



Materials and Manufacturing

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Founded 1853

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Reading

Essential

Thompson, R. & Kim, YY. (2011) Product and Furniture Design (The Manufacturing Guides). Thames & Hudson.

Thompson, R. (2011) Prototyping and Low-volume Production (The Manufacturing Guides). Thames & Hudson.

Thompson, R. & Thompson, M. (2011) Sustainable Materials, Processes and Production (The Manufacturing Guides). Thames & Hudson.

Recommended

Lefteri, C. (2011) Making It: Manufacturing Techniques for Product Design (2nd edition). Laurence King Publishing Ltd.

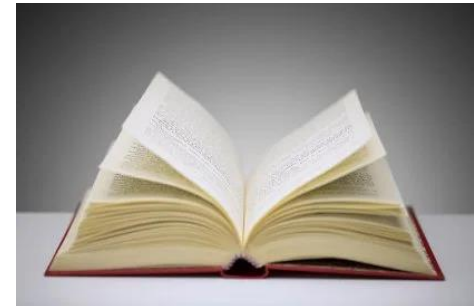
Thompson, R. (2007) Manufacturing Processes for Design Professionals. Thames & Hudson.

Callister, W. (2002) Materials and Design: The Art and Science of Materials Selection in Product Design. Butterworth-Heinemann.

Background

Hudson, J. (2011) Process: 50 Product Designs from Concept to Manufacture. (2nd edition). Laurence King Publishing Ltd.

Bramston, D. (2009) Basics Product Design 02: Material Thoughts. AVA Publishing.



Introduction to Material and Manufacturing.

Week 1

Manufacturing processes to cover in 3 weeks

- Moulding
- Casting
- cutting
- Fabrication
- Additive



Manufacturing processes

Moulding

Injection/reaction injection/compression moulding

Blow moulding

Rotational moulding

Vacuum forming

Pressing

Extrusion

(Surface finishes colours post processes)



