



THE GLOBAL PAINT AND COATINGS INDUSTRY 2022

As uncertainty and volatility continue to beset the global paints and coatings industry, prudent strategy is king.
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Thus far in 2022, we have seen lockdowns in China; the Russian invasion of Ukraine; raging global inflation, coupled with concomitant efforts to counteract it; shifting attitudes regarding China's role as a "trading partner"; the significant strengthening of the U.S. dollar; cash flow issues from larger-than-normal orders placed on longer-than-normal lead times due to the unreliable global supply chain over the past 18-20 months; and many more issues causing no end of headaches for the global community, in general, and for the global paint and coatings industry, specifically.

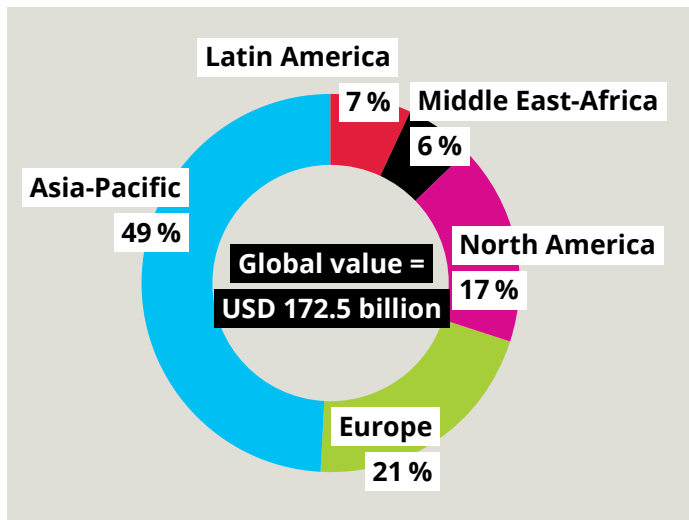
While it is true that the global paint and coatings industry recovered in 2021 from a dip in volume in 2020, and that volume growth appears to be tracking GDP, the growth in value of coatings products has increased dramatically. Every component of these products has been negatively affected by the high cost of crude oil; global supply chain issues; material shortages, allocations, and even a few lingering force majeure declarations that have celebrated their first birthdays; logistics problems; labour shortages; and decreasing capacity. While it is also true that the global refinery capacity for crude oil has been steadily increasing since 1970, this is merely a relative, rather than fully revealing, statistic. As of 2021, the total global refinery capacity for crude oil was some 101.2 million barrels per day. The refinery throughput worldwide, however, was only slightly over 79 million barrels of oil per day. In the U.S., which has the world's largest refining capacity, refinery closings due to either lack of demand

(in 2020) or damage done by the "Great Freeze" in the Permian Basin (February 2021), have caused a reduction in capacity of 5 % from 2020 to 2021 and an additional 1 % from 2021 to midyear 2022e.

There are no reasons to expect an increase in capacity anytime soon, although it is likely that 2023 will bring a level of improvement in capacity utilisation. Several closed petroleum refineries have been converted to renewable diesel production, with serious consideration for similar conversions in the future. This is excellent news for the long-term global good, but - in the short term - declining crude oil refinery capacity is not good news for the global chemicals industry. Many basic raw materials for all types of coatings are derived from crude oil. The headwinds of inflation and financial actions on GDP, however, have begun cooling down the hot demand. For these reasons, we should look for some easing of both supplies and prices of coatings raw materials as we move through 2022e into 2023f, but only moderate easing. Global structural issues will continue to mitigate against any scenarios in which "things return to normal," or even to a semblance of normal, whatever that may be. The value of durable goods manufacturing shipments is up 11 % in mid-2022e, and total manufacturing shipments value is up 14.8 %, but this dramatic increase in value is almost entirely the result of price increases, not volume of goods, which was only up 1.1 %, after adjusting for price.

The high prices, allocations, material shortages, force majeure, labor shortages, and transportation problems that have led to the current coatings industry headaches are not going away anytime soon—the "Global Falling Domino Effect" that was initiated in early 2020 is still with us, and the dominoes are going to keep falling - it's just a matter of how

Figure 1: Global coatings market 2021, value by region



many, and for how long. The worst, however, is likely behind us, and for that we should be grateful.

GLOBAL ECONOMIC OVERVIEW

So, what should the industry expect during 2022? At the outset, it is important to understand that the global coatings industry still remains a mature and stable component of the world economy, and coatings demand still tends to follow overall economic activity. Thus, a correlation exists between Gross Domestic Product (GDP) per capita and coatings consumption per capita, so as the economic conditions in second- and third-world nations improve, their demand for paint and coatings will increase. Coatings demand also continues to exhibit notable dependence upon industrial production and construction spending, and the mid-to-long-term outlook is positive for both, barring a major intervening economic event, such as another global Great Recession.

Since coatings trends tend to follow GDP, it is first important to consider total GDP, then focus on segments where coatings fit into the overall GDP and to what degree they influence it.

