Global Paint Standards

The International Use of Standards from ASTM Committee D01

By Cicely Enright
Paint and coatings color our world, and ensuring their quality as well as that of varnish, lacquer, printing ink and artists’ materials are the standards developed by a longstanding ASTM International committee.

The more than 600 members of Committee D01 on Paint and Related Coatings, Materials and Applications, which traces its roots to the early years of ASTM International, include representatives from 36 countries who oversee more than 650 standards.

Globalization has changed the face of business in many ways, and one result is that ASTM D01 standards are in use around the world, specifying pigments and surface preparation, and called for in the testing of coating components and paint properties.
D01 members say they have encountered D01 standards in Asia and South America, Europe and the United States.

“I have encountered D01 standards in all continents and most industrial countries around the world. This is because some of the ASTM standards are unique, and they are referenced because there is no equivalent,” says D01 chairman John Fletcher, technical support manager, Elcometer Ltd., Manchester, United Kingdom.

A CASE IN PAINT: D562

Among notable D01 standards finding international use is D562, Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer, which determines the load required to produce a certain number of revolutions for a paddle immersed in paint. The information guides the coatings community in specifying paints and coatings, and in controlling their consistency.

The Krebs viscometer, so named for its original U.S. developer, is used in ASTM International standards for paint viscosity testing. “There are no other international standards for this test, and it is widely used to characterize paint products as the viscosity affects how a paint can be applied,” Fletcher says.

The viscosity of a paint is noted on the data sheet for paints made in one country and exported to another, for example, with data about that paint property. Viscosity impacts the amount of energy it takes to transport paint through pipes and hoses to the spray gun used to coat a car, for example. “By giving someone the Krebs viscosity, they can tell whether a coating is going to perform correctly in an application or not,” says Joe Peters, technical standards manager for Leneta Co. in Mahwah, N.J., and D01 vice chairman. For a car, if the paint does not flow properly, a non-uniform finish could result.

Peters notes that a large database of historical data about the method’s use has the additional advantage of further information comparison. “It is a method that answers everybody’s needs,” Peters says.

WHERE U.S. FEDERAL LAW CITES A D01 STANDARD

It’s all in the labeling with D4236, Practice for Labeling Art Materials for Chronic Health Hazards, which has been codified into U.S. law as part of the Federal Hazardous Substances Act (15 USC S1277).

The law requires that all artists’ material sold in the United States, whether imported or manufactured in the country, must comply with the standard through material labeling. Such materials would include paints, adhesives and mediums, that is, any art material packaged for individual use.

According to D4236, precautionary product labels must consider reasonable use or misuse and indicate any potential chronic adverse health effect through review by a toxicologist.

FHSA became law in 1988, five years after the original publication of D4236. “D4236 is globally adopted by manufacturers selling art materials in the United States, and besides the obvious benefits of having proper health and safety labeling for hazardous substances that might be contained in art materials, the uniform labeling of pigment names and list of pigments certainly helps artists make informed decision about the materials they use,” says Michael Skalka, conservation administrator, National Gallery of Art, Washington, D.C., and chairman of the responsible D01 group, Subcommittee D01.57 on Artists’ Materials. He notes, “It is a great safeguard for the consumer as well as for workers at the manufacturing facility where colorants and binders are processed into art materials. It assures everyone that new products or old ones that have adopted a change in raw materials are still in accord with the labeling required by federal law.”

More lies in store for artists’ materials with the work of D01.57 as the
Paint group develops specifications for traditional artist oils and watercolors, among other standards.

The subcommittee also has the long-term goal, according to Skalka, of increasing the international use of the lightfastness rating system for colorants in art materials. The system, covered in D4303, Standard Test Methods for Lightfastness of Colorants Used in Artists’ Materials, addresses how to perform accelerated exposures. The information guides producers and users about suitable colorants because, according to the standard, “The retention of chromatic properties by a colorant over a long period of years is essential in a work of art.”

THE ASTM AND ISO PAINT MOU

In today’s more global marketplace, the paint industry is attempting to harmonize standards on the same topic from different organizations, with the goal of making the standards more technically equivalent. Members of Committee D01 members and its counterpart in the International Organization for Standardization (ISO), Technical Committee 35 on Paints and Varnishes, have participated in the work of both groups in developing and reviewing similar standards.

In 2001, to further cooperation between the two groups and to eliminate the creation of separate ISO and ASTM standards for the same property, ISO TC 35 on Paints and Varnishes and D01 signed a memorandum of understanding. Similar, but not necessarily identical, standards, according to the MOU, foster marketplace confusion and contradictions between the standards, increase testing and human resource costs, and require constant “catch-up” to align requirements between the two standards.

Through the MOU, D01 and ISO TC 35 agree not to develop a standard when one already exists that fulfills market needs, and they are working to eliminate duplicate standards. In addition, the agreement notes that the groups would determine which standard would remain if two exist.

“Where we’ve come in the last several years with the MOU is encouraging,” Peters notes, “but we’ve got a lot more work to do.”

MORE D01 STANDARDS WITH INTERNATIONAL USE

Fletcher notes examples of other ASTM standards with broad international use such as those for fineness of grind (D1210 and D1316), Ford and Zahn viscosity cups (D1200 and D4212), and spiral bar coaters (D4147).1

Peters cites D4400, Test Method for Sag Resistance of Paints Using a Multinotch Applicator, which describes a simple and rapid procedure to demonstrate sag resistance through numerical values for observations. He says that the applicator is unique and that the ASTM test helps paint designers balance sag resistance — the paint’s ability to stay on the wall — with another needed attribute called leveling, which is the paint’s ability to fill in minor imperfections.

And, D3359, Test Methods for Measuring Adhesion by Tape Test, known as the crosshatch test, gives both laboratory and field testing options to assess the adhesion of coating films to metallic substrates by applying and removing pressure sensitive tape over cuts in the film. The test works for coatings in many different industries: automotive, marine, construction, printing, electronics and more. In fact, D3359 is D01’s best-selling standard.

These are just a sampling; D01’s standards make their way around the world through global commerce and just plain usefulness.

As Peters says, “One way or the other, ASTM D01 methods influence a great deal of testing around the world.”

FOR MORE INFORMATION

All those interested are welcome to participate in the work of ASTM Committee D01. To learn more, go to www.astm.org/COMMIT/D01, or contact Jeffrey Adkins, ASTM staff manager (610-832-9738; Email: jadkins@astm.org).

REFERENCE

1. D1210, Test Method for Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-Type Gage; D1316, Test Method for Fineness of Grind of Printing Inks By the NPIRI Grindometer; D1200, Test Method for Viscosity by Ford Viscosity Cup; D4212, Test Method for Viscosity by Dip-Type Viscosity Cups; and D4147, Practice for Applying Coil Coatings Using The Wire-Wound Drawdown Bar.