Coil and Extrusion Coatings

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Coil and extrusion coatings comprise an extremely important component of the U.S. paint and coatings industry. Even though they do not constitute a market segment, as such, coil and extrusion coatings are second in value only to the automotive segment among all OEM finishes. In 2010 alone, the U.S. Census Bureau reported that the U.S. market for coil coatings was 36.5 million gallons, valued at $712 million.

Although traditionally referred to in the industry as "Coil and Extrusion Coatings," the U.S. Census Bureau, Current Industrial Report (CIR) MA325F, *collects data for this segment under the category entitled "Metal Building Product Finishes including Coatings for Aluminum Extrusions and Siding." These coatings are factory-applied under controlled conditions by professional coil, sheet, strip, and extrusion coaters to metallic substrates.*

Coil coating involves rollcoating flat metal that will be post-formed after the coating has been applied and cured, and extrusion coating involves spray coating either pre-formed parts or flat sheets that will normally be used in that state.

Following coil coating, the metals (generally steel and aluminum) are typically put through a forming process that bends and draws the coated metal into the appropriate shape for the intended end-use, with little or no cracking of the coating visible to the naked eye. The principal end-use for coil-coated ("pre-coated") metal is the construction industry, for sidewalls and roofing, but coil-coated metal also plays a vital role in the HVAC (heating, ventilating, and air conditioning), entry and garage door, and appliance market segments. Minor applications for coil-coated metal also include the transportation and general metal market segments. End-uses in the latter segment are almost unlimited, from lunch boxes to waste containers, and are generally not tracked by anyone in the industry. Spray-coated extruded metal and flat sheet are used almost exclusively in the construction industry for window and door frames, facia, trim, curtain wall, etc. Although there are additional uses for coil- and sheet-coated metal in the manufacture of metal container end caps and food cans, they are classified differently by the U.S. Census—and by the industry at large—and are therefore not discussed in this article.

In 2011, the American Coatings Association (ACA) partnered with The ChemQuest Group, Inc., the global strategic management consulting firm, to prepare an update to ACA's U.S. Paint & Coatings Industry Market Analysis, *covering the years 2010 to 2015. This article examines the coil and extrusion coatings area—just one market segment that is detailed in the publication.*

Photos courtesy of AkzoNobel Coatings, Inc.

INTRODUCTION

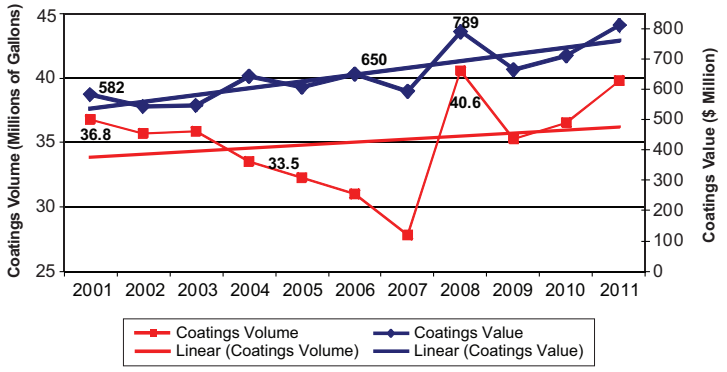
The significance of coil and extrusion coatings to the overall OEM finishes market is not commonly recognized. The majority of those individuals who have worked in the coil and extrusion industry for many years tend to think of it as one of the "smaller" paint industry sectors, and—if compared to the $8.7 billion, 644 million gallon architectural coatings market segment—it is. When compared, however, to the other OEM industrial coatings segments like automotive and light truck coatings; wood furniture and cabinet finishes; machinery and equipment coatings; heavy truck, bus, and RV coatings, etc., it acquires an entirely different stature. At 36.5 million gallons valued at $712 million by the 2010 U.S. Census, coil and extrusion coatings are second in value only to the "automotive, light truck, van, and SUV finishes" market segment, which produced 43.2 million gallons valued at $1.0 billion according to the 2010 Census. Coil and extrusion coatings represented 11% of the volume and 13.4% of the value of all OEM coatings, and 3% of the volume and 4% of the value of the entire U.S. coatings industry in 2010. They are poised for similar performance in 2011, when it is projected that the industry will ship 39.8 million gallons valued at $812 million (see *Figure* 1).

