

	<b>Patching Insulation inside Furnace Chamber</b>	<b>DOC NBR:</b> TEC-232
		<b>APRVD:</b> JMC 1 MAR 11
<b>Field Instruction</b>		<b>PAGE 1 OF 2</b>

## 1.0 SCOPE

- 1.1 Instructions for temporary field repair of minor damage to insulation within an IR furnace chamber using high temperature cement.

## 2.0 RISKS

- 2.1 Be aware that field repair of furnace internals is risky. The furnace can be further damaged during the attempt to repair the breach. However, any damage incurred by attempting to repair the internals in the field can be rectified by sending the chamber or furnace to the factory to be refurbished.
- 2.2 Chief areas of concern and places where damage can occur:
  - 2.2.1 The chamber insulation is brittle and can easily be broken or damaged.
  - 2.2.2 The chamber contains internal zone baffles which further limit access to the furnace internals and can be easily damaged.
  - 2.2.3 The chamber contains quartz tubes which are hard but very brittle and can be cracked or broken if struck by a hard instrument.
- 2.3 Damage to IR furnace internals are generally repaired by sending the chamber or entire furnace to the factory to be rebuilt using new materials. Factory rebuilt chambers can significantly extend the life of the furnace.

## 3.0 EQUIPMENT AFFECTED

- 3.1 IR furnace chamber

## 4.0 MATERIAL USED

- 4.1 Cement - high temperature Unifrax QF-180 Refractory Ceramic Fiber cement (see MSDS No. M0090)
- 4.2 Tool - Small application tool to apply thin cement paste (painters palate knife or small spatula).

## 5.0 FURNACE DISASSEMBLY

- 5.1 Disconnect power to the furnace.
- 5.2 Remove the covers surrounding the furnace chamber.
- 5.3 Remove all lamps in the affected zone.
- 5.4 Nearest to the damaged area:
  - 5.4.1 Remove the baffle top by unscrewing the brass wing nuts, remove metal clamps, and pull off the top. Be careful to not damage the silicone gasket.
  - 5.4.2 Cover belt with cardboard or some other material to protect belt and furnace internals from cement splatter.

## 6.0 APPLY PATCH

- 6.1 Using the Tool to hold the cement, locate the damaged area and spread cement onto the area that needs to be repaired.
- 6.2 Allow cement to dry for 2 hours
- 6.3 Inspect area after 2 hours and apply a second coat if necessary.

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## **7.0 REASSEMBLE THE FURNACE**

- 7.1 Remove protective cardboard or other material used to cover belt.
- 7.2 Clean up any splatter inside the furnace.
- 7.3 Reinstall the baffle top, position clamps and tighten wing nuts evenly (hand tight only) to seal the top.
- 7.4 Reinstall all lamps and seals.
- 7.5 Reinstall the covers surrounding the furnace chamber.
- 7.6 Reconnect power to the furnace.
- 7.7 Cure furnace for 1-2 hours at 450-500 C.