Historically, China's industrial output and trade policies were important drivers of global growth, with GDP growth rates around 8%-10%. While still a major driver, China's economy has cooled significantly due to a variety of factors, including the COVID-induced lockdowns, which took a toll on the production of basic chemicals used in coatings.

Although GDP provides an important macro view of business trends, only 20-40% of GDP - depending on the country - fits into the CIA Factbook's definition of "Industrial GDP":

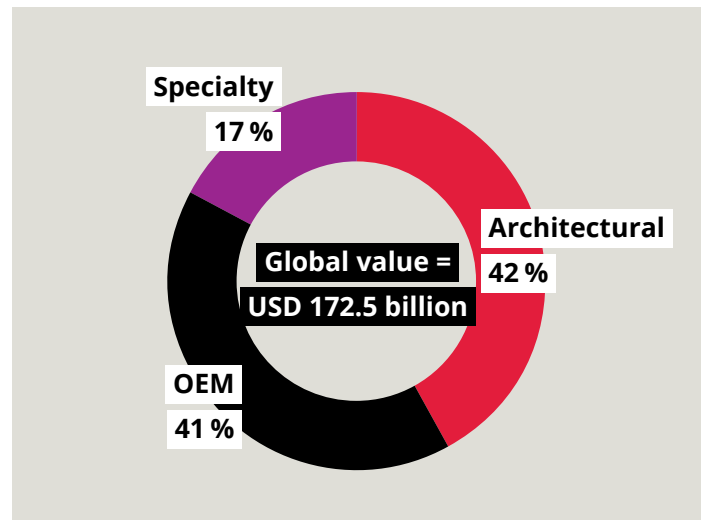
- > Mining
- > Manufacturing
- > Energy production
- > Construction

The largest component of GDP in all countries is "Services," covering government activities, communication, transportation, finance, and other economic activities that do not produce material goods. "Agriculture," a much smaller category than the other two, covers farming, fishing, and forestry. Since coatings fall primarily into the manufacturing and construction segments, the overall GDP values that are on the news (i.e., services + industrial + agriculture), are insufficient to present the most accurate picture of the coatings industry.

Considering the Industrial GDP segment, it is sensible to look at the size of Industrial GDP for the world's leading economies.

The U.S. and the EU have nearly the same value of Industrial GDP (USD 4.4 trillion in each), and each is about half the value of the Asia-Pacific re-

Figure 2: Global coatings market 2021, value by market



gion's Industrial GDP (USD 9.2 trillion), 62% of which is China alone. Latin America and Middle East-Africa, combined, represent another USD 1.1 trillion. Relative to other countries, the U.S. has the smallest Industrial GDP component (19.1%), especially when contrasted to China with the largest (40.5%).

Although the correlation of total GDP to each country's coatings industry is acceptable (Pearson r = 0.86), the correlation between Industrial GDP and coatings value is excellent (Pearson r = 0.97).

While it doesn't tell the entire story, total GDP is a good measure of the overall wealth of a nation. The large GDP-per-capita countries are populated with citizens with greater purchasing power, most of whom purchase coatings or have coatings purchased on their behalf.

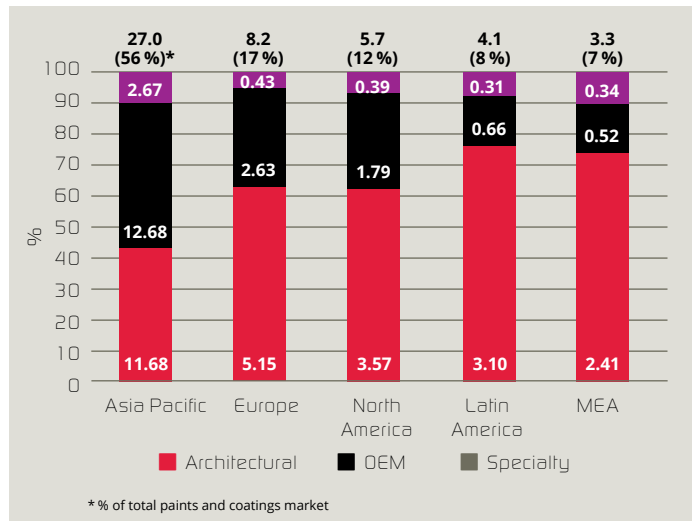
INFLUENCE OF THE CORONA VIRUS

The global pandemic, and resulting "lockdowns" intended to contain the spread of the virus, led to a sudden decrease of economic activity - especially as it pertains to the coatings industry, in industrial activity - toward the end of Q1 2020 and continued essentially unabated through Q1 2022. Because the negative economic effects occurred so rapidly, albeit at differing times regionally, many coatings companies find it difficult to prognosticate to their investors about the remainder of 2022 and 2023. The unemployment picture is not necessarily a helpful indicator, either. However, no sooner was 2021 ushered in than the high unemployment numbers began to drop, and within less than a year, "hiring" signs were appearing outside of businesses worldwide (Furloughs in Europe are not included in the official unemployment numbers).

