

Mold Oil Lubrication

Question

What is the function of mold oil lubrication in a billet caster? How does it work? Why do we get sticking in the mold when using mold oil? P.C. USA

Answer

Quite simply, mold oil lubrication helps to prevent sticking of the newly formed billet shell in the mold. Near the mold tube meniscus the oil decomposes, pyrolysis, to form a gas cushion, which prevents the strand shell from sticking to the mold walls. Mold lube oil is used in most billet casters rather than powders because of cost and other practical considerations.

The use of a mold powder is precluded in many small section billet casters due to the need to use a submerged entry nozzle (SEN). Bridging of solid steel between the SEN and the mold walls may occur in addition to the added incurred cost by using consumable powder combined with the SEN. Mold lube oil causes a 15 to 20 % higher mold heat transfer rate than powder. When using a tundish to mold sealed gas shroud the oil flow rate can be reduced by a factor of 1/3.

Uniform flow of the mold oil around the top perimeter of the mold should be periodically checked during operations. Sticking of the newly formed billet in the mold can be caused by a lack of oil flow to any part of inside perimeter of the mold tube. Selective reduction of oil flow along the inside perimeter is usually caused by steel splash blocking the oil flow slit.