The American Coatings Association (ACA) is a voluntary, nonprofit trade association working to advance the needs of the U.S. paint and coatings industry and the professionals who work in it. ACA represents some 250 paint and coatings manufacturers and distributors, and raw materials suppliers, as well as the technical professionals who work within the industry. ACA serves as an advocate and ally for members on legislative, regulatory and judicial issues, and provides forums for the advancement and promotion of the industry through educational and professional programs and services. The association promotes policies to enable its members to bring innovative, effective and safe products to market, so that they may protect and preserve the surfaces to which they are applied. As such, Sustainability is a focus for ACA’s various committees and initiatives.

Industry products are entrenched in our world — almost every human-made product has a coating that is necessary to protect it and maintain its value. ACA members manufacture architectural, industrial — factory-applied — and speciality purpose coatings, including automotive refinish, traffic marking and marine coatings.
Message From ACA’s President

This 2017 Sustainability Report highlights the paint and coatings industry’s Sustainability story.

We are proud of industry’s ongoing efforts to advance technologies in coating science, while minimizing impacts on human health and the environment. Our industry has taken numerous steps to reduce waste, water use and air emissions, and to promote product and environmental stewardship. From sourcing renewable raw materials, to improving products and processes through advanced manufacturing, just-in-time distribution and the use of supply chain management systems, the industry’s commitment to efficiency and Sustainability is evident.

Innovation in industry research and development (R&D) and the continued trend toward water-based coatings, powder coatings, high-solid ultraviolet (UV) cure coatings and lower-emitting coating products, among many others, have contributed to significant reductions in hazardous air pollutants (HAPs) and volatile organic compound (VOC) emissions from production.

Coatings make products more sustainable through enhanced durability and increased performance properties. Coatings protect the surfaces we depend on every day. Coatings preserve materials, so they last longer. Coatings enhance and beautify our world.

This report shares examples of the critical role coatings play in Sustainability, showcases some of our members’ Sustainability efforts, underscores industry’s environmental strides, and spotlights our own PaintCare® paint product stewardship program. I hope you will find the report useful and informative. Additional information on Sustainability in our industry is available on the ACA website at www.paint.org.

Andrew Doyle
President, American Coatings Association
COMMITMENT FROM INDUSTRY LEADERSHIP

Over the past several years, the ACA Sustainability Committee has worked actively on projects that improve green chemistry, green buildings and life-cycle assessment across the various product markets that industry serves. The committee is also proactively addressing emerging Sustainability issues affecting the paint and coatings markets. Sustainability is a core priority for ACA. We are fortunate to work with committee members who are passionate about developing guiding Sustainability principles for the coatings industry that address challenges and opportunities, both domestically and globally. The industry’s underlying commitment is to continuously improve its products in a manner that successfully balances performance, costs, and Sustainability impacts. The industry has made great strides over many years and will continue on this journey.
ACA’S COMMITMENT TO SUSTAINABILITY

ACA’s Sustainability commitment is highlighted in efforts to advocate for the coatings industry, and to undertake programs and services that demonstrate the sustainable value industry’s products add to the world. As part of that commitment, ACA prioritizes the following:

- Human health for industry workers, customers, and consumers;
- Reducing the environmental impact of industry products and operations;
- Corporate responsibility and social wellbeing for industry and the communities in which it operates;
- Sustainability-related benefits to our customers;
- Economic prosperity and the advancement of science and technology.

ACA evaluated the industry’s key Sustainability areas and opportunities related to these priorities by surveying several member companies to identify the critical issues for the association and the industry. In coordination with member companies, ACA implemented programs and initiatives to address these issues and fulfill its commitment to Sustainability, which are detailed in this report.

Collaborating to Advance Sustainable Coatings

ACA has established relationships with other organizations seeking to advance Sustainability globally. ACA collaborates with the U.S Green Building Council to provide insight on technical issues within the Leadership in Energy and Environmental Design (LEED) rating system. The association also works within the building-code space with organizations like the American Society of Heating, Refrigerant and Air-Conditioning Engineers (ASHRAE) and the International Code Council (ICC) to provide technical comments on the building codes and their potential impact on the paint and coatings industry.

