



**Electrochem<sup>®</sup>**  
Ultra Performance Silicones & TPE  
ELECTROCHEM SILICONES LTD



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**ELECTROCHEM SILICONES Ltd**

SILICONE ELASTOMERS – SPECIALTY POLYMERS  
EN ISO 9001:2015 - EN ISO 13485:2016 CERTIFIED

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Heat and  
Fire-Resistant  
Silicones

## Siloheat® FR 600 serie: Fire-resistant silicones for Buildings and Constructions

Our Siloheat® FR 600 serie HCR silicone rubber has been specifically designed for Railway and Mass Transit featuring very high levels of efficiency in fire resistance and ultra low levels of smoke emissions (Typical values : Heat 300°C, Flame 800°C). Siloheat® FR 600 is made by Electrochem Silicones under license by Elkem Silicones (France) and is available in several grades of hardness and colors for extrusion of profiles intended for doors, windows and frames with specifications to top flame resistance. In order to help customers meet stringent requirements and comply to the European and International standards we have additionally designed the Siloheat® FR 680 Plus with improved performance to open flames.



### Siloheat® FR 600 serie & EN 45545-2 Standard: New challenge in fire-resistant silicones

EN 45545-2 is a recent standard with strict safety requirements and has been in effect and mandatory application across EU. The scope of this standard is to standardize the regulation and guarantee the same level of security across all countries in which high temperature resistance applications are located (public buildings, business centers a.o.). Electrochem Silicones has the answer to this challenge: Siloheat® FR 600 serie meets the requirements of the EN 45545-2 : R1/R6 and IEC 60695-1-10 : VO, standards . Additionally, NF 16 101 : I2/FO, BS 6853 : A1 (LOI43%) standards are also met.

#### KEY BENEFITS



Excellent fire resistance



LSZH:  
Low Smoke Free of Halogen up to 800°C



Non-toxic and non-corrosive smokes



Ultra performance heat stability up to 300°C



Low temperature flexibility up to -50°C

## EN 45545-2 Standard: Requirements for fire behavior of materials and components, Hazard Levels & Testing

### Examples of product requirements:

- R1 requirements for horizontal / vertical interior surfaces, e.g. ceiling and walls, window frames or display screens.
- R6 requirement for fire behaviours of materials and components
- R22 / 23 requirements for interior seals, inductance coils, coils and contacts.
- R24 / 25 requirements for printed circuit boards
- R26 requirements for small electronic products

	Flame spread	Ignitability	Rate of heat release	Smoke production	Toxicity of smoke
R1	ISO 5658-2		ISO 5660-1	ISO 5659-2	ISO 5659-2
R7	ISO 9239-1		ISO 5660-1	ISO 5659-2	ISO 5659-2
R22			ISO 5660-1	ISO 5659-2	ISO 5659-2
R23		ISO 4589-2		ISO 5659-2	NFX 70-100-1 NFX 70-100-2

### Hazard Levels

Mass transit vehicles are classified in accordance with the fire hazard level associated with their design and operation. There are three hazard levels; HL1, HL2 and HL3 with HL1 being the lowest requirement and HL3 being the highest. The classification depends on how many kilometres the trolley is in tunnels and whether it is automatic, two-storey or if sleepers are on board.

### Testing

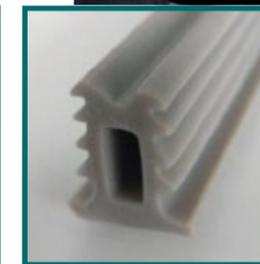
A series of tests are used to measure how the product compares to the product requirement sets. Key parameters that are measured include flame spread, ignitability, heat release, smoke opacity and toxicity. Some test methods include:

- TO1 Oxygen Index
- O3 Flue gas density
- T12 Smoke toxicity

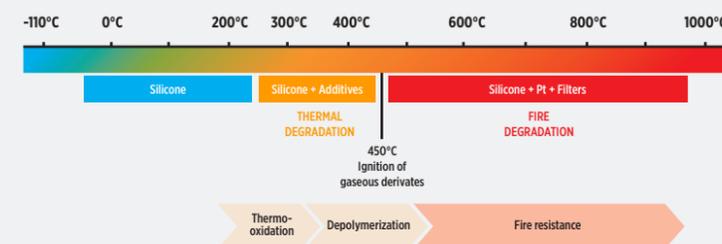
## Self-extinguishing and low-toxicity silicones: Siloheat® FR 600 serie & Siloheat® FR 680 plus

### Main applications:

- Air- and Watertight seals for doors and windows, ducts, cables etc
- Profiles and tubes used in construction and manufacturing of components
- Insulation of high-voltage conductors



### HEAT STABILITY & FIRE-RESISTANT MECHANISMS



During the burning of silicone rubbers, some volatile and cyclic molecules are produced with self-ignition near 450°C and are transformed into inert silica, H<sub>2</sub>O, SiC and CO<sub>2</sub>. By consequence, low smokes emissions are nontoxic, noncorrosive and halogen free. This behavior allows a safe and quick evacuation of people during the event of fire.