

Comments of the
Semiconductor Industry Association (SIA)
on
Regulation of Persistent, Bioaccumulative, and Toxic Chemicals Under TSCA Section 6(h); Phenol,
Isopropylated Phosphate (3:1); Further Compliance Date Extension

EPA-HQ-OPPT-2021-0598-0001

86 Fed. Reg. 59684 (October 28, 2021)

Submitted December 21, 2021

The Semiconductor Industry Association (SIA)¹ submits these comments in response to the proposal by the Environmental Protection Agency (EPA) to extend the compliance date until October 31, 2024 applicable to the processing and distribution in commerce of certain articles containing Phenol, Isopropylated Phosphate (3:1) (“PIP (3:1)”) and to make certain related reporting and recordkeeping changes.

As SIA summarized in its comments filed in May 2021,² the equipment suppliers to the semiconductor industry inform us that PIP (3:1) is used in the complex industrial equipment used in the fabrication of semiconductors. SIA strongly supports the proposed extension of the compliance deadline because it will take several years – perhaps even longer than the proposed extension period – for semiconductor equipment suppliers to work with their complex supply chain to identify the presence of PIP (3:1) in components, determine options for substitution, qualify alternatives, and implement these changes throughout their supply chain.

SIA supports the comments submitted by the association of the semiconductor equipment and materials industry, SEMI. In particular with regard to PIP (3:1), SIA agrees on the following:

- EPA should exclude semiconductor manufacturing and related equipment (SMRE) from the scope of the PIP (3:1) rule.
- EPA should incorporate an exclusion for replacement parts in SMRE in the PIP (3:1) rule.
- EPA should adopt a threshold limit of 0.1% for the presence of PIP (3:1) in articles.

Background on Semiconductor Manufacturing and Equipment

Semiconductor manufacturing is a highly complex manufacturing process that occurs at advanced fabrication facilities (“fabs”) employing sophisticated and specialized manufacturing equipment (known in the industry as “tools”). This equipment conducts hundreds of carefully controlled steps to deposit, modify, and remove chemicals – in exactly the right amount, in exactly the right place, at exactly the

¹ SIA is the trade association representing leading U.S. companies engaged in the research, design, and manufacture of semiconductors. Semiconductors are the fundamental enabling technology of modern electronics that has transformed virtually all aspects of our economy, ranging from information technology, telecommunications, health care, transportation, energy, and national defense. The U.S. is the global leader in the semiconductor industry, and continued U.S. leadership in semiconductor technology is essential to America’s continued global economic leadership. More information about SIA and the semiconductor industry is available at www.semiconductors.org.

² <https://www.semiconductors.org/wp-content/uploads/2021/05/PIP-comments-may-17-2021.pdf>.

right time – to a thin, round slice of silicon (known as a “wafer”) to create numerous patterned layers of integrated circuits, typically many thousands of times thinner than that of a human hair. Tools are costly, highly engineered pieces of durable capital equipment comprised of many thousands of components and costing millions of dollars. Each tool can contain tens of thousands of parts, and each of these individual parts are highly engineered articles that may contain countless chemical substances, potentially including PIP (3:1) and other chemical substances. The equipment can require service periodically which can include installation of replacement parts that must conform for years to come to the original components’ design and performance specifications.

One machine used to make the most advanced chips has been described as “the most complicated machine humans have built.”³ The machine costs more than \$150 million and shipping it to customers requires 40 shipping containers, 20 trucks and three Boeing 747s. Large-scale commercial fabs consist of hundreds of individual tools and each of these tools are extremely sophisticated, complex products comprised of tens-of-thousands of individual components supplied in a complex global supply chain of thousands of material and component suppliers.

Importance of Semiconductor Manufacturing in the U.S.

It is imperative that EPA regulations on chemical substances used in the production of semiconductor manufacturing equipment avoids disruption of the fabrication of chips. Doing so would undermine the national goal of increasing domestic semiconductor manufacturing. Semiconductors are a critical part of the U.S. and global economy and a key driver of U.S. national security. The current shortage of semiconductors impacting sectors throughout the economy illustrates the central role of semiconductors in the economy – from automobiles and medical devices to information technology and telecommunications. Given the importance of semiconductor manufacturing, Congress has made it a national priority to incentivize increased semiconductor fabrication in the U.S. As part of the FY2021 defense bill (P.L. 116-283), Congress authorized the “Creating Helpful Incentives to Produce Semiconductors (CHIPS) for America Act” and funding this initiative is supported by national security leaders,⁴ bipartisan governors from around the country,⁵ industry and labor groups,⁶ and others.