ACA also collaborates with major paint and coatings trade associations around the globe as a member of the International Paint and Printing Ink Council (IPPIC). IPPIC issued policy papers on Sustainability and developed guidelines for national and regional associations to consider when implementing their Sustainability programs, to provide a useful organizational framework and ensure harmonization across the globe. IPPIC organized its ongoing industry stewardship and issue management to align with established Sustainability principles and life-cycle thinking, and to advise and direct the global effort towards sustainable development.
Sustainability is a concept that requires holistic thinking, outlined in three pillars: environmental protection, social Sustainability, and economic Sustainability. These pillars were developed and brought to the forefront during the 2005 World Summit of Social Development. This report will highlight initiatives that the association and industry have undertaken to contribute to the three pillars individually and the concept of Sustainability holistically.

While paint and coatings are commonly known for providing aesthetic appeal, adding color and beauty to the materials they coat, they also have the unique power to extend the useful life of products used every day. Below are examples of essential infrastructure.

- Interiors and exterior architectural materials
- Bridges
- Commercial Buildings
- Automotive Surfaces
- Farm Implements
- Food Packaging
- Insulation
- Waterproof Fabric
- Traffic Paint
- Beverage Cans
The intended use of many of these products is dependent on the proper functionality of the coating. Just a thin coating or layer of paint — no more than a few thousandths of an inch, or thinner than a human hair — can:

- Fend off corrosion and abrasion;
- Withstand high or low temperatures, chemical attacks and ultraviolet rays;
- Protect against moisture and microbes;
- Endure a host of aggressive or destructive conditions that threaten the objects and surfaces that make up our homes, workplaces, vehicles and structures.

For example, paints and coatings protect cars so they can last longer and water lines so they can bring us clean water.

Coatings provide value by enhancing the ability of commercial buildings and homes to regulate temperature, leading to a reduction in energy usage. For example, cool roof coatings can be a cost-effective way to improve energy efficiency in existing buildings. Roofs with cool roof coatings can save 10 to 70 percent on energy, compared to traditional roofing materials, and reduce the heat island effect.²

Coatings are also essential for renewable energy generation. Anti-reflective coatings applied to solar panels increase the amount of light passing through the panels, ultimately generating more solar power. Protective coatings designed for wind turbine blades promote fast drying and provide UV and weathering resistance, keeping blades rotating in challenging conditions from ridgelines to offshore sites. Electrical insulation coatings help disperse heat in electric motors and transformers, which can enable them to increase their efficiency by operating at higher temperatures.

Safely Managing Leftover Paint through PaintCare

Responsible paint management throughout the product lifecycle is a priority for ACA and its members. For end-of-life architectural paint management, ACA created the nonprofit program, PaintCare, that facilitates the reduction, recovery, reuse and recycling of leftover architectural coatings, which includes:

- Interior and exterior architectural paints: latex, acrylic, water-based, alkyd, oil-based, enamel (including textured coatings)
- Deck coatings, floor paints (including elastomeric)
- Primers, sealers, undercoaters
- Stains
- Shellacs, lacquers, varnishes, urethanes (single component)
- Waterproofing concrete/masonry/wood sealers and repellents (not tar or bitumen-based)
- Metal coatings, rust preventatives
- Field and lawn paints

PaintCare does the following:

- Reduces the generation of leftover paint by encouraging consumers to buy the right amount;
- Provides for the collection, transport, and processing of post-consumer paint using the hierarchy of “reduce, reuse, recycle,” and proper disposal; and
- Offers convenient locations for leftover paint drop-off via a network of retail sites and household hazardous waste facilities, among others.

PaintCare participation is open to all architectural paint manufacturers, has been adopted as a legislative requirement in eight states and Washington, D.C., and is expanding. The program’s success is impressive and includes the following milestones.

- More than 1,780 paint drop-off sites have been established within 15 miles of more than 61 million consumers.
- More than 27 million gallons of post-consumer paint have been collected, recycled or responsibly managed to date.