Why this disconnect between perception and reality? If we begin to explore this a bit, it becomes clear that automotive, wood furniture, machinery and equipment, heavy trucks, etc., are all clear-cut *markets,* and the categories of paints, coatings, and finishes that are applied to them are clearly descriptive of the respective markets—e.g., "automotive" coatings describe the market itself, as do "wood coatings," "machinery and equipment finishes," and so forth. On the other hand, "coil coatings" do not describe a market, but rather an *application method* used to apply the coatings to coils of flat, unformed metal, which can then be formed into an almost endless variety of objects. Similarly, the phrase "extrusion coatings" indicates that the coatings are applied to extruded (shaped) metal, but it references neither the end market(s) that will use this metal, nor does it describe the application method (generally electrostatic spray) used to apply the paint to the metal. Because of this, producers of coil and extrusion coatings do not have a chance to see their products being applied to finished objects, such as cars, equipment, or wood furniture, because that happens at a later time, once the coated coils and extrusions have been shipped to a fabricator. Depending upon the fabricator, the coil-coated metal and spray-painted extrusions will then be turned into the metal roofs and sidewalls, air conditioners and other HVAC (heating, ventilating, and air-conditioning) items, garage doors, window and door frames, refrigerators and washing machines, side panels for trucks, building facia, and countless other objects that are sold through a variety of market segments represented in *Figure* 2.

The U.S. Census Bureau, in its *Current Industrial Report MA325F,* refers to the coil and extrusion segment as "Metal Building Product Finishes including Coatings for Aluminum Extrusions and Siding," which is reasonable, insofar as approximately 70% of all coil-coated products—and on the order of 80% of painted, extruded metal—are used in some aspect of the metal building industry. This categorization ignores, however, the many other uses for both coil and painted extruded metal, including the use of coil coated metal in the fabrication of major white goods appliances, such as refrigerators, freezers, washers, dryers, dishwashers, and related items. It also fails to recognize the use of painted extruded metal in applications such as seat rails for cars and semi-truck trailer applications, electronic parts for cooling, and solar panel frames, among many others.

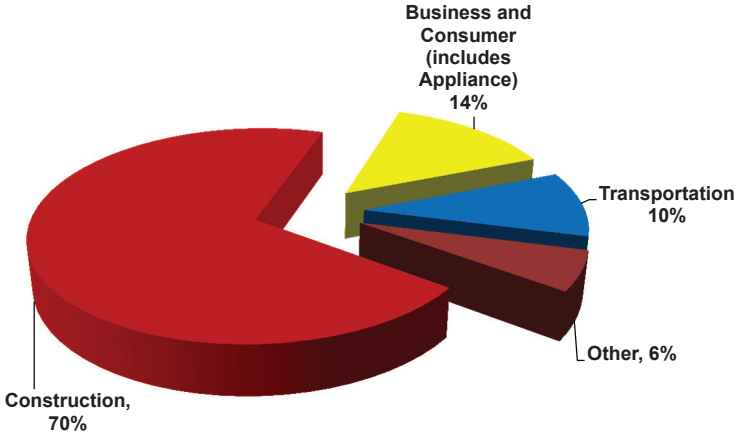
HISTORICAL VALUE AND VOLUME

Per Census data, shipments of coil and extrusion coatings dropped steadily between 2001 and 2007, with a very minor blip in 2003. In 2008, the revised Census numbers indicated that shipments increased by a dramatic 46% in gallons and slightly over 33% in value compared to 2007. These values are not supported by



Source: U.S. Census Bureau, Current Industrial Report MA325F; The ChemQuest Group, Inc. estimates.

Figure 1—Historical volume and value of coil coatings (2001–2010).



Source: The ChemQuest Group, Inc. estimates.

