adhesion, and Mandrel Bend

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-5:2001 RESISTANCE TO RAPID (impact test)	ASTM D2794-93(2019) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)	II-6	4.2.5
EN 13523-6:2002 ADHESION AFTER INDENTATION (cupping test)	ASTM E643-15 Standard Test Method for Ball Punch Deformation of Metallic Sheet Material	--	--
EN 13523-7:2001 RESISTANCE TO CRACKING ON BENDING (T-bend test)	ASTM D4145-10(2018) Standard Test Method for Coating Flexibility of Prepainted Sheet	II-19	4.2.8
--	D4146 Standard Test Method for Formability of Zinc-Rich Primer/Chromate Complex Coatings on Steel	II-23	4.2.9
--	D3359 Standard Test Methods for Measuring Adhesion by Tape Test	II-5, II-16	4.2.10
--	D522-17(2021) Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings	--	--
--	Wedge Bend (no ASTM equivalent)	II-10	4.2.7

Accelerated Testing: Corrosion & Weathering

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-8:2010 RESISTANCE TO SALT SPRAY (fog)	ASTM B117-19 Standard Practice for Operating Salt Spray (Fog) Apparatus	III-2	5.4.6
	ASTM G85-19 Standard Practice for Modified Salt Spray (Fog) Testing	--	5.4.9
	ASTM D5894-21 Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)	--	--
	ASTM B368-21 Standard Test Method for Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test)	--	--
	D2803 Standard Guide for Testing Filiform Corrosion Resistance of Organic Coatings on Metal	--	5.4.10
EN 13523-9:2001 RESISTANCE TO WATER IMMERSION	ASTM D870-15(2020) Standard Practice for Testing Water Resistance of Coatings Using Water Immersion	III-1	5.4.2
EN 13523-10:2010 RESISTANCE TO FLUORESCENT UV LIGHT AND WATER CONDENSATION	ASTM D4587-11(2019)e1 Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings	--	--
	ASTM G151-19 Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources	--	--
	ASTM G154-16 Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials	--	5.3.2
--	G152 Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials G153 Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials D3361-13(2018) Standard Practice for Unfiltered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings	III-7	5.3.1
--	G155-21 Standard Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials	--	--

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
--	D4141-22 Standard Practice for Conducting Black Box and Solar Concentrating Exposures of Coatings	--	--
--	G90-17 Standard Practice for Performing Accelerated Outdoor Weathering of Materials Using Concentrated Natural Sunlight	--	--

Solvent Resistance

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-11:2011 RESISTANCE TO SOLVENTS (RUBBING TEST)	ASTM D5402-19 Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs	II-2	4.2.11
	ASTM D7835/D7835M-19 Standard Test Method for Determining the Solvent Resistance of an Organic Coating Using a Mechanical Rubbing Machine	--	--

Scratch Resistance

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-12:2004 RESISTANCE TO SCRATCHING	ASTM D7027 - 13 Standard Test Method for Evaluation of Scratch Resistance of Polymeric Coatings and Plastics Using an Instrumented Scratch Machine	--	--
	ASTM G171-03(2017) Standard Test Method for Scratch Hardness of Materials Using a Diamond Stylus	--	--

Accelerated Heat Aging

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-13:2001 RESISTANCE TO ACCELERATED AGEING BY THE USE OF HEAT	ASTM D6491-09(2016) Standard Practice for Evaluation of Aging Resistance of Prestressed Prepainted Metal in a Dry Heat Test	--	4.3.5
	ASTM D2454-18 Standard Practice for Determining the Effect of Overbaking on Organic Coatings	--	--
--	ASTM D6665-09(2019) Standard Practice for Evaluation of Aging Resistance of Pre-stressed Prepainted Metal in a Boiling Water Test	--	--

Abrasion Resistance

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-16:2004 ABRASION RESISTANCE	ASTM D968-17 Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive	--	4.3.3
	ASTM D4060-19 Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser	II-21	4.3.2

Adhesion of Strippable Film

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN13523-17:2011 ADHESION OF STRIPPABLE FILMS	No ASTM equivalent.	--	--

Resistance to Staining; Detergent Resistance

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-18:2002 RESISTANCE TO STAINING	ASTM D2248-01a(2018) Standard Practice for Detergent Resistance of Organic Finishes	--	--
	ASTM D1308-20 Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems	--	--

