



Manufacturing Techniques for Product Design | Fraunhofer CCPE Monomaterial Design Set

The Basics
PLA or PET
or PA

Fibres



Textiles, Ribbons, Tapes



Hard Foam
Sheets/ Molding



3D Mesh
Soft Seating



Injection Moulding



Increasing Impact Energy Absorption and Lightweight Design

Thermoplastic
Organo Sheets



180 cm x 100 cm
0.5 cm - 3 mm

Sandwich Plates

Organo Sheets or Fleece + Foam in the middle



180 cm x 100 cm
5 - 30 cm



180 cm x 100 cm
5 - 30 cm

Increasing Tensile Strength

Filament Winding
Reinforcement Skeleton
(Thermoplastic Fibers)



Embedded inside
Injection Moulded Part



Advanced
Manufacturing
Sheets, Plates &
Simple 3D-Forms

Feasible
Dimensions
Length x Width:
Thickness:

Increasing Complexity & Designing Large-Volume Components

Thermoforming



Core Compacting



Co-Injection Moulding



Advanced
Manufacturing
Complex
3D-Forms &
Components

Costs for Thermoforming or Injection Moulding Tools: 20 k€ up to > 100 k€