COMMENT OF SABIC INNOVATIVE PLASTICS US LLC ON DOCKET ID NO. EPA-HQ-OPPT-2020-0465, METHYLENE CHLORIDE; REGULATION UNDER THE TOXIC SUBSTANCES CONTROL ACT (TSCA), 88 FED. REG. 28,284 (MAY 3, 2023)

July 3, 2023

INTRODUCTION

SABIC Innovative Plastics US LLC ("SABIC") submits the following comments on the proposed rule entitled "Methylene Chloride; Regulation Under the Toxic Substances Control Act (TSCA)", published in the Federal Register on May 3, 2023 (88 Fed. Reg. 28,284) (the "Proposed Rule"). SABIC manufactures an array of high-performance engineering resins globally. Within the U.S., SABIC operates two polycarbonate ("PC") manufacturing facilities that use methylene chloride following the interfacial polymerization process. EPA has identified this use as part of the Condition of Use: Industrial and Commercial Use for Plastic and Rubber Products Manufacturing. Proposed Rule at 28,296.

SABIC is a member of the American Chemistry Council ("ACC") and the American Chemistry Council's Polycarbonate/BPA Global Alliance ("Alliance"), both of which are also submitting comments on the Proposed Rule. SABIC adopts and incorporates the ACC's and the Alliance's comments on this Proposed Rule but writes separately to provide additional operating information and data in response to EPA's proposal to prohibit the use of methylene chloride for interfacial polymerization in PC manufacturing and to propose, as EPA's primary alternative regulatory action, to allow a Workplace Chemical Protection Program ("WCPP").

As discussed in more detail below, SABIC's facilities have sophisticated and effective risk management systems already in place and have demonstrated the ability to meet and exceed the current Occupational Safety and Health Administration ("OSHA") standards.[1] Substantial sampling data shows that SABIC's facilities are well-positioned to achieve the Existing Chemical Exposure Limit ("ECEL") and EPA Short Term Exposure Limit ("STEL") in the Proposed Rule.

[1] OSHA already exercises statutory authority to prescribe and enforce standards that address worker safety, including exposure to methylene chloride. SABIC's facilities are fully compliant with these requirements.

Given this data and the operating context, there is every reason to conclude that, given the opportunity, SABIC's PC manufacturing operations can fully comply with these proposed limits. As a result, the WCPP is achievable and can adequately manage the risk of methylene chloride exposure at SABIC's facilities. SABIC therefore requests that EPA abandon the proposed prohibition on methylene chloride use in the Industrial and Commercial Use for Plastic and Rubber Products Manufacturing condition of use, and instead adopt the primary alternative regulatory action of the WCPP.

BACKGROUND

I. Significance of SABIC's PC operations

SABIC pursues excellence and compliance regarding both employee health and safety measures and emissions from our plants that could affect the surrounding communities. SABIC owns and operates two PC facilities located in Mt. Vernon, Indiana and Burkville, Alabama. These facilities have safely operated and provided critical jobs and financial benefits to their local communities for over four decades. The plants are major employers in these two more rural communities, both of direct labor and external contractors that provide additional services to the facilities. Approximately 1,000 SABIC personnel and 600 local contractors rely on the PC assets for employment. This does not count the potential impact on jobs in the local communities should these operations close. Overall, these plants are significant contributors to the economic health and employment opportunities in their locations. More U.S. economic details are provided in the comments from the Alliance.

There is no technically and financially feasible alternative to methylene chloride that would allow these facilities to continue to operate. As a result, prohibiting the use of methylene chloride (as EPA has proposed) would result in the complete closure of the Burkville, Alabama plant and the largest production assets in Mt. Vernon, Indiana. In addition, SABIC's Mt. Vernon, Indiana,

facility is the only production site globally that is capable of producing specialty PC co-polymers. These co-polymers have unique properties which are specified in critical medical, military, electronics, and aviation uses. Thus, a forced shutdown of the Mt. Vernon assets would also directly impact these important end products in the global marketplace by denying brand owners these necessary raw materials.