Manufacturing processes

Cutting

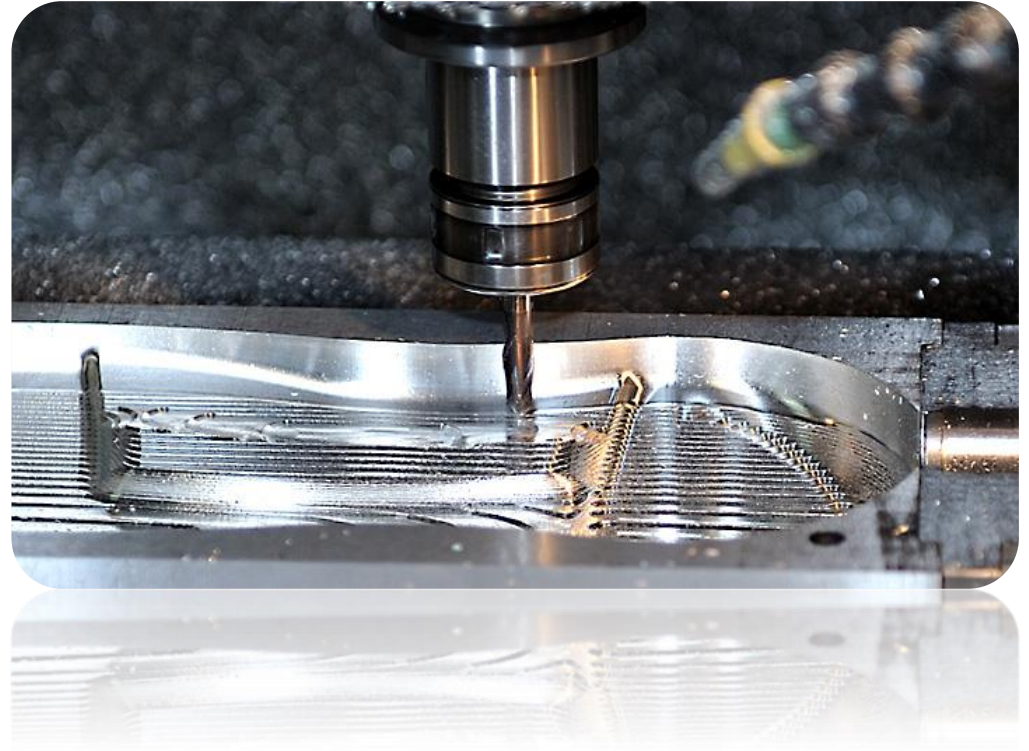
Laser cutting

Waterjet cutting

Plasma cutting

CNC machining – Subtractive manufacturing

Welding, Fabrication



Manufacturing processes

Casting

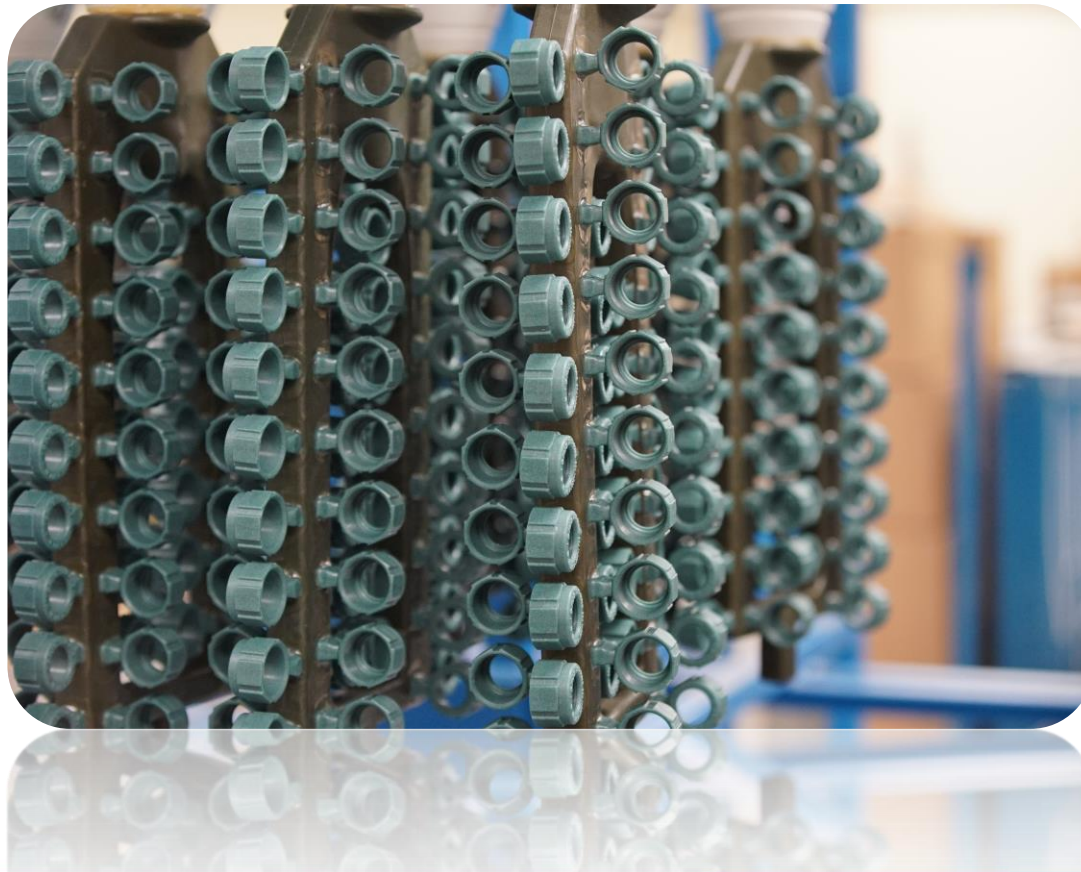