PaintCare also provides tips to help in every step of the process of painting, including:

- Informing consumers how much paint to buy
- Proper storage techniques to extend the life of the paint
- Tips for using up leftover paint
- Ideas on how to pass on extra paint
- How to recycle leftover paint

Learn more about the exemplary PaintCare story at www.paintcare.org.
ACA recognizes the importance of science, technology, engineering and mathematics (STEM) education for the next generation of scientists and engineers to innovate and advance sustainable coatings. ACA partnered with educators to develop and publish a free coatings science educational program for middle school students in the classroom. The Got You Covered! program brings STEM subjects to students through structured activities that facilitate scientific investigation of coatings on everyday objects. The free program package includes a teacher’s guide, poster, instructions for five activities and a take-home coatings career guide for students. The materials have been distributed to 1,000 middle school science teachers nationwide. Additionally, ACA has partnered with coatings professionals throughout the United States to develop a network of guest presenters for Got You Covered! who bring professional coatings experience to the classroom program at the request of educators.
Promoting Worker Health & Safety

Worker health and safety is an ACA core value and an important focus area for member companies. ACA encourages and recognizes member company facilities with outstanding safety records through its annual ACA Safety Awards Program. The program’s aim is to:

- Honor member company facilities that demonstrate superior safety performance, which is a key part of social Sustainability; and
- Allow members to benchmark their performance against others in the industry.

The chart below identifies 2017 ACA Safety Award recipients.

<table>
<thead>
<tr>
<th>Safety Awards of Excellence</th>
<th>Safety Awards of Honor</th>
<th>Safety Awards of Commendation</th>
<th>Safety Awards of Merit</th>
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</thead>
<tbody>
<tr>
<td>Given to member locations in various sized categories, which establishes zero death and total lost work day cases involving days away from work and/or restricted work activities for the subject five-year period.</td>
<td>Given to member locations in various sized categories, which establishes the lowest rate of death and lost work day cases involving days away from work and/or restricted work activities per total employee hours worked for the latest calendar year reported.</td>
<td>Given to member locations in various sized categories, which establishes the lowest rate of death and days away-from-work cases for the latest calendar year reported.</td>
<td>Given to the member location in each size category for the greatest improvement shown in its safety record for the reporting year as compared to the base year.</td>
</tr>
<tr>
<td>Arkema Coatings Resins Cary, NC</td>
<td>Behr Process Corporation Brampton, ON, Canada Santa Ana, CA; Chicago Heights, IL; Algona, WA</td>
<td>Behr Process Corporation Santa Ana, CA; Allentown, PA; Sauk Village, IL; Denver, CO</td>
<td>DAP Products, Inc. Tipp City, OH</td>
</tr>
<tr>
<td>Behr Process Corporation Calgary, AB, Canada; Orlando, FL; Santa Ana, CA</td>
<td>DAP Products, Inc. Baltimore, MD</td>
<td>DAP Products, Inc. Pacific, MO</td>
<td>Vogel Paint, Inc. Orange City, IA</td>
</tr>
<tr>
<td>Columbia Paint Corporation Huntington, WV</td>
<td>ICP Group Waukegan, IL</td>
<td>Induron Coatings, Inc. North Birmingham, AL</td>
<td></td>
</tr>
<tr>
<td>DAP Products, Inc. Dallas, TX</td>
<td>RUST-OLEUM Corporation Waupun, WI</td>
<td>PROSOCO, Inc. Lawrence, KS</td>
<td></td>
</tr>
<tr>
<td>RUST-OLEUM Corporation Attleboro, MA</td>
<td>Vogel Paint, Inc. Burlington, IA; Minneapolis, MN; Lincoln, NE; Sheboygan Falls, WI</td>
<td>Vogel Paint, Inc. Orange City, IA</td>
<td></td>
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<tr>
<td>Vogel Paint, Inc. Marshalltown, IA</td>
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</tbody>
</table>

Note: No award is presented to a location which has had a work-related death during the current base year. A location which obtains a negative number because of the Award of Merit calculation is not eligible for the Award of Merit.
Improving Air Emissions

The coatings industry recognizes the importance of reducing the air emissions associated with its products to protect human health and the environment. The industry’s commitment to improving air emissions is evidenced by numerous initiatives that have achieved quantifiable success:

- Total volatile organic compound (VOC) emissions from architectural coatings (household paints) have drastically decreased over the past few decades, even while these paints have experienced greater use and higher sales.³

- The U.S. Environmental Protection Agency’s (EPA) Toxics Release Inventory (TRI) data shows that releases by the paint and coatings sector decreased by 81 percent between 1990 and 2014. Release of hazardous air pollutants dropped by 82 percent during this time.⁴

- Coatings manufactured for industrial applications — such as new and repaired cars, heavy duty and utility trucks, rail stock and other vehicles — are increasingly available in waterborne formulations, replacing solvent-borne products that emit higher levels of VOCs.