In the U.S., unemployment skyrocketed and then plummeted within a matter of only 18 months. This "yo-yo" effect caused endless problems and frustration globally. Further, the "Great Resignation" and "Great (early) Baby Boomer Retirement" have constrained the labor supply, according to an analysis by The Federal Reserve Bank of St. Louis. The effects are still being felt in 2022 and will continue well into 2023.

The EU and China's numbers were not nearly as devastating as those in the U.S. in 2020, yet unemployed individuals are less likely to contribute to the economic recovery by limiting their spending to essentials. It is important to consider that China unemployment numbers are likely understated, excluding rural communities and the majority of the 290 million migrant workers who comprise unskilled labour in trades, construction, manufacturing, and other low-paying but vital activities. Once these are incorporated, there could easily have been 80 million people (17-19%) unemployed in China by end of Q2 2020, a situation that might easily have been mirrored in Western countries.

Figure 3: Global coatings market, by volume (liters, billions).



While unemployment appears only moderately affected by Covid in the EU, consumer spending certainly has been affected. Spending has still not returned to pre-pandemic levels. Spending in the U.S., however, continues to grow steadily, excepting the “pandemic dip.” Taking the above into consideration, along with a careful review of quarterly earnings reports published by coatings companies through Q2 2022, and recognizing that the geopolitical situation in Russia and Ukraine continues to create uncertainty, a forward-looking picture for the coatings industry emerges - but it is more French Impressionism than Dutch Realism.

GLOBAL PAINT AND COATINGS MARKET

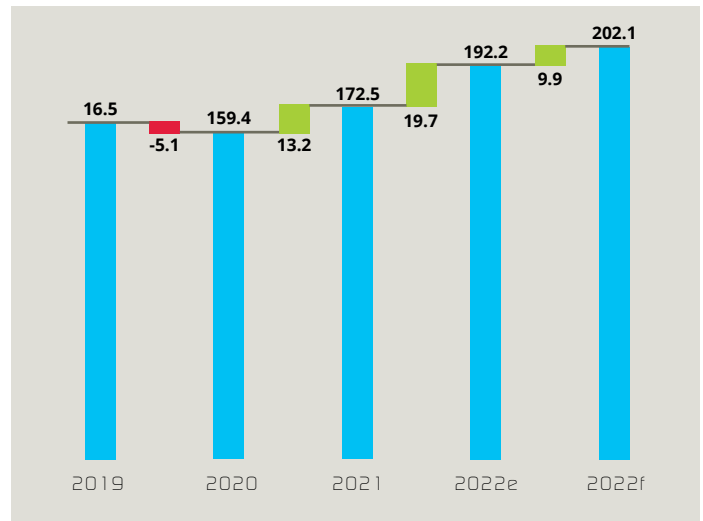
Europe and North America (U.S. and Canada; Mexico falls into Latin America) show segment splits that are similar, both by value and volume. Latin America (LATAM) and Middle East and Africa (MEA) are similar to North America and Europe vis-à-vis value, although architectural coatings clearly dominates LATAM and MEA on volume compared to the other regions. Asia-Pacific represents 48 % of the value and 56 % of the volume of the global coatings market, with China representing ~60 % of the Asia-Pacific segment. The architectural segment in Asia-Pacific is notably smaller than other regions, while the OEM segment is significantly larger. Mentioned earlier, total GDP is an important value, especially when considering population. Figure 5 considers per-capita GDP and per-capita coating consumption for 2021, to factor in both countries’ economies and their populations.

The importance of Figure 5 to the coatings industry should not be underestimated. With an R2 value 0.99, it is a critical tool for long-term prediction of both growth rates and absolute value of the global coatings industry.

Although GDP in Asia-Pacific is large - about one-third of global GDP— it represents approximately half the world’s population, resulting in low per-capita GDP. As this region’s economy develops, expect its per-capita consumption of coatings to move up the curve.

At the end of 2019, the outlook for a bright future in the coatings market was positive. The coatings industry had been growing somewhat greater than GDP for many years, and- although the rate of growth in China was slowing - there was good reason to believe the coatings industry would maintain its greater-than-GDP growth rates. Then COVID struck, and the outlook for 2020 and 2021 changed considerably. The following Figure 4 describes the coatings markets globally. The first bar in the waterfall graph represents 2019, followed by the decline in the first half of 2020,

Figure 4: Global coatings market value, all segments, 2019-2023f (USD, billions).



and the partial recovery in the second half of 2020 - leading to the 2021 results, an estimate for 2022, and finally a 2023 forecast.

From a global perspective, we can see that indicators are on the upswing, although it is important to keep in mind that values are still significantly outpacing volumes, principally due to supply chain issues and rising inflation.