These two plants represent over 60% of the domestic PC capacity to serve the American markets. The additional capacity in the region also requires methylene chloride to operate and would also likely go offline if the use of methylene chloride for PC and co-polymer manufacturing is prohibited, leaving America with no local production of PC to serve multiple markets and applications, including: automotive, healthcare, military, electrical infrastructure, consumer electronics, building and construction and more. Reestablishing PC production in the Americas without methylene chloride would take as much as 7 years and costs would likely exceed $500,000,000. Even then, the new plants would not meet the unique properties and market demands by only producing PC with a lower performance profile, also they would not be able to produce PC co-polymers, as detailed later in these comments.

II. Polycarbonate Plays a Vital Role in Health and Safety Applications

PC and co-polycarbonates are amorphous engineering thermoplastics used in a diverse set of applications and markets, including health care, consumer electronics, aerospace, mobility, military, infrastructure, and personal protective wear. Their transparency, high impact strength, mechanical performance, heat resistance, thermal performance, chemical resistance, and resistance to fire and corrosion, along with other chemical and physical properties uniquely suit them for key applications in medical devices, health care, and automotive safety.

SABIC uses interfacial polymerization to manufacture PC and co-polymers. This process requires the use of methylene chloride to achieve the properties needed for high-performance

applications. The interfacial production process creates a higher performing product, due to increased purity, compared with other PC manufacturing processes (i.e., melt polymerization). It also allows for better control over the polymer chain length and distribution and importantly, enables the manufacture of co-polycarbonates. This control is advantageous when specific molecular weight ranges or tailored properties are needed for the final PC product. In addition, the interfacial process has sustainability advantages by using less energy and produces a higher yield, reducing the carbon footprint of PC as compared to other processes.

Key industries and applications in medical, automotive, appliance, aerospace and consumer electronics markets depend on these interfacial PC-based materials for impact and safety performance which would be compromised if they were produced using melt PC technology. The improved impact, aging and clarity of interfacial PC is critical for applications in high end markets that require these characteristics. Medical devices require high clarity and good impact/durability over time and after sterilization processes. Automotive headlight applications require clarity and long-term impact performance after UV exposure. Flame retardant materials in appliances, building and construction, infrastructure and consumer electronics demand high impact resistance over long product life span. Product testing over more than a decade has shown there are markets, applications and performance windows where interfacial PC cannot be substituted with melt PC without losses of critical performance and safety requirements of the applications.

For example, only the interfacial process can create PC grades with the necessary optical quality that is required for high performance LED lighting solutions. This application, which results in lower energy use, is widespread in both general lighting applications and in the automotive industry. In fact, 100% of automotive headlight lenses made from PC were manufactured in the interfacial process.

Additionally, PC co-polymers extend and enhance the performance of PC homopolymer in several key performance areas: higher impact performance, improved chemical resistance, adding flame retardance, enhanced UV resistance, and sustainability.[2] The manufacture of PC co-polymers requires the use of the interfacial polymerization process to attain these additional performance enhancements. Co-polymers cannot be produced by the melt process. These co-polymers are used in higher end medical, military and infrastructure markets where standard melt PC resin would not meet the functional requirements.[3] Multiple co-polymers are only made in U.S. facilities.

COMMENTS

I. Methylene Chloride is Necessary to Manufacture High-Performance PC.

Prohibiting the use of methylene chloride in the manufacture of PC would have significant adverse impacts on the United States' ability to make the high-performance products today's safety, medical and other applications require. Methylene chloride is either the main solvent or a primary co-solvent in making PC using the interfacial process. Methylene chloride has several properties that make it uniquely important, including a low boiling point, very low flammability, immiscibility with water, and very high solubility of PC. These properties are essential to

[2] One example is SABIC's BLUEHERO product line, which is an expanding ecosystem of materials, solutions, expertise and programs designed to help accelerate the world's energy transition to electric power and support meeting global goals on climate change. BLUEHERO's starting point is to support the automotive industry's mission to create better, safer and more efficient electric vehicles (EVs), with an emphasis on optimizing structural battery components with unique flame retardant materials and solution development expertise. Another is SABIC's lightweight LEXAN™ polycarbonate sheet portfolio, which helps aerospace customers meet the critical challenges of reducing weight to conserve fuel and lower emissions. These efforts require the continued use of interfacially-produced PC.

[3] For example, SABIC's LNP™ CRX polycarbonate (PC) co-polymer resins offer a distinct combination of robust chemical and impact resistance, thin-wall transparency, dimensional stability and processability that are important for medical device applications such as clear covers, screens and display lenses exposed to disinfectants or aggressive chemicals. PC co-polymers are also used in ventilators, Covid-19 testing equipment, insulin pens, auto-injectors, and insulin monitoring devices.

providing the unique property profile of interfacially-produced PC. Finally, methylene chloride can be efficiently recovered and reused in the PC processes due to its low boiling point.