Figure 2—End-use markets for coil coatings by volume (2010).

industry interviews, however, and it is possible that the revised Census numbers are in error, especially since 2008 is the year in which PPG purchased BASF's North American Industrial Coatings business, which was essentially all coil and extrusion products. It is possible that an element of double-reporting crept into the revised Census numbers. In 2009, volume and value dropped 13.1% and 15.8%, respectively, but made a comeback in 2010, largely due to the industry's ability to pass along their escalating raw material costs, increasing in volume by 3.4% and value by 7.2% over 2009. Nonetheless, in spite of the apparent gain in 2010 selling price, after adjustment for constant dollars, using the Producer Price Index (PPI) for Industrial OEM Coatings, the selling price of an average gallon of coil and extrusion coatings products is less in 2010 than it was in 2001—$15.82/gal in 2001 vs. $14.48/gal in 2010.

Historical data relevant to coil and extrusion coatings shipments for the past 10-year period are shown in *Table* 1.

Following a period of dramatic growth in the final two decades of the 20th Century, the coil and extrusion coatings segment has settled into a period of relative maturity in the U.S., which follows agricultural, light commercial, and pre-engineered metal building construction closely, and is subject to the negative effects of imported, painted steel coils at various periods, depending upon the price and availability of domestic construction-grade galvanized steel and zinc-aluminum coated steel. Over the years, however, imports have fluctuated over a very narrow range, so that their year-over-year effect has had a minimal impact on the ability to get a clear picture of what the U.S. situation looks like. Nonetheless, imports play a role in the volume of coil coatings at any given time, although they play no role in the volume of extrusion coatings, nor do they play a role in coils of coated aluminum, which are not imported. Replacing these imports, which constitute about 13% of all coil coated steel, with domestic production would bring about a commensurate increase in the number of coil coatings gallons produced and shipped in the U.S., as can be seen in *Figure* 3.

MARKET SHARE

Since the last ACA *Market Analysis* was published, Sherwin-Williams divested its coil business to Beckers, and BASF sold its North American coil and extrusion business to PPG. The current U.S. coil and extrusion coatings market is therefore supplied principally by three companies: AkzoNobel, Valspar, and PPG (*Figure* 4) which among them have a market concentration of ~90%. The remaining 10% of the market is made up of smaller players, including Dura Coat, Beckers, and Titan.

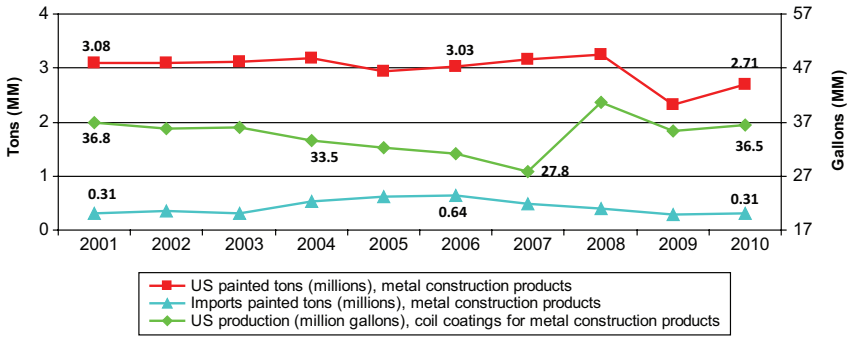
MARKET TRENDS AND DRIVERS

Although there is a definite relationship between the volume of coil and extrusion coatings shipped and the construction, business and consumer, and transportation segments of the U.S. economy, there is not always

Table 1—Historical Volume and Value of Coil Coatings (2001–2010)