ACA is proud of the environmental strides industry has made over the past several decades and supports continued efforts by industry to make further progress to reduce emissions and provide sustainable products.

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³ South Coast Air Quality Management District Rule 314 - Fees for Architectural Coatings
⁴ U.S. Environmental Protection Agency’s Toxic Release Inventory
Volatile Organic Compound (VOC) Emissions

Advancements in coatings technology have led to significant reductions in coatings product VOC emissions. California’s South Coast Air Quality Management District (SCAQMD), which includes the Los Angeles Area, is the air basin with the most severe air quality issues in the country. SCAQMD, via Rule 314, collects architectural coatings sales data (in gallons) and emissions data (tons per day). The data demonstrates that, despite increasing or similar sales, emissions from architectural coatings have decreased by more than 40 percent. This dramatic reduction in emissions illustrates industry’s commitment to reducing its environmental footprint.

The California Air Resources Board (CARB), which is the state’s “clean air agency,” collects similar industry emissions data. The graph below shows sales (in gallons) and VOC content (per gallon) of architectural coatings sold in California over a 20-year period, beginning in 1993. As sales increased over the 20-year period, the average VOC content of architectural coatings decreased by 80 percent.  

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5 South Coast Air Quality Management District Rule 314 – Fees for Architectural Coatings

In addition to reduced VOC emissions from architectural coating products, technology advances are resulting in significant reductions in emissions from coatings manufacturing operations. U.S. EPA TRI air release data indicates that, since 1990, coatings manufacturing emissions dropped by 81 percent, and the adjusted toxicity-weighted hazard associated with these releases decreased by 94 percent.\(^7\)

Industry, through increased use of low VOC waterborne, high solids and powder coatings, significantly reduced VOC and HAP emissions from manufacturing processes. In addition, business conditions also led to dramatic changes in manufacturing process. One example is smaller batch sizes. The industry evolved into more of a “made-to-order” oriented business than a “made-to-stock” business. Smaller batch sizes allow some coatings to be made in one container and not transferred, eliminate emissions from transfer/loading operations, and reduce wastes associated with cleaning. Further, the industry is trending toward using slurries as opposed to dry pigments where possible, minimizing emissions and wastes.

\(^7\) U.S. Environmental Protection Agency’s Toxic Release Inventory
\(^8\) U.S. Environmental Protection Agency’s Toxic Release Inventory
The U.S. paint and coatings industry employed more than 295,400 workers in 2016, and its payroll of $14.1 billion increased at nearly twice the average U.S. private sector rate from the previous year. The industry’s economic impact was felt at the 46,900 paint and coatings establishments around the country. For example, 720 million gallons of architectural coatings were sold during 2014, representing 60 percent of the volume of all paints and coatings sold in the United States (1,209 million gallons) with a value of $10.7 billion, accounting for 49 percent of the total value in U.S. paint sales.

Exports to Canada (over $1.3B) and Mexico (nearly $588M) in 2017 totaled $1.6B combined

Positive trade surplus of $1.4B in trade

The third largest export market was China at $101M in 2017

Exported $2.3B in paint and coatings products in 2017

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9 U.S. Bureau of Labor Statistics’ Quarterly Census of Employment and Wages. Labor statistics were derived using the following NAICS codes: 238320 Painting and Wall Covering Contractors; 325510 Paint and Coating Manufacturing; 424950 Paint, Varnish, and Supplies Merchant Wholesalers; and 444120 Paint and Wallpaper Stores


11 Trade statistics were derived from U.S. Bureau of the Census data and are reported on a Census or Customs basis.
MEMBER SUSTAINABILITY STORIES

ACA is proud of the initiatives its members are undertaking every day in their operations and through their innovative products and services to advance a Sustainability commitment. Several member company stories are highlighted here, and additional information about their Sustainability initiatives may be found on their websites and annual financial and Sustainability reports. There are many more stories of the industry’s Sustainability commitment. These are a few examples.

Dunn-Edwards Paints LEED® Gold Certification from the U.S. Green Building Council

Dunn-Edwards Paints was awarded the U.S. Green Building Council’s LEED Gold Certification for its new manufacturing facility in Phoenix, Ariz. LEED is the nation’s pre-eminent program for the design, construction and operation of high-performance green buildings. Dunn Edwards’ 336,000 square-foot plant is the world’s first LEED-certified paint manufacturing facility. The ultra-modern building encompasses manufacturing, product development, quality control laboratories, a distribution center, retail outlet and office space.

