

Furnace Fire

EPSC Learning Sheet April 2023



What Happened:

A furnace tube was not well cooled by a flowing liquid inside the tube and became overheated. The carbon steel tube softened and ruptured, spraying hydrocarbons in the furnace and creating a large fire outside the furnace.



Reference

Aspects:

- Plain carbon steel furnace tubes will soften as of 600 °C while the temperature in the furnace is typically above 1000 °C
- Furnace tubes must be cooled by a flowing liquid inside the tube to avoid overheating. If the liquid stops flowing, the fuel to the furnace must be stopped immediately by an interlock.
- Validate the furnace tubes outside temperature with IR and check for red spots regularly. While softening might be a slow process, stop the furnace in time with detected hot spots.
- Carbon deposit inside the tube can limit heat transfer and cause hot spots and tube rupture.
- When the burner does not distribute the flames evenly, “Flame impingement” on a tube can result in overheated steel

Avoid Furnace tubes from overheating