

# PREDICTING PART TEMPERATURES IN HIGH TEMPERATURE PUSHER FURNACE

## OBJECTIVE:

Manufacturer of a fuel injection filter was having problems in sintering their Silicon Carbide parts inside high temperature continuous pusher furnace. Due to high operating temperature, trailing thermocouples could not be used to determine the part temperatures during heating cycle. The objective of the test was to understand the thermal characteristic of the furnace and predict the part temperature during heating.

## METHODOLOGY

Simulations were run using FurnXpert software. First, the software was configured to make the model represent the actual furnace and actual operational criteria. To represent actual part characteristics special shaped parts were created in the software. Thermo-physical data of the actual part material was used. Since there were no direct ways to track the part temperature along the furnace, indirect information was used to check the validity of the simulation run. Tests were run to obtain operational data. This data was then used to fine-tune the model for accurate furnace configuration.

## CONCLUSION:

Having no direct ways to measure the temperatures of the Silicon Carbide parts, during sintering, the model came very handy to predict the part temperatures. After tuning the model parameters with actual test data, the simulation software was used to determine the furnace operating conditions like zone temperatures and push rate. Several operational and design issues were addressed with the results obtained from the model. Later, the model was enhanced and used to determine physical and operational parameters of a future prototype furnace.