Exposure Testing and Evaluation: Corrosion and Weathering

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-14:2001 CHALKING	ASTM D4214-07(2015) Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films	III-8	5.5.2
EN13523-19:2011 PANEL DESIGN AND METHOD FOR ATMOSPHERIC EXPOSURE TESTING	ASTM G7/G7M-21 Standard Practice for Natural Weathering of Materials	III-9	5.2.1
	ASTM D1014-18 Standard Practice for Conducting Exterior Exposure Tests of Paints and Coatings on Metal Substrates	III-9	5.2.1
EN 13523-21:2010 EVALUATION OF OUTDOOR EXPOSED PANELS	ASTM D610-08(2019) Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces	III-3	5.5.1
	ASTM D714-02(2017) Standard Test Method for Evaluating Degree of Blistering of Paints	III-3	5.5.1
	ASTM D660-93(2019) Standard Test Method for Evaluating Degree of Checking of Exterior Paints	--	--
	ASTM D1654-08(2016)e1 Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments	III-3, III-5	5.1.1
	Comparison of Outdoor Weathering Sites and Accelerated Weathering Devices	III-10, III-11	5.2.2, 5.2.3, 5.2.4

Sulfur Dioxide, Color Change Testing

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN 13523-23:2002 COLOUR STABILITY IN HUMID ATMOSPHERES CONTAINING SULPHUR DIOXIDE	ASTM G87-02(2018) Standard Practice for Conducting Moist SO2 Tests	--	5.4.7, 5.4.8

Blocking and Pressure Marking

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN13523-24:2004 RESISTANCE TO BLOCKING AND PRESSURE MARKING	ASTM D3003-01(2016) Standard Test Method for Pressure Mottling and Blocking Resistance of Organic Coatings on Metal Substrates	II-17	4.3.1

Foam Adhesion

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN13523-20:2011 FOAM ADHESION	No ASTM equivalent.	--	--

Humidity Testing

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN13523-25:2006 RESISTANCE TO HUMIDITY	ASTM D2247-15(2020) Standard Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity	--	5.4.4

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
	ASTM D1735-14 Standard Practice for Testing Water Resistance of Coatings Using Water Fog Apparatus	III-4	5.4.3
	ASTM G60-01(2018) Standard Practice for Conducting Cyclic Humidity Exposures		
EN13523-26:2006 RESISTANCE TO CONDENSATION OF WATER	ASTM D4585/D4585M-18 Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation	III-6	5.4.5

Other Environmental Tests

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
EN13523-27:2009 RESISTANCE TO HUMID POULTICE (CATAPLASM TEST)	No ASTM equivalent	--	--
EN13523-29:2010 RESISTANCE TO ENVIRONMENTAL SOILING (DIRT PICK-UP AND STRIPING)	No ASTM equivalent	--	--

Viscosity, Rheology

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
--	D1200 Standard Test Method for Viscosity by Ford Viscosity Cup	--	3.1.1
--	D2196 Standard Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational Viscometer	--	3.1.2

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
--	D4212 Standard Test Method for Viscosity by Dip-Type Viscosity Cups	--	3.1.3

Density, Weight & Volume Solids, VOC

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
--	D1475 Standard Test Method for Density of Liquid Coatings, Inks, and Related Products D2369 Standard Test Method for Volatile Content of Coatings D2697 Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings	--	3.2.1
--	D3960 Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings	--	3.2.2

Glass Transition Temperature

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
--	E1545 Standard Test Method for Assignment of the Glass Transition Temperature by Thermomechanical Analysis E1640 Standard Test Method for Assignment of the Glass Transition Temperature by Dynamic Mechanical Analysis E1356 Standard Test Method for Assignment of the Glass Transition Temperatures by Differential Scanning Calorimetry or Differential Thermal Analysis	II-22	4.3.4

Pretreatments

European Coil Coating Standards	ASTM Coil Coating Guides, Practices, and Test Methods	Archived NCCA Standards, Pre-1996	Archived NCCA Standards, 1996-2003
--	D5723 Standard Practice for Determination of Chromium Treatment Weight on Metal Substrates by X-Ray Fluorescence B767 Standard Guide for Determining Mass Per Unit Area of Electrodeposited and Related Coatings by Gravimetric and Other Chemical Analysis Procedures	II-1, II-2, II-3, II-7, II-8	4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6