

ESAB Welder

Switch to plastic housing and internals cuts cost; multiplies welder service life in corrosive environments

Thermoforming of a proprietary thermoplastic coating of steel drastically reduces corrosion of ESAB Welder in shipyard/salt air while cutting fabrication and material costs by 40 percent.

Electric welders require thorough insulation of internals to avoid shocking the operator—and it was as an insulating material that ESAB North America in Florence, SC first evaluated KYDEX® thermoplastic sheet for use in its welding machines. The company—largest welding equipment maker in the world—quickly discovered additional uses for the material.

“I originally suggested KYDEX® sheet to ESAB for use as an insulator material inside their welder to avoid use of metal brackets to hold capacitors,” points out Joel Futrell, Manager of Commercial Plastics, Inc. in Columbia, SC, ESAB’s plastics consultant.

“They made the original brackets from several pieces of metal and then insulated them with NOMEX®,” Futrell goes on. “By thermoforming the brackets from KYDEX® T, ESAB could use just one, lower-cost part, had no assembly costs and eliminated the need for a separate, expensive insulating material. KYDEX® T has an impact resistance of 801 J/m (15 ft./lbs./in) and excellent rigidity. I particularly suggested KYDEX® T because the material also passes the UL flammability standard 94 V-O^{3/4} another requirement for these welders,” he noted. “It’s also easy to work with and can be thermoformed, brake formed or punch pressed,” he adds.

But, while working with ESAB, Futrell noticed that they were also experiencing another problem. Metal housings on their units would begin to rust, peel and look bad in as little as 4 to 6 months of exposure to the corrosive salt air of shipyards and offshore drilling platforms where they are used. Futrell knew that the KYDEX thermoplastic alloy was more resistant to a wider range of chemicals than any other plastic.

“ESAB Welders had a real tough life on the waterfront,” Futrell continues. “At that point, the housings were steel, which was then powder coated. No one is very careful around a ship-building project or oil rig, so the welders got plenty of bangs and dents and rough handling – and they were out in the weather all the time. The rough handling would open cracks in the coating, I suppose. Then the salt air did the rest. In a few months these units could be a sorry sight indeed.



ESAB electrical welders used in shipyards, on oil rigs and at construction sites are subjected to corrosive salt air and rough handling. To withstand these environments ESAB switched from powder coated metal housings to colour-matched, thermoformed, KYDEX sheet

KYDEX, LLC

ISO 9001 and 14001 Certified

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Setting the Specs

“We knew our welders needed look better, longer,” confirms ESAB Product Manager Robert Fernicola. But if we were to make a change, we needed to use a material that offered high impact strength, weather resistance and durability at a reasonable cost.

With an impact rating of 961 J/m at 23°C (18 ft/lbs/in at 73°F) as determined by the ASTM D-256 test, KYDEX® 510 sheet demonstrated performance well beyond that of ABS. It has a weatherable cap, and carries a UL Std 94 V-0 flammability rating, and its ability to resist corrosion was a given. With a Rockwell Hardness rating of 94 (ASTM D-785),-- and an impact resistance of 801 J/m (15 ft./lbs./in) -- the panels only reinforced their promise of excellent resistance to abrasion and surface wear as well. In damp marine atmospheres, its low moisture absorption was also important. And, the material has excellent forming properties resulting in uniform wall thicknesses and crisp details. It can be drilled, brake formed, or punch pressed with standard woodworking and metalworking tools.

“Then came the real clincher,” Futrell interjects. “We informed ESAB that KYDEX sheet could be formulated in a color that matched the special ESAB yellow then in use on all products.” That meant that the outside of the welders could be plastic -- and no coating that could degrade or allow corrosion was involved. In turn, this saved the manufacturing time and effort formerly needed for powder coating.

Only one part of the welder’s exterior was left in question - the front operating panel. That is now also KYDEX sheet, in a pecan-shell color and no part of the welder that was formerly exposed to weather and corrosion is now vulnerable. Small wonder that the product line is now designated as “ESAB Weather Guard”

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