TECHNICAL BULLETIN

EHE

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Impeder & Weld Coil Coolant Systems

Many tube mill central coolant systems do not provide adequate cooling for impeders & induction welding coils. Providing an alternative source of filtered coolant at the correct pressure and temperature will greatly increase impeder & coil life, will increase production rates and reduce operating costs.

Cooling requirements

Modern high frequency induction tube welders operate at high power levels & the impeders and coils dissipate large amounts of waste heat which has to be removed by the cooling medium (usually mill coolant). This coolant is frequently contaminated with metal particles & oxide scale, and may be too warm to effectively cool the ferrite in an impeder. In addition, many types of impeders require coolant at a higher pressure than is normally available from the central system.

EHE coolant systems

EHE's impeder & coil coolant system is available in several configurations. The most basic consists of a pressure boost pump & dual filter assembly, with tank and instrumentation. For mills that run Hot Rolled Steel, we recommend the addition of a magnetic pre-filter to remove metallic fines & oxide. This will greatly reduce the frequency of filter cleaning. Refrigerative or evaporative coolant chillers are available in several size ranges as an additional option.

All coolant systems comprise the following items:

Welded & powder coated tank.
Multi stage centrifugal or single stage turbine pump.
Dual 100 micron stainless steel mesh filters & housings.
Two circuit changeover valve allows either filter to be cleaned without shutting downthe system.
Pressure regulating valve & gauge.
Flow indicator and/or flow switch.
Filter "clean/dirty" indicator.
Temperature gauge.

Optional items:

Magnetic pre-cleaner for hot rolled steel.
Refrigerative chiller (12,000 to 60,000 BTU/Hour available)
Evaporative chiller (up to 250,000 BTU/Hour)

Coil cooling considerations

Coils used with older vacuum tube welders operate at high voltages & relatively low currents. These can usually be cooled adequately using available mill coolant.

Solid state welders are low voltage, high current devices which may have several thousand amps circulating through the work coil. Since all this current travels on the surface of the coil due to the high frequency "skin effect", even a heavily constructed copper coil can have a significant amount of resistance. With 5000 amps flowing through a coil, even 1/1000 of an ohm of resistance results in a power loss of 25 kilowatts! This must be removed by circulating coolant through the coil.

The resistance of copper increases with temperature, so the cooler the coil operates, the more efficient it will be. Use of a well designed coolant system, including a chiller in some cases will greatly increase welding efficiency & will extend coil life.

Cost

EHE impeder & coil coolant systems start at prices below US $1800.00.

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