Vacuum casting

Slip casting

Investment casting

Lost wax casting

Die casting



Manufacturing processes

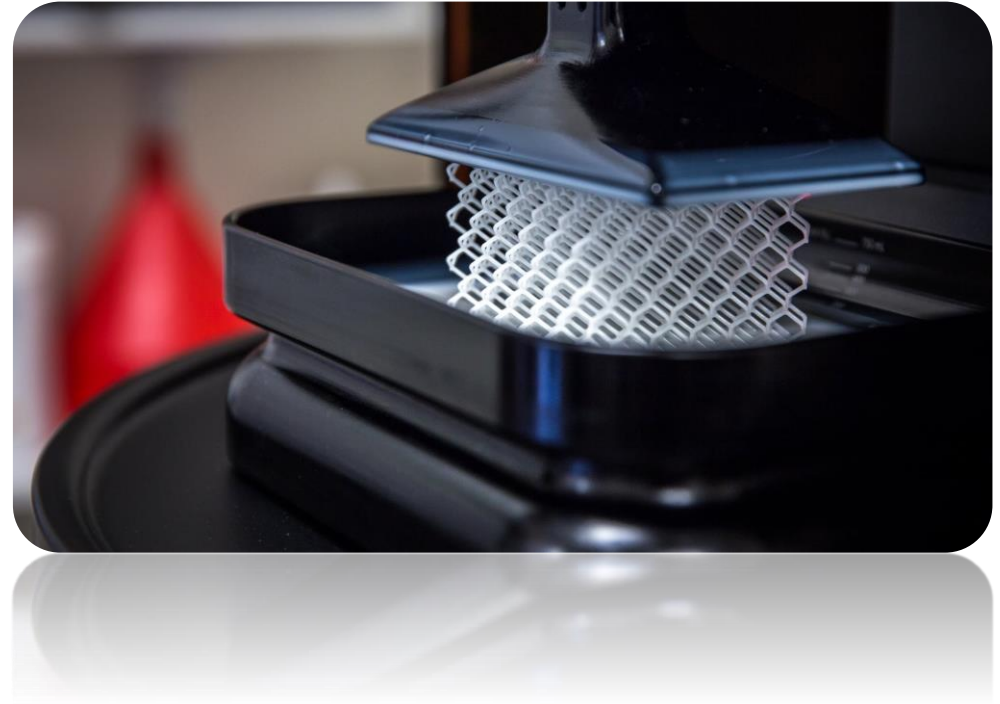
Additive Manufacturing

Technology overview

3D farming

Fabrication

Other processes for Fabrics, composites



