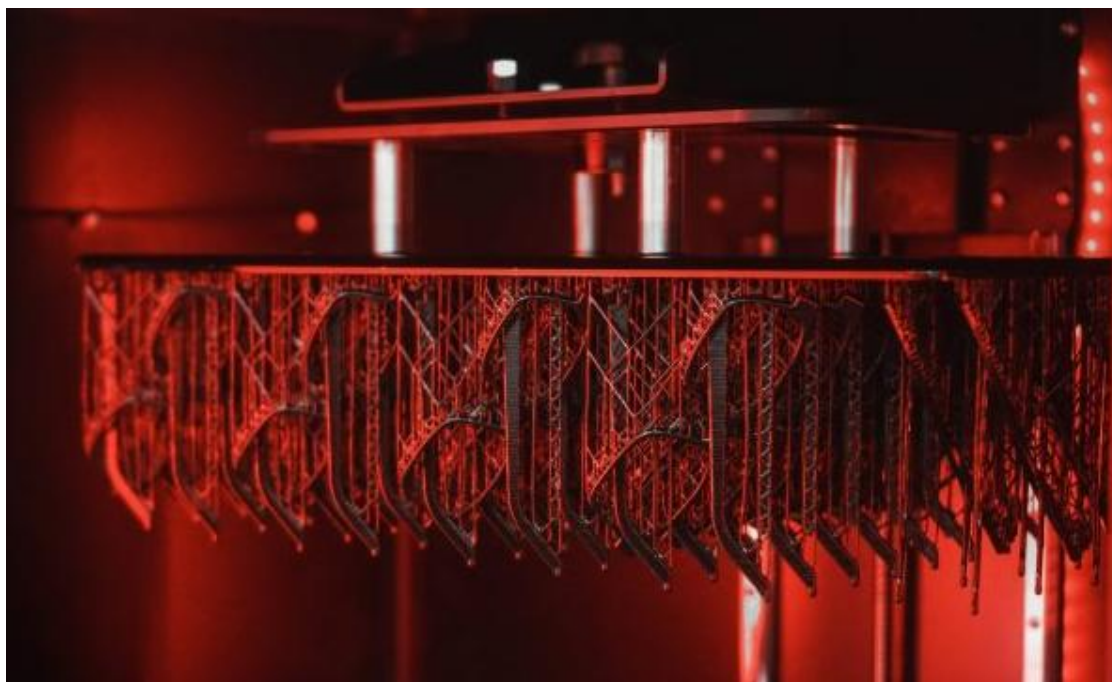




Remote workshop for additive manufacturing



Practice 1 - Orientation and arrangement of a piece in the
Slicer of LCD technology additive manufacturing
equipment.

Theoretical Concepts Questionnaire

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Theoretical Concepts Questionnaire

1. What does LCD technology mean in additive manufacturing?
 - a) Light Crystal Design
 - b) Liquid Crystal Display
 - c) Layer Control Design
 - d) Laser Controlled Deposition

2. What is the main material used in LCD technology?
 - a) PLA filament
 - b) Metal powder
 - c) Photocurable liquid resin
 - d) Nylon

3. What component of the LCD printer allows the resin to harden?
 - a) Liquid crystal display
 - b) Diode laser
 - c) Extrusion system
 - d) Heated platform

4. What is the main advantage of LCD technology over FDM?
 - a) Higher printing speed
 - b) Higher resolution and detail
 - c) Use of cheaper materials
 - d) Lower electrical consumption

5. What safety measure is key when handling resins?

- a) Use of gloves and a mask
- b) Working without ventilation
- c) Direct exposure to UV light
- d) Storage in open containers

6. What type of light does LCD technology use?

- a) Ultraviolet (UV) light
- b) Infrared (IR) light
- c) Broad spectrum visible light
- d) Blue laser light

7. What is the main use of LCD printers?

- a) Creation of metal industrial parts
- b) Manufacturing of high-resolution models
- c) Rapid prototyping with filaments
- d) Printing of large structures

8. Which parameter mainly affects the resolution of the print?

- a) The temperature of the resin
- b) The thickness of the layer
- c) The power of the motor
- d) The color of the resin

9. What is the function of the build platform in the LCD printer?

- a) Heating the resin
- b) Holding the parts during printing
- c) Solidifying UV light
- d) Controlling the screen LCD

10. What personal protective equipment (PPE) is mandatory when cleaning printed parts?

- a) Sunglasses
- b) Reflective clothing
- c) Nitrile gloves and safety glasses
- d) Metal shoes

11. What parameter influences the printing speed in LCD technology?

- a) LCD screen size
- b) Layer thickness
- c) Laser power
- d) Cooling time

12. What is the main function of ultraviolet (UV) light in LCD technology?

- a) Heating the resin
- b) Hardening the photocurable resin
- c) Solidifying the plastic material
- d) Removing air bubbles

13. What happens if the resin is not mixed properly before use?

- a) A glossy finish is obtained
- b) The part may have structural flaws
- c) Printing will be faster
- d) The part will have greater hardness

14. What is the main advantage of using Low viscosity resins?

- a) Longer printing time
- b) Better adhesion to the platform
- c) Increased layer thickness
- d) Reduced resolution

15. What should be done after printing a part with LCD resin?

- a) Let it air dry
- b) Cure it with additional UV light
- c) Submerge it in hot water
- d) Put it in a low temperature oven

16. What is the name of the base where the part adheres during printing?/

- a) Build platform/Manufacturing
- b) Leveling base
- c) Support grid
- d) Heated bed

17. What can cause a part to peel off the platform during printing?

- a) Lack of ventilation
- b) Low exposure to UV light
- c) High quality resin
- d) Use of a large screen

