

# VAT PHOTO POLYMERIZATION

Principle of Operation

Process

Material

Pros & Cons

Applications : 3D Systems & CMET's SOUP



## PRINCIPLE OF OPERATION

Uses photo polymer resins

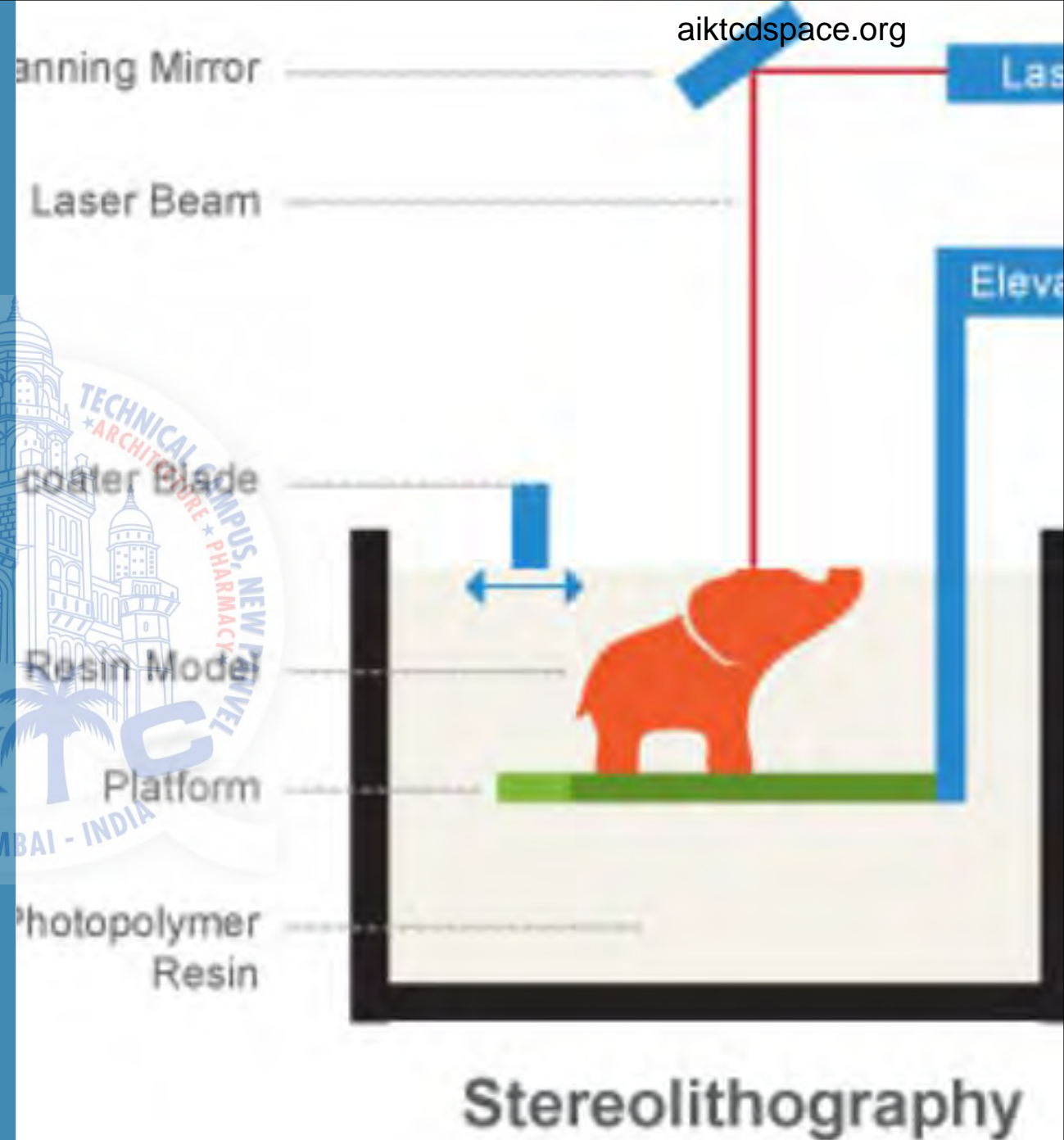
Model is constructed layer by layer

The height of a single layer is usually  
0.025 - 0.5mm

Usually no structural support (if needed  
provided with same material)

UV light is directed across the resin  
surface with the help of motor controlled  
mirror

Where the resins comes in contact with UV  
laser light, the resin cures or hardens



## PROCESSING

- UV light cures resins
- Platform moves downward by the layer thickness
- Use of Recoater blade to remove air gaps and good finish through out
- Single laser and Single optics
- Support structure for structural usage
- VAT is drained of resin and the object removed.

## POST PROCESSING

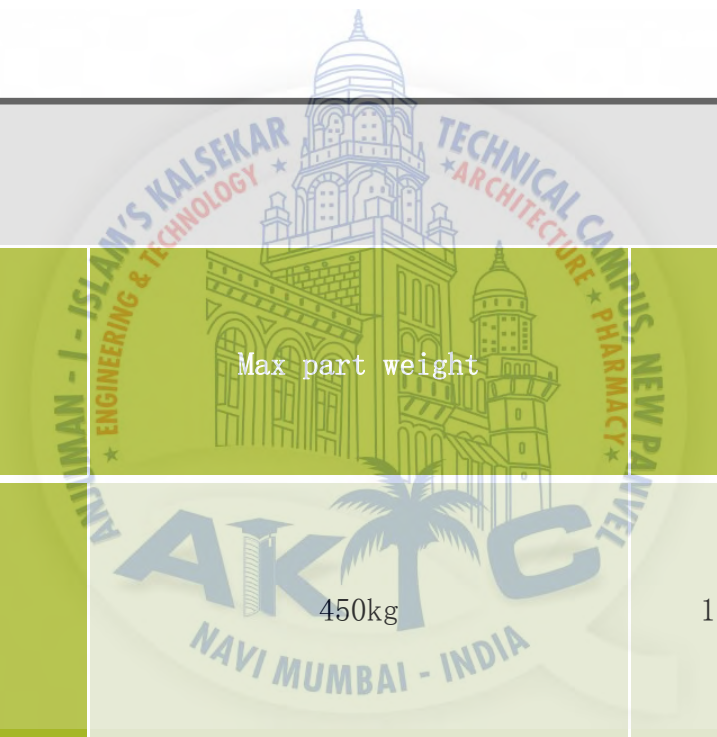
- Parts removed from resin and drained
- Supports removed by knife, or by alcohol and water rinse
- Care taken not to contaminate resin while removing parts
- Parts dried naturally or by air hose
- UV light for final post cure for high quality product

## MATERIALS

- UV curable photo polymer and resins
- Polymers in use are acrylate, epoxy, vinyl ether, etc.
- Resins in use VisiJet. The VisiJet M3-X is a stiff, ABS-like material with the look, feel and performance of injection moulded plastic. It produces tough parts with a stunning white finish and high temperature resistance, making it ideal for product mock-ups, prototyping, and rapid tooling applications.

# MACHINE EXAMPLE

Machine	Max part weight	Built up area
3D Systems ProX 950	450kg	1500 mm x 750 mm x 550 mm



## PROS AND CONS

### PROS

- High level of accuracy and good surface finish
- Relatively quick process
- Typically, large built areas

### CONS

- Relatively expensive
- Lengthy post processing time and removal from resin
- Limited used of photo-resins
- Often requires support structures and post curing for parts to be strong enough for structural use