Year	Volume Gal (Millions)	Value Dollars ($ Millions)	AGR[a] Volume (%)	AGR Value (%)	Average Price ($/Gal)	AGR Price (%)	Price in 2001 Constant Dollars ($/Gal)
2001	36.8	582	-19.3	-20.2	15.82	-1.1	15.82
2002	35.7	542	-3.0	-7.0	15.17	-4.1	15.08
2003	35.9	548	0.6	1.1	15.25	0.6	15.03
2004	33.5	645	-6.7	17.7	19.24	26.1	18.72
2005	32.3	607	-3.6	-5.9	18.79	-2.4	17.20
2006	31.0	650	-4.0	7.1	20.95	11.5	18.14
2007	27.8	592	-10.3	-8.9	21.28	1.6	18.17
2008	40.6	789	46.0	33.3	19.42	-8.7	15.53
2009	35.3	664	-13.1	-15.8	18.82	-3.1	14.31
2010	36.5	712	3.4	7.2	19.51	3.7	14.48

Source: U.S. Census Bureau, Current Industrial Report MA325F.
(a) AGR—Annual Growth Rate



Source: U.S. Department of Commerce and the U.S. International Trade; The ChemQuest Group, Inc. estimates.

Figure 3—Comparison among coil gallons shipped, tons of U.S. coil painted steel shipments, and tons of imported coil painted steel.

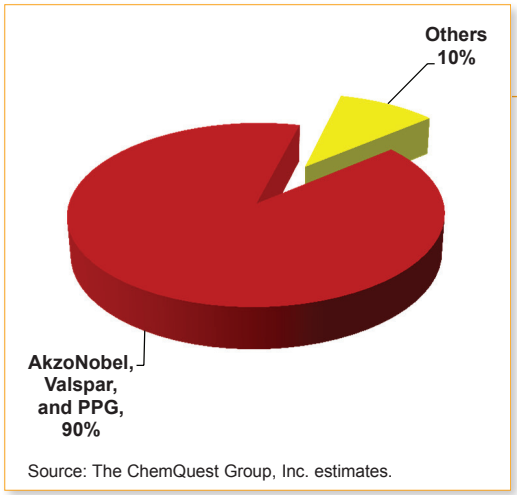
a direct relationship with economic trends in construction spending, durable goods shipments, and vehicle shipments. This is because coil and extrusion coatings are so heavily dominated by construction spending, and because the construction industry has so many aspects to it, some of which may be doing well while others may be doing poorly. Moreover, construction, business and consumer, and transportation are such large industrial segments, and the amount of coil and extrusion coatings so small by comparison (less than 0.1% of construction spending), that it is extremely difficult to track the role that coil and extrusion coatings play in them at any given time. Even small shifts in construction spending can have notable effects on the use of coil and coatings without having any measurable effect on total construction spending. For example, an increase in the use of coil or spray coated extruded metal at the expense of other materials (glass, concrete, etc.) could have a significant impact on coil and extrusion coatings shipments, without even showing up in the construction statistics.

During the late 2007–mid-2009 recession, coil and extrusion sales into agricultural and light commercial buildings were far less negatively affected than sales into architectural and pre-engineered buildings ("monumental buildings") where huge loans are required to erect the structures—and this segment was also much slower to begin to emerge from recession. It was only during the first six months of 2011 that recovery began in the architectural and pre-engineered building segment, at a time when agricultural and light commercial building sales were doing well from a coil and extrusion coatings sales perspective.

TECHNOLOGY INFLUENCES

Coated flat coil metal offers numerous advantages when compared to traditional coating techniques of prefabricated articles. These advantages include:

- Coil coating lines in the United States are run at very high speeds—typically from 350 to 750 ft/min.
- Within assembly plants utilizing coil-coated metal, coating lines are unnecessary since coil coated stock is formed into commercial articles, which can, therefore, be highly automated.
- Because the coil coating process itself is a highly automated process, labor costs on a finished product per square foot basis are significantly lower than for a traditional spray line or other application operation.
- In traditional spray paint applications, it would not be unusual to achieve only 65–70% transfer efficiency. However, since coil is coated using a roll-coat method (almost always "reverse coated" for finish coats, but often "direct coated" for backing coatings or "backers"), nearly 100% of the coating is consumed. While it is true that only the trim pieces of the coil discarded constitute waste, they can be sold as scrap. (Note: small amounts of liquid paint caught in the filters between the paint drum and the coating pan must be treated as liquid hazardous waste, but this is of minimal concern compared to more traditional industrial paint application methods.)
- With regard to the extrusion coating process, where liquid coatings or, occasionally, powder coatings are applied using electrostatic high-speed discs which provide extremely efficient transfer of the coating onto the parts, transfer efficiencies are usually above 90%.



