MANIFATTURA 4.0
PER L'EVOLUZIONE DELLE PMI

Juno Design srl - Studio Pedrini Srl



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	PP Plaster-based 3D Printing	SLS Sinterizzazione Laser	SLA Stereolitografia	PLJ Polijet	FDM - Fused Deposition Modeling
Stratificazione	0,1 mm	0,1-0,15 mm	0,05-0,1 mm	0,01-0,03 mm	0,1-0.254mm
Potenza impiegata	ridotta	elevata	media	ridotta	media
Processo	datato	consolidato solo per galleria del vento	datato	innovativo	Consolidato
Materiali	polveri di gesso o resine	polvere di poliammide con possibilità di componenti aggiunti (alluminio, carbonio) Polistirene	resine epossidiche liquide	vari tipi di resine liquide in forte evoluzione	ABS PC PLA ULTEM PPSU
Cambio materiale	difficoltoso	difficoltoso	difficoltoso	semplice	semplice
Finitura superficiale	discreta	discreta	buona	ottima	sufficiente
Costo medio del prototipo	elevato	non elevato	elevato	non elevato	basso
Caratteristiche materiali	caratteristiche meccaniche scarse Colori eccellenti	elevata rigidezza e buone caratteristiche meccaniche in presenza dei componenti aggiunti	caratteristiche meccaniche paragonabili a una plastica rigida	dal rigido al gommoso	caratteristiche meccaniche basse se non caricato con polifenisulfone molto costoso

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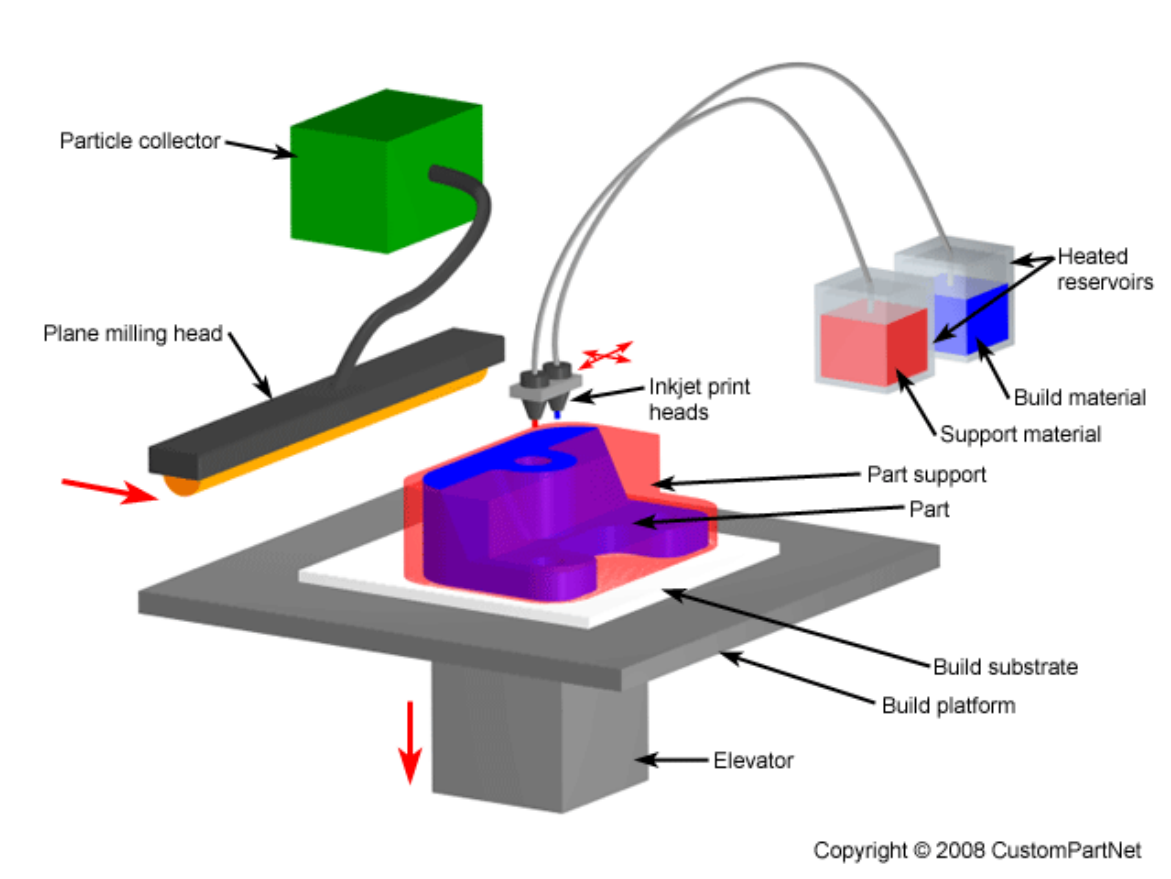
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	DMLS Direct Metal Laser Sntering	SLM Selective Laser Melting	EBM Electron Beam Melting	LOM Laminated Object Manufacturing	DLP Digital Light Processing
Stratificazione	0,02mm	0,02mm	0,02mm	-	0,1-mm
Potenza impiegata	elevata	elevata	innovativo	ridotta	media
Processo	innovativo	innovativo	innovativo	datato	datato
Materiali	Steel Stainless Steel CrCoMo Al Ti64 Nickel Alloy	Steel Stainless Steel CrCoMo Al Ti64	CrCoMo Ti64	Carta metallo termoplastico	Polimeri
Cambio materiale	difficoltoso	difficoltoso	difficoltoso	semplice	semplice
Finitura superficiale	discreta	discreta	discreta	scarsa	sufficiente
Costo medio del prototipo	molto elevato	molto elevato	molto elevato	basso	basso
Caratteristiche materiali	caratteristiche meccaniche molto elevate	caratteristiche meccaniche molto elevate	caratteristiche meccaniche molto elevate	dal rigido al flessibile	rigido

