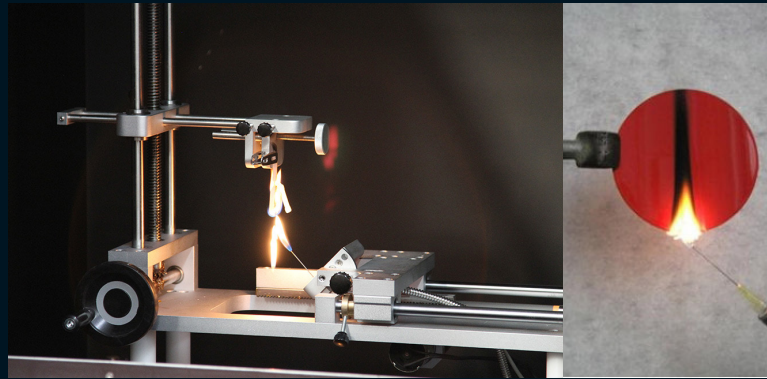


Enclosures

IEC 60695-11-10 Needle Flame Test or UL94 - Flame Resistance Test



Hinges

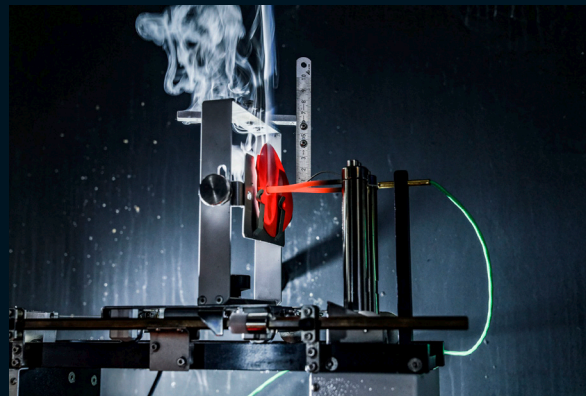
Locks

5VA Surface Burn	Burning stops within 60 seconds after five applications of five seconds each of a flame (larger than that used in Vertical burn testing) to a test bar. Test specimens MAY NOT have a burn-through (no hole). This is the highest (most flame retardant) UL94 rating.
5VB Surface Burn	Burning stops within 60 seconds after five applications of five seconds each of a flame (larger than that used in Vertical burn testing) to a test bar. Test specimens MAY HAVE a burn-through (a hole).
V-0 Vertical Burn	Burning stops within 10 seconds after two applications of ten seconds each of a flame to a test bar. NO flaming drips are allowed.
V-1 Vertical Burn	Burning stops within 60 seconds after two applications of ten seconds each of a flame to a test bar. NO flaming drips are allowed.
V-2 Vertical Burn	Burning stops within 60 seconds after two applications of ten seconds each of a flame to a test bar. Flaming drips ARE allowed.
H-B Horizontal Burn	Slow horizontal burning on a 3mm thick specimen with a burning rate of less than 3"/min or stops burning before the 5" mark. H-B rated materials are considered "self-extinguishing." This is the lowest (least flame retardant) UL94 rating.

Handles

Accessories

IEC 60695-2-11 Glow Wire Test



Rotary Operating
Handles

Insulators

Glow wire tests are a requirement for enclosures that house electrical circuits. It is a very important requirement for materials that are made from petrochemical base materials. Plastics and Resin materials both fall into this category.

The importance of verifying the properties of the insulation material has been illustrated recently with the Grenfell Tower fire in 2017. Glow wire testing for electrical enclosures is traditionally done at 3 different temperatures depending on where the part is used in the system. A cover can be tested at 650° whilst boxes that are built into a wall need to be tested at 850° and a part that is in contact with current carrying components should be tested at 960°. Due to the confusion that can be created many end-users ask for an additional test to be performed which is a needle flame test. The reason for this is that 650° is often not a high enough temperature to ignite the material so the flammability is not necessarily tested.