COMPETITIVE LANDSCAPE

It is no surprise that the coatings industry is dominated by large, multi-national producers. The industry has become increasingly consolidated over the past two decades, with the top ten suppliers in 2021 representing 44 % of the total market - up from 42.0 % in 2019 and 43.5 % in 2020. Taking this further, the top three global players account for 63.0 % of the top ten firms’ sales in 2020, which is up from 62.4 % in 2019, but not quite back to the 63.4 % share posted in 2019 (Figure 6).

The “all others” category consists of thousands of regionalized/localized companies and/or producers offering a small set of value-added, niche products. The level of diversity represented by the “all others” category is ample evidence that the industry can support the wide-ranging needs of both consumers and industries relying on its products that range from purely decorative to highly functional.

ARCHITECTURAL (DECORATIVE) PAINTS

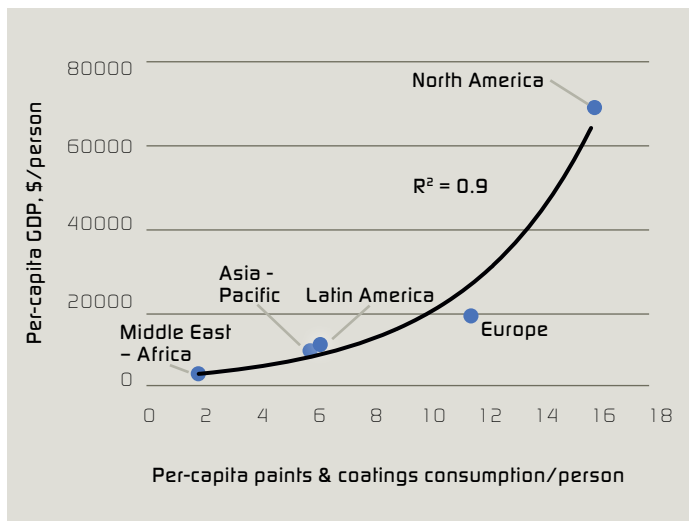
Architectural paints are used to decorate and provide light-duty protection to residential and commercial structures. They are applied by both professional painters (“PRO”) and by consumers willing to tackle a project themselves (“DIY”). This segment is comprised of paints and primers, stains, varnishes, clears, and lacquers, with an array of gloss levels for both interior and exterior surfaces of residential, commercial, institutional, and industrial buildings.

Architectural coatings sales are highly correlated with the health of the housing/construction market. The architectural paints segment currently accounts for 54 % of the volume, and 42 % of the value, within the global coatings industry (Figure 3).

Because of myriad factors - not the least of which were the severe supply chain issues and raw material price increases - architectural coatings grew 5.7 % in value in 2021, compared to 2020, but volume only increased by 1.7 %. We anticipate increases in volume and value of 1.1 % and 11.1 %, respectively, in 2022e.

The regional shares of the architectural coatings market are illustrated in Figure 7. Asia-Pacific has the largest share of the total paint and coatings

Figure 5: 2021 Per-capita GDP vs. per-capita coatings consumption (USD/person).



market (49%, up from 47% in 2020), but just 34% of the architectural market, which represents no change from 2020.

Figure 5 shows per-capita coatings consumption as a function of per-capita GDP, with a strong relationship between them. In more economically developed regions, consumption of coatings increases as GDP per person increases - a correlation clearly observed in the architectural segment. Thus, while it is true that a USD 24.6 billion Architectural market

within Asia-Pacific is quite large, at least relative to the other regions, there remain significant growth opportunities in APAC as increasing numbers of upwardly mobile people enter the “middle class,” precipitating a demographic shift. North America and Europe, however, are likely to be at a saturation point, and growth in these two regions will be driven by GDP and population growth, rather than any foreseeable demographic shifts. Construction is a significant driver for the use of architectural coatings and construction spending in both the U.S. and the EU have increased since January 2015.

The architectural coatings category represents 42% of the total value of the 2021 coatings industry (down from 43% in 2020) and is tied to both consumer spending - which is affected by unemployment - and also by construction spending, which generally dips during an economic downturn. Partially occluding the data, however, was the significant increase in value resulting from increases in raw material costs caused by shortages, increased energy and shipping costs, increasing crude oil prices, the expense of raw material substitutions, and many other factors.

Consequently, 2022 saw “more of same.” Some challenges are beginning to abate as more raw materials come off of force majeure, allocations are dropped/become more generous, price increases are becoming less frequent, some raw materials are even exhibiting modest price decline, and the price of crude oil seems to be stabilising around the \$100/barrel level. However, these issues will continue in 2023, albeit to a lesser extent, at least through Q1 and very likely through Q2. Our value prediction for architectural coatings in 2023 is based on significant price increases coupled with very modest volume growth.