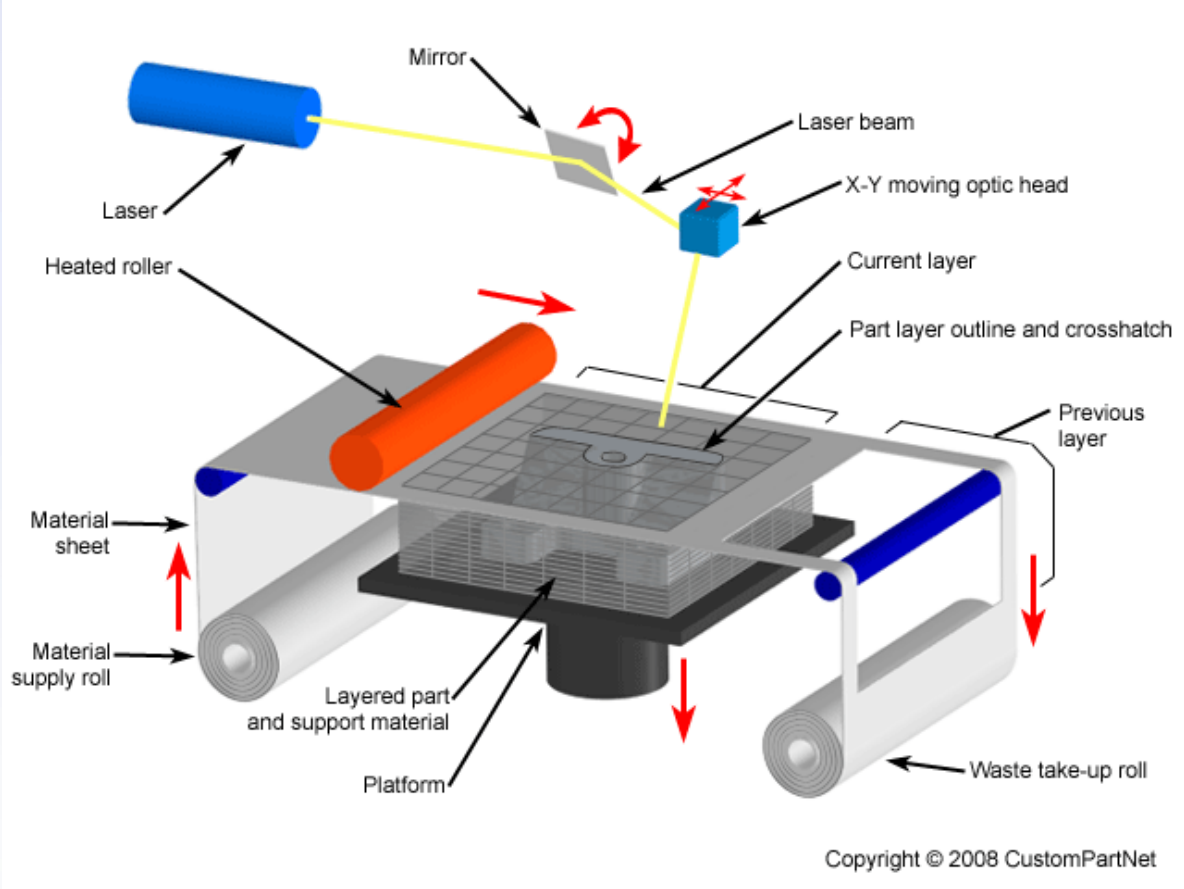
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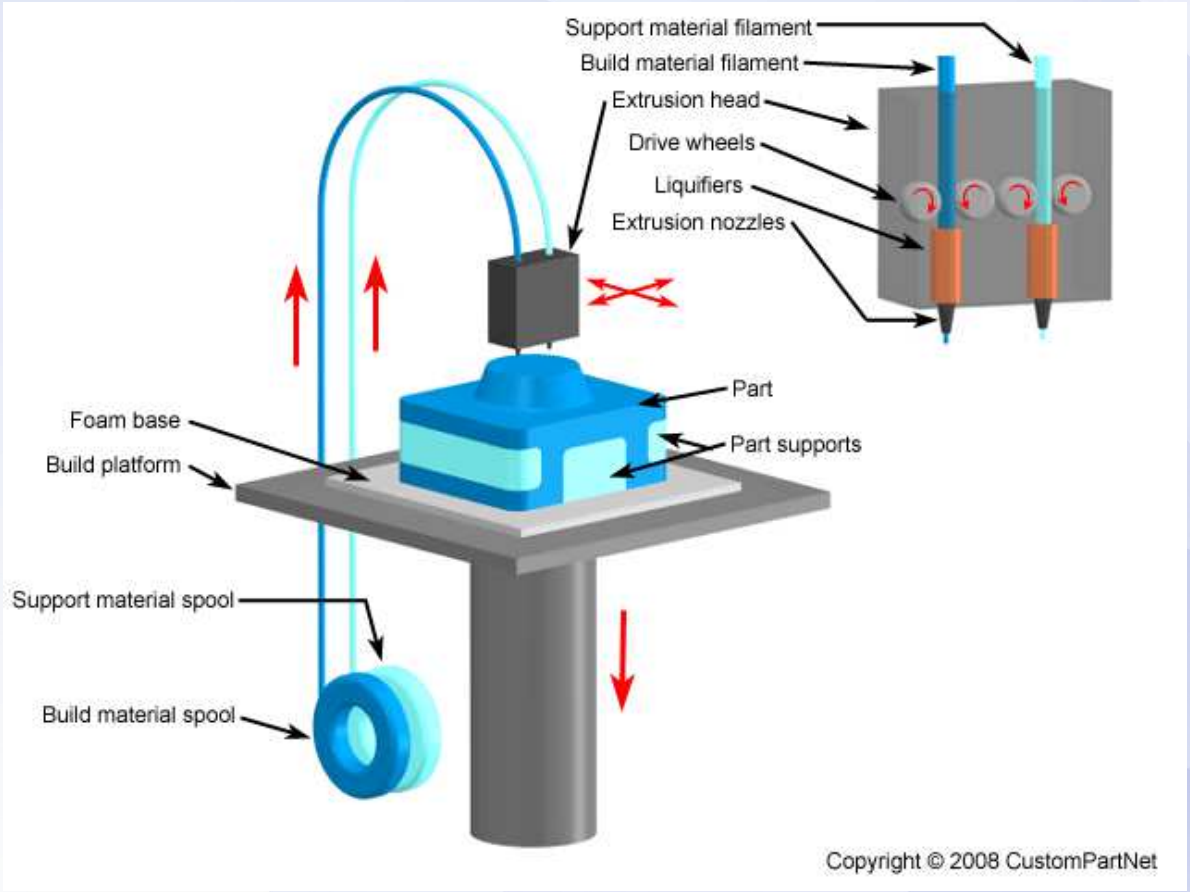
3DP
3D Printer



