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SL METAL-CLAD Composites

Electroplating additive manufactured (AM) parts with a structural metal coating to enhance part performance is a well-established practice. Although practically all polymer AM parts can be plated, stereolithography(SL) provides significant advantages over other AM.

SL advantages for metal-cladding

- Widest range of part size capability
- Smooth, non-porous surfaces
- Material options that facilitate higher-volume metal plating
- A large existing database for mechanical and physical properties

Multiple companies have developeddatabases of mechanical properties to facilitate the design of parts from the composite properties of SL and metal-cladding. Mechanical properties are determined from the characteristics of the polymer AM material as well as the percent and type of metal coating.

What can you achieve with SL + metal-cladding?

Stereolithography is capable of achieving extremely high detail in parts. Metal-cladding retains the majority of that detail, while adding strength.

Credit to DSM for photo

Electroplating has been used for decades to reinforce and structurally stabilize plastic parts. With a high-strength coating, form and fit SL parts can be used as functional prototypes, as well as in low-volume production applications.

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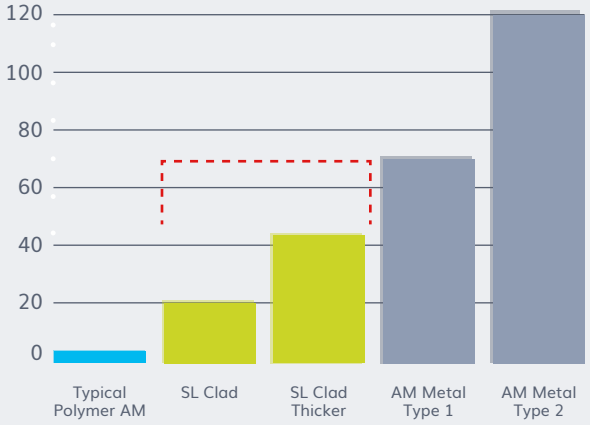
Metal-clad SL composites have been used in prototyping and low-volume production applications for over 15 years. The advent of direct-metal AM has introduced a new potential market for metal-clad SL. As seen from the charts here, metal-clad SL offers the potential to bridge the performance gap between polymer AM properties and direct metal AM, creating a potentially new application space.

Additional benefits of metal cladding include flame retardency, EMI shielding, and protection from environmental factors. Depending on size and part complexity, metal-clad SL composites can be produced for as low as 20% of the cost of direct metal parts.

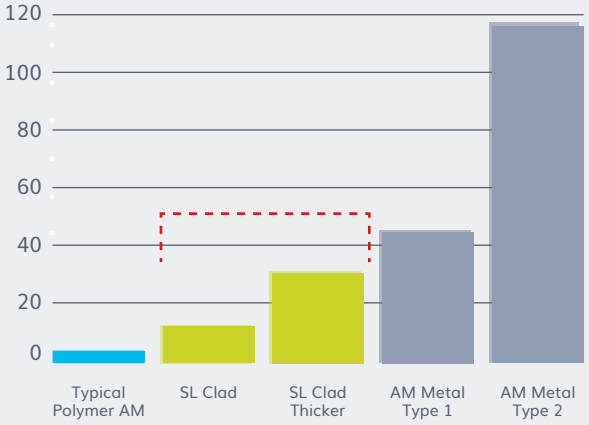
Comparison of Tensile Modulus

• Tensile Modulus, GPa



Comparison of Tensile Strength

• Tensile Strength, MPa



Teccluster Industrial SL Equipment

- Platform sizes ranging from 250 mm sq. to 800 mm sq.
- Exceptionally smooth sidewalls with layer thickness capability of 0.05 mm to 0.15 mm
- High accuracy and precision RP

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