There has historically been a tug-of-war within the three global regions of the architectural coatings segment, in which DIYers and PROs vie for the number of architectural gallons sold. The U.S. has a sizable DIY market,

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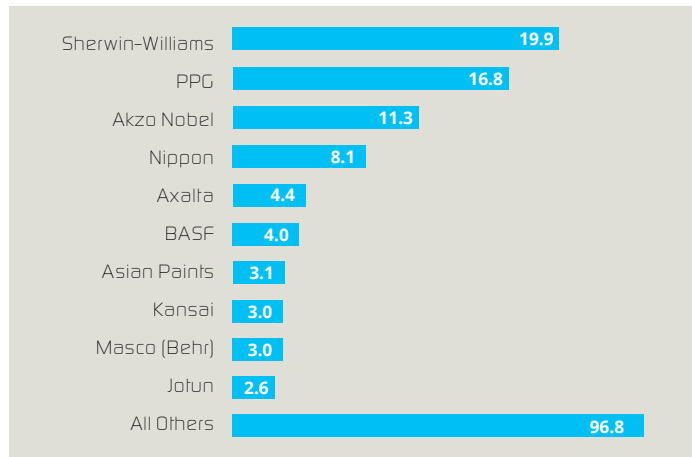
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Figure 6: Top ten global coatings producers, by value (USD, billions, 2021).



which is smaller in Europe and considerably smaller in Asia-Pacific. Using the U.S. as a rough proxy for other global DIY constituencies. The percentage of PRO-applied paint had continued to increase, unabated, since 2009, reaching a relationship of 63–64 % PRO to 36–37 % DIY in 2019, the highest ratio since 2006.

Going into 2020, we expected this relationship to stabilise, but the Covid effect caused the PRO share in the U.S. to nosedive from 64 % to 58 % in 2020, as homebound consumers decided to purchase and apply paint themselves. Following the flurry of homeowner painting in 2020, the ratio of DIY:PRO ended up at 40 %:60 % for 2021.

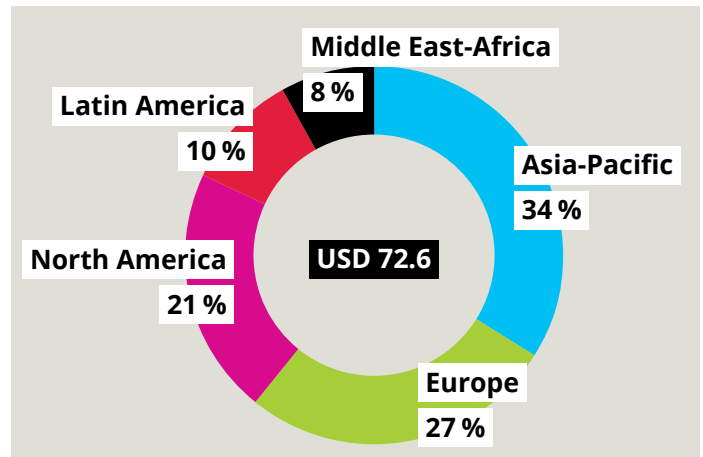
As Covid waned (or at least its mortality declined, due to vaccines), DIY activity decreased and PRO activity increased, beginning mid-May 2022. The rate of increase for PRO activity, however, will depend on when the Covid effects are fully mitigated, when businesses commit to having workers report to site or continue to allow certain work to be performed from home, to what degree the behavior of homeowners has become permanently altered, and how long the post-pandemic economic upturn lasts. As of early July, it seems reasonable to anticipate that the DIY:PRO ratio for 2022 will end the year around 38 %:62 %, and PRO will continue trending up to 62–63 % during 2022–2023.

INDUSTRIAL OEM COATINGS

Comprised of seven sub-segments, the industrial OEM coatings segment includes coatings used in factory-applied settings.

- > Automotive OEM are those coatings applied at assembly plants on the paint lines, as well as coatings used by parts suppliers to the automotive industry (the so-called “Tier II” and “Tier III” suppliers), including metals and plastics. This category covers light-vehicle production, i.e., plastic and metal substrates for interior, exterior, and underbody applications for new cars, light trucks, vans, and sport utility vehicles.
- > Powder coatings represents a technology, not a market sub-segment, but historically has been given its own category because of the unique nature of this coatings chemistry. These coatings are used in a variety of applications, both on articles that are similar to those discussed in the General industrial category, as well as many that are included in the other industrial OEM categories. These coatings are used primarily on metal substrates, since the technology requires a baking cycle to sinter the particles and to promote crosslinking. There is no duplication in these numbers; for example, ACE equipment that is powder-coated is listed under “Powder-whereas similar equipment that is coated with liquid paint is listed under “General industrial.”
- > Other transportation refers to medium- and heavy-duty trucks; recreational vehicles; truck trailers; buses; aerospace; rail rolling stock;

Figure 7: Global architectural coatings, value by segment, 2021 (USD, billions).



and other transportation equipment, i.e., not light-vehicle production captured under Automotive OEM. Aerospace production is centered in North America and Europe. Rail rolling Stock production historically has been greatest in Europe, but China has accelerated its domestic manufacturing and is now the largest exporter.

