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Burn-In Procedure for Wire Resistance Diffusion Style Heating Elements

Proper heating element burn-in prior to use helps ensure maximum life and optimal performance. During the burn-in procedure, an aluminum oxide layer will form on the element wire. The oxide layer increases the tensile strength of the wire, helps to prolong the life of the wire, provides protection against elongation of the wire throughout the life of the element and helps to protect against chemical attack. By nature, ceramic fiber will absorb moisture from its surroundings. The burn-in procedure will drive out any moisture, therefore it is important to follow the recommended ramp and soak rates so that the heating element is dried out thoroughly and slowly during initial heat up

To prepare the element for burn-in, pack the openings at the ends with insulating material. Be sure to leave a 1 to 2 inch diameter hole in the center of the packing to allow for airflow into the element. The oxygen in the air is necessary to form adequate amounts of aluminum oxide on the wire. The aluminum oxide is gray in color and should be observed on the wire after the burn-in process is completed. The formation of the oxide layer is a function of time and temperature and the best results are achieved with a longer burn-in time of gradual temperature ramping as opposed to immediate high temperature exposure.

- **Heavy Gauge Helical Diffusion Style Elements (Duracraft DC-1300, DC-1300Plus and DCHT-500, 1300°C max):** Ramp from ambient to 400°C with maximum power values. Soak for 2 hours. Ramp to 1000°C with maximum power values. Soak for 4 hours. Ramp at 5°C/minute to 1200°C or 25°C above process temperature, whichever is greater and soak for 8 hours.

- **Low Mass Diffusion Style Elements (Fibercraft FC-200 and FC-200L, 1200°C max):** Ramp from ambient to 200°C at 5°C/minute. Soak for 2 hours. Ramp to 500°C at 5°C/minute. Soak for 2 hours. Ramp at 5°C/minute to 1000°C. Soak for 4 hours. Ramp at 5°C/minute to 1200°C or 25°C above process temperature, whichever is greater and soak for 12 hours.

Burn-In Procedure for Fibercraft Ceramic Fiber Heaters
If possible, create an opening sufficient to ensure a ventilation path for excess moisture. Ramp from ambient to 200°C at 5°C/minute. Soak 1 hour for each inch of insulation thickness. Ramp to 500°C at 5°C/minute. Soak for 2 hours. Ramp at 5°C/minute to 25°C above process temperature. Soak heaters with a maximum process temperature of 1050°C or less for 4 hours. For processes of 1051°C to 1150°C soak for 8 hours. Above 1150°C, soak for 12 hours to ensure proper oxidation of the element wire.

Burn-In Procedure for Silicon Carbide Heated Chambers
If possible, create an opening sufficient to ensure a ventilation path for excess moisture. Ramp from ambient to 250°C at 5°C/minute. Soak for 4 hours. Close furnace. Ramp at 5°C/minute to 25°C above process temperature, or 1500°C, whichever is greater and soak for 12 hours.

Burn-In Procedure for Molybdenum Disilicide Heated Chambers
If possible, create an opening sufficient to ensure a ventilation path for excess moisture. Ramp from ambient to 250°C at 5°C/minute. Soak for 4 hours. Ramp at 5°C/minute to 25°C above process temperature, or 1500°C, whichever is greater and soak for 12 hours. We recommend repeating the last step for all continuous process furnaces upon restart in order to re-oxidize the elements.