

Dramatic Improvement with Molub-Alloy 491 C in Tube Extrusion Process

METALS

HOT METAL TUBE EXTRUSION

Castrol Molub-Alloy® 491 C



THE SITUATION

A leading European manufacturer in Sweden produces seamless tube from stainless steel, nickel alloy, titanium, zirconium and other advanced materials with sizes ranging from 0.5 to 260 mm outside diameter using a hot extrusion process.

The billets are heated to a temperature of 600°C to 800°C. Hot extrusions are done on horizontal hydraulic presses with pressure up to 11,000 metric tons, therefore excellent lubrication is required.

BEFORE

- Graphite in rapeseed oil used to lubricate the mandrel and extrusion cylinder
- Burning during extrusion process created smoke and fumes which were unpleasant to operators and deemed a health hazard
- Applied manually using a brush. This was unpleasant work due to the heat, fumes, and 'dirty' nature of the oil.

AFTER

- All smoke and fumes were eliminated
- The atmosphere in the shop was greatly improved, removing the health issues
- Application of the Molub-Alloy 491 C was found to be much easier and cleaner

THE SOLUTION

- Castrol Molub-Alloy 491 C mixed at a ratio of 50/50 with water was recommended.
- Application method was changed to spray, with portable pressure spray equipment provided.
- Spray application produced an even film on the billet and mandrel.
- The application process was still manual, but now it became possible to automate in the future.

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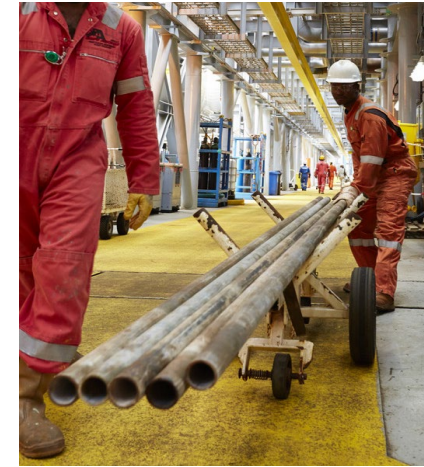
RECOMMENDATIONS

Castrol Molub-Alloy 491 C dry film lubricant is a unique hydrothermal product, specially formulated with solid lubricants for heavy industrial applications where high temperatures prohibit the use of normal lubricants. Extreme temperatures present no problem, as the fluid base is water and therefore non-flammable. Molub-Alloy 491 C is a water based concentrate designed to be diluted to the required ratio for the intended application.

CONCLUSION

After conversion to Castrol Molub-Alloy 491 C, smoke and fumes were completely eliminated.

The safety, environment and housekeeping of the tube extrusion process were dramatically improved.



Spray equipment



Applying Molub-Alloy to mandrel



Extrusion chamber coated with Molub-Alloy

Note: Extrusion forces were found to be slightly higher when using Molub-Alloy 491 C particularly for a very short period at the beginning of the process when the billet engages with the die. This was not seen as a problem as the forces were well within the operating parameters of the extrusion press.