SLA – Stereolithography

Applications

- **Rapid Prototyping**
- **Medicine**: Stereolithographic models have been used since the 1990s, for creating accurate 3D models of various anatomical regions of a patient, based on datasets from computer scans.
- **Design objects**: the high level of detail and superior surface quality are perfect for design studies or detailed elements in architectural models.
- **Molding**: SLA is commonly used to create prototypes for molding, e.g. vacuum casting or metal casting. For casting metal, the castable resin would be completely burned out after setting it in a plaster mold. This makes the casting process more efficient and a great benefit for applications in dentistry or jewellery.

Costs

- The main cost driver for SLA 3D printing is material consumption. That includes both the model itself and any required support material.
- For small batch series and/or parts with little or no support material needs, costs can be significantly lower.
- Support material is highly dependent on the geometry of the part. Small parts with complex geometries can be considerably more expensive per cm³ of material volume.

Materials

- **Standard resin**
  - ABS-like mechanical properties, white or transparent.
- **Biocompatible resin**
  - Certified biocompatible for medical applications.
- **Castable resin**
  - For metal casting it can be fully burned out after setting in plaster or other mold materials.
- **Heat-resistant resin**
  - Heat-resistant up to 200°C

Advantages

- Surface finish and tolerances are superior to laser sintering. Tolerances (200 µm for parts <= 10 cm, 0.2% for larger parts)
- Fast and reliable
- There are many resins available for Stereolithography each with its own set of mechanical properties

Disadvantages

- Standard resins are less heat-resistant and mechanically weaker than SLS prints
- Support structures are required

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Source: http://www.rapidprototyping.nl, 2017

Source: https://3faktur.com, 2017