



Surface Alloying of Mild Steels During Casting OTT ID # 1585

APPLICATIONS

Water, Wastewater Treatments, Surface Alloying, Gravity Sand Casting, Corrosion Resistance, Wear Resistance, and Surface Modifications.

TARGET PROBLEMS

- Current techniques used to coat mild steel components are messy and can release harmful chemicals into water.
- These techniques are difficult and not applicable for applying coating on large hollow and complex geometries.

KEY FEATURES

- **Low cost** – Low cost approach with enhanced surface properties.
- **Versatile** – No size or shape limitations.
- **Single Step Process**- Straight forward coating process that can be done during the casting process itself.
- **Precise** – Thickness control in the range of 200-400 microns by controlling the powder quantity in the slurry.

TECHNOLOGY

Inventors at University of Wisconsin, Milwaukee (UWM) have developed an alternative approach of surface alloying that enhances surface properties of the components during the casting process itself. This in-situ technique allows addition of metal alloying powders and their combinations to the surface of low cost mild steel during the sandcasting process under laboratory and full scale industrial casting.

Steels of selected grades are in high demand for applications in the water and wastewater industry. Plain carbon, WCB grade steel castings are utilized for components like valves, fittings, flanges, and pump casings. Wear and corrosion of metal components, especially mild steel components, used in the water industry is a growing concern and can lead to tremendous loss of components as well as water. Although alloying of mild steel is a viable solution for corrosion resistance, it is very expensive when the entire cross-section is alloyed, increasing the overall cost of the system. Coatings on mild steel components to reduce corrosion are cheaper, but there are issues such as low durability, possibility of release of toxic chemicals from coatings into water, and the difficulty of applying coating on large hollow and complex geometries.

INTELLECTUAL PROPERTY

Patent Pending – U.S Utility

ABOUT THE INVENTOR(S)

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