

Carbon Black Production Furnace Thermocouple

Applications:

- Carbon Black Production Furnace Thermocouple
- Carbon Black Production Furnace Temperature Measurement
- Thermocouple for Carbon Black Furnace Temperature Measurement
- Thermocouple to Optimize Carbon Black Furnace Combustion

Application Background:

The majority of carbon black is produced using the “Oil Furnace” process where feedstock is injected into a hot gas flame in an enclosed reactor. Simplified it is like a blow torch in a ceramic tube. The carbon black formation reaction is controlled by a steam or water spray. The carbon black particles produced are conveyed through the reactor, cooled, and continuously collected by filters.

In order to optimize the production of carbon black means optimizing the combustion process by controlling the fuel (natural gas), the oxygen (air), and the ignition (flame). Temperature measurements during the combustion process at various locations in the reaction furnace can provide useful and beneficial information to enhance the desired efficiency and quality of the carbon black produced. To measure temperatures at the elevated furnace temperatures and in the harsh combustion environment requires a very special thermocouple if it is to survive for any reasonable length of time.

Application Solution:

Type “C” thermocouples with a peak operating range of 2315°C (4,199°F) are the most popular choice for high temperature and ultra high temperature furnace applications. The conductors in a type “C” thermocouple are tungsten/5% rhenium and tungsten/26% rhenium and tantalum is the sheath of choice. To further the lifetime in the combustion environment it is required to house the thermocouple in a alumina ceramic sheath (tube).

The engineers at Delta M Corporation working with the largest producer of carbon black in the world to perfect a unique construction design for their type “C” thermocouple assembly that provides for an extended lifetime in this application.

To learn more about this optimized thermocouple assembly from Delta M Corporation, please contact Rob Belcher at rbelcher@deltamcorp.com or by calling 1-800-922-0083.