Source: The ChemQuest Group, Inc. estimates.

Figure 4—Market share estimates for coil coatings by value (2010).

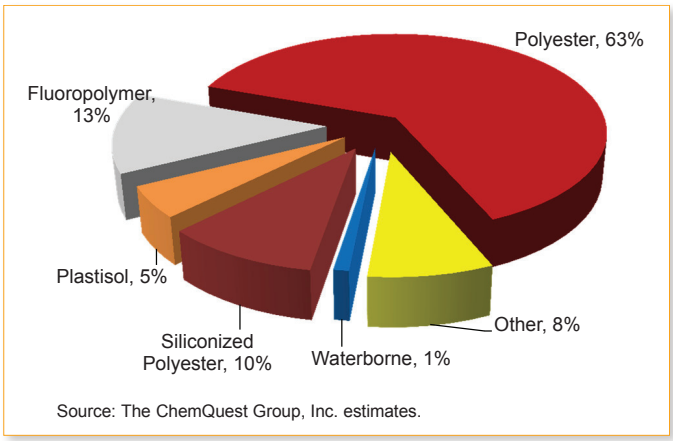


Figure 5—Technology types used for coil coatings.

- By using pre-painted metal, manufacturers (OEMs) can achieve substantial savings in space, capital, energy, labor, insurance, and environmental costs associated with the coating process. As a result, the footprint required to produce the same number of finished units can be significantly reduced, and this can greatly impact the design for new plants that will produce finished articles made from coil-coated metal.

Because coil coatings are applied to flat metal sheet, cured, and then formed into articles, the coatings require a variety of special properties not generally associated with coatings applied using other application methodologies:

- *Formability:* Outstanding flexibility, adhesion, and damage-resistance of the cured coatings are necessary to allow the metal substrate to be formed into a large variety of shapes that require the coating to maintain its integrity when subjected to tight bending and metal drawing operations.
- *Durability:* Even coil-coated applications intended for interior installations, such as home laundry equipment, must be highly resistant to physical damage, moisture, standing water, and the effects of detergents. Metal office furniture must be able to stand up to having objects scraped along the surface, body oils and lotions deposited by constant contact with hands, rough handling as furniture is moved from location-to-location, etc.
- *Weatherability:* Coil and extrusion coatings formulated for exterior exposure are virtually always warranted systems, and are expected to exhibit resistance to color change, loss of gloss, chalking, cracking, and delamination for extended periods of time, generally between 10 and 40 years, depending upon the type of resin and pigmentation that comprised the coating system.
- *Damage resistance:* The coatings must be able to withstand damage, such as scratching, marring, and cutting not only from the initial forming process, but also damage that might occur to the metal during shipping, installation, and the service life of the product.
- *Corrosion, chemical, and stain resistance*: These are priorities for many of the different service conditions to which coil coated metal might be subjected.

The advantages and the key properties listed above drive the types of chemistries that can be used in these markets. *Figure* 5 gives the breakdown of the chemistries used in the coil coatings market.

Siliconized polyesters and poly(vinylidene)difluoride (PVDF or PVF_2) coatings are almost exclusively used in exterior construction applications, as are a fair amount of durable polyesters. The backbone resin for PVDF coil coatings is normally 70% PVDF, with the remainder being solvent-borne acrylic. There may be some exceptions in extrusion coatings, where the PVDF level may be as low as 50%, but these products would by no means constitute the majority of gallons. PVDF coatings have excellent weathering characteristics and are typically used on exterior metal cladding for high-rise buildings as well as on roofing for a broad variety of commercial and residential applications. Their resistance to weather allows the coatings manufacturer to give 20- to 40-year warranties, and occasionally longer, right up to—and including—so-called "lifetime" warranties. As might be expected, fluoropolymers are significantly more expensive than nonfluorinated resins.

