MEA MAGAZINE

DEPARTMENT OF MECHANICAL ENGINEERING

SRI VENKATESWARA COLLEGE OF ENGINEERING

VOLUME-2 ISSUE-2 JAN-JUNE 2018

SMART HELMETS

Inside This Issue

DAQRI, a Los Angeles-based enterprise augmented reality company, has developed a smart helmet designed to reduce operational complexity, increase productivity, and improve work life in an industrial workplace. DAQRI's smart helmet is an Industrial Internet of Things (IoT) device that increases the connectivity between people, data, and machines. It enables operating engineers to overlay maps, schematics and thermal images to see through walls, pipes, and other solid objects. The helmet can also provide an immense amount of data back to the industrial big data servers, specifically, things like photographs, videos, thermal and environmental noise monitoring, and 3D mapping.

Such helmets can be used in extremely loud environments like a steel plant where transferring information through walky-talkies is precluded. "The analysis showed that by eliminating trips back to the control room, the plant would be able to increase overall productivity by around 40% and reduce factory downtime by 50%," estimates Mullins , founder and CEO of DAQRI.

We have already mentioned Skully and Bike Hud in our previous articles. For more information please read our article Motorcycle Season Starts.

Babaali is a company known for developing smart helmets. They integrated Bluetooth optical heart rate collector into the helmet for tracking your heart rate. The helmet is connected to an app that shows you your heart rate statistics. Another cool product from the same company is called Smart Construction Helmet. Smart Construction HelmetIt measures your heart rate, speed, temperature, oxygen, VOC and pressure. For more information about the other selection of helmets please visit their website.

Daqri Smart Helmet is tailored to the person´s field of work and the industry he is working in. It helps laborers work free hands because all machine information and instructions are displayed on the visor. The prices of these helmets are higher and will be mainly sold to corporations and not to individuals.

By

G. Vamsi Krishna
14BF1A0320– IV-ME

P. Nikhila

14BF1A0358-IV-ME

WELDING PROCESS TO JOIN HIGH STRENGTH METALS

Ohio State University materials science professor Glenn Daehn and his team have devised a solution that joins the new materials without melting.

Their system is called vaporized foil actuator welding (VFA), and works using a high-voltage capacitor bank to produce a very short electrical pulse within a thin piece of aluminium foil. The foil vaporizes within microseconds and the resulting hot gas pushes pieces of metal together at very high speed, joining them without melting. The bond is produced by impact so there is not a seam of weakened metal that is the result of melting.

"One of the biggest potential applications is in auto body construction," Daehn says.

The low-alloy high-strength steels represent the bulk of the remaining steels in the AISI designation system. These steels are welded with E-80XX, E-90XX, and E-100XX class of covered welding electrodes. It is also for these types of steels that the suffix to the electrode classification number is used. This article gives you information about welding of low-carbon steels and low-alloy steels, welding of medium-carbon steels, welding high-carbon steels, welding low-nickel chrome steels, welding low-manganese steels, welding low-alloy chromium steels.

Almost 85% of the metal produced and used is steel. The term steel encompasses many types of metals made principally of iron. Steel is an alloy of iron and carbon, but steels most often contain other metals such as manganese, chromium, nickel, etc., and non-metals such as carbon, silicon, phosphorus, sulphur, and others.

There are so many different types and kinds of steels that it is sometimes confusing just to be able to identify the steel that is being used. For example, there are structural steels, cast steels, stainless steels, tool steels, hot rolled steel, reinforcing, steel, low alloy high strength steel, etc. Steels are sometimes given names based on their principal alloy such as carbon steel, chrome-manganese steel, chrome-molybdenum steel, etc.

Low-Carbon Steels and Low-alloy Steels

Low-carbon steels include those in the AISI series C-1008 to C-1025. Carbon ranges from 0.10 to 0.25%, manganese ranges from 0.25 to 1.5%, phosphorous is 0.4% maximum, and sulfur is 0.5% maximum. Steels in this range are most widely used for industrial fabrication and construction. These steels can be easily welded with any of the arc, gas, and resistance welding processes.

When welding the low-alloy high-strength steels, the operating characteristics of the electrode are not considered since the E-80XX and higher-strength electrodes are all of the low-hydrogen type. There is one exception, which is the E-XX10 class. These are shown in the AWS specification for low-alloy steel-covered arc welding electrodes, AWS 5.5. This specification is more complex than the one for mild steel electrodes, even though there are only two basic classes in each strength level. The lower strength level includes the E-8010, E-XX15, E-XX16, and the more popular E-XX18 classes.Improved weldability is an additional objective and this is achieved by reducing the hardenability of the steel, the carbon content of some steels being lower than 0.05%C, and reducing undesirable elements such as sulphur and phosphorous to as low a level as possible.

By

M. Raj kumar

16BF5A0317

III-ME

ROBOTIC SELF STARTERS

Machine-intelligence startup Osaro of San Francisco aims to slash the time and skill needed to train industrial robots. Manufacturers will use the in-house-developed operating system to teach robots how to take their own actions toward human-set goals. In other words, industrial robots learn from their human mentors, then keep learning on their own from the software's algorithms.

"The company plans to offer machine learning for industrial robots, which will allow manufacturers to perform more nimbly by reducing the time they spend training robots", says Derik Pridmore, Osaro's president.

This type of machine learning is particularly useful in environments that change over time, such as a manufacturing plant, Pridmore adds.

The company's artificial intelligence operating system takes a deep learning approach that involves feeding the program large quantities of data to train it to make inferences based on new data. The system further blends deep learning with reinforcement learning, that is, teaching machines how to carry out certain functions through trial and error, Pridmore says.

Deep learning and deep reinforcement learning are two techniques that fall under the broad heading of machine learning, which is allowing algorithms to learn from data

Don't Count the days. Make the days count - ***Muhammed Ali***

By

C. Ramya-

16BF1A0321-II-ME

V.V.S.Hasini

16BF1A03A2-II-ME