“We have incorporated innovative, energy-efficient equipment and protocols, such as unique high-efficiency process equipment with integrated dust-suppression technology, so that no particulates are emitted to ambient air, and advanced wastewater recycling techniques to conserve water,” said Karl Altegott, president of Dunn-Edwards Corporation. “Our systems are classified as ultra-low discharge, meaning that waste generation is virtually eliminated.”

The Dunn-Edwards “Greener by Design” philosophy focuses on initiatives, including energy efficiency, waste minimization, recycling, emissions reduction, and health and safety protection. “So, not only are we manufacturing paint that is more eco-friendly, we have taken great steps to conserve energy and material resources, and to reduce waste in our physical environment,” said Altegott.

Learn more at https://www.dunnedwards.com/.
RPM: Building a More Sustainable World

From homes and workplaces to infrastructure projects and marquee edifices worldwide, the fundamental nature of many RPM International Inc. products is to make these structures more sustainable. They protect and repair these structures to extend their usable lives for many decades, reduce landfill from demolition and improve their energy efficiency. Here are just a few examples of how RPM is proactively contributing to a more sustainable world:

PRODUCTS

- Dryvit’s Outsulation high-performance exterior insulation and finish systems (EIFS) can be installed directly over an existing façade, which reduces landfill and delivers superior insulation to enhance energy efficiency.
- Tremco Roofing offers vegetated, cool and photovoltaic roofing systems as an eco-friendly, cost-effective option for sustainable facility construction. It also promotes roof restoration rather than replacement through its AlphaGuard fluid-applied system, which extends a roof’s life cycle by 10-20 years.
- Rust-Oleum’s Krud Kutter water-based, biodegradable, non-toxic cleaning solutions are made from green formulations that are safer than many traditional products on the market and contain little to no VOCs.
- Structures damaged by water and fire can often avoid replacement and instead be renovated, thanks to Legend Brands’ restoration equipment, accessories and chemicals.

PROCESSES

- Packaging material and waste reduction: Stonhard, the world’s largest producer of polymer flooring, has moved from rigid metal pails to flexible pouches and cardboard boxes that cost less to produce and ship, require less storage space and are easily recycled. This unique packaging prevents more than 4.8 million one-gallon pails and quart cans from being dumped into landfills annually.
- Sustainable innovation: RPM businesses incorporate Sustainability at the very forefront of their product innovation process, which includes the reduction and elimination of chemicals of concern, as well as the implementation of processes that reduce waste generation and energy consumption. For example, Viapol’s plant switched from fossil fuels to biomass and reduced greenhouse gas emissions by 85 percent.
- Water recycling: Many of RPM’s manufacturing facilities have implemented technologies that reduce water consumption by taking cooled water and running it through a chiller or heat exchanger to reuse in their processes. This results in significantly less water and energy use. One such project at the Rust-Oleum facility in Attleboro, Massachusetts, cut its water consumption by nearly 30 million gallons per year.

Beyond these instances, RPM operating companies around the globe continue to develop innovative new products and improve their processes along the ongoing journey to build a more sustainable world.

Learn more at http://www.rpminc.com/about-rpm/Sustainability/.
In water-stressed areas across the United States, PPG facilities are implementing changes to help conserve limited water resources. Examples of those efforts include the following:

- One architectural coatings facility in Texas reorganized some key paint production processes to use water more efficiently, ultimately reducing 2016 water use by more than 15 percent compared with the previous year.
- In Southern California, members of the Sustainability team at PPG’s Mojave aerospace facility are reusing industrial rinse water, a process change that reduces the site’s annual water use by more than 100,000 gallons.
- PPG’s Houston, Texas architectural coatings plant incorporates microbe-free, white-wash water into a low-cost flat paint product. This innovative reuse saves 500,000 gallons of water and $375,000 in disposal costs each year.

