

## Can TO's furnace for electromechanical tension testing machines be used below 600°C?

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- TO's furnace has a standard Temperature uniformity specification:  $\pm 5$  °C or better over a length of 200mm at temperatures above 650 °C - Through the TO controller there is a standard 12 power function. This is user selectable and allows the furnace to be used and controlled from approx 400°C up. The 12 power function prevents wild over and undershoot in the temperature control at lower temperatures.

That said temperature control does fall away from the standard  $\pm 5$  °C to  $\pm 12$  °C it also limits the maximum temperature which can be achieved and accurately controlled. This function is not available in many competitors furnace offerings. - 600°C in furnaces at large is a critical point, it is where radiated heat, that glowing red look in the furnace and internal parts occurs and becomes the dominate heat effect as opposed to the dull dark tinge of red below 600°C where convection heat is the dominate heat effect. The radiated heat state and subsequent 'Heat saturation' of the internal furnace and parts is the condition for which furnace controllers at large are designed and perform extremely well. - Working below 600°C in furnaces at large and below 400°C using the 12 power function in a TO furnace is not practical.

For work at temperatures between ambient and 400°C a temperature chamber technology is required. Such chambers are designed to work and accurately control temperature under a convection heat condition. Heat saturation of internal chamber parts is not an objective, the heating systems have less power and temperature control is achieved using a circulating heat. In the case of TO's standard chamber this is achieved through a combination of a specifically designed centrifugal fan, dual chambers (working test chamber and fan chamber) and strategically placed air ducts between the chambers, net effect being accurate control of hot air movement around the test specimen deriving a Temperature Gradient of  $\pm 1$  °C after 30 minutes within 80% centre volume of chamber