



Vycom's Flametec® Cleanroom PVC-C chosen to fit stringent needs of wet-chemical processing

When Apex Industries, a plastics engineering, machining, fabrication and integration company, needed a material to meet the design and safety needs of their customer ClassOne Technology, they selected Flametec® Cleanroom PVC-C by Vycom. Apex provides the machine parts and welded housings used in ClassOne's flagship product, the Solstice® technology platform. Solstice is used for the wet-chemical processing of semiconductor substrates, a process that undergoes extreme conditions and harsh, corrosive chemicals.

Flametec Cleanroom PVC-C is ANSI FM-4910 compliant, a designation given to a material that passes the Factory Mutual test for fire propagation and smoke damage. Contamination from smoke particulates and toxicity can endanger employees as well as damage factory facilities, sensitive chip products and equipment. Flametec Cleanroom PVC-C also meets UL-94 5VA and is RoHS and REACH compliant.

"Apex uses Flametec Cleanroom PVC-C because it meets fire-safe compliance standards, is chemical and moisture-resistant, machinable, easy to fabricate and stands up to punishing environments," said Jason Shostrand, sales and business development manager, Apex. "This allows us to design and manufacture solutions that serve a multitude of semiconductor wet process tools used for cleaning, etching, plating and chemical and fluid distribution applications."

ClassOne's Solstice performs not only the wet chemical processing steps that prepare wafers for plating, but also the electroplating itself, as well as the post-plating wet chemical process steps. It does so using ultra-high purity and often haz-

ardous chemistries with full automation. Solstice features the precision controls needed for these processes, as well as the safety systems necessary to manufacture high-tech semiconductor devices used for applications such as wireless communications, mobile phones, LEDs, PCs and tablets.

According to Shostrand, "Just as important as the design and manufacturing of these wet processing systems are the PVC materials that go into them — with their own set of performance

properties that improve the end result and provide processing benefits to the OEM or end-user chip fabricator."

Flametec Cleanroom PVC-C is used to wrap and build many facets of the ClassOne Solstice plating systems, most notably, the housing. The material is also used in many components in the CopperMax™ chamber itself to ensure the bath remains clean and bath life is extended.

"Materials are of critical importance to

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Application Showcase

ClassOne and its customers in the semiconductor industry," agreed Kevin Witt, president of ClassOne. "As our flagship product, the Solstice is sold to deliver precision results across a range of demanding technologies. This means that each component and sub-assembly is scrutinized in terms of performance and cost to ensure that it is compatible and capable of getting the job done."

In addition to complying with materials standards such as FM4910, "Materials must also be workable in manufacturing so that welding and machining processes are possible and result in a safe and aesthetically pleasing part. The materials must also be suitable for the environment and chemical exposure expected during the wet-chemical process. PVC-C is an inherently clean material, resistant to bacteria, very low-maintenance and easy to clean. It also is abrasion resistant, reducing particles created from internal components rubbing together, which can lead to contamination of the wafer bath as well as the reverse — corrosion or contamination of tool components from the chemicals," explained Josh Powell, fabrication and machine shop manager for Apex. "These properties are particularly beneficial during chemically harsh wet processing applications."

To produce the parts and weldment housing for ClassOne, the Apex staff cuts the Flametec Cleanroom PVC-C on a CNC router with edges cleaned up. Pieces are joined by either glue or stainless-steel fasteners. For the panel and window components, for example, a counter-borer is drilled and a threaded insert installed. There is also some automation used to complete the fabrication. Welding is also critical to the creation of the Solstice housing, to prevent leaks that can damage product and to maintain strength and integrity from vibrations during shipping. Apex uses AWS standards for calibrating hot gas welding rods to ensure the correct parameters for air flow and temperature. "Leaks are very detrimental for processing systems because they can be hard to access and cause production delays," said Powell. He said Apex performs full-scale leak and assembly tests. "The welded part of the material becomes almost as strong as the material itself, unless it's in a spot where there's not much surface area or is bonding a thicker to thinner material."

Flametec Cleanroom PVC-C by Vycom is machinable and easy to fabricate, allowing Apex to meet tight design specifications of clients such as ClassOne. The material's fire-safe compliance

standards, chemical and moisture-resistance and ability to withstand punishing environments ultimately benefit end users such as the advanced semiconductor manufacturers who rely on the Solstice for quality electroplating processes. www.vycomplastics.com.

Durable polycarbonate sheet makes for a safer learning environment

When Sister Thea Bowman Catholic School in East St. Louis, IL, USA, was vandalized in 2015, the damage included several broken glass windows. School officials were reluctant to replace the boarded-up windows with glass glazing, fearing the windows would once again be an easy target for destruction. In search of a high security window system that would protect against forced entry, Sister Thea Bowman Catholic School reached out to Winco Window Company, a supplier of architectural and heavy commercial aluminum windows.

Understanding the need for a more durable material than the glass previously used, Winco collaborated with Covestro LLC to find the ideal product for use in its Versatile™ window system. Featuring high impact resistance, Makrolon® 15 polycarbonate sheet proved to be the top choice for this secure glazing solution.

"School security has traditionally been a key application for Makrolon polycarbonate sheets," said Tom Niziolek, architectural segment manager, polycarbonate sheet, Covestro LLC. "In the case of Sister Thea Bowman Catholic School, there was a direct need to use durable Makrolon 15 to help eliminate the future threat and cost of vandalism."

Makrolon 15 polycarbonate sheet features high impact resistance and is virtually unbreakable, making it a superior choice when compared to metal screens and shutters. Designed using advanced manufacturing technology, this material features high optical quality with minimal distortion in clear and standard glazing tints. All of these benefits enable Sister Thea Bowman Catholic School to provide students with a safer school without changing the learning environment.

"We've had past success with Makrolon 15 polycarbonate sheet in our Versatile window platform," said Kurtis Suellentrop, technical sales manager, Winco Window Company. "With high impact strength, abrasion resistance and long-term durability, we knew this grade of polycarbonate sheet would be the perfect replacement material for the vandalized windows at Sister Thea Bowman Catholic School." www.sheets.covestro.com.



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