

ForTii®



Make a USB Type-C that is both thin and reliable

Make magic with plastic

Thinnovation is the design challenge in mobile. On average smart phones become 12% thinner every year. USB Type-C is enabling the next step in thinnovating, this connector has 75 % thinner walls than the previous generation and offers more speed and power.

With USB Type-C connectors being so small, the performance properties of the materials used for their housings are especially critical. Reliability is a key requirement, so the industry is looking for a plastic that has the magic combination: tough, reliable, rigid and with high flow. DSM's Stanyl® and ForTii® offer the best balance of mechanical properties and precision molding.

About USB Type-C

- the industry standard as of 2017
- first USB connector with a reversible design
- backwards compatible with billions of USB devices
- delivers up to 100W (20 volts & 5 amps) at twice the speed of current USB ports



thin up to 0.12mm

safe, no short circuit due to high CTI

any color you like

miniaturized and integrated

high retention between contacts and plastic housing

high friction strength

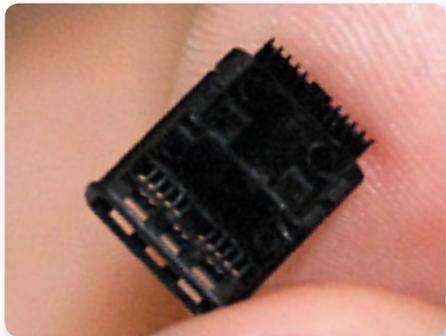
halogen-free



The design challenge

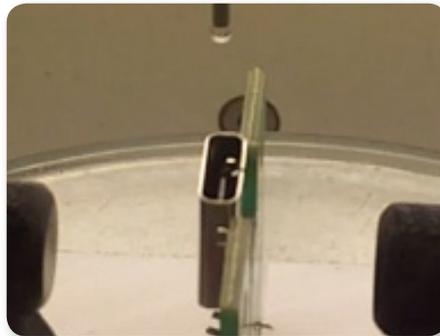
The trend for thinner devices means that the sizes of connector receptacles and plugs is being reduced, and so is the space for parts. USB Type-C receptacle walls are 25% of the previous generation. For the plug they are even thinner at 0.12 mm. Stanyl and ForTii from DSM have the mechanical performance and environmental properties for the new generation USB Type-C. And you can make them to the exact color specified by the OEM's, enabling aesthetic design freedom and product differentiation.

Miniaturized molding



The most critical part of the connector are the ribs that house the metal contacts for power and data transfer. DSM's Stanyl and ForTii offer high flow in combination with high weld-line strength. This ensures on one side excellent processability needed to meet the high production demand for over 5 billion USB Type-C devices a year and on the other hand the required high pin pull-out strength. Stanyl and ForTii will also withstand the very high temperatures used in lead-free soldering processes, and are compatible with ultrasonic welding.

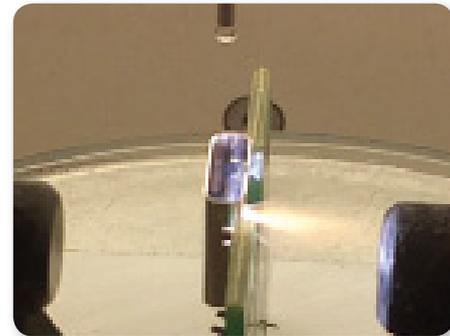
Reliable performance



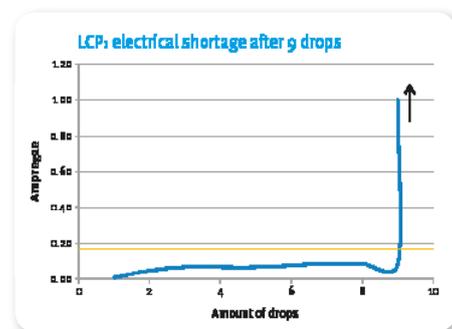
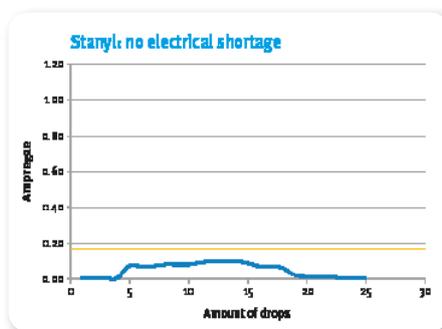
Stanyl and ForTii have a high CTI rating - a measure of electrical insulation properties to withstand tracing from particles, sweat or moisture that reaches the connector. Stanyl and ForTii are approved by global producers for use in USB Type-C, maintaining performance for twice as long as alternative materials with CTI $\leq 400V$.

"We are getting great performance from DSM materials, and they provide deep application expertise which together has helped us develop and produce USB Type-C in a very short time."

Accon, Taiwan



Testing the next best alternative, LCP, the connector pins fail after 9 drops and causes a short circuit, whereas Stanyl does not (see graph). A short break circuit in both performance and safety issues for the complete device.



Design planet friendly devices

The introduction of the USB Type-C connector is the result of the need to reduce electronic waste. We can help you deliver a low or neutral carbon footprint. DSM's portfolio of plastics includes halogen-free and bio-based materials. Make your next mobile device more planet friendly with components that are smaller, more durable, and environmentally responsible.

Expertise in USB Type-C for your team

We are supporting the design and engineering teams at the world's leading OEMs - bring our expertise into your team. Contact your local DSM office today with your challenge. www.dsm.com

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DSM materials are approved by the main global component suppliers.

DSM – Bright Science. Brighter Living.™

Royal DSM is a global science-based company active in health, nutrition and materials. By connecting its unique competences in Life Sciences and Materials Sciences DSM is driving economic prosperity, environmental progress and social advances to create sustainable value for all stakeholders simultaneously. DSM delivers innovative solutions that nourish, protect and improve performance in global markets such as food and dietary supplements, personal care, feed, medical devices, automotive, paints, electrical and electronics, life protection, alternative energy and bio-based materials. DSM's 24,500 employees deliver annual net sales of around €10 billion. The company is listed on NYSE Euronext. More information can be found at www.dsm.com.