



I SQUARED R ELEMENT CO., INC.



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## FACTORS THAT AFFECT MOLY-D ELEMENT LIFE

MoSi<sub>2</sub> elements do not exhibit any change in resistance when they are used continuously in air. While a Silicon Carbide heating element will increase in resistance (age) with use, the resistance of a MoSi<sub>2</sub> heating element will not change at all. Therefore, in theory, a MoSi<sub>2</sub> heating element should last for many years.

However, in reality, there are a number of other factors that usually cause MoSi<sub>2</sub> elements to fail, which makes it nearly impossible to predict element life, even under the ideal conditions. Some of the more common modes of failure for MoSi<sub>2</sub> elements include:

- Pest – oxidation/degradation of the cold ends – happens if the ends get too hot.
- Electric contact failure – i.e. arcing due to loose straps
- Erosion and Spalling – the protective glaze layer can flake away when cycling the temperature, eventually eroding the element after many cycles.
- Mechanical Forces – hot elements soften and can distort depending how they are oriented in a furnace.
- Insulation Issues – elements too tight in insulation, insulation shifts and breaks the element, or elements contact the insulation and overheat.
- Product contamination – product or atmosphere reacts with the protective glaze causing deterioration of the element.
- Overheat / Control failures
- Over power – too high a watt loading

Unfortunately there is no way to predict the life of a MoSi<sub>2</sub> element in an application because one can not predict how any of the above factors will come into play. Generally, the higher the temperature, the more likely one of the above problems will occur. We have a test element that has been operating at 1400°C in air with no product load for more than 4.5 years now with no sign of changing. It is doubtful that the same element would last that long at 1775°C. We would expect problems due to spalling or distortion to shorten the life.

I Squared R manufactures the MoSi<sub>2</sub> element under the trade name Moly-D®. They are manufactured to the same resistance value as the competitors brand therefore they are interchangeable. We offer very fast delivery and excellent customer service.