Siliconized polyesters typically provide improved weathering characteristics over a longer period of time when compared to exterior quality polyesters and thus they command a higher price. They are typically found on exterior construction panels, where they compete with PVDF coatings on the high end and weatherable polyester coatings on the low end.

Plastisol coatings, based on poly(vinyl)chloride, offer excellent forming and mar-resistance characteristics, and superior resistance to aggressive chemical environments. They are principally used in construction applications for chemical plants, smelting operations, and in agricultural applications for animal containment.

Waterborne coil coatings (there are no waterborne extrusion coatings) are a rapidly vanishing technology in coil, although there was a time in the past when they appeared to have a bright future, and usage was at a level that could actually be calculated. As of 2011, significantly less than 1% of all coil coatings are waterborne,

and it seems unlikely that this situation will reverse itself in the foreseeable future. U.S. coil coaters generally have oxidizing units in place that burn the volatile organic compounds (VOCs) generated during the coating process and return the heat to their curing ovens (thus reducing their natural gas requirements) or to heat their factories and offices, resulting in lower energy costs. Waterborne coatings require greater energy to drive off the water and cure than do solventborne coatings. As a result, energy costs are higher to run water-based products which, in any event, generally do not possess the overall balance of desirable properties exhibited by their solventborne counterparts. Water-based coatings also present a variety of operational difficulties, including extensive cleanup and changeover costs that are required to convert from applying waterborne to solventborne paint. Contamination between waterborne and solventborne coil coatings can wreak havoc by causing imperfections in the cured film and/or interfering with the curing of the respective systems.

Although much discussed over the past several years, there seems to be very limited interest in the use of energy-curing coil technology, whether ultraviolet (UV) or electron beam (EB). It seems unlikely that the coil coatings segment is going to move in this direction, unless the monomer and/or polymer suppliers are able to engineer materials more suitable for energy-curing coil coatings than are currently available for use. It is also the belief of many of the U.S. coil coaters that the actual energy costs to cure UV and/or EB coatings would be higher than current costs to cure them thermally.

In the "Other" category (shown in *Figure* 5) are the following chemistries:

- *Epoxies:* Used mainly as primers, where use is declining; also used for certain topcoats, such as those used on ballast boxes.
- *Acrylics:* Used primarily in transportation, and to a more limited extent in building applications.
- *Urethanes:* Used as primers—these are based on polyester resins reacted with blocked aliphatic isocyanates, and fall under the "polyester" category in *Figure* 5.

The only significant technology challenge facing the coil and extrusion coatings producers during the period from 2010–2015 is one that they have been working on for at least the past 20 years—the replacement of primers containing hexavalent chromate ion (virtually always from strontium chromate) with more benign corrosion-inhibitive species that give the same long-term protection to metal. While there is no federal legislation currently on the horizon to deal with this concern, it has been an issue in several countries in Europe for the past decade, and is likely to become more of one in both the Western Hemisphere and Asia Pacific as a result of coil and extrusion coatings suppliers desiring to rid their products of this extremely controversial material.

REGULATORY AND ENVIRONMENTAL INFLUENCES

From an environmental point of view, coil-coated metal has a number of significant advantages. Fabricators (OEMs) have no need for their own paint lines, thereby eliminating the need to comply with regulatory issues associated with emissions and the handling of chemical products. The coil coaters themselves generally have solvent destruction systems in place, which enables them to use organic paint solvents as a fuel supplement. Such capture-and-destroy systems typically operate at an efficiency level of ~96% or higher. For this reason, VOC and hazardous air pollutant (HAP) emissions are not currently an issue, although—since the solvents are burned to carbon dioxide and water—it is possible that CO_2 generation could someday become a concern. That day is not likely to occur within at least the coming 10 years, however, and probably longer.