18. What characteristic defines the LCD screen in this technology?

- a) Acts as a light projector
- b) Provides cooling to the system
- c) Generates heat to solidify the resin
- d) Allows printing with metallic materials

19. What is the main maintenance required by an LCD printer?

- a) Motor lubrication
- b) Regular replacement of the LCD screen
- c) Adjustment of the print head
- d) Extruder change

20. What property of the resin influences the transparency of the parts?

- a) Curing point
- b) Viscosity
- c) Color and additives
- d) Size of the container

Theoretical Concepts Questionnaire. Solutions

1. What does LCD technology mean in additive manufacturing?

a) Light Crystal Design

b) Liquid Crystal Display because LCD printers use an LCD screen to selectively mask UV light and cure the resin layer by layer.

c) Layer Control Design

d) Laser Controlled Deposition

2. What is the main material used in LCD technology?

a) PLA filament

b) Metal powder

c) Photocurable liquid resin because LCD technology discussed refers to metal additive manufacturing using a photopolymer binder and metal powder mixture.

d) Nylon

3. What component of the LCD printer allows the resin to harden?

a) Liquid crystal display is correct because it controls the light pattern that cures the photopolymer resin, allowing each layer to solidify.

b) Diode laser

c) Extrusion system

d) Heated platform

4. What is the main advantage of LCD technology over FDM?

a) Higher printing speed is correct because LCD printers cure entire layers at once using masked UV light, making them faster than FDM's point-by-point extrusion.

b) Higher resolution and detail

c) Use of cheaper materials

d) Lower electrical consumption

5. What safety measure is key when handling resins?

- a) Use of gloves and a mask** is correct because resins can be irritating or toxic on contact or inhalation, so personal protective equipment is essential.
- b) Working without ventilation
- c) Direct exposure to UV light
- d) Storage in open containers

6. What type of light does LCD technology use?

- a) Ultraviolet (UV) light** is correct because LCD 3D printers use UV light to cure the photocurable resin layer by layer, initiating polymerization and solidifying the material.
- b) Infrared (IR) light
- c) Broad spectrum visible light
- d) Blue laser light

7. What is the main use of LCD printers?

- a) Creation of metal industrial parts
- b) Manufacturing of high-resolution models** is correct because LCD printers are known for producing very fine details thanks to pixel-based light masking.
- c) Rapid prototyping with filaments
- d) Printing of large structures

8. Which parameter mainly affects the resolution of the print?

- a) The temperature of the resin
- b) The thickness of the layer** is correct because thinner layers capture more detail and directly determine the vertical resolution of the print.
- c) The power of the motor
- d) The color of the resin

9. What is the function of the build platform in the LCD printer?

a) Heating the resin

b) Holding the parts during printing is correct because the build platform serves as the surface where each cured layer adheres as the model grows upward.

c) Solidifying UV light

d) Controlling the screen LCD

10. What personal protective equipment (PPE) is mandatory when cleaning printed parts?

a) Sunglasses

b) Reflective clothing

c) Nitrile gloves and safety glasses is correct because cleaning printed parts involves contact with uncured resin and alcohol, which require hand and eye protection.

d) Metal shoes

11. What parameter influences the printing speed in LCD technology?

a) LCD screen size

b) Layer thickness is correct because thicker layers cure faster, so reducing the number of layers directly increases printing speed.

c) Laser power

d) Cooling time

12. What is the main function of ultraviolet (UV) light in LCD technology?

a) Heating the resin

b) Hardening the photocurable resin is correct because UV light initiates the polymerization process that solidifies each layer of resin in LCD printing.

c) Solidifying the plastic material

d) Removing air bubbles

13. What happens if the resin is not mixed properly before use?

a) A glossy finish is obtained

b) The part may have structural flaws is correct because unmixed resin components separate, causing inconsistent curing and weak or defective areas in the print.

c) Printing will be faster

d) The part will have greater hardness

14. What is the main advantage of using Low viscosity resins?

a) Longer printing time

b) Better adhesion to the platform is correct because low-viscosity resins flow and level more easily, improving contact and bonding with the build surface.

c) Increased layer thickness

d) Reduced resolution

15. What should be done after printing a part with LCD resin?

a) Let it air dry

b) Cure it with additional UV light is correct because printed parts still contain uncured resin and require post-curing to reach their final strength and stability.

c) Submerge it in hot water

d) Put it in a low temperature oven

16. What is the name of the base where the part adheres during printing?

a) Build platform/Manufacturing is correct because this is the surface where each layer adheres and the model is formed during the printing process.

b) Leveling base

c) Support grid

d) Heated bed

17. What can cause a part to peel off the platform during printing?

a) Lack of ventilation

b) Low exposure to UV light is correct because insufficient curing prevents proper layer adhesion, causing the part to detach from the build platform.

c) High quality resin

d) Use of a large screen

18. What characteristic defines the LCD screen in this technology?

a) Acts as a light projector is correct because the LCD screen selectively blocks or allows light to cure the resin layer by layer, effectively “projecting” the image of each layer

b) Provides cooling to the system

c) Generates heat to solidify the resin

d) Allows printing with metallic materials

19. What is the main maintenance required by an LCD printer?

a) Motor lubrication

b) Regular replacement of the LCD screen is correct because the screen degrades over time due to constant UV exposure, affecting print quality and accuracy.

c) Adjustment of the print head

d) Extruder change

20. What property of the resin influences the transparency of the parts?

a) Curing point

b) Viscosity

c) Color and additives is correct because pigments or fillers in the resin determine how light passes through, directly affecting the transparency of the printed part.

d) Size of the container