WALKER MAGNETICS

HOT STEEL LIFTING

Handling hot material is a demanding application for a magnet. Steel turns non-magnetic at 1436 degrees F which is called the Curie point, however remains 100% magnetic up to approximately 1300 degrees F.

The performance of a magnet on high temperature application is dependant upon various factors.

These include:

a) The temperature of the material to be lifted.
b) The amount of time that the magnet is in contact with the material vs. the time not in contact with the material.
c) The amount of time in a day that the magnets are in use.
d) The ambient temperature of the area the magnets are in
e) The electrical duty cycle of the magnet.

The major cause of failure of magnets in a hot application is the failure of the electrical insulation of the coil due to advanced thermal aging. Walker uses the highest rated insulation available that is rated at 220 degrees C. This does not mean that the insulation fails immediately when the temperature exceeds 220 degrees C but repeated or extended temperatures in excess of 220 degrees C will lead to insulation failure.

Walker has developed the Heatmaster series of hot material handling magnets to meet the needs of today's steel producers to handle more material at higher temperature with increased efficiency.

The features of the Walker Heatmaster design include:

a) Extended poles to increase the distance of the coil from the hot material.
b) Ventilated magnet case for a convection air flow to dissipate the heat.
c) External cooling fins to increase the thermal heat transfer fromthe magnet case to the surrounding air.
d) Triple bottom plate construction with ventilated air space and space age thermal insulation to limit the radiated heat transfer from the load to the coil.
e) Extra conductor in the coil of the magnet to reduce the internal heat generation of the magnet.

Walker is realistic in it's approach to hot material handling. Even though the Walker Heatmaster Magnets are the best magnets available for high temperature applications, the ultimate success and life of the magnet is still dependant upon the operator of the magnet.

MAXIMUM MAGNET LIFE WILL BE ACHIEVED IF:

a) The operator does not leave the magnets in contact with the hot material when not lifting the load.
b) The operator does not leave the magnets energized on the return trip to get more material.
c) The operator does not leave the magnets suspended over the hot material.
d) The operator does not leave a hot load suspeneded for an extended period of time.

ADDITIONAL SUGGESTIONS TO MAXIMIZE HOT STEEL LIFTING:

HEAT MONITOR- The electrical resistance of a magnet increases as the internal temperature of a magnet increases. This is a mathematical formula. As the resistance increases the current draw of a magnet, measured in amps, decreases. Walker can provide a Magnet Temperature Monitor to be mounted in the crane that would sound a 110 dB horn and warning light when the internal magnet temperature exceeds a predetermined value.

MAGNET ROTATION- The temperature monitoring system will alert the crane operator that the magnets have reached a critical temperature. Continued use of the magnets can cause severe damage to the magnet's insulation. Once alerted it is recommended that the operator take the magnets out of service and replce them with a set of cooled magnets as soon as possible.

OPERATOR TRAINING- Walker Magnetics offers a 1-2 hour training course entitled "Prevention of Premature Magnet Failures". This course enlightens operators, managers, and engineers to the various aspects of magnet operation with emphasis on hot material and duty cycles.

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