Over the past several years our industry has been inundated with a seemingly endless stream of new or “updated” regulations from around the world.

The information that follows has been accumulated from many sources and is correct to the best of our knowledge. The various documents and other write-ups are meant as guidance and should not be construed as legal documents or advice. Here is what you’ll learn...

**Important terms**

- **PTFE (polytetrafluoroethylene)**: What most people know as Teflon® (the brand name of DuPont, now Chemours). PTFE provides the release component to these coatings. PTFE was discovered in 1938 by Roy Plunkett of DuPont and has been used as a component of cookware coatings since the early 1950s. Other fluoropolymers are sometimes used in conjunction with PTFE, including FEP (fluorinated ethylene propylene) and PFA (perfluorinated alkoxy). All these materials are well proven and accepted throughout the world as being safe for use in food-contact applications.

- **PFOA (perfluorooctanoic acid)**: Also sometimes referred to as APFO (ammonium perfluorooctanoate) or by the chemical shorthand C-8, PFOA has been used as a process aid in making certain kinds of PTFE resins. Only about 10% of the PTFEs produced use PFOA in the manufacturing process, including the materials historically used in cookware coatings. Through a voluntary initiative between the resin manufacturers and the US EPA, however, PFOA use is being phased out. As a result there are many PFOA-free versions available.

- **VOCs (Volatile Organic Compounds)**: These are the solvents that evaporate from coatings when they are applied and cured. Most cookware coatings are waterborne, with the water being evaporated during the cure process. Any solvents that are used are a minor component of the formulae. All liquid (before the curing) coatings have “allowa-
ble” amounts of VOCs set by the EPA in the US and by the EU. These regulations are administered by the environmental departments of the various states or member countries. Generally for the US, pigmented liquid coatings are allowed 3.5 pounds/gallon (120 grams/liter) of VOCs. Clear coatings have an allowance of 4.3 pounds/gallon (150 grams/liter) of VOCs.

It should be noted that following correct application and curing, VOCs are generally completely eliminated from the final coated items.

• APEO (Alkyl phenol ethoxylates): These are surfactants used to disperse solids (e.g. fluoropolymers) in the liquid phase. These compounds have increasingly been controlled in the EU as there is a concern over their effect in the environment. They are, however, still allowed in fluoropolymer dispersion manufacture.

In some cases APEO-free coatings systems are available by request.

• Sol-gel “Ceramic” Coatings: These coatings are suspensions of tiny particles that react during curing to form a hard, glass-like film. The cured coatings are ceramic-like; they feature many of the same characteristics as ceramics but to a lesser extent. This provides a hard surface, similar to porcelain enamel, and is formulated in a way that allows good release without the use of fluoropolymers (e.g. PTFE).

• Globally Harmonized System (GHS): GHS is a United Nations effort to harmonize the classification and labeling of chemicals. GHS contains a toolbox harmonized classification categories, communication elements (e.g. phrases and pictograms), and SDS and labeling requirements. Each country must adopt GHS regulations and all are free to omit portions of the regulation. The fifth revision to GHS was published by the UN in October 2013. These regulations cover the coatings used in manufacturing, and, because of the revisions, individual country modifications, and adoption dates, the classification of the same product for different countries may vary. Additional requirements may also apply depending on the country.

European Food-Contact Regulations

• EU Commission Regulation 1935/2004/EC: Commission Regulation1, “1935/2004/EC: Materials and articles intended to come into contact with food” is known as the “Framework Regulation” and covers all materials which might come into contact with food. It states that “food contact materials shall be safe. They shall not transfer their components into the food in quantities that could endanger human health, change the composition of the food in an unacceptable way or deteriorate the taste and odor of foodstuffs.”

The regulation establishes 17 groups of materials and articles which may be covered by specific measures, three of which could apply to nonstick coatings: silicones, textiles, varnishes and coatings.

As with the US FDA, there is no formal authority approving food-contact coatings but coating manufacturers have specific requirements:

• Follow “Commission Regulation 2023/2006/EC: Good manufacturing practice for materials and articles intended to come into contact with food”.

