



Technical Information

SUGGESTED HEATING PROCEDURES FOR EXTREME SERVICE CASTABLES

The following schedule is recommended for Resco Products' Extreme Service Castables. Controlled release of water in the castable is necessary to prevent possible build-up of steam pressure and potential steam spalling. Heating can be done before or during unit start-up.

NOTE: For **R-MAX MP** lining thickness of 1" (25mm) or less, see **NOTE #2**

The following schedule is recommended **FOR SINGLE COMPONENT LININGS UP TO 9" THICK.**

1. At anytime following the initial 24 hour curing period, raise the temperature from ambient temperature to 300°F (149°C) at a rate of 50°F (28°C) per hour.
2. Hold at 300°F (149°C) for 1½ hours per inch (25 mm) of lining thickness up to a maximum of 8 hours.
3. Raise temperature at a rate of 50°F (28°C) per hour to operating temperature or 1000°F (540°C), whichever is less.
4. If the operating temperature is above 1000°F (540°C), then heat at a rate of 100°F (56°C) per hour from 1000°F (540°C) to operating temperature if the lining is up to 6" thick (152 mm); heat at a rate of 50°F (28°C) per hour from 1000°F (540°C) to operating temperature if the lining is 6" to 9" thick (152 mm to 229 mm).

If the unit is not going into operation, but will be cooled down, hold at the operating temperature for a minimum period of 1½ hours per inch (25 mm) of lining thickness up to a maximum period of 8 hours.

The following schedule is recommended **FOR SINGLE COMPONENT LININGS OVER 9" THICK.**

1. At anytime following the initial 24 hour curing period, raise the temperature from ambient temperature to 300°F (149°C) at a rate of 50°F (28°C) per hour.
2. Hold at 300°F (149°C) for one hour per inch (25 mm) of lining thickness.
3. Raise temperature at a rate of 50°F (28°C) per hour to 450 °F (232°C).
4. Hold at 450°F (232°C) for one hour per inch (25 mm) of lining thickness.
5. Heat at a rate of 25°F (14°C) per hour to 600°F (315°C).
6. Hold at 600°F (315°C) for one hour per inch of lining thickness.
7. Heat at a rate of 50 °F (28°C) per hour to 1000°F (540°C).
8. Hold at 1000°F (540°C) for one hour per inch (25 mm) of lining thickness.
9. If the unit is not going into operation, but will be cooled down, hold at the operating temperature for a minimum period of 1½ hours per inch (25 mm) of lining thickness up to a maximum period of 8 hours.

NOTES:

1. **NOTE FOR HYDROSTATIC TESTING:**
Prior to hydrostatic testing units lined with R-MAX MP, the lining must be heated throughout its thickness to 650°F (343°C).
2. **R-MAX MP** that is installed in ¾" to 1" thick hexmesh can be heated at a rate of 100°F (50°C) per hour with no hold periods.
For linings greater than 1 inch thick of R-MAX MP, the above heating schedule should be followed.
3. Temperatures shown are measured at the hot face of the lining for in place heating.
4. Allow the lining to cool down naturally; do not exceed 100°F (56°C) per hour.
5. The dry out of refractory entails more than just following a heating schedule. Issues such as burner sizing and location, exhaust location, air volume and velocity, etc need to be addressed. Resco recommends that an experienced dry out company be consulted.
6. Temperatures should be monitored at the refractory surface at several locations in the unit.
7. If steaming is observed at any time during the schedule, the temperature should be held constant until the steaming subsides. The schedule can resume when steaming ends.



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8. If, for any reason, the heating schedule is interrupted by a loss of heat and/or power into the unit, Resco Products recommends that the heating schedule be initiated from the beginning once power and/or heat is restored. At the end user or contractor's discretion, they may elect to attempt to restart the cycle and "stabilize" the lining temperature at the point of interruption. After the lining has been stabilized, the heat up cycle may be resumed as scheduled from that point on. Resco assumes no liability for this procedure, as it is difficult to determine that point at which the entire lining is stable to prevent the possibility of a steam spall.
9. **This schedule is recommended for situations where proper heating equipment and air circulation are used, weep holes are present and unclogged, and the ambient temperature ranges from 60° to 90° F. If all of these parameters are not met, a more conservative dry out schedule is needed. Consult your Resco Products, Inc salesman, the RESCO website (www.rescoproducts.com), or call 888.283.5505.**