Materials

Material selection?

- Polymers
- Metals
- Composites
- Ceramics
- Wood
- Smart



Shore hardness



Why is material selection important to a designer?



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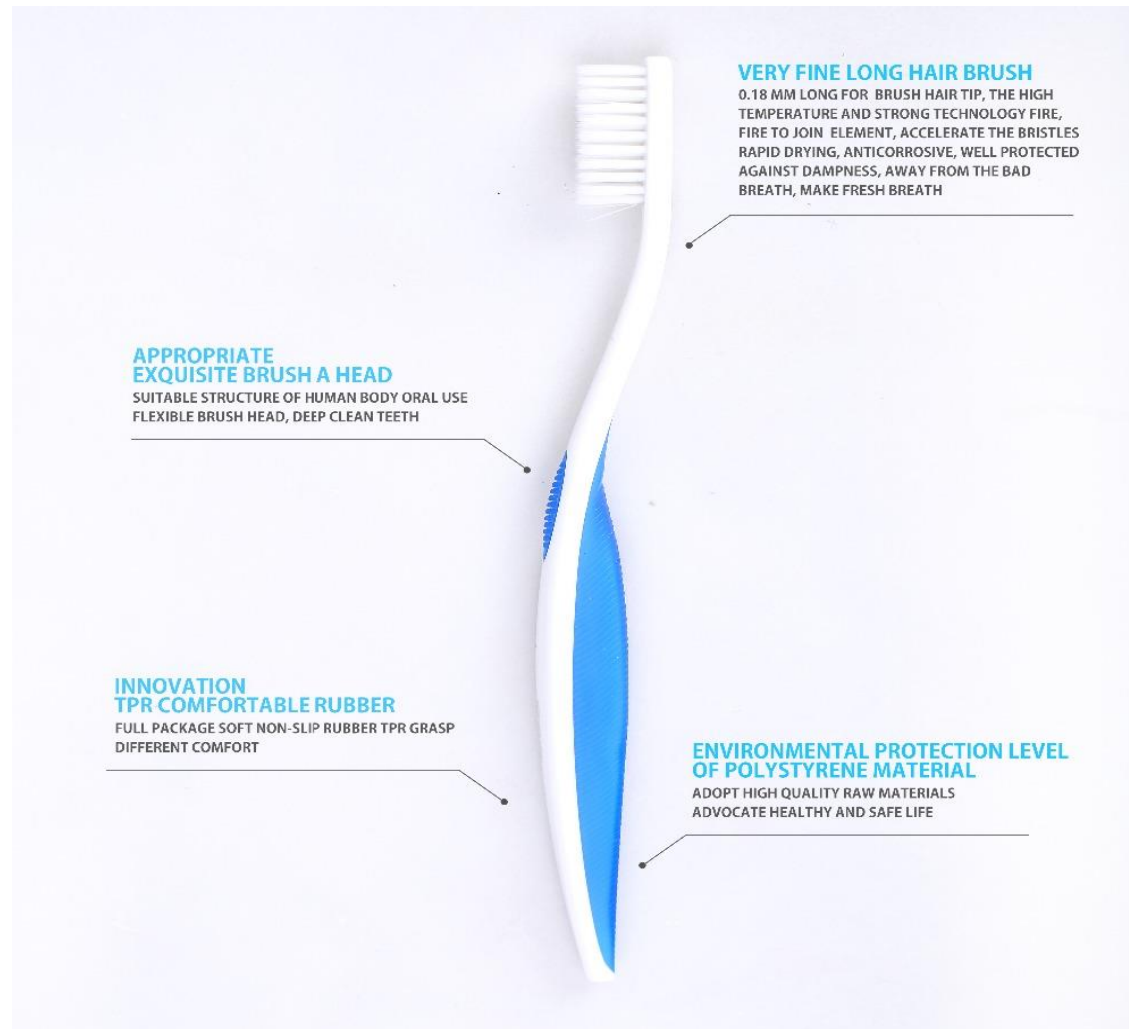