Alternative solvents for the interfacial PC process were evaluated in the early development of the interfacial process. These studies indicate inefficient polymer chain build occurred when alternative solvents were trialed. If the polymer chain build does not reach the entanglement molecular weight, mechanical performance as well as other performance properties will be negatively impacted. PC using other solvents demonstrated increased stress cracking as well as polymer crystallization, rendering these impractical alternatives for high-performance applications requiring, for example, superior ductility and optical properties.

Beyond the enhanced PC performance gained by using methylene chloride versus alternative solvents as described in the preceding paragraph, the PC resins themselves exhibit very low residual solvent content or other potential chlorinated toxic side products. Viable alternatives that dissolve PC and are immiscible in water are higher molecular weight chlorinated hydrocarbons which are less stable to decomposition and much harder to remove from the PC resins leading to increased residual content.

For these reasons, the need to replace methylene chloride in the interfacial polymerization of polycarbonates has not been an active area for either industrial or academic research.

II. SABIC's PC Facilities Have Sophisticated IH Programs That Carefully Control for Methylene Chloride Exposure.

SABIC operates two facilities that make PC in the United States. Its Burkville, Alabama facility manufactures PC resin, compounded PC, and PC/acrylonitrile-butadiene-styrene (ABS) pellets.

Burkville, Alabama

Mt. Vernon, Indiana

SABIC's Mt. Vernon, Indiana facility is SABIC's largest facility in the United States, primarily manufacturing PC. Both Burkville and Mt. Vernon serve customers in the automotive, building and construction, healthcare, military, medical, and consumer goods industries. Both are ISO certified, implement a Safety, Security, Health and Environmental Management System, are members of Operation Clean Sweep Blue,[4] and hold an Ethisphere Institute Compliance designation.[5]

In the proposed rule, EPA correctly noted that "regulated entities may have fewer challenges implementing requirements to meet an ECEL and EPA STEL because work activities may occur in sophisticated facilities or take place in a closed system." 88 Fed. Reg. at 28,322. That aptly describes SABIC's two PC manufacturing facilities, which are carefully controlled sites with a sophisticated industrial hygiene program that is deeply engrained and has proven highly successful to protect human and environmental health.

[4] A campaign dedicated to helping every plastic resin handling operation achieve zero plastic resin loss.

[5] A third-party verification of SABIC's corporate ethics and compliance program structure and oversight, employee training and communications, risk measurements, and monitoring and handling of misconduct.

In the PC manufacturing process[6] methylene chloride is used as a solvent or primary co-solvent for PC in the reaction phase, and as a carrier solvent for PC during purification until it reaches the drying stage, where methylene chloride is recovered and reused. At SABIC's facilities, methylene chloride risks are managed by a world-class safety and health program that is designed to instill a strong safety culture and clear procedures, underpinned by active, engaged participation by employees and contractors, to support worker safety and meet or exceed all legal and industry-leading standards to control exposure to hazardous chemicals like methylene chloride. All SABIC-affiliated chemical manufacturing sites, including Burkville and Mt. Vernon, are certified to Responsible Care® practices and principles, which is a strict commitment to the health, safety, and security of our employees and the environment in the communities in which we operate. The SABIC Life Saving Rules (LSR) program complements our belief that EHSS is a core value. The goal of these LSR's is to highlight the hazardous elements of our operations and reinforce the procedures that require absolute focus to avoid serious incident or injury. The LSR program emphasizes the standards and expectations for all employees and contractors working at SABIC facilities.

Both facilities employ full EHSS teams on site that include EPA air permit compliance, process safety, and occupational health and safety specialists. The Mt. Vernon facility employs a dedicated Industrial Hygienist, and the Burkeville site employs an IH & Safety Engineer who holds the Certified Industrial Hygienist certification in good standing. Both sites are supported by the Americas Region EHSS team which consists of Certified Safety Professionals, a Certified Industrial Hygienist, process safety specialists and environmental specialists. The EHSS teams at

[6] SABIC also uses methylene chloride for laboratory use. SABIC supports EPA's proposal to subject industrial and commercial use of methylene chloride as a laboratory chemical to the WCPP as both the proposed regulatory action and primary alternative regulatory action. Proposed Rule at 28,317, Table 3.

each site are dedicated to ensuring best practices are employed using the hierarchy of controls to prevent exposures to hazardous chemicals below OSHA and ACGIH exposure limits as required by external regulations and internal SABIC standards.