It is recommended that all enclosures that are installed in public spaces are glow-wire tested to 960° (IEC 60695-2-11) as well as Needle flame (IEC 60695-11-10)

Transformer
Equipment

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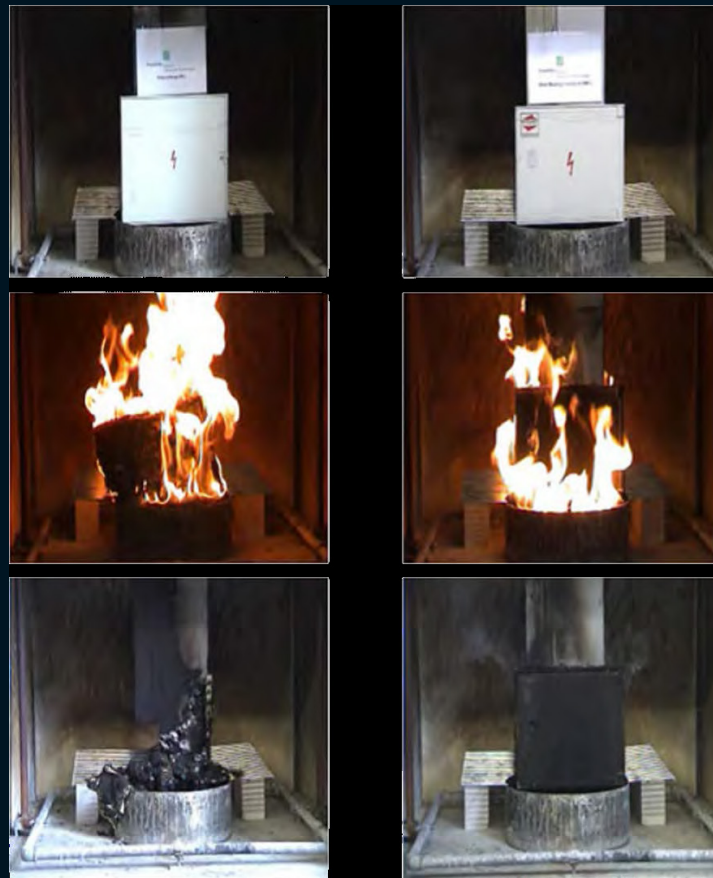
Extended - Real Life Flammability Test

While Needle flame is an interesting flammability test for plastics in general the test below shows how much better SMC performs against even the most advanced engineered V0 plastics. Such testing is being introduced in places where "Veld Fires" (Bush fires) are a possibility. The test below is not a standard IEC test. In this test an enclosure is exposed to a 4-min burn instead of a 30 second small flame exposure.

The challenge that even self-extinguishing plastics experience is that they can only self extinguish once the flame source is removed. A sustained arc or external flame renders even fire-retardant plastics to essentially become a fuel source for the flame. When such an enclosure is mounted to a wooden pole or a building the concentrated source of fuel can create devastation. SMC is therefore a better choice than plastic.

Thermoplastic Cabinet UL94 V0

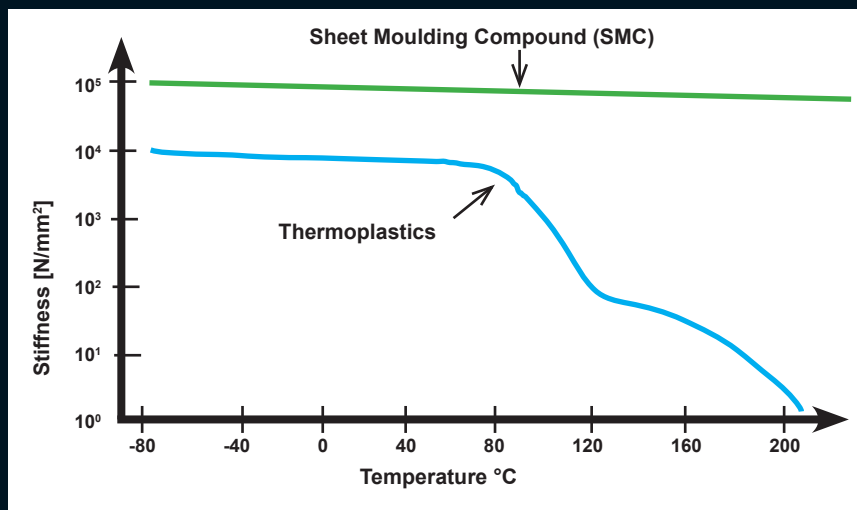
SMC Cabinet



4 minutes

25 minutes

Retention of dimensional properties: GRP compared with plastics



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