The annual listing of 10 companies that are at the forefront of providing Additive Manufacturing solutions and transforming businesses.
Concurrent Technologies Corporation
A ONE-STOP ADDITIVE MANUFACTURING
SOLUTIONS PROVIDER

For manufacturing companies today, the prospect of lower production cost, greater flexibility, and customization have created an increase in demand for Additive Manufacturing (AM). Despite the progress, the AM industry still faces significant challenges such as financial considerations, certification, lack of skilled staff, and consumer awareness. One prominent reason for this is the tendency to view design for AM through the lens of traditional manufacturing. Since the requirements for each design is vastly different, applying only traditional design approaches to additive manufacturing can lead to further inefficiencies during the production and post-processing stages. For instance, support structures are used to prevent issues like distortion and collapse within a part. However, to reduce printing and post-processing time and costs, as well as the amount of material used, the volume of support structures should be minimized when designing for AM. Concurrent Technologies Corporation (CTC) is applying its 30-year history in the metal processing field to be a full-service provider for Metal Additive Manufacturing/3D Printing solutions. The company offers a comprehensive suite of AM processes to manufacture intricate metal parts and the ability to repair worn or damaged high-cost components. “We’re a full-service provider offering everything as a sort of one-stop-shop versus just making parts and sending the items out the door,” explains Ken Sabo, Senior Director, Manufacturing at CTC.

CTC focuses on three metal AM processes—Laser Powder Bed Fusion, Hybrid Additive Manufacturing, and High-Pressure Cold Spray. To help clients create customized, high-quality metal parts, CTC is equipped with the SLM 280HL 3D printer. The SLM 280HL is an all-in-one selective laser melting machine with a build envelope of 280 x 280 x 350 mm and is capable of creating metal parts of various alloys of aluminum, titanium, stainless steel, cobalt-chromium, and others. In addition, the equipment is utilized for prototyping and small-scale production runs. For Hybrid Additive Manufacturing, CTC uses a patented series of deposition heads and the
Manufacturing at CTC.

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associated docking station called ‘AMBIT multi-task system’ developed by Hybrid Manufacturing Technologies. It utilizes a combination of a laser as the energy source and deposited metal powder to build up material onto the desired substrate. This helps CTC experts to employ a cladding process to build new geometry before switching to a milling operation to finish the part. In a single setup, cladding, machining, and inspection can be automated with this equipment. CTC offers either the Hybrid system or a High-Pressure Cold Spray system as a cost-effective means for application of metal alloys and blends to create new parts or repair damaged or worn military aircraft, vehicle, and submarine components and surfaces. The company utilizes a VRC Metal Systems Gen 3 Max Cold Spray system, which uses three 15kW heaters mounted within a single mobile unit. The Gen 3 Max allows easy mobility for production, repair, or in-the-field applications and can be manually or robotically operated. Furthermore, the Cold Spray system enables 80 percent deposition efficiency, with bond and coatings strengths greater than 10 and 40 ksi, respectively, with no real limit on deposition thickness.

What differentiates CTC from other companies in the market is the company’s in-depth expertise in the field of metallurgy and three decades of experience in bringing technical success to the Office of Naval Research (ONR), Navy Metalworking Center (NMC), and the Navy Manufacturing Technology (ManTech) Program. The company provides all of its AM solutions in-house and also offers services to evaluate, validate, and qualify any metal part through mechanical and physical property characterization in its laboratory and high-bay demonstration space. To illustrate the effectiveness of CTC’s solutions, Michael Tims, Advisor Engineer, cites a case study, where the company was tasked with redesigning a system used for weld repair of large-diameter pipes on Navy vessels. In the original design, components before and after the region to be weld repaired were too large and physically could not fit through the elbows. CTC redesigned the system from the ground up as an additive part that was far narrower in width, allowing it to fit around the elbows. “Frankly, our design allowed the client to repair pipes that were not repairable by any means like that in the past,” proclaims Tims.

While AM had been a complement to conventional manufacturing processes, primarily utilized for low-volume part production, AM is now increasingly becoming a critical part of the production process. This is attributed to advancements in the field, such as high building speeds, enhanced reliability for quality, and increased precision in a great variety of applications. In the future, together with its strategic partners, CTC aims to continue leveraging the latest research, development, test, and evaluation in the field of AM to provide transformative and full lifecycle solutions. “We work with our customers throughout the entire process; from the beginning stages of design all the way to the end product,” concludes Sabo.