In 1997, OSHA established requirements for employers to control occupational exposure to methylene chloride. In response, SABIC evaluated all routes of exposure, including inhalation, ingestion, and dermal exposure. SABIC has established engineering and administrative controls and PPE policies and applied them in an iterative fashion to confirm effective management of these risks.

Specifically, SABIC has implemented detailed methylene chloride management policies at both its Burkville and Mt. Vernon facilities (Attachments A and B). These policies, which are tailored to the specific needs of each facility, provide for:

- A written policy detailing the programs and controls in place at each site to protect employees from exposures to methylene chloride, consistent with the methylene chloride OSHA requirements. 29 CFR 1910.1052. This policy details initial and periodic air monitoring, medical surveillance, employee training, handling practices, respiratory protection requirements and area signage;
- Signage and labelling of all piping, vessels and containers containing methylene chloride;
- Initial and periodic exposure monitoring of methylene chloride for compliance with both short-term and full-shift time-weighted average ("TWA") exposure limits;
- Adherence to the OSHA hierarchy of controls, including control through engineering and work practice controls prior to reliance on personal protective equipment ("PPE") and use of PPE in any area with a potential to exceed the applicable short-term or full-shift TWA exposure limits;
- Training of employees that work in areas or perform tasks in areas where methylene chloride is used, both on the applicable standards and the associated hazards and how to protect themselves from overexposure, with new employee training on methylene chloride hazards and regular refresher training for all affected personnel on methylene chloride awareness;[7]

[7] *See also* Fresh Methylene System Training (Attachment C).

- Action levels of one half the applicable full-shift TWA exposure limit; and
- Medical surveillance for exposure scenarios above the permissible exposure limit and medical removal protections for at risk employees.

Both facilities also follow detailed protocols for methylene chloride alarm response, and activities that may lead to methylene chloride exposure such as pump maintenance, resin reaction sampling, unloading of methylene chloride trucks. *See, e.g.*, Attachments D, E, F, G, and H.

Due to our strong safety and compliance culture, the inherently protective design of our systems, and our consistent adherence to these policies and procedures, SABIC has had no fatalities, recordable incidents or allegations of significant adverse reactions to human health or the environment due to exposure to methylene chloride. Further, our facilities have never been issued a notice of violation, fine or penalty regarding methylene chloride use.

III. SABIC Can Successfully Implement the WCPP at Its Facilities.

As part of assessing whether to allow use of "a WCPP under the primary alternative regulatory action" for the Industrial and Commercial Use for Plastic and Rubber Products Manufacturing condition of use, EPA requested comment on "the degree to which users of methylene chloride in these sectors could successfully implement the WCPP, including requirements to meet an ECEL and EPA STEL." 88 Fed. Reg. at 28,322.

Extensive IH sampling at both SABIC sites in the manufacturing areas and supporting quality assurance laboratories confirms that our programs have achieved consistent compliance with the OSHA standards. As demonstrated by the attached data (Attachment I):

- All 47 STEL samples (100%) collected across both facilities in an array of contexts over the past five years have been well below the OSHA STEL;
- 121 of 121 samples (100%) taken across both facilities in the past five years have confirmed compliance with OSHA's PEL of 25 ppm; and
- 118 of 121 samples (over 97%) were below the OSHA PEL action level of 12.5 ppm.

This consistent compliance is the natural result of our well-developed policies and procedures, substantive expertise and the strong safety culture at SABIC and each of our operating sites.

We recognize that the ECEL and EPA STEL will be lower than the OSHA PEL and STEL, but SABIC is confident that similar success can be achieved at the levels in the Proposed Rule. SABIC employs a continuous improvement process that ensures its health and safety measures meet or exceed all legal and industry-leading standards. This means that, while the OSHA standards have been in place since 1997, SABIC has continued to implement process improvements and lessons learned that continue to reduce methylene chloride exposure over time. There is every reason to believe that demonstrated ability to refine our processes and procedures can be extended to consistently achieve the ECEL and EPA STEL.