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natural
bamboo



VERY FINE LONG HAIR BRUSH

0.18 MM LONG FOR BRUSH HAIR TIP, THE HIGH TEMPERATURE AND STRONG TECHNOLOGY FIRE, FIRE TO JOIN ELEMENT, ACCELERATE THE BRISTLES RAPID DRYING, ANTICORROSIVE, WELL PROTECTED AGAINST DAMPNES, AWAY FROM THE BAD BREATH, MAKE FRESH BREATH

APPROPRIATE EXQUISITE BRUSH A HEAD

SUITABLE STRUCTURE OF HUMAN BODY ORAL USE FLEXIBLE BRUSH HEAD, DEEP CLEAN TEETH

INNOVATION TPR COMFORTABLE RUBBER

FULL PACKAGE SOFT NON-SLIP RUBBER TPR GRASP DIFFERENT COMFORT

ENVIRONMENTAL PROTECTION LEVEL OF POLYSTYRENE MATERIAL

ADOPT HIGH QUALITY RAW MATERIALS ADVOCATE HEALTHY AND SAFE LIFE



Group Task

Name at least 4 other products that use different Materials 30mins

WHICH MATERIAL TO CHOOSE?

Material selection

What are the most important considerations?

- Environment
- Function
- Aesthetics

Links

Material

manufacturing process – surface finish

Quantities

Cost

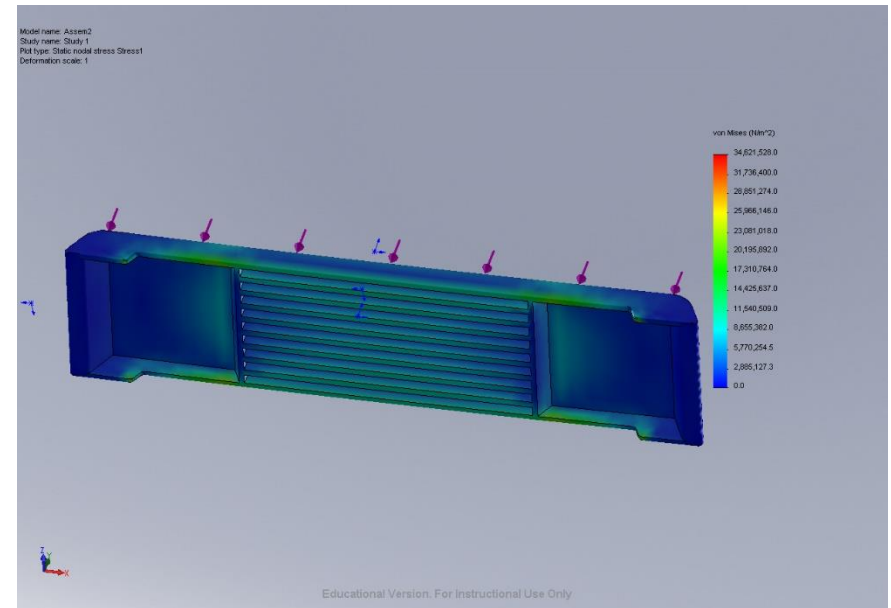
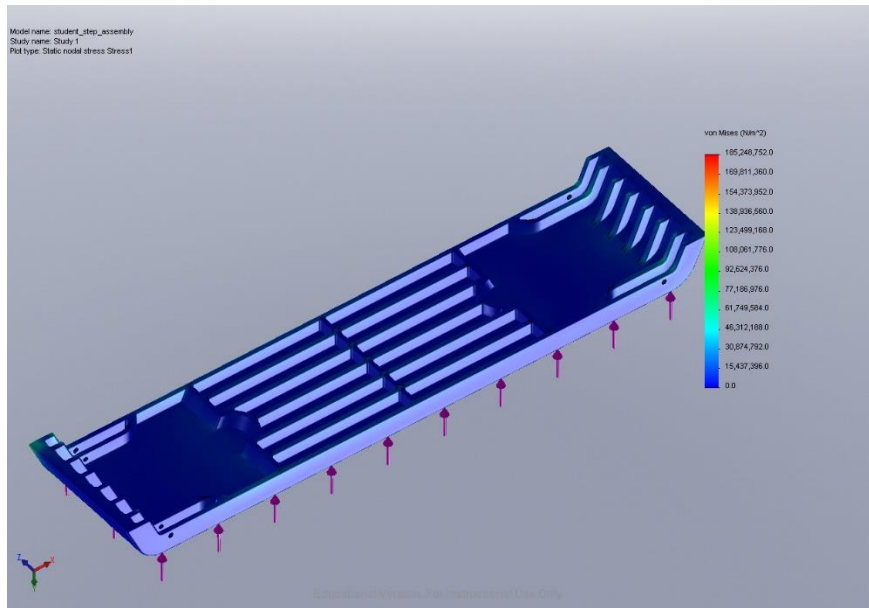
Re-Manufacture design task

Client mock up prototype



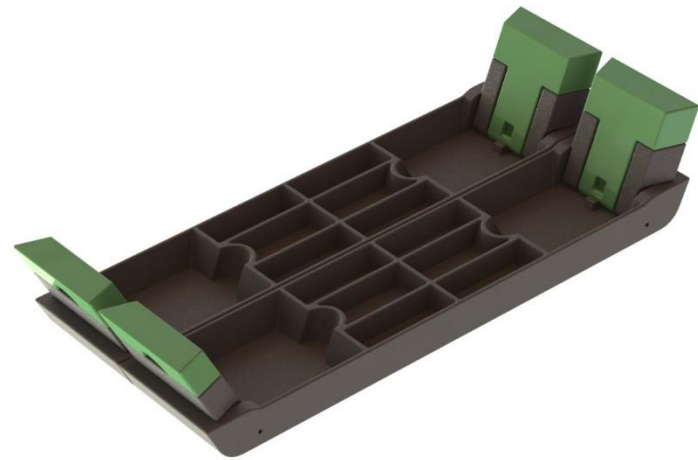
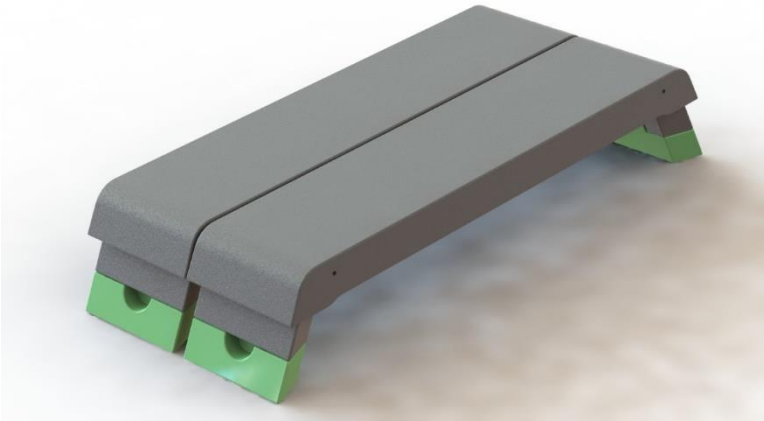
Manufacture design task