On the energy side, in 2016, PPG’s Global Supply Management Logistics group launched an initiative in North America to lower costs, increase fuel efficiency and reduce environmental emissions through best practices in logistics. Achievements through year’s end include the following:

- Reducing global next-day parcel shipments by 71 percent and heavy air shipments by 28 percent;
- Increasing the conversion of truckloads to intermodal shipments by 106 percent;
- Reducing empty miles by more than 13 percent through the securement of backhaul shipments;
- Encouraging key carriers to become more fuel-efficient by minimizing idling, using lighter equipment, improving truck aerodynamics and planning more efficient routes; and
- Reducing the number of trucks needed to haul freight by more than 3,000 loads, by consolidating shipments and improving the utilization of truck weight capacity.

Sherwin-Williams’ Harmony® Paint contains Formaldehyde Reducing Technology that promotes improved indoor air quality. This unique technology helps reduce VOC levels from potential sources like insulation, carpet, cabinets, fabrics and other building materials. In addition, Harmony contains Odor Eliminating Technology, which helps reduce ambient odors of organic origin, like pet, cooking and smoke odors. Harmony meets the most stringent VOC regulations.

Laboratory methods confirm that Harmony® Paint with Formaldehyde Reducing Technology can reduce the amount of formaldehyde from the gaseous phase near the paint. This was validated via a school demonstration study conducted by UL-GREENGUARD. The school demonstration study showed that airborne formaldehyde levels were significantly reduced in the classroom with enhanced Harmony® Paint. The average 5-day airborne levels for each classroom prior to painting were compared to the seven-day average level after painting. There was a 45 percent reduction in airborne formaldehyde in the room painted with enhanced Harmony® Paint. In contrast, there was no reduction of formaldehyde level in the room painted with the conventional semi-gloss paint and only a 9 percent reduction in the room painted with the low VOC semi-gloss paint.


12 The Sherwin-Williams Company
Axalta Coating Systems: Reducing the Environmental Footprint of Coatings with 3-Wet Technology

The paint application process is one of the most time-consuming and capital-intensive steps in vehicle manufacturing. Axalta Coating Systems’ portfolio of Harmonized Coating Technologies™ (HCTs) provide automotive manufacturers with a variety of start-to-finish systems for the application of each layer of paint and is designed to improve productivity while reducing VOC emissions, energy consumption, and the cost of the plant and equipment.

Axalta’s 3-Wet HCT system takes steps out of the traditional paint application process that use high-temperature and costly ovens to cure each coating layer: primer, color basecoat, and the clear coat that protects the finish from the elements. The first paint layer applied using 3-Wet provides the properties of a primer, but can be applied in an exceptionally thin coat, reducing the need for costly robotic applicators by as much as 50 percent. A brief passage through a low or even ambient temperature zone replaces a full curing oven, which can reduce the length of a paint shop by more than 1,000 feet. A colored basecoat is then applied while the first coat is still wet, and the clear topcoat can be applied before the basecoat has dried. While energy, time and capital costs are saved, optimal control of the interfaces between the paint layers ensures that the paint finish continues to meet premium appearance standards.

Because of the benefits from reduced plant emissions that 3-Wet offers car manufacturers and the environment in communities where manufacturing facilities are located, Axalta estimates that about 20 percent of the worldwide light vehicle production will be painted using such a process by 2020.

VALUE PROPOSITION IN SAVINGS PER CAR
(Relative to conventional paint process)

<table>
<thead>
<tr>
<th>$ / VEHICLE</th>
<th>SAVINGS</th>
</tr>
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<tbody>
<tr>
<td>CAPITAL</td>
<td>$2.20</td>
</tr>
<tr>
<td>LABOR</td>
<td>$2.60</td>
</tr>
<tr>
<td>ENERGY</td>
<td>$9.90</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$14.70</td>
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</tbody>
</table>

ANNUAL VEHICLE BUILDS IN PLANT: 210,000
ANNUAL PLANT SAVINGS: > $3 MILLION/YEAR


13 Axalta Coating Systems
Dow’s CANVERA™ Polyolefin Dispersions technology enables food packaging in recyclable metal cans. Launched in 2016, this technology, when formulated into a coating, protects cans from corrosion and offers excellent food flavor retention, adhesion, corrosion protection and flexibility. Production of CANVERA™ Polyolefin Dispersions is a more energy- and water-efficient alternative to traditional bisphenol-based products. The product also aligns with the principles of green chemistry as follows:

- **Atom Economy.** Methods should be designed to maximize product output and minimize process inefficiencies. The production of CANVERA™ Polyolefin Dispersions has a much higher yield than the chemistry of traditional bisphenol monomers.