- > Coil coatings is an application technique, not a market sub-segment, but the majority of these coatings are used as coil-coated panels in the prepainted metal construction products industry. Since they are often installed together with coil coated panels on a building, liquid spray coatings for aluminum extrusions are included in this segment.
- > Packaging coatings are materials used for both metal and non-metal (e.g., flexible) packaging. These coatings protect and/or add decorative or functional properties to packaging materials, labels, and commercial print - including paper, paperboard, corrugated cardboard, film, and foil substrates - and metal (rigid) containers and closures. Non-metal applications include gravure, flexographic, or inkjet printing methods by flexible packaging printers/converters, commercial and narrow web printers/converters, consumer products companies, and specialty substrate manufacturers, e.g., folding cartons, boxes, magazines, book covers, brochures, catalogs, labels, blister packs, and flexible foil products, etc. This segment is considered recession-resistant, especially in the era of on-line shopping, where every item ordered must be packaged.
- > Wood coatings, as a part of Industrial OEM, are factory-applied finishes in an OEM setting or applied by an independent job shop/fabricator, producing furniture, cabinetry, fixtures, and flat-stock applications, which is made either of solid wood or composition board and refers to pre-finished products ready for installation or assembly, such as flooring; kitchen and bath cabinets; electronic home entertainment cabinets; interior paneling; exterior siding; trim board; moldings; shelving; and case goods.
- > General industrial, the largest slice of the global Industrial OEM pie, is a catch-all term used to indicate the myriad factory-applied coatings that do not fit into the other six major OEM markets. Categories include ACE (agricultural, construction, and earthmoving equipment); appliances; electrical and HVAC equipment; sporting goods; industrial machinery; non-wood furniture; computer and related electronics equipment (IT); shelving; racks; lockers; blinds and shades; lighting fixtures; burial caskets; musical instruments; signage; dumpsters; fasteners; gaskets; and packing and sealing devices. There are many suppliers of such coatings (China claims to have 10,000+ suppliers), and companies of all sizes participate in this market. The global distribution of this broad and diverse market space is shown in Figure 8.

Because industrial OEM is a function of industrial production, both manufacturing output and automotive builds are major drivers for this segment, which was seriously harmed by the Covid-related lockdowns. China's light-vehicle production bottomed-out in February 2020, followed by the same trend in Europe and the U.S., where production was essentially non-existent in April. By June, however, things began to improve, but production has not returned to pre-COVID levels in any of these regions, and it is unlikely to do so until the global shortage of microchips has been addressed and either a recession occurs and ends or the fears of a recession come to an end.

The manufacturing sector of any economy plays another crucial role vis-à-vis coatings sales. Manufacturing is a broad category, including:

- > Apparel production
- > Packaging
- > Chemicals
- > Electronics
- > Fabricated metal
- > Food production
- > Machinery
- > Transportation equipment
- > Many others

Each of the above areas include items that are coated for various functions, such as chemical resistance, corrosion protection, aesthetics, scratch/damage resistance; conductivity; et al. There was a sudden decline in manufacturing production in all regions (China earliest; U.S. and EU a few months later), and evidence of recovery. It is easy to see the impacts of the "Deep Freeze" in the Permian Basin in February 2021 and of China's Covid-related shutdowns well into 2022.

Recovery continues globally, but it is a mixed blessing; volume growth is minimal relative to inflation-driven value growth.

SPECIAL PURPOSE COATINGS

Automotive refinish coatings, marine coatings, and industrial maintenance/protective coatings are the major sub-segments in the special purpose coatings category. As a result, this segment tends to track with industrial construction, infrastructure refurbishment, crude oil prices, and shipping (industrial maintenance/protective and marine coatings), as well as with accident rates, automotive sales, size of the car parc (total number of registered vehicles in use at any given time), and total miles driven (automotive refinish coatings).

Special Purpose coatings represent the smallest segment of the coatings industry, representing field-applied coatings (versus factory-applied coatings in the Industrial OEM category). *Figure 9* shows the global value of the three sub-segments of special purpose coatings.

The following briefly describes the sub-segments within special purpose coatings:

- > Automotive refinish is typically applied in body shops/repair facilities onto plastic and metal substrates for exterior surfaces of cars, vans, SUVs, light trucks, and commercial vehicles undergoing repair, refurbishment, or customisation. This category includes aftermarket paints used on heavy-duty trucks, buses, and other body types. A significant economic driver is vehicle accidents, in which approximately 3,700 people are killed each day, globally.
- > Marine coatings applies to salt and freshwater vessel types, including passenger ships, freighters, tankers, container ships, recreational boats, yachts, platform vessels (PSVs), offshore supply vessels