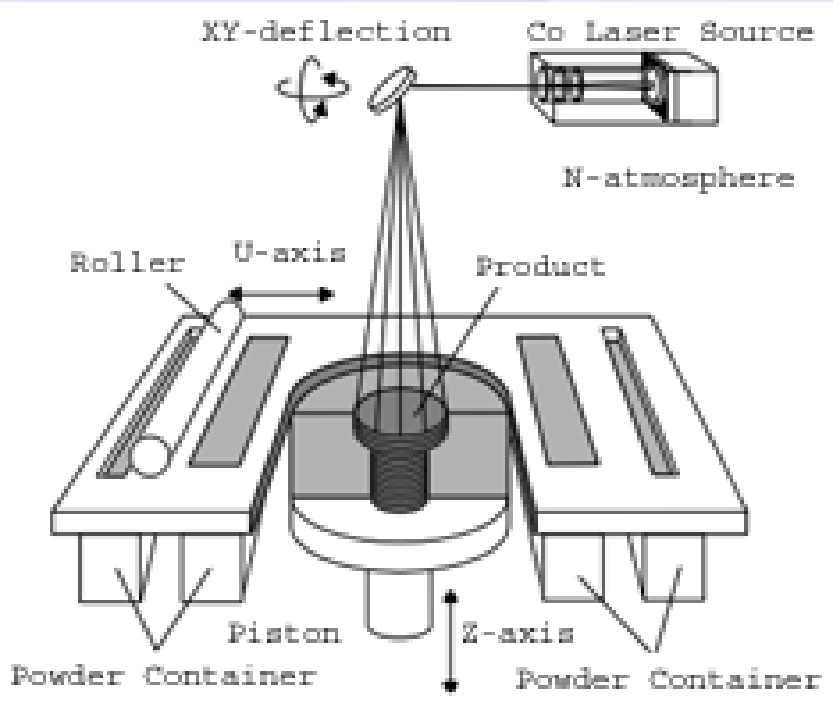
LOM
Laminated object manufacturing



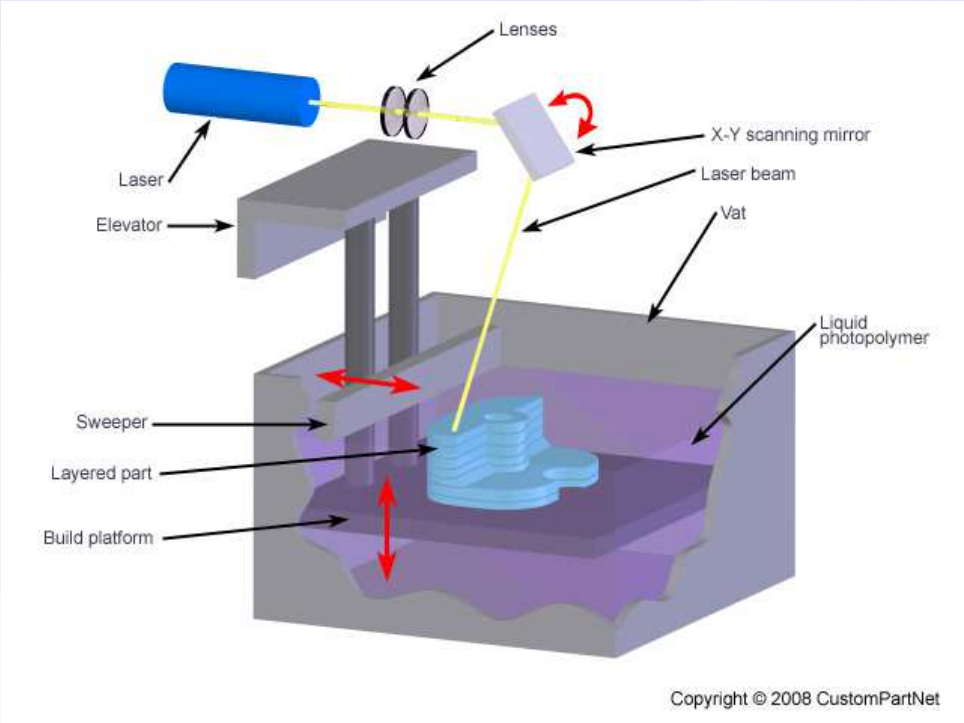
FDM
Fused Deposition Modeling



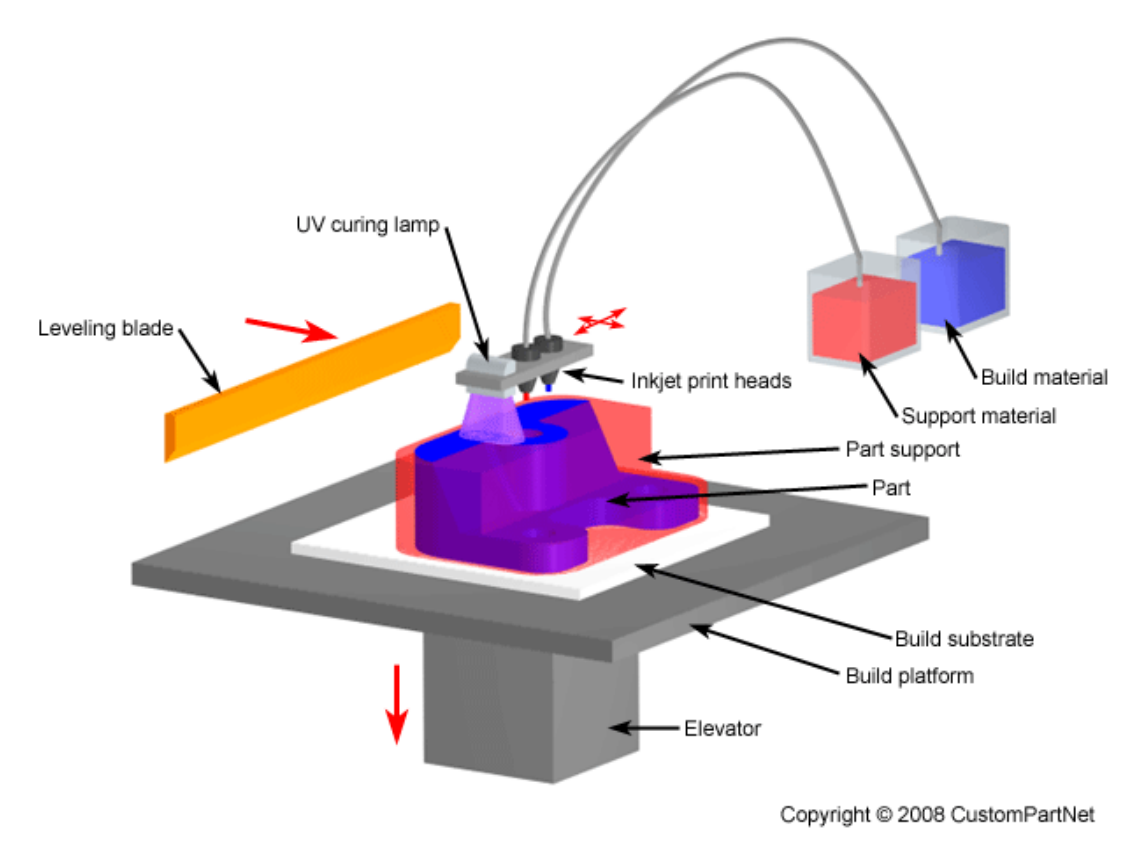
SLS
Selective Laser Sintering



SLA