In fact, the data provided in Attachment I demonstrates that the measures SABIC has taken have *already* gone a long way towards meeting the WCPP limits in the Proposed Rule. Even without taking any additional measures specifically gauged to comply with the Proposed Rule:

- 44 of 47 STEL samples (over 93%) are below the proposed 16 ppm standard, with most far lower; and
- The substantial majority (over 72%) of the 8-hour TWA samples already satisfy the proposed ECEL of 2 ppm, with most of the others being close to meeting the limit.

This sampling data, combined with our extensive expertise and demonstrated ability to reduce exposure risk over time, gives EPA every reason to expect SABIC can and will meet the ECEL and EPA STEL with the WCPP.

Indeed, SABIC has already begun investigating ways to further mitigate exposure risks. Reviews of site practices and equipment by process safety, air emission specialists and industrial hygienists have found further improvements, including sampling point enclosures, lower site leak detection and repair limits, and other sources of ambient airborne levels where current practices can be enhanced to further reduce employee exposures. In addition, SABIC is fully prepared to

meet the respiratory protection requirements set forth in the proposed rule, including provision of either supplied air respirators or self-contained breathing apparatus (as provided for already in SABIC's methylene chloride management program). *See* Attachment A at § 12.1.

SABIC appreciates EPA's willingness to consider the WCPP for the Industrial and Commercial Use for Plastic and Rubber Products Manufacturing condition of use, and in particular for use of methylene chloride in the manufacture of PC. We are confident that the proposed limits are achievable and that our sites will satisfy the WCPP if given the opportunity.

IV. Prohibiting Methylene Chloride Use at SABIC's PC Facilities is Not Necessary to Address Unreasonable Risk.

EPA's risk management authority is expressly limited to crafting measures "to the extent necessary so that the chemical substance…no longer presents" an unreasonable risk. 15 U.S.C. §2605(a). Given the demonstrated level of sophistication at SABIC's PC manufacturing facilities, the carefully controlled nature of the operations that use methylene chloride, and the extensive data already showing compliance with the ECEL and EPA STEL is achievable, it would be arbitrary and capricious for EPA to prohibit methylene chloride use entirely for SABIC's facilities. EPA proposed prohibition for the Industrial and Commercial Use for Plastic and Rubber Products Manufacturing condition of use because the Agency had "not yet received any monitoring data or detailed description of methylene chloride involving activities … to confirm that compliance with an ECEL of 2 ppm is possible." Proposed Rule at 28,314. As discussed above, and as demonstrated by the attached data, SABIC's Burkville and Mt. Vernon facilities can achieve the ECEL and EPA STEL, supporting EPA's primary alternative regulatory action of WCPP. This supports the conclusion that there is no technical basis for EPA's proposed prohibition and that EPA's primary alternative regulatory action should be adopted.

Even if EPA were to identify other facilities within the same condition of use that may not be able to achieve the ECEL, this would not support prohibiting methylene chloride use for all facilities in the current condition of use. If only a sub-set of the current condition of use can achieve the new limits in the Proposed Rule, EPA should consider either a sub-condition of use or applying the WCPP to the entire condition of use, as EPA has proposed for Industrial and Commercial Use as a Process Aid. Proposed Rule at 28,314. Otherwise, EPA would be regulating beyond "the extent necessary so that the chemical substance…no longer presents" an unreasonable risk. 15 U.S.C. §2605.

CONCLUSION

As discussed in more detail above and in the Alliance's comments, prohibiting methylene chloride use in the PC manufacturing process would take away a necessary ingredient for high-performance PC and co-polymer applications to meet global market demands. Doing so will negatively impact product performance and safety, taking critical applications of PC off the market without a readily available alternative, as well as contributing to significant loss of jobs due to the closure of U.S. manufacturing assets. This should not be done lightly, and not in the face of strong evidence that methylene chloride can and has been used safely.

SABIC's PC manufacturing operations can fully comply with the WCPP and safely manage the risk of methylene chloride exposure. As a result, prohibition of use for the Industrial and Commercial Use for Plastic and Rubber Products Manufacturing condition of use is not necessary, at least as to PC manufacturing and as to SABIC's operations. SABIC therefore requests that EPA adopt the primary alternative regulatory action of the WCPP for this condition of use.