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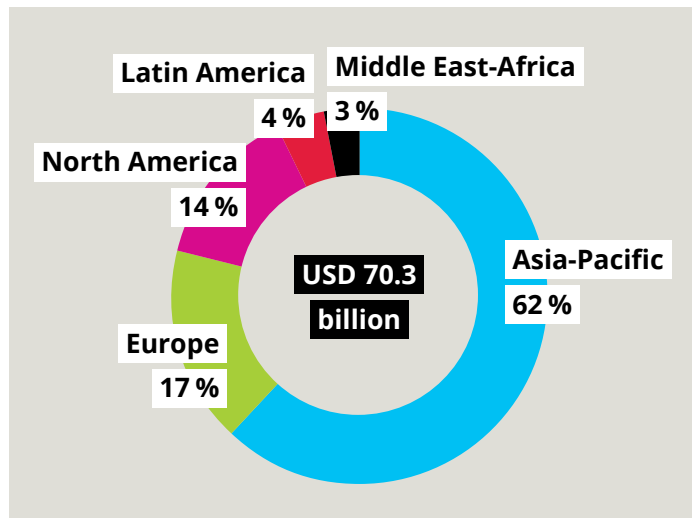

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Figure 8: Global industrial OEM market, value by region, 2021 (USD, billions).



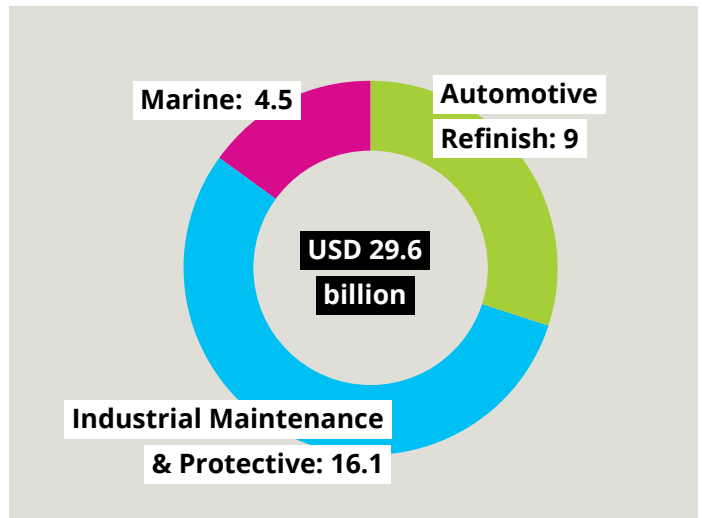
(OSVs), fishing boats and ferries, as well as inland waterway ships, barges, and tugboats. These coatings provide multiple functions: protect substrates, reduce drag, decrease energy costs, provide aesthetics, and/or facilitate asset performance, depending on the vessel.

- > Protective coatings is a large and broad category that includes sub-segments such as:
- > Upstream and downstream oil and gas production and delivery
- > Infrastructure (bridges, water tanks, et al.)
- > Processing and manufacturing, especially coatings for concrete floors, equipment and holding tanks, containment areas, et al.
- > Commercial architecture
- > Water and wastewater treatment
- > Power generation
- > High-temperature fireproofing

Coatings in the protective coatings segment provide long-term protection and aesthetics to substrates in many different industrial environments, formulated to prevent corrosion; abrasion; thermal, chemical, and UV degradation; sound dampening; and fire retardancy, among other characteristics. Although these coatings serve an important functional role in asset protection, they may also be formulated to maintain appearance (gloss, color retention, cleanliness, etc.) of a structure. Protective Coatings are field-applied during construction or during maintenance/repair operations (MRO) by professional (often certified) applicator. The coatings are used both on interior and exterior assets, often in aggressive corrosive or chemical environments, high-heat environments, or commercial applications requiring long-term protection. This segment of the coatings market is closely tied to oil and gas activities and commercial/industrial construction. The business environment associated with this activity is often tied to short-term interest rates, government subsidies, and large, government-funded infrastructure projects, especially roads and bridges.

Protective coatings represent the largest sub-segment of the Special Purpose Coatings market, accounting for 55% of its total value. It is generally most realistic to characterize activity in this sub-segment by employing the use of proxy values, such as oil production/consumption; numbers of oil rigs; and cement production. These proxies work well to characterize the large projects associated with sewerage systems, water tanks, roads, bridges, dams, airports, railway structures, and pipelines. Many of these projects involve the energy sector (pipelines, off-shore oil platforms, land-based drilling operations, chemical processing facilities, etc.), and were affected with significant downturns in two important submarket segment

Figure 9: Special purpose coatings market, value by sub-segment, 2021 (USD, billions).



indicators due to Covid. The rapid decline in oil rig count (both off-shore and land-based), along with the sudden drop in crude oil demand, indicates that the market for gasoline and jet fuels was clearly affected by Covid-induced lockdowns. Oil rig maintenance requires the use of protective coatings, so a decline in oil rig count signals, at least nominally, a decline in the use of Protective Coatings in this sub-segment.

The demand for cement, key component of concrete, is an indicator that also impacts the need for protective coatings. Since China produces about 2 billion metric tons of cement (roughly half of the world's production), its cement production functions as a proxy for cement demand and the subsequent influence on the demand for protective coatings. This segment showed yet another dramatic drop in demand, similar to oil consumption, but - in this case - followed by a quick recovery and another drop in 2021.

