AUTOMOTIVE WIRE HARNESS

PA 12 Flame Retardant (FR) and Multi Jet Fusion (MJF) leveraged to replace broken automotive car door components within 24 hours.

The connector sizes range from 25mm-74mm. Tolerance is a standard 0.010mm and wall thickness is between 1mm – 2mm.

CHALLENGE

Traditionally manufactured car door components—such as wire harness connectors, electrical housings, and a speaker cover—failed and required replacement with a more durable material. Additionally, any material within 0.5 inches of the vehicle's occupant compartment air space must comply with the burn resistance standards outlined in Federal Motor Vehicle Safety Standards (FMVSS) No. 302 (Flammability of Interior Materials), making material selection critical for safety and performance.

SOLUTION

After identifying more than 10 broken components, Endeavor 3D quickly reverse-engineered and 3D scanned each part to create precise CAD models. Using PA 12 Flame Retardant (FR) material and HP Multi Jet Fusion (MJF) technology, we printed on-demand replacements that met strict industry flammability standards. Endeavor 3D was able to 3D scan, print, and install the components within 24 hours, helping strengthen supply chain resiliency.

BENEFITS

1. On-Demand Replacement Parts

MJF 3D printing enabled the on-demand production of the components by fitting multiple parts into a single build. From scan to installation, the process took less than 24 hours.

2. Digital Design Library

After reverse engineering and 3D scanning the components, the design file became fully repeatable—making future modifications fast and seamless.

3. UL 94 V0 Certified

All components met the automotive standards outlined in the FMVSS No. 302, *Flammability of Interior Materials*. PA 12 FR's UL 94 V0 certification ensured car occupants are safe at all times.

AT A GLANCE

INDUSTRY

Automotive

TECHNOLOGY

Multi Jet Fusion

MATERIAL

PA 12 Flame Retardant (FR)

BENEFITS

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- Digital Design Library
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