Go to: productknowledge.com
• Use “approved substances.”
• Meet requirements of Council Directive “82/711/EEC, as amended, laying down the basic rules necessary for testing migration of the constituents of plastic materials and articles intended to come into contact with foodstuffs” for specific overall migration using appropriate stimulants, time, temperature and method.

Sol-gel coatings are expected to be regulated as part of the coatings and varnishes group.

Note:
• A regulation is automatically law in all EU countries without having to go through each country’s legislative body.
• A directive has to be passed by each country’s legislative body before becoming law.
• Minor amendments/changes/corrections to regulations/directives are made regularly but by quoting “as amended” all such adaptations are included without having to list numerous other numbers.

Council of Europe Food-Contact Framework Resolutions

The Council of Europe consists of 47 member states, of which 28 are also EU members. The Council provides a mechanism for creating common standards across the member states through the publication of common standards, known as resolutions. Once a resolution is adopted, the individual member states must pass national legislation to implement the resolutions in that country.

One important aspect of the resolutions is that the member states cannot adopt limits that differ from those in the resolution. Consequently, Council of Europe Resolutions are used as guidelines for determining compliance in Member States, including the EU, even if no regulations have been adopted within those countries.

For coatings, several Framework Resolutions (Res Aps) have been published that apply to nonstick coatings.

• Res Ap 2004 covers food-contact materials, establishing categories that include two that are relevant to nonstick coatings: Coatings intended to come in contact with foodstuffs; and Silicones used for food contact applications.
• Res AP (89) 1 covers colorants used in plastic materials coming in contact with food.

National Legislation LFGB (Germany) and DGCCRF (France)

While many European countries have adopted legislation governing food-contact articles, the most commonly known are those from Germany and France. Under the provisions of mutual recognition, however, once a substance is approved and marketed in one country, it is accepted for use in all other EU member states.

The LFGB (Lebensmittel-, Bedarfsgegenstände-und Futtermittelgesetzbuch, or...
“Foods, Consumer Goods and Feedstuffs Code”) is sometimes thought to be the European equivalent of the FDA. This is not quite correct. The LFGB is the German enactment of European law as operated by the Bundesinstitut für Risikobewertung (BfR). The BfR recommendations for food-contact materials are some of the more comprehensive in the EU.

The Directorate General for Competition Policy, Consumer Affairs and Fraud Control (DGCCRF) published regulations governing food-contact materials under the French Décret no. 92-631 of 08/07/1992. These regulations also include extraction test methods that are based on, but more extensive than those identified in the EU Directive (EC) 82/711.

**Other European Regulations**

- **REACH**: REACH is a European Union regulation and it stands for “Registration, Evaluation, and Authorisation of Chemicals which is administered by the European Chemicals Agency (ECHA). The purpose of REACH is to ensure that the effects of chemicals on human health and the environment are known before they are introduced into commerce. REACH affects the entire supply chain where it passes through the EU, including non-EU companies that export chemicals, chemical mixtures (called “preparations”), and some articles when exported to EU-based customers.

- **Registration**: All chemicals substances used in coatings formulations must meet the registration requirements by 31 May, 2018. Registration is required for substances or monomers of polymers imported or manufactured in quantities equal to or greater than one (1) metric ton per year (1 metric ton = 2205 pounds). Registration must be completed by the EU manufacturer or importer of the substance. For importers, the registration may also be completed by an EU-based representative acting on behalf of the non-EU manufacturer. (Such a representative is termed an “Only Representative”.)

- **SVHCs and Authorisation**: Authorisation is a multistep process that begins with the identification of Candidate Substances of Very High Concern (SVHCs) for Authorisation. For this reason, SVHCs are also known as candidates for authorisation. Once listed, SVHCs can continue to be used; however manufacturers must notify customers if their product, including articles, contains an SVHC > 0.1%.

