

DSM develops a connector material safe for home appliances worldwide

DSM Engineering Plastics continues to lead the way in the plastics industry as they develop a product aimed at making home appliances safer. DSM has recently announced a new material for electrical components that meets universal safety requirements and reduces fire hazards, contributing to safer homes around the world.

The home appliance industry has long exhibited the need for a material utilized in the production of appliance connectors, meeting all needs globally. Seeing an opportunity to both simplify production for OEMs and improve safety for consumers, engineers at DSM Engineering Plastics began development on such a product.

After two years in development, DSM recently unveiled a material that exceeds the highest flame-resistance requirements of Standards groups worldwide, while also exhibiting the various required electrical properties. With specially developed Akulon® SafeConnect PA66 grades, DSM now enables OEMs to meet the EN 60335-1 international standard on home appliance safety as well as their own internal requirements. This gives appliance manufacturers producing and selling in global markets the ability to simplify their supply chain by utilizing the same material for connectors, wherever the appliance is sold.

With the growth of the Internet of Things, consumers are increasingly able to remotely control electrical and electronic devices in their homes from their smart phones and tablets. The 2017 Consumer Electronics Show (CES) in Las Vegas showcased numerous new 'smart' appliances that will soon be a part of the connected home. Consumers may have virtual connections to their smart appliances, but the appliances themselves still need real, actual electrical and electronic connectors. If designed poorly, these connectors can increase the risk of electrical failure, with potentially serious consequences.

According to the Consumer Product Safety Commission, over 15 million appliances have been recalled in the past five years due to fire hazards. From 2006 to 2008, the CPSC added, appliances were responsible for over 150,000 residential fires each year, resulting in 3,670 injuries, 150 deaths, and \$547 million in property damage.

Although performance requirements for appliance connectors are universally getting stricter, regional differences create varying standards. As a result, connectors fitted to equipment sold in one regional market are often made from a different housing material than those on equipment sold in another market. Thus, a need emerged for a material capable of meeting all global regulations.

Because DSM has been committed to developing plastics for use in appliances for decades and its materials are already widely used in the sector, DSM were prepared for the challenge. In close cooperation with leading OEMs and connector manufacturers, their innovative focus has led to the development of several materials that achieve the highest UL 94 flammability rating, V0, at a thickness of just 0,4mm. This enables end products to pass the IEC 60695-11-10 Glow Wire Test (GWT) without igniting at 850°C. The products also have a high Comparative Tracking Index (CTI) up to 450V.

		Safe Connect SC21	Safe Connect SC41	Frianyl A3V0XI	Schulamid 6MV 14 FR4
UL94	@0,4 mm	V0	V0	V0	V2
	@ 1,5 mm	V0	V0	V0	V2
GWIT in °C	@0,4 mm	960	960	850	930
	@1,5 mm	960	960	775	825
	@3,0 mm	800	850	775	825
CTI in V	IEC60112	250	450	/	300
	UL746	265	550	250	/
RTI electrical in °C	@0,4 mm	125	t.b.d.	120	130
	@1,5 mm	125	t.b.d.	130	130

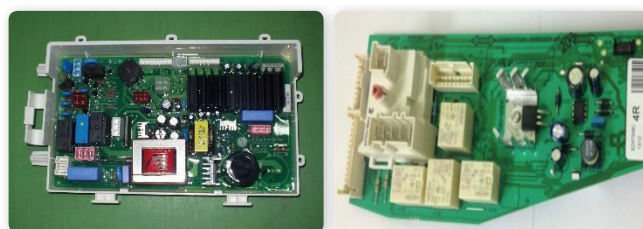
A material with a higher CTI results in increased tracking resistance in the presence of moisture and particles, eliminating the need for a protective housing unit. A higher CTI also allows for minimized terminal spacing, permitting increased functionality in a smaller space. This design solution offers optimal safety while lowering production costs for manufacturers.

Connector Material CTI

250V

≥400V

- | | |
|--|---|
| <ul style="list-style-type: none"> • Housing unit required • Increased tracking distance • Higher production cost | <ul style="list-style-type: none"> • Housing unit not required • Decreased tracking distance • Lower production cost |
|--|---|



The holy grail in appliance connectors is the combination of V0@0,4mm, solid GWIT@0,4mm together with CTI equal or higher than 400V according to IEC standard. DSM is the only company who can offer three grades of Akulon® SafeConnect that meet the universal requirements, with varying customer specifications.

DSM Engineering Plastics

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dsm.com/plastics

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