AFS Casting of the Year

Top honors in the annual American Foundry Society (AFS) Casting of the Year competition went to Dotson Iron Castings, Mankato, Minn., for its ductile iron alternator/air conditioning bracket. The 2010 Casting of the Year supports and attaches the 12 lb (5 kg) high-output alternator and the 14 lb (6 kg) air conditioning compressor on the engine of John Deere skid loaders. The casting, which replaced an 11 piece weldment requiring eight setups, weighs 10.7 lb, measures 15 × 6 × 5 in., and was cast via horizontally-parted green sand molding. The conversion saved 48% of the cost of the welded assembly.

www.dotson.com/PDFs/Success%20Story%20Deere%202010.pdf.

Electrospark deposition holds promise as welding technology

Electrospark deposition (ESD) is being developed as a welding technology by Edison Welding Institute, Columbus, Ohio. ESD produces metal transfer through rapid discharges of electrical current.

ESD requires a capacitor-based power supply and a torch with a rotating electrode. The capacitors are repeatedly fired through a timer circuit at frequencies up to 1 kHz. Individual discharges typically have rise times of 10 to 20 μs, and peak currents of 200 to 500 A. The individual discharges result in the transfer of small volumes of metal from electrode to substrate. A single ESD pass typically results in a coating having a thickness of 1 to 5 μm.

The process is suitable for both coating and repair applications. Coatings can be of similar or dissimilar materials, and alloyed coatings can be produced by various shielding gas configurations. Repair applications typically focus on surface discontinuities in high-value-added parts; most commonly, nickel-base superalloy components.

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U.S. Steel upgrades sheet-producing facilities

United States Steel Corp., Pittsburgh, has been working over the past several years to upgrade the facilities at all four of its sheet-producing plants. Among the upgrades reported by the company:

- Improving steelmaking facilities to make more specialized steel chemistries
- Upgrading the hot strip mill at the Gary Works (Indiana) to provide enhanced thickness control
- Upgrading cold mills at both Mon Valley Works (Pennsylvania) and Gary Works to provide enhanced product uniformity
- Installing new hot-dip coating lines at both the Fairfield Works (Alabama) and at Pro-Tec Coating Co. (USS-Kobe Steel Ltd. joint venture, Ohio)
- Installing specialized equipment to apply surface coatings such as roll-applied prephosphate films and clear, acrylic polymer coatings over Galvalume 55Al-Zn coated steel sheet and galvanized sheet for applications that require distinctly defined surface properties.

Sheet product information on the USS website has been organized into sections for hot rolled, cold rolled, and coated sheet products. The primary focus is product information, but a considerable amount of processing information also has been included, as well as a glossary and metric conversion guide.