Stereolitografia

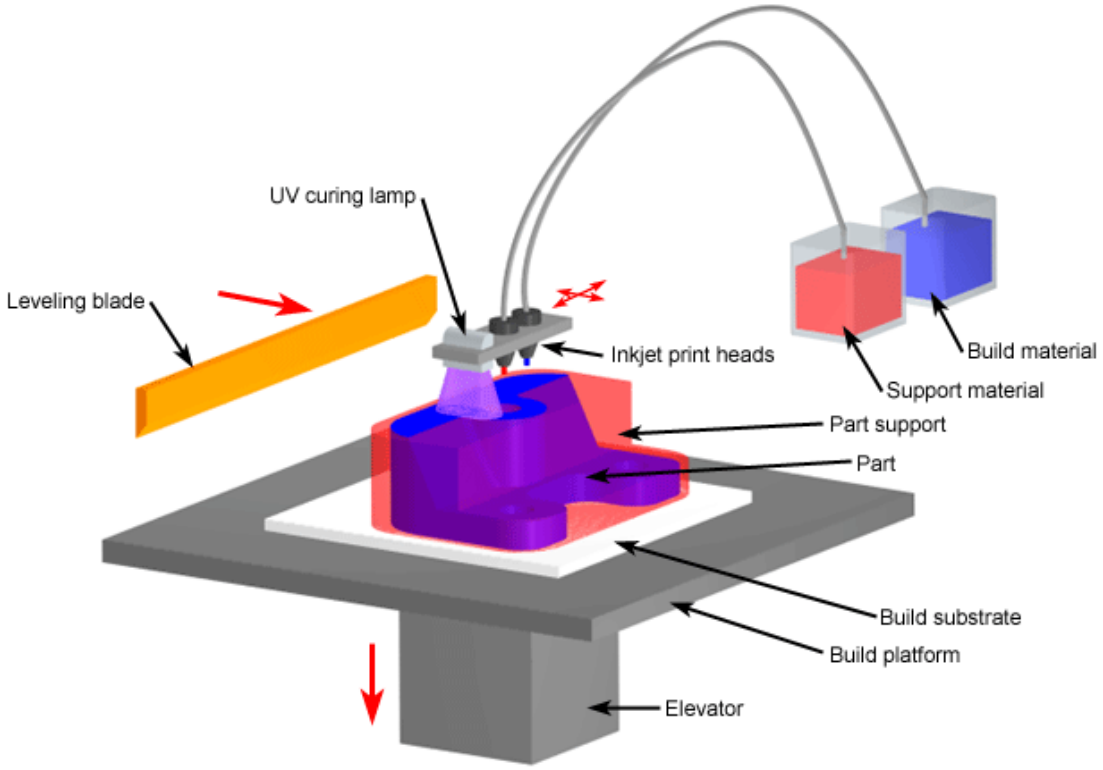


PolyJet


UV curing lamp
Leveling blade
Inkjet print heads
Build material
Support material
Part support
Part
Build substrate
Build platform
Elevator
Copyright © 2008 CustomPartNet

