Personal Protective Equipment

Trends in Metalworking

Brought To You by MCR Safety | Aug 08, 2018

There are ***517,000 metalworkers*** working in the Fabricated Metal Product Manufacturing industry. These workers, along with anyone who has ever studied metalworking history, know that technology is always changing.

With everyone living in a fast-paced world, staying on top of the latest metalworking industry trends becomes a challenge. Seeing the latest trends in person or getting your hands on the hottest new metalworking tool is ideal. However, daily life and work kicks in, and within a flash an entire industry changes before your eyes.

MCR Safety has simplified your life some by taking the time to break down the latest metalworking trends. For each trend listed below, click on the link for additional information on that specific trend.

In regards to seeing and simplifying your PPE knowledge for Metalworking, MCR Safety has got you covered. Their dedicated Metal Fabrication industry page breaks down the hazards faced where gloves, glasses, and garments are required.

Additive technology

3D printing has come a long way. It's no longer just a quick method for assembling plastic mock-ups, but it is being used in everything from ***aircraft engines*** to ***prosthetic limbs***. It is estimated that additive manufacturing will be an ***$8.7 billion industry by 2020***.

Advanced Robotics and Machine Intelligence

Unlike the single-task robots of the past, today's advanced robots are able to do a degree of problem-solving and respond to a wider variety of environmental conditions. They are able to make use of improved sensors, as well as communicate with other devices. In addition, they are more flexible and better suited to a rapidly changing manufacturing industry. Rather than being an investment that ties a business down to a single process, they empower the business to adopt emerging best practices and generate new knowledge about optimal manufacturing processes in-house.

Big Data in Manufacturing

With a wide variety of sensors now available that are small, accurate, and cheap, the amount of data available within manufacturing is nearly limitless. Speed, temperature, pressure, efficiency, accuracy … all of these can be measured continuously. Additionally, ***big data*** can go on to encompass things like supply chain issues, consumer demand, and the cost of fuel, utilities, labor, and raw materials. An entire industry has sprung up around the analysis of large amounts of data, with both new technologies and human experts becoming critical parts of the workplace.

Binder Jetting

Similar in process to material jetting, binder jetting involves dispensing droplets of a binding agent onto powder. Since the resulting structure is fairly brittle, it is best used for things like architectural models and not finished products.

Directed Energy Deposition

Metal filaments are melted using a laser, electron beam, or plasma arc in DED manufacturing. Since the metal can be deposited along four or five axes, it is ideally suited to making repairs.

Material Extrusion

This is what most people tend to think of when they hear "3D printing." A thermoplastic filament is heated while extruded, and then cools after it has been laid down. Quick and cheap but with some structural issues, material extrusion is best for prototypes that aren't expected to hold up to use. It is also an ideal process for practicing additive manufacturing in educational settings, since the materials are inexpensive and readily available.

Material Jetting

Material jetting uses drop-on-demand technology similar to 2D printers. Droplets of photopolymer are dispensed, then cured through exposure to UV light. Then the next layer is added. Simultaneously, another set of nozzles produces the waxy support materials. Once the structure is complete, the supports are dissolved. Since material jetting can include multiple colors, it's excellent for detailed models and prototypes.

Power Bed Fusion

In powder bed fusion technology, each layer is laid out in metal powder, which is then melted by a laser, electron beam or heat source. As the metal cools, it fuses to the layer underneath. This is also a common additive method, and useful for a wide variety of manufacturing applications.

Sheet Lamination

Sheet lamination is unusual in that it starts with solid layers of material which are sandwiched between layers of adhesive. Because melting isn't necessary, a wide variety of materials can be used, including metal, wood, or paper. Multiple material types can also be used within the same structure. It is best for non-functional models.

Smart Manufacturing Technology

Smart manufacturing involves the intersection of big data analytics, robotics and technology integration. When these two come together and are fully integrated using the internet, ***you get smart manufacturing***. This is when you get a machine that turns itself off and announces what part needs to be replaced and how before it causes any damage. You get facilities that adjust their pace depending

on demand projections based on the last decade worth of data. You have schedules that adjust themselves based on optimal energy use. This is what smart manufacturing looks like, and it will continue to evolve as long as the technology does.

Vat Photopolymerization

Vat photopolymerization starts with a liquid photopolymer resin rather than a powder. Variations of vat photopolymerization include stereolithography, direct light processing, and continuous direct light processing. This process is ideal for medical devices, jewelry, and other industries in which fine levels of detail are needed.

Trends shift, but one thing does not: safety comes first.

Metalworking technology advancements are always changing and improving operational efficiencies! We have come a long way from the days when mankind first learned to hammer metals into simple objects.

There is one thing that never changes and must never be forgotten—human beings play an important part in the metalworking process. From the metal material handling, to the industrial mechanics working on machines, injuries will always be a concern.

To see all the PPE options offered by MSC from MCR Safety, please click the link to be directed to their brand landing page on ***MSCDirect.com.***

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