KEY BUYING FACTORS

Producers of coil and (quite often) extrusion coatings are faced with two sets of customers, both of whose needs and interests must be addressed: the coaters who paint the metal and the OEMs who fabricate the final articles and bring them to market. (The latter are generally referred to as "fabricators.") The needs of these two sets of customers differ, and sometimes even conflict with each other, yet each has a degree of influence over the type—and supplier—of the coating that will be used, depending upon the relationship between the fabricator and the coater. In general, the fabricators are most concerned about performance attributes, which vary depending upon the specific market sub-segment, and the

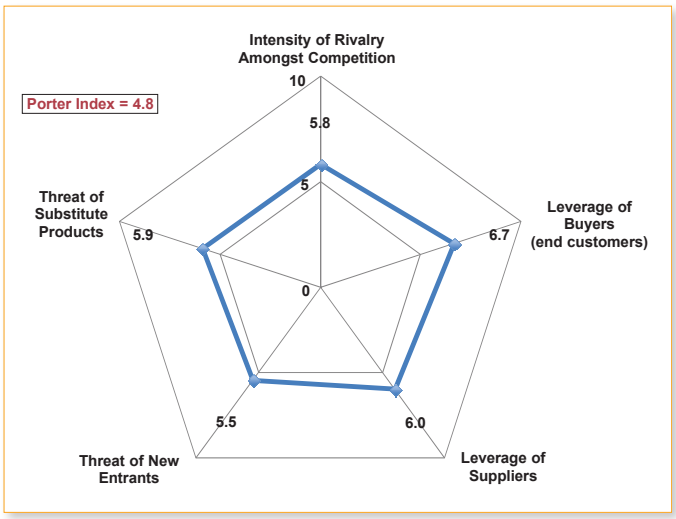


Figure 6—Industry Structure Five Force Analysis.

coaters are more concerned about attributes that relate to their ability to economically apply the coatings to the metal. In the majority of situations the fabricators will specify a coating to be used. In these cases, the coater is theoretically a toll manufacturer and has no influence over the type of coating used, but may still attempt to exert a degree of influence through pricing strategies to the fabricator for using coatings from different suppliers. In some cases, the fabricator may specify that the coating should be of a generic type with certain properties, at which time the coater may choose the product and supplier of the coating. This seems to be occurring less frequently with the passage of time, however, as fabricators exert more control over the type and producer of the coatings used on their products.

Typically, product performance—both short- and long-term—and appearance are of the greatest concern to the fabricators, and these properties will vary for each end-use. Durability, resistance to damage during construction, corrosion resistance, warranty coverage, and long-term weathering characteristics are of paramount importance in construction applications, where fluoropolymers and silicone polyesters will typically be used at the high end of the market, and exterior grade polyesters at the low end. Manufacturers of appliance finishes, however, are more concerned with appearance, stain resistance, and resistance to damage during shipping, and polyesters especially engineered for appliance needs are used. For transportation applications (almost exclusively the side panels of heavy-duty trucks), appearance is of significant concern, although corrosion control and durability are also real—but lesser—issues. Historically, acrylics were used for this purpose, but this market has been largely converted to polyesters, which are less brittle, and less easily damaged. Regardless of end use, however, it is vital that the coil of painted metal be able to undergo the fabrication process with little or no damage to the coating.

For the coater, the key buying factors are:

- Speed of cure (faster cure=faster line speeds=improved economics)
- Ease of application
- Availability of technical service
- Price, especially as it relates to known line speeds for any given product
- Delivery—Just-in-Time (JIT), inventory requirements for commonly run products

There are a fair number of coil coaters each competing for what is often the same business, so economic factors are more important than performance attributes to the coater. The coater needs to be sure that it can run a coating so that it conforms to the fabricators' specifications, but—once this has been established—the coil coater's greatest concern is speed of cure and ease of application, since a coating that can be quickly and easily applied allows the coater to run the lines at faster speeds, leading to greater efficiency, enhanced capacity utilization and increased profitability.