PolyJet Digital Materials

Stratasys



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PolyJet Photopolymers

Rigid



Flexible

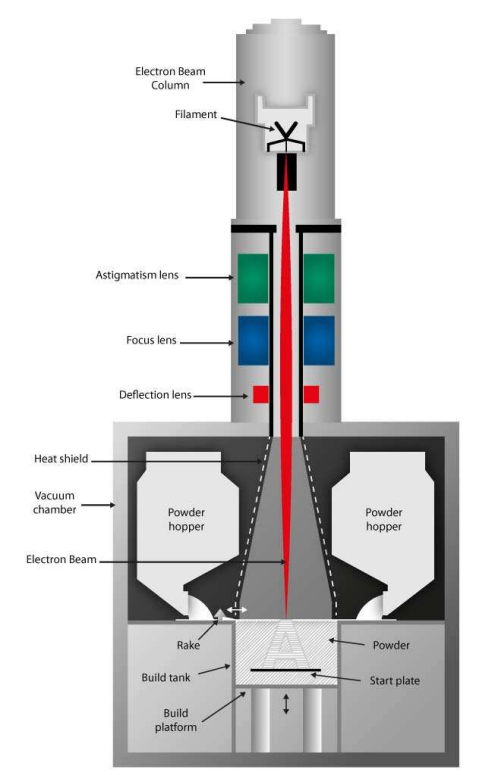


Digital Materials / Digital ABS

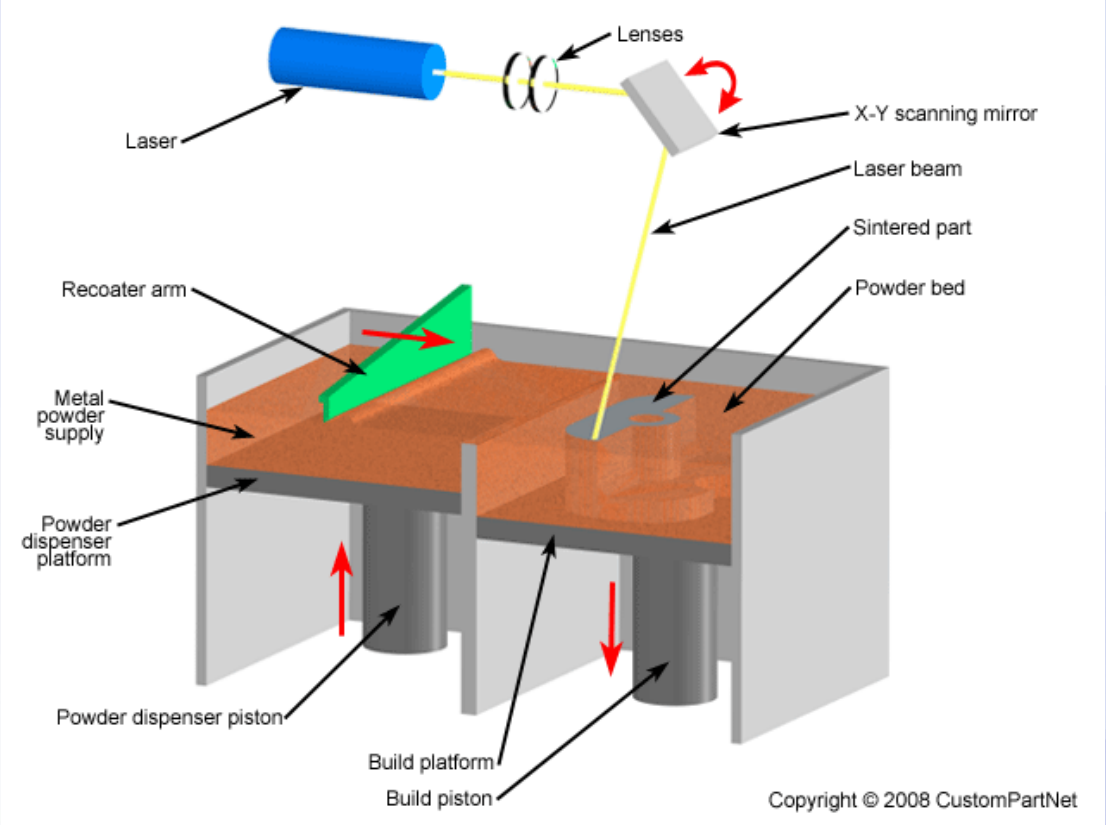


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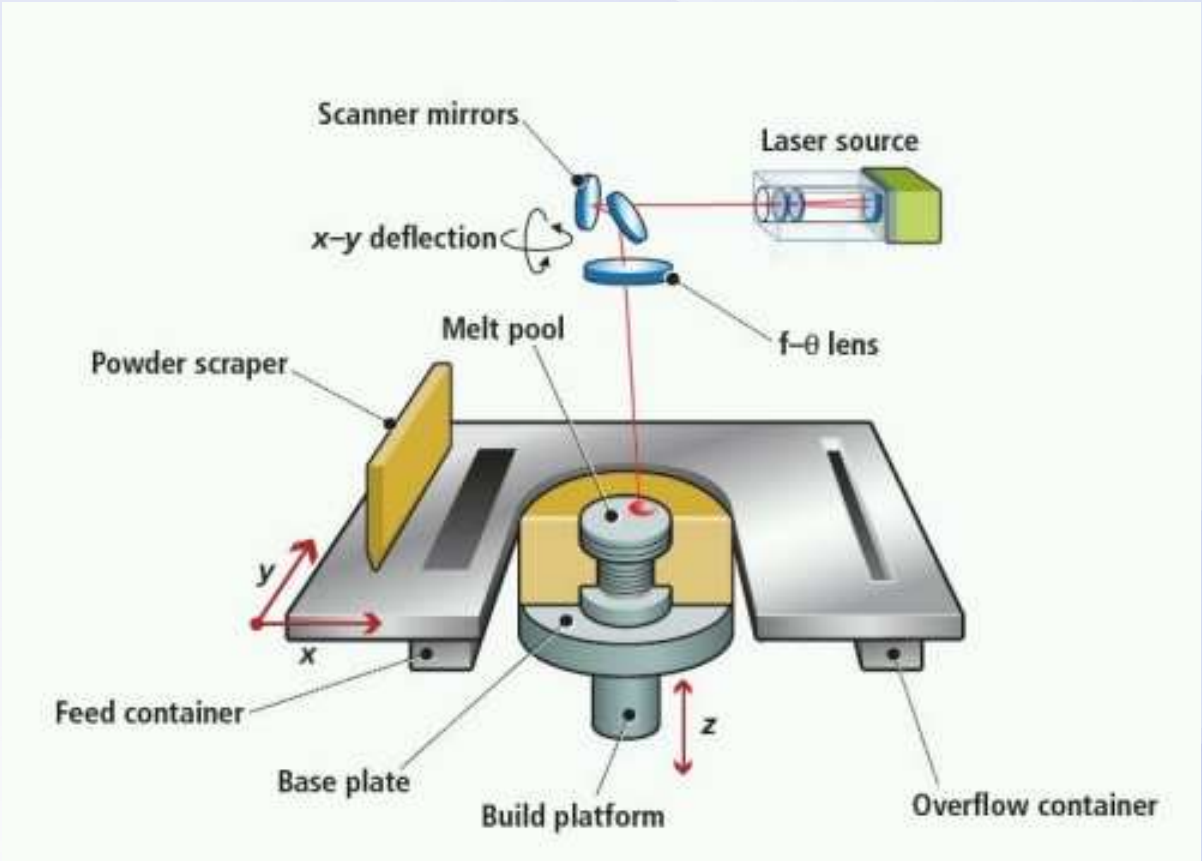
EBM
Electron Beam Melting