Injection Moulding



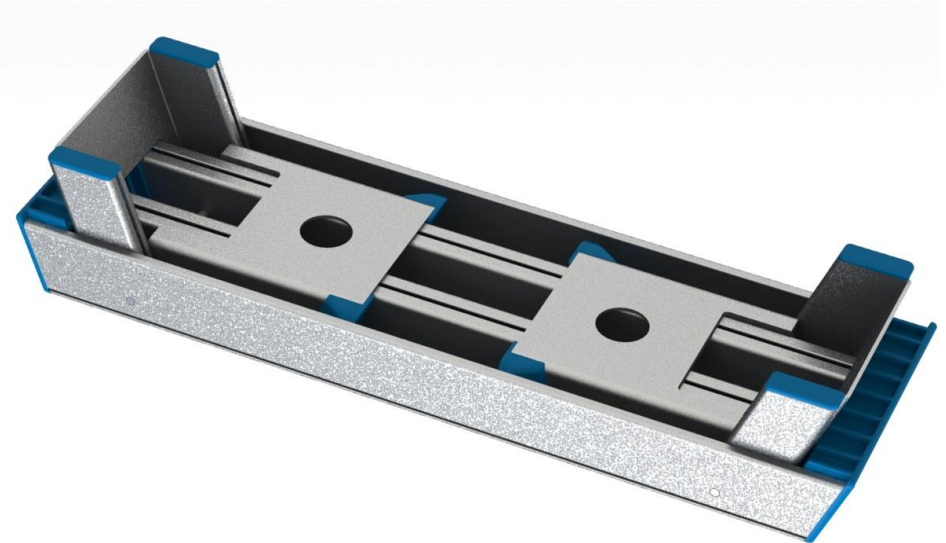
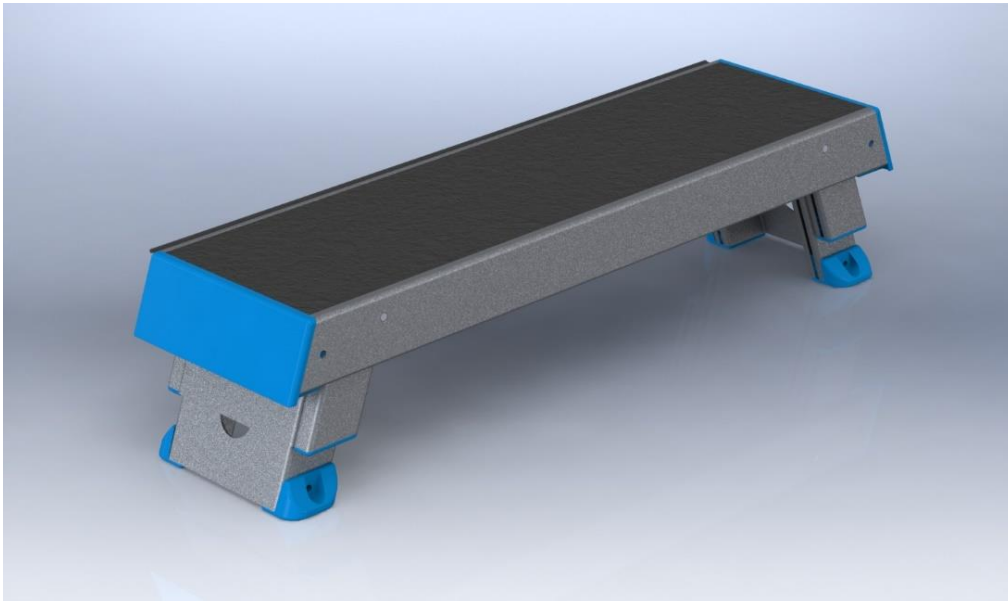
Manufacture design task

Reaction Injection Moulding



Manufacture design task

Aluminium extrusion + injection moulding



Manufacture design task





Thank You



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