

Fire behavior

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Like all organic materials, plastics are flammable. The primary and secondary fire properties for them are classified according to various norms and standards.

Primary fire properties:

- Flammability and active continued burning
- Contribution to flame spread
- Release of heat

Secondary fire properties:

- Flaming droplets / particles
- Smoke density
- Smoke toxicity
- Corrosiveness of fire gases

As the fire properties are very often tested on the end product, the design and the structure of the end product has a substantial impact on the subsequent fire properties. For example, the thickness of a cable sheath is crucial for the smoke density that is to be expected.

The respective fire scenario has a crucial bearing on the application of a particular test. If the components are subsequently to be fitted in rail vehicles, for example, tests in accordance with DIN EN 45545 are relevant. In automotive construction, the tests conducted include those according to FMVSS 302.

For numerous applications in the electrical industry, a classification of the plastics under UL (Underwriters Laboratories) 94 is indispensable. For many Elastollan® grades, corresponding tests have been conducted. Depending on the wall thickness, the Elastollan® grades with halogen-free flame retardance achieve V0, V1 or V2. Unfilled standard grades generally achieve UL-HB. As well as the fire class, further properties such as HWI, HAI, RTI and CTI have also been determined for selected Elastollan® grades. The current classifications can be viewed on the UL website under File No. E140250.

DIN EN 45545: For applications in rail vehicles, the materials are subjected, depending on the application and deployment location, to selected flame tests and then classified into what are known as "hazard levels". Depending on the design of the components, selected Elastollan® grades achieve very good classifications, e.g. R22/R23 HL3.

FMVSS 302 (Federal Motor Vehicle Safety Standard): All Elastollan® grades meet this standard, which permits a maximum burn rate of 4 inches/min (101.6 mm/min) with a defined test setup.

DIN EN 50267-2-2 (IEC 60754): The demands of this standard with regard to the corrosiveness of the fire gases are met by all unmodified and plasticizer-containing Elastollan® grades. Additives can influence the fire behavior of Elastollan®.