DLMS
Direct Laser Metal Sintering

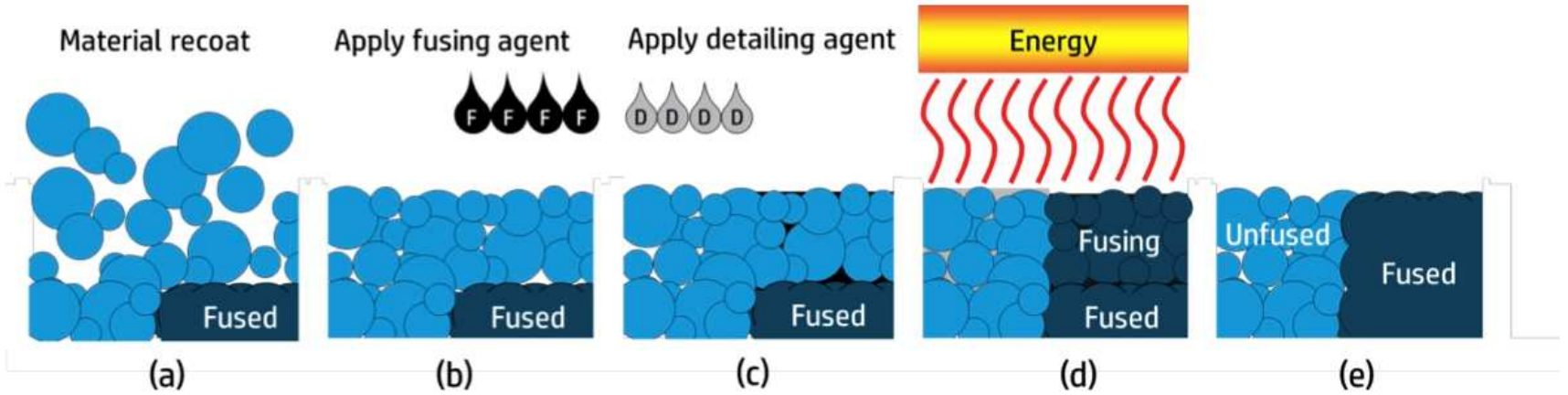


SLM
selective laser melting



MJF
Multi Jet Fusion

Figure 2—Schematic of HP multi-agent printing process (cross-section views)



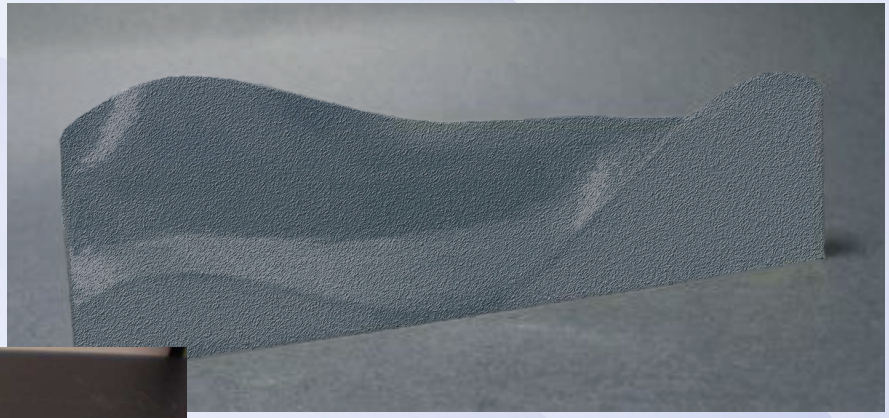
FABBRICAZIONE DIGITALE

- Rapid manufacturing
- Coating
- Reverse engineering
- Vacuum casting
- Rapid molding
- Carbon fibre

