



Chicago White Metal Casting

High-Tech Al, Mg, Zn & Zr Die Casting
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Spectra™ Precision designs an "Armored" Al Die Cast Housing

Pipelaying Efficiency Up 35% with SP's Dialgrade® Laser Unit

The most powerful and brightest laser allowed by law was placed in the hands of the pipelaying industry with Spectra Precision's introduction of the Dialgrade, the new "armor-plated" wireless remote unit for trench installation of gravity flow pipe.

Encased in a nearly impenetrable housing, the unit's



Two CWM near-net-shape aluminum die castings were the material-process choice for the advanced unit designed for the most rugged construction applications.



highly visible tight, bright laser beam spot at the end of the pipe being laid provides grade, elevation, and line information at the point of optimum control. New Dialgrade features mean fewer setups and increased accuracy for improved installation quality, pipe seal test results and safety. The net result is a 35% estimated improvement in material costs, rework and installation efficiency.

"Armor-Plated" Enclosure

Dialgrade engineers designed a new durable yet lightweight metal housing to meet the most extreme conditions confronted in rugged construction applications.

While an earlier model, with a plastic injection molded case, performs under ordinary conditions, the new armored metal unit can withstand virtually any random environmental abuse, such as direct dislodged rock hits and slams to pipe walls during unexpected pipe washouts.

The new die cast housing design can stand up to leak-inducing water torrents and the enclosure-crushing impacts of rock falls.

Accurate beam readouts and uninterrupted remote operation of its battery pack is assured with the new units, even when sitting in water.

An extruded aluminum housing was considered for its strength over a plastic molding for extreme-duty use, but extruders would have made many of the housing's design features costly or impossible to execute.

Near-Net-Shape Die Casting

Aluminum die casting allows engineers to realize the same design freedom and cast-in-place features possible with a plastic molded housing, and thus was the material and process choice for the new model.

Cast by Chicago White Metal Casting to near net shape in Aluminum 380, with 30 cored holes, the trimmed enclosure components receive minor post-casting

machining. This consists of cored hole tapping and milling of seal grooves. Specifications call for a critical flatness tolerance of .010 in. (.0025 mm) over a 12 in. (30.5 cm) length.

The two housing sections are nickel chrome electroplated to prevent corrosion from acids, chemicals, salts and other destructive elements frequently found underground. Plating, followed by powder painting for brand identification, also provides a smooth surface that allows for easy cleanup.

Each sealed Dialgrade enclosure, made up of two aluminum die castings, is given final nitrogen pressurization and leak-detection testing to assure that it is 100% waterproof.

Paperless Workflow

The housing design was executed by Dialgrade engineers in SDRC's IDeas 3D solid modeling software. A series of rapid prototype models were generated from the CAD files with modifications made at each iteration. During this process, CWM engineers were consulted for revisions that would enhance final die cast production.

Using the CAD files, CWM conducted die cast flow and thermal analyses to assure optimized metal flow. Paced with a fast-track production schedule, RP Fused Deposition Models were generated by CWM to speed design and construction of the final die casting dies and trim die tooling—and assure accuracy to specifications.

Feedback from users indicates the SP Dialgrade unit is performing as designed, to withstand some of the most severe field conditions a product can endure—and sales are up by 35%.

For more information on Chicago White Metal high-tech Al, Mg, Zn & Zr die casting, contact your CWM Sales-Engineer Representative, the CWM Sales Dept., or visit the CWM website at: www.cwmf.com



FDM prototypes by CWM sped the production process and assured the accuracy of tooling design and construction.