  Once a substance becomes an SVHC, member states can then nominate the substance for authorisation. Under the authorisation process, manufacturers, importers, and/or users must request “authorisation” from ECHA to continue using the substance after a specified sunset date. If authorisation is not granted, that specific use of the substance in the EU is prohibited. Authorisation is limited to the scope of the request, so an SVHC could be authorized for use in one application, but not another.

- **Restriction**: The restriction provisions of REACH differ from those for authorisation in two important aspects. First, the use of a substance can be restricted without first being listed as an SVHC (because SVHCs are candidates for authorisation). Second, once use of a substance is restricted, it cannot be subsequently authorized for that use. ECHA has consolidated all previously existing chemical restrictions under this section of REACH.
• **REACH – Turkey**: In 2008, Turkey adopted its Regulation on the Inventory and Control of Chemicals which is similar to the EU REACH regulation. Also known as Turkish REACH, the regulations require manufacturers and importers of substances on their own or in preparations over 1 ton per year to notify authorities. As with REACH, articles are exempt from these notifications. However, unlike the EU regulation, there is no requirement to register substances intended for release from articles. The Turkish regulation also does not contain provisions for restricting the use of substances.

• **European Take Back Regulations**: Extended Producer Responsibility (EPR) as defined by the OECD is “an environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle.” This concept has been extended to many products such as batteries, oil, and electronic products through “take-back” regulations. These regulations require manufacturers to collect used household electronics for recycling and/or recovery.

• **RoHS**: Restrictions of Hazardous Substances: RoHS (pronounced “rows”), originally published in 2002 (2002/95/EC), the Directive restricts the use of certain substances in electrical and electronic equipment. The Directive says: “Member states shall ensure that, from 1 July 2006, new electrical and electronic equipment put on the market does not contain lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (CrVI), polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE)” (in sum, “Restricted Hazardous Substances”). This only affects a coating if (1) the coatings contain RoHS-listed substances and (2) the coatings are applied to electrical or electronic equipment.

In 2011, the Directive was recast (2011/65/EU). The revised Directive gradually extends the requirements to additional components and requires a review of the regulated substances to determine if additional restrictions are warranted. The applicability requirements for coatings noted above are unchanged.

• **WEEE**: “Waste Electrical and Electronic Equipment” comes from a Commission Decision of 18 August 2005 (2005/618/EC), also effective 1 July 2006, which amended the RoHS Directive to “tolerate” a maximum concentration value of 0.1% by weight in homogeneous materials for Pb, Hg, CrVI, PBB, and PBDE and 0.01% by weight of homogeneous materials for Cd. (See also Directive 2002/96/EC of 27 January 2003 on waste electrical and electronic equipment.) The current Directive remains in force until 15 August 2018 when revisions adopted in 2012 under 2012/19/EU on waste electrical and electronic equipment (WEEE) (Recast) come into force.

This directive requires the company placing the original electrical item on the market to establish a mechanism for collecting and recycling that item. Where an item was manufactured prior to the regulation coming into force, it is not clear who is responsible for recycling that item (e.g. if you buy a new washing machine, who is responsible for disposing of the old electrical item?). Each Member State is responsible for establishing mechanisms for collecting, transporting, and recycling of electronic items, with the costs and responsibilities shared between producers and municipalities. Small household appliances are one of ten (10) categories regulated under the 2005 Directive and which will continue to be regulated under the 2012 Recast Directive. This Directive does not apply to nonstick coatings; however it does apply to appliances that have nonstick
coatings.

• **Norway PoHS**: Norway has adopted regulations entitled Prohibition on Certain Hazardous Substances in Consumer Products. These regulations restrict the use of 18 substances in consumer products, and the only overlaps with the substances regulated in the EU RoHS regulations are lead and cadmium. The regulation applies to electronic and electrical equipment, but it does not apply to food-contact materials.

• **Turkey RoHS**: Turkey’s RoHS regulations became effective in June 2014. Manufacturers must submit a Conformity Declaration Form to the Turkish government annually and maintain records demonstrating compliance with the requirements for five years.