

SPOT+ AL: THE KEY TO SUCCESSFUL ALUMINUM EXTRUSION

Temperature, Temperature and Temperature

It is often said that the three most important factors in producing a high-quality extrusion are temperature, temperature and temperature. The temperature of the billet (sometimes called a log), the temperature of the die and the temperature profile of the extrusion as it quenches (cools) are all important in determining the throughput of the press and the characteristics of the finished product.

These temperatures are not easy to measure using conventional tools such as thermocouples. The billet spends only a brief time between the reheat oven and the press, and its temperature can vary along its length. The extruded product moves continuously and different dies produce a variety of sizes and shapes. Infrared thermometry is ideal for these types of measurement: it has a fast response, it is non-contact and it works well on hot materials. Unfortunately, aluminum has several characteristics which prevent a standard infrared pyrometer from making accurate temperature measurements. Its emissivity is low, varies with temperature and each alloy has a different value. That means it is not possible to correlate the intensity of infrared radiation emitted by the metal with its temperature, as is commonly done with steel, glass and other industrial process.



SPOT+ AL



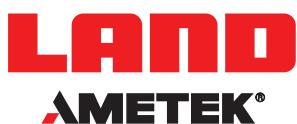
The SPOT+ AL uses measurements at carefully-selected wavelengths combined with proprietary algorithms to determine the temperature of hot aluminum. Each SPOT+ AL has algorithms optimized for measurements of oxidized aluminum billets, freshly-extruded aluminum and cooling aluminum at the quench exit. The algorithms can also be adjusted to match the exact temperature characteristics of a specific alloy, using a one-time comparison with a thermocouple measurement.

The SPOT actuator is especially useful in extrusion applications: it can scan the length of the billet to provide a temperature profile, and it can automatically locate the position of the extrusion at the press exit.

Practical Experience

AMETEK Land has helped many extruders to improve their process control and the quality of their products. Published case studies at Hydro Extrusions and SAPA Profiles are available on the AMTEK Land website. Cristiano Baiano of SAPA Extrusions told us, *“With precision control of extrusion conditions, we have minimal to no temperature variation for each extrusion length or from extrusion to extrusion, resulting in repeatable reliable material production with even metal quality and strength.”*

For more information, refer to www.ametek-land.com/industries/aluminium/extrusionplant



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