MARKET FORECAST

The U.S. coil and extrusion market segment will continue to appreciate in value, driven by raw material price increases. Since this segment is almost exclusively based on solventborne coatings, and unlikely to change, the price of oil will continue to exert a significant influence on the cost of solvents, monomers, resins, additives, and—to a lesser extent—organic pigments used in this segment. Also, the cost of energy will influence the cost of the inorganic chromatic pigments and fillers/gloss depressants that are the mainstay of this segment. Coil is also a very significant user of titanium dioxide—it is incorporated into virtually all products at some level, including primers and backers—and the ore shortages as well as the shortage of refining capacity for titanium dioxide will assure that the price for this pigment

will continue to increase. The industry is anticipating that selling prices for coil coatings could increase by as much as 35% during the period 2010–2015, although this seems unrealistically high.

The appliance market is expected to follow the general construction market, which is unlikely to fully recover before the 2014–2015 timeframe, when it could increase substantially as a result of pent-up demand. The on-going recovery of the automotive segment is unlikely to exercise a significant positive effect on the coil and extrusion segment, since the majority of these gallons are involved in the painting of side panels for the heavy-duty truck segment, which is heavily influenced by the general business climate, and can therefore be expected to follow GDP. Nonetheless, there are new applications for coil coatings that need to be taken into account, especially with regard to energy efficient "cool roofing." Work by the steel companies to modify the metallic coating layers (zinc galvanizing and zinc aluminum) used on steel with magnesium is looking very promising, and appears to allow them to cut back these layers by as much as 50%, while maintaining the same level of corrosion resistance. If this approach should yield fruit, the net effect would probably be to significantly reduce imports of painted galvanized steel into the U.S., because the magnesium-modified steel would be less expensive than the Asian imports. Based upon these various considerations, ChemQuest forecasts a 2.4% CAGR in volume and a 4.8% CAGR in value for the period 2010–2015.

INDUSTRY STRUCTURE (PORTER/'FIVE FORCE') ANALYSIS

Using our firm's special approach to Joseph Porter's famous industry analysis technique, Porter's Five Forces provides a framework for industry structure analysis and business strategy development, utilizing five factors that determine competitive intensity and, therefore, attractiveness of a market.

Used in this context, "attractiveness" refers to the overall market profitability and the likelihood that the market can sustain that level of profitability. A Porter Analysis is static—it is a "snapshot in time," and must be periodically revisited as overall market conditions, which are dynamic, change with time. The Five Forces are:

- Intensity of Rivalry Amongst Competition
- Leverage of Buyers
- Leverage of Suppliers
- Threat of New Entrants
- Threat of Substitute Products

ChemQuest uses a proprietary process for evaluating information relevant to these five forces to arrive at a Porter Index, with "0" indicating an average market, negative values indicating an undesirable market, and positive values indicating definite market attractiveness.

The more negative the Porter Index, the less attractive a market is; the more positive the Porter Index, the more attractive it is. The Porter Index for the Coil and Extrusion market segment can be seen *Figure* 6.

The Industry Structure Analysis, with a Porter Index of 4.8, indicates that the coil and extrusion market segment currently benefits from a low level of rivalry, is able to pass along raw material increases, has a choice of raw material suppliers, is unlikely to be targeted by new entrants in the U.S., and faces a low level of probability that its products will be substituted. CT

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U.S. Paint & Coatings Industry

MARKET | *Analysis*

2010 - 2015

This article is taken, in part, from the *U.S. Paint & Coatings Industry Market Analysis (2010–2015)*, sponsored by ACA. This leading market study, now available through an online subscription, profiles performance of the coatings industry's 21 market sectors over the past two years and projects sector performance for the five-year period following the most recent industry Census figures. The report features "real world" interviews from key industry experts, as well as chapters on industry mergers and acquisitions, regulatory issues, raw material trends, technology trends, and green/sustainability issues. It also includes an industry structure assessment of each market segment using the Porter "Five Forces" analysis. A valuable new feature that provides additional benefit with each purchase of the *Market Analysis* is a full day of on-site consulting by ChemQuest (travel expenses not included).

For additional information, contact Allen Irish, ACA, at airish@paint.org; www.paint.org/market.