



6 MAINTENANCE PROCEDURES

6.1 Electrical Elements

The furnace heating system consists of six (6) elements split into two (2) zones of control of three (3) elements per zone, star connected, all elements are identical in construction. The main element characteristics are as below :-

- Element power: 36.67 kW
- Operating Voltage: 398 volts
- Phase current: 92 amps
- Cold resistance: 4.329 Ohms (Including terminal rods)
- Wire diameter : 5.0 mm dia.
- Effective length: 56.6 metres.

The above figures are subject to manufacturing tolerances.

6.2 Resistance of electrical heating elements to chemical influences

Influence of the furnace atmosphere

The service life of a wire heating element depends on the oxide layer of the heating element. Destruction within the oxide layer shortens the life span of the heating element. Whenever the oxide layer is destroyed through a reducing firing, it will form again during the next firing or annealing process in a normal furnace atmosphere. However, each time oxide forms, the heating wire loses some of its substance. A loss in the substance of the heating element leads finally to over heating and consequently to failure of the element.

Air

Heating elements made of wire can be used in air without any difficulty. Contamination of the atmosphere can, however, impair the formation of oxide.

Controlled Atmospheres

In controlled furnace atmospheres containing carbon, no matter whether endogas or exogas, the oxide layer on the surface of the heating element creates an effective protection against the penetration of the active components of these gases. A good pre-oxidation in air, at 800°C over a period of 7 to 10 hours, improves the life span of the heating elements in protective gases considerably. In order to guarantee the longest possible service life, repeated oxidation should be carried out at given intervals dependent on the prevalent operating conditions. Carbon deposits can result in damage to the elements.