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Is stainless steel fire resistant?

Did you know that stainless steel is highly resistant to fire?

In construction, a common question is whether stainless steel can withstand fire and if fire could affect its mechanical properties. Unlike other materials, stainless steel:

- Does not burn or emit toxic gases, making it safe in case of fire.
- Starts melting at around 1400°C, whereas other metals may do so much earlier.
- Austenitic stainless steels such as AISI 304 and 316 can withstand up to 870°C without significant material loss, making them ideal for high-temperature applications.
- Acts as a barrier against flames: in fire tests*, 316 stainless steel doors maintained their integrity for more than 2 hours without fire spread.
- It heats up more slowly than carbon steel: a 12 mm stainless steel plate reaches 620°C after 30 minutes of exposure, while carbon steel reaches 750°C.
- It maintains its rigidity at high temperatures, reducing deformation compared to other materials, which makes it key for passive fire protection elements.

In applications such as fire doors, railings, firewalls, and electrical cable trays, stainless steel not only provides protection in case of fire but also reduces long-term maintenance costs, making it a safer and more efficient choice.

*Study by Stewart Fraser Ltd. on 316-type doors and frames in accordance with BS 467 part 22.

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