Negative Strip (1)

Queston

I've always heard the term "negative strip" bandied about in connection with continuous casting. How does one calculate this term and confirm it on a continuous caster? C.K., USA

Answer

Negative strip is a term used to describe the key motion of the mold oscillator on a continuous caster. Negative strip is either the percentage amount or time during which the mean mold speed (v_m) is higher than the casting speed (v_c) during the downward movement of the mold.

Negative Strip (%) =

$$((v_c - v_m) * 100)/v_c$$

Where v_m = (2 * h * n)/1000   (m/min)
      h = stroke   (mm)
      n = frequency   (cpm)

Negative strip percentage is used in connection with continuous casters that use open pour oil lubricated molds. The negative strip percentage can vary from -5% to -80% without any contrary effect to the surface quality.

Negative strip time (s)=

$$(60/(PI * n)) * arcos ((1000 * v_c)/(h * PI * n))$$

The negative strip time for closed pouring system casters may range from 0.08 sec up to 0.15 sec.

A shorter stroke improves the mold-lubricating behavior; makes allowances for small mold/strand misalignments and reduces the overall dynamic load on the oscillator mechanism.

Regular confirmation of negative strip parameters is critical to good surface quality. If possible, an operator should simultaneously measure the stroke of the oscillator on all four mold corners. The frequency is calculated from the rpms of the oscillator motor while the stroke in ideal situations is measured using linear transducers on a continuous basis or by off line measurements during downtime or caster turnarounds.

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