- **Designing Safer Chemicals.** Highly reactive chemicals are often used to manufacture products for efficacy, but they are more likely to react with unintended human and ecological targets, with adverse effects. Molecules involved in CANVERA™ Polyolefin Dispersions are stable and less reactive than their conventional counterparts. The technology was designed to be entirely free from common materials of concern.

- **Design for Energy Efficiency.** Dow conducted a formal environmental life-cycle assessment of CANVERA™ Polyolefin Dispersions relative to a traditional epoxy coating. The analysis found that CANVERA™ Polyolefin Dispersions outperformed the epoxy coating relative to the four primary environmental issues considered in the study: climate change, acidification, marine eutrophication, and water resource depletion.

Benjamin Moore recognizes that product and third-party certifications meet a growing demand from customers to identify products that may reduce or eliminate negative human health and environmental impacts. To this end, Benjamin Moore has undertaken various sustainable product initiatives, such as developing paint and coating products that can support the U.S. Green Building Council’s LEED certification for buildings.

Using Benjamin Moore paints and coatings can now contribute up to five credits under LEED’s v4 standard. For example, to earn maximum LEED credits as a low-emitting interior material, flat paint must meet a VOC level of 50 g/L or less (100 g/L or less for non-flats), as well as be emissions-certified. Several Benjamin Moore products are formulated to meet the VOC criteria and are emissions-certified. Additionally, Benjamin Moore provides customers with the Health Product Declarations that earn LEED credits for transparency. Beyond LEED certification, Benjamin Moore also has many products on the market that are approved under the Master Painters Institute X-Green™ Performance Standard, meaning they have the durability of conventional paint but with no more than trace quantities of undesirable chemical products, such as phthalates, and reduced levels of VOCs.

At BASF, we create chemistry for a sustainable future. We enable our customer’s success by providing them innovative and sustainable solutions that meet their market challenges and needs. By using our raw materials, formulators can develop coatings that differentiate from the competition, contain little to no VOCs, while meeting or exceeding increasingly strict government regulations. We are committed to solutions that embrace Sustainability and provide a viable future with an enhanced quality of life for everyone.

- Our Loxanol® line of products is specially designed to help you formulate strong performance, ultra-low VOC coatings
- Our Acronal® EDGE 4247 achieves outstanding resistance to the harshest elements while being ultra-low VOC capable
- Over 95% of BASF’s global formulation additives portfolio is APEO-free
- Our Acronal® EDGE 4750 latex for paint-and-primer-in-one applications allow painters to remove a step and still achieve the highest quality results
- Our AQACell® HIDE 6299 na allows formulators to reduce TiO2 loading by as much as 15% and achieve equal hiding power
- Our new reactive dispersant Efka® PX 4787 can achieve exponentially better dispersing efficiency while maintaining coating hardness and color development
- Our Biomass Balance Approach is a groundbreaking way of deriving products from renewable raw materials. Environmentally and social responsible bio-feedstocks that reduce greenhouse emissions with no compromise on performance
- Our Joncryl® line of products include waterborne technologies that offer comparable performance to solventborne counterparts for light to medium duty industrial applications.
- Our Laromer® UP 9118 & Laromer PR 9119 products enable formulators to produce 100% solids and BPA free coating systems for wood applications.

BASF has a long standing history of involvement and commitment to sustainable solutions. As a founding member of the UN Global Compact in 2000, BASF contributed to the development of the Sustainable Development Goals proclaimed by the UN in 2015. In 2018, BASF was recognized as a UN Compact Global Sustainable Development Goals Pioneer for innovative solutions driving sustainable water and climate action.

For more information on our Sustainability practices, please visit www.Sustainability.basf.com. To inquire about any of the products listed above, please visit www.basf.us/dpsolutions.
Sustainability is at the heart of everything we do at AkzoNobel, and in fact it is one of our three Core Principles, along with Safety and Integrity. It’s vital for the future success of our company, our society and our planet, and our commitment to Sustainability is evident in our consistently high ranking on the Dow Jones Sustainability Index. Sustainability is a broad topic and can range from using less raw materials and energy, to reducing waste streams. It also encompasses working with suppliers who have similar principles to AkzoNobel and understanding our customers’ Sustainability objectives as we serve them. Additionally, Sustainability is important as we promote human rights and treating all people with dignity and respect in the workplace and demonstrates how we care about the communities where we operate. At AkzoNobel we use Sustainability to spark innovation in the products we make, the processes we follow and the procedures we use to be a leading paint and coatings manufacturer. Here are some good things happening in the United States that demonstrate our ongoing commitment to Sustainability:

► In our Aerospace business, AkzoNobel is the global leader in developing and manufacturing coatings for the Original Equipment Manufacturer (OEM) and Maintenance, Repair and Overhaul (MRO) sectors of the Commercial Airline, General Aviation and the Military Air markets. Our emphasis is on producing sustainable, high-performance, cost-effective coatings that are easy to use. Our Aerobase and Aerodur basecoat clearcoat systems were developed to improve durability and reduce application time which can lead to fewer layers and lower film build and weight on the plane, thus improving operations and fuel efficiency.

► In our Automotive and Vehicle Refinish segment, Sustainability is an important metric and we continue to strengthen our credentials by sourcing sustainable raw materials where possible. We are also releasing low-energy curing solutions to enable body shops to dramatically reduce their energy usage which in turn reduces their costs and the impact on the environment.

► In the Wood Coatings business, Sustainability remains a priority for AkzoNobel. Our diverse portfolio of waterborne paints and stains gives manufacturers a choice when selecting products that meet functional requirements, while considering environmental performance in their operations and for the consumers that purchase their products.

► Our Metal Coatings business launched a line of chrome-free primers for the building products market including metal roofing, siding and steel doors. We generated more than 15 years of natural exposure test data to qualify a safer and more sustainable alternative to chromated metal primers. The new product is specially formulated with anti-corrosive pigment for long-term protection and helps customers meet changing regulations in Europe and the US.

► In our Powder business, AkzoNobel continues as a top supplier of powder coating materials to this diverse market space. With an ambition to reduce environmental impact, customers continuously aim to improve process efficiencies, such as streamlining coatings steps or better utilization of coatings materials. A reduction in baking temperatures means powders can be applied on a broader range of substrates, resulting in lower energy consumption, no VOCs, and therefore a more sustainable alternative to liquid coatings and anodizing. The ever-increasing color offer will reinforce powder as a strong option for coating protection. Our ambition is to make powder coatings available to as many markets as possible.

► Marine Coatings: AkzoNobel is developing a revolutionary fouling prevention technology which uses ultraviolet light-emitting diodes (UV-LED). The pioneering solution – which uses underlying technology developed by Royal Philips – will be applied to underwater surfaces to eliminate fouling growth. By teaming up AkzoNobel’s cutting-edge surface protection and adhesion know-how with Royal Philips’ unrivalled capabilities and intellectual property in UV-LED lighting and electronics, the two companies are aiming to develop an economically viable solution for underwater fouling prevention. The innovation will integrate UV light-emitting diodes in a protective coating scheme which will allow for the UV light to be emitted from the coating surface, providing the total prevention of biofouling accumulation on the surface of the protected area. The fully biocide-free solution will provide groundbreaking performance and offer complete fouling prevention to the hulls of ships and boats. The total control of biofouling represents a substantial economic and environmental benefit, and when realized, the impact of this new technology on vessel owners and operators will be significant.

More about AkzoNobel at www.akzonobel.com
Sustainability is the core concept of The Behr Paint Company’s business strategy and culture ensuring top economic, social and environmental performance. Our commitment to Sustainability, quality, value and performance has driven our desire for innovation and transparency. The Behr Paint Company focuses on developing products that meet environmental standards, governmental and private, like CARB, UL-GREENGUARD® and Master Painter Institute (MPI) Green Performance®. Over the past few years, Behr has increased the percentage of revenue generated from the sale of sustainable products.

In 2017, The Behr Paint Company, home to Behr Process Corporation and Masterchem Industries LLC, the makers of BEHR® and KILZ® Brands respectively, developed a Life Cycle Assessment (LCA) to evaluate the environmental impact of our entire process. The LCA analyzes raw material extraction, manufacturing, transportation, application and disposal. This assessment allows Behr to find areas in our processes that can be altered to decrease our environmental impact and increase Sustainability. After we developed the LCA and verified it with a third-party certifier, we created Environmental Product Declarations (EPD). These EPD’s evaluate the environmental impact of individual products. Both the LCA and EPD increase transparency and allow The Behr Paint Company to continuously find ways to improve Sustainability and reduce our environmental impact.