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Stack Metallurgical Launches Production Of New HIP Process Installed by Quintus

Stack Metallurgical Group, Portland, OR, has entered the hot isostatic press (HIP) market with the installation of a QIH 286 “Mega-HIP” manufactured by Quintus Technologies, Västerås, Sweden. Earlier this year Stack turned the key on the Quintus HIP, which was installed at the company’s new 25,000 sq. ft. facility in Albany, OR. In addition, there are plans for the installation of a second HIP unit in the fourth quarter, also at the Albany plant.

Doug Puerta, chief executive officer, and Craig Beaumier, vice president, sales and marketing, said Stack’s HIP is designed for processing aerospace and defense parts, additive manufacturing components, medical implants, and parts for power generation made of titanium, nickel-based super alloys, steels, and aluminum alloys. Puerta, in a company press release, explained that the burgeoning additive manufacturing environment played a large role in Stack’s decision to expand its HIP portfolio. “We see opportunities not only in traditional markets such as castings, but also in emerging markets, with additive manufacturing being the most notable,” he said.

Stack executives, citing



proprietary non-disclosure agreements with customers, declined to elaborate on its internal business strategy behind the HIP investment. However, it is known that this region of the Pacific Northwest is a hub for titanium casting operations in need of HIP services.

The HIP installed by Quintus is equipped with proprietary uniform rapid cooling and features a large-capacity work zone of 63 inches (1,600 mm) in diameter and 102 inches (2,591 mm) in height, allowing densification of large batches at 29,000 psi (2,000 bar) and a maximum operating temperature of 2280°F (1,250°C).

HIP is a proven technology for heat treatment consolidation of

powder and removal of porosity from metal castings. Stack officials said common applications for hot isostatic pressing include defect healing of castings, consolidation of powder metal, and diffusion bonding. “HIP can achieve 100 percent of maximum theoretical density, as well as improve the fatigue properties of critical, high performance parts, such as aerospace components. Our HIP capabilities combine HIP and heat treatment of special alloys, which avoids re-heating of the material. This enables tailored heat treatment cycles under pressure for superior quality and optimal material properties.”

Beaumier said hot isostatic pressing involves the application



of an extremely high pressure at approximately 85 percent of the melting point of a metal, which allows the material to plastically flow. The pressure and temperature are sustained for a predefined time with the purpose to eliminate internal voids and defects in components or to consolidate powder to solid objects. The pressure and heat are applied uniformly to the components

via an inert gas, normally argon. A hot isostatic press consists of a cylindrical pressure vessel with high-temperature heating elements inside and different subsystems to support the process.

A privately held company founded in 1946, Stack has installations in Albany, Portland, OR, Spokane, WA, and Salt Lake City. Aerospace, power generation,

heavy industry, medical implants and precision cutlery are the primary business sectors served by Stack, which has an overall head count over 110 employees. In addition to its HIP capabilities, Stack's metal processing operations include a portfolio of heat treating services, chemical processing, ion nitriding, vacuum carburizing, aluminum anodizing, and penetrant inspection. ■