The drop in oil demand between Q2 2020 and Q2 2021, was largely caused by Covid travel restrictions. Fewer miles driven results in less automobile traffic congestion, which leads to fewer accidents and a decline in the need to repair light vehicles. This leads to a proportionate decline in demand for Automotive Refinish Coatings.

Shipping activity is an indicator of shipping vessel maintenance in the Marine Coatings sub-segment, and it exhibited a dip at the Port of Los Angeles in March 2020, followed by a choppy recovery. Accordingly, Marine Coatings dipped in 2020, followed by slow and steady growth in value, but little-to-no anticipated volume growth in 2023.

The modernisation that is taking place in China, India, and Southeast Asia explains the very significant 51.6% share by value (up from 49% in 2019) and 64.0% share, by volume, of the global special purpose coatings segment that is concentrated in Asia-Pacific.

SUMMING UP

Most of the dominoes set in motion in early 2020 have fallen, but there are probably a few yet to come. As of August, there are few coatings producers able to fill all their current orders, due to a confluence of high demand, restricted supply, rising inflation, labor shortages, and cash flow issues. There are still global logistics issues; difficulties in obtaining all raw materials necessary to make any given batch of paint; lost R&D time due to raw material substitutions needed on short notice; long lead times; and inventory imbalances. The supply chain issues initiated by COVID are slowly abating, but we aren't out of the woods yet.

In 2021, as the world was clawing itself back to work, decades of creating complex supply chains suddenly — and dramatically — demonstrated

the downside of complexity. Critical imports were not reaching global ports, and when they did, there was insufficient intermodal capacity to move those materials from ports to inland manufacturing facilities. Demand quickly outpaced supply, causing shipping prices to rise, which forced raw material prices to increase rapidly. Coatings manufacturers were forced to raise their prices. This condition is still upon us. Then Russia invaded Ukraine, and when that happened, the oil market became seriously unstable (not that it is ever truly stable), prices rose, and supplies were once again constrained. Thus, world GDP is expected to drop, and many expect a recession right around the corner. Most developed countries, having poured trillions of dollars into their economies during the pandemic to minimize the economic pain of their people, now need to raise interest rates to control inflation.

The supply chain constraints that have been experienced over the past 18 months were exposed by the global pandemic but were not caused by it. We have been living dangerously close to the edge for many years without acknowledging it, and there are still dominoes poised to fall that will prolong the industry's difficulties - orders for larger-than-usual amounts placed for longer-than-usual lead times to address the supply chain challenges are being canceled in response to both current and anticipated cash flow issues. In response, suppliers are cutting back production to avoid their own cash flow issues. And so the global supply chain issues continue.

Ultimately, we will look back on this period and recognize that the "Covid Era" exposed that global supply chains lack fundamental resilience, forcing individual governments and businesses within the manufacturing sector to bring greater resilience to the overall process. If we have learned nothing else from the past two years, it should be the value of having a robust, proactive, agile business strategy. Make no mistake - we cannot just talk about creating a strategy; we must create one for every business in the coatings market supply chain. Yes, of course, the target is moving, just like when the various "bubbles" broke (housing, tech), or when the various recessions hit in the 1970s, 1980s, 1990s, and The Great Recession of 2008-2009. But a concise, carefully considered, and clearly articulated strategy for the future will enable raw material suppliers and coatings producers to weather what next comes our way. Ultimately, having a strategy—and implementing that strategy - is of paramount importance, because it will separate the winners from the losers. It is that simple. Whether coatings producers create their strategies and new products "in-house" or work with outside partners - strategic business advisers, technology consultants, independent laboratories, universities, or all four - should be seriously and carefully considered, because we live and work

in a changing world where in-house assets are increasingly challenged and easily overwhelmed, and external experts are able to bring extensive knowledge of multiple fields in specialty chemicals to drive advancement and cross-fertilization of technology at both raw material suppliers and coatings producers.

BOTTOM LINE

We must create tactical solutions for whatever problems that land daily on our plate, because we each need to address current events and deliver the financial performance demanded by our investors, so that we remain viable in the short term. We absolutely must, however, be using our recent history to guide the creation of a strategy that will move us "back from the edge" so that future surprise events won't have such a debilitating effect on our individual companies, as well as on the global economy. This is the only path forward that will enable our businesses to remain viable in the long term.

REFERENCES

- [1] N. Sönnichsen, Jul 20, 2022 www.statista.com/statistics/273579/countries-with-the-largest-oil-refinery-capacity/
- [2] www.cisa.gov/sites/default/files/publications/Chemical-Sector-Profile_Final%20508.pdf
- [3] American Coatings Association, Industry Pulse: Industrial Coatings, 2022 Q2, 5 July, 2022.
- [4] www.cdc.gov/injury/features/global-road-safety/index.html



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