Given the critical importance of semiconductor manufacturing and the Administration’s and Congress’ efforts to increase fab capacity in the U.S., it is critical the equipment suppliers to the semiconductor industry are given sufficient time to undertake this difficult and time-consuming process in an orderly way to avoid any disruption in providing advanced semiconductor manufacturing equipment.

SIA Comments on Specific Issues in the Proposal

1. Need for Equipment Suppliers to Have Additional Time to Address PIP (3:1) Regulations

SIA supports EPA’s proposed extension of time for suppliers of semiconductor manufacturing equipment to address regulations governing the presence of PIP (3:1) in semiconductor manufacturing equipment. The process of phasing out PIP (3:1) in semiconductor manufacturing equipment will require a significant effort over a period of multiple years because of the complex and global nature of the supply chain and the thousands of individual components making up these complex machines. This process will require, at a high level, the following steps:

³ <https://www.nytimes.com/2021/07/04/technology/tech-cold-war-chips.html?searchResultPosition=2>

⁴ <https://www.semiconductors.org/wp-content/uploads/2021/04/2021.04.13-National-Security-Letter.pdf>

⁵ <https://www.semiconductors.org/bipartisan-governors-urge-chips-funding/>

⁶ <https://www.semiconductors.org/wp-content/uploads/2021/07/CHIPS-coalition-letter-july-22-2021-FINAL.pdf>

- Determining where PIP (3:1) is present in each of the thousands of components in a fab tool;
- Evaluating whether it is feasible to phase out the use of PIP (3:1) in each component;
- Identifying potential substitutes to PIP (3:1) in each component part;
- Qualifying these substitutes and ensuring they maintain product performance and quality;
- Implementing the use of replacements for PIP (3:1) in each of these components.

SIA appreciates EPA's recognition of the complexity of this challenge and the recognition of the unique factors that warrant providing semiconductor equipment producers with additional time to phase-out PIP (3:1). First, as noted in the proposal, semiconductor manufacturing equipment is unlike other products containing PIP (3:1) in that it is comprised of numerous specialized components distributed in small quantities industrial users, unlike consumer products that are sold in high volumes to the general public. See 86 Fed. Reg. at 59688. Second, EPA acknowledges the limits on the ability of suppliers to obtain material composition data from across their supply chain is limited due to three factors: "(1) The length and complexity of the supply chain; (2) the preponderance of suppliers located outside of the U.S.; and (3) the tens of thousands of parts incorporated into each article eventually manufactured or distributed in commerce within the U.S." *Id* at 59689.

2. EPA Should Provide an Exemption for Semiconductor Manufacturing Equipment and Replacement Parts

SIA requests EPA provide an exemption for semiconductor manufacturing equipment similar to those EPA provided for the aerospace and automotive industries. Many of the same factors that led EPA to provide an exemption for the aerospace and automotive industries – such as the challenges of identifying and implementing appropriate substitute materials in supply chains, the complexity of the components, and the complexity of the supply chains – apply to the suppliers of semiconductor manufacturing equipment. For these same reasons, EPA should provide scope exclusions for semiconductor manufacturing and related equipment. Moreover, Congress anticipated the need to provide for such exemptions, which it specifically authorized when it amended Section 6 of TSCA.

In addition, EPA should provide an exemption for replacement parts in semiconductor manufacturing equipment. As noted above, semiconductor manufacturing equipment are expensive, complex products designed to last for decades. To keep these machines operational over their useful life, suppliers must provide replacement parts and maintenance. EPA has already provided exclusions for replacement parts for motor and aerospace vehicles, and EPA should provide a similar exemption for replacement parts in semiconductor manufacturing equipment. Likewise, the 2016 amendments to Section 6 of TSCA specifically require EPA to consider specifically the need to exempt replacement parts for complex durable good and equipment.

3. EPA Should Provide a Threshold for PIP (3:1) in SMRE

EPA to adopt a 0.1% threshold for PIP (3:1) in articles such as SMRE. The inclusion of a clear threshold level for PIP (3:1) in SMRE would facilitate compliance throughout the supply chain by providing a reasonable detection level. We note a threshold of 0.1% is consistent with the threshold levels set in other global regulatory contexts, such as the European RoHS directive.

Conclusion

SIA is committed to working with our equipment suppliers to drive replacements where feasible for PIP in semiconductor manufacturing equipment. Our equipment suppliers indicate to us that additional time is needed for this process and we support EPA's extension of the compliance deadline. SIA supports the comments of the association of the semiconductor equipment industry, SEMI, and SIA urges EPA to (1) exclude SMRE from the scope of the PIP (3:1) rule, (2) incorporate an exclusion for SMRE replacement parts in the PIP (3:1) rule, and (3) adopt a threshold limit of 0.1% for the presence of PIP (3:1) in articles.