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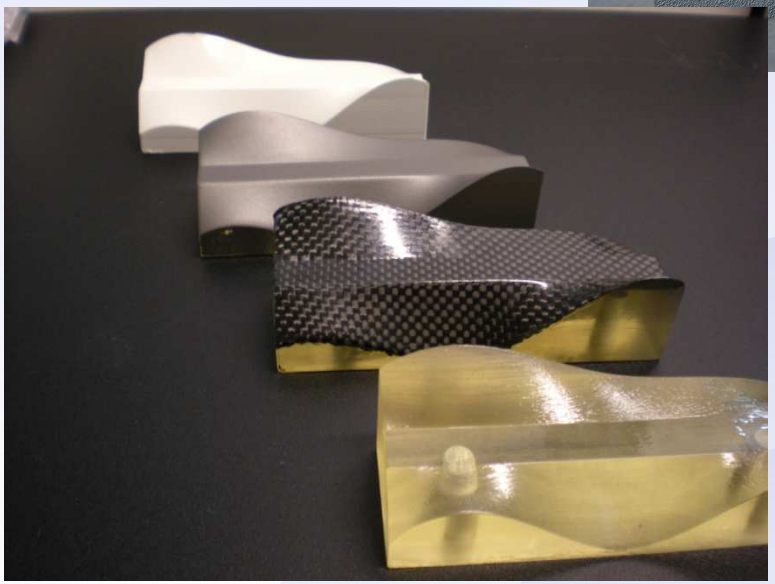
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Obiettivo: sostituzione di particolari in materiale metallico sulle macchine automatiche



Rivestimenti:

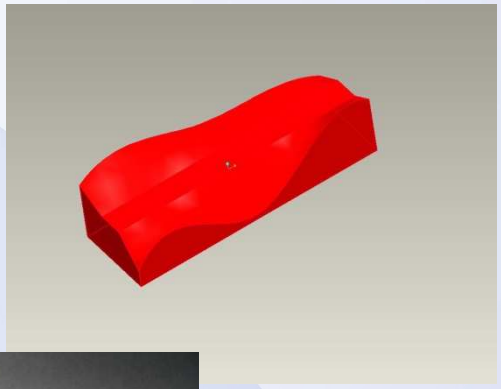
- A base di resine
- A base Metallica



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1. Modellazione 3D



2. Realizzazione con Rapid Prototyping



3. Modifica in pratica

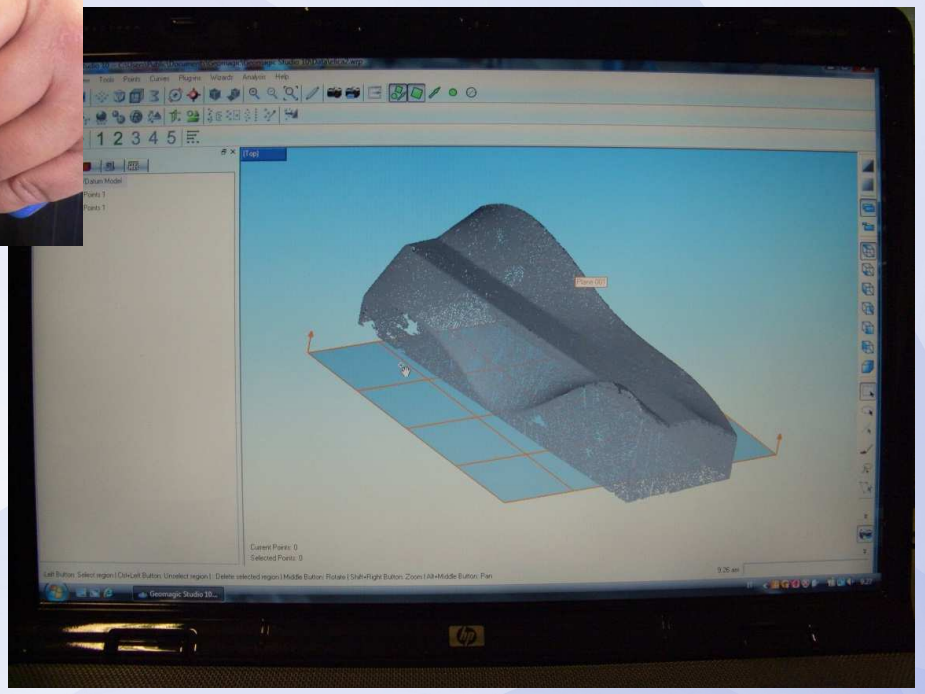


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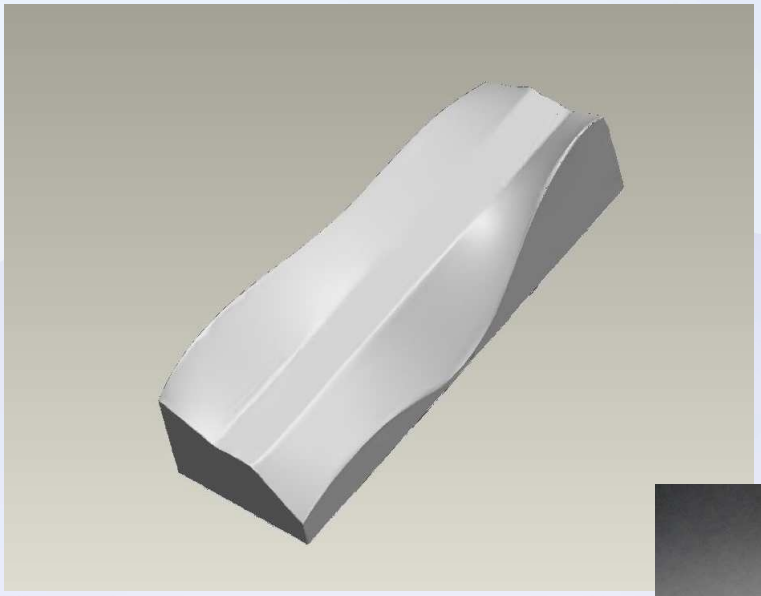
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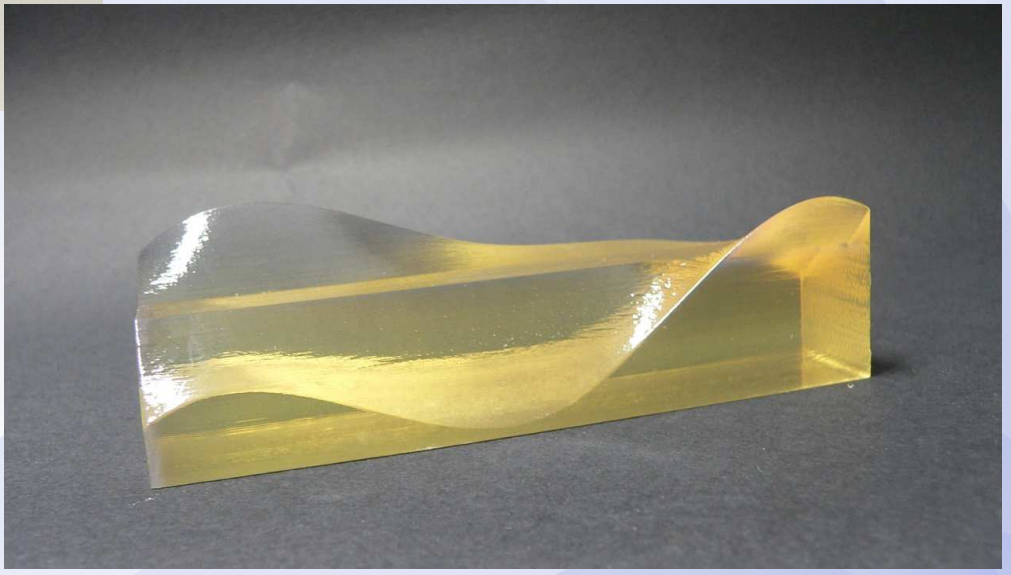
4. Ricostruzione geometrica con scanner 3D



5. Nuvola di punti



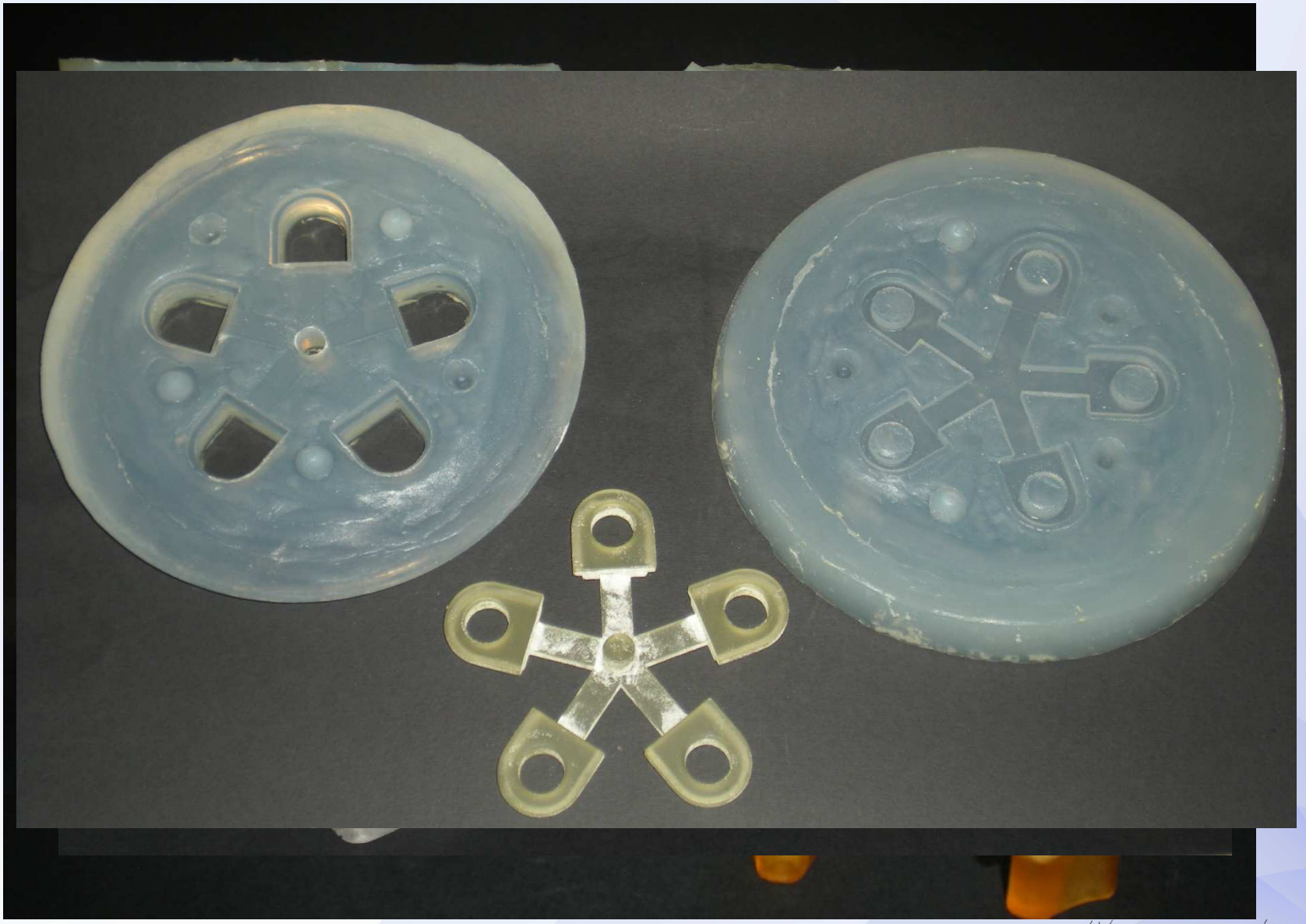
6. Fase di rimodellazione



7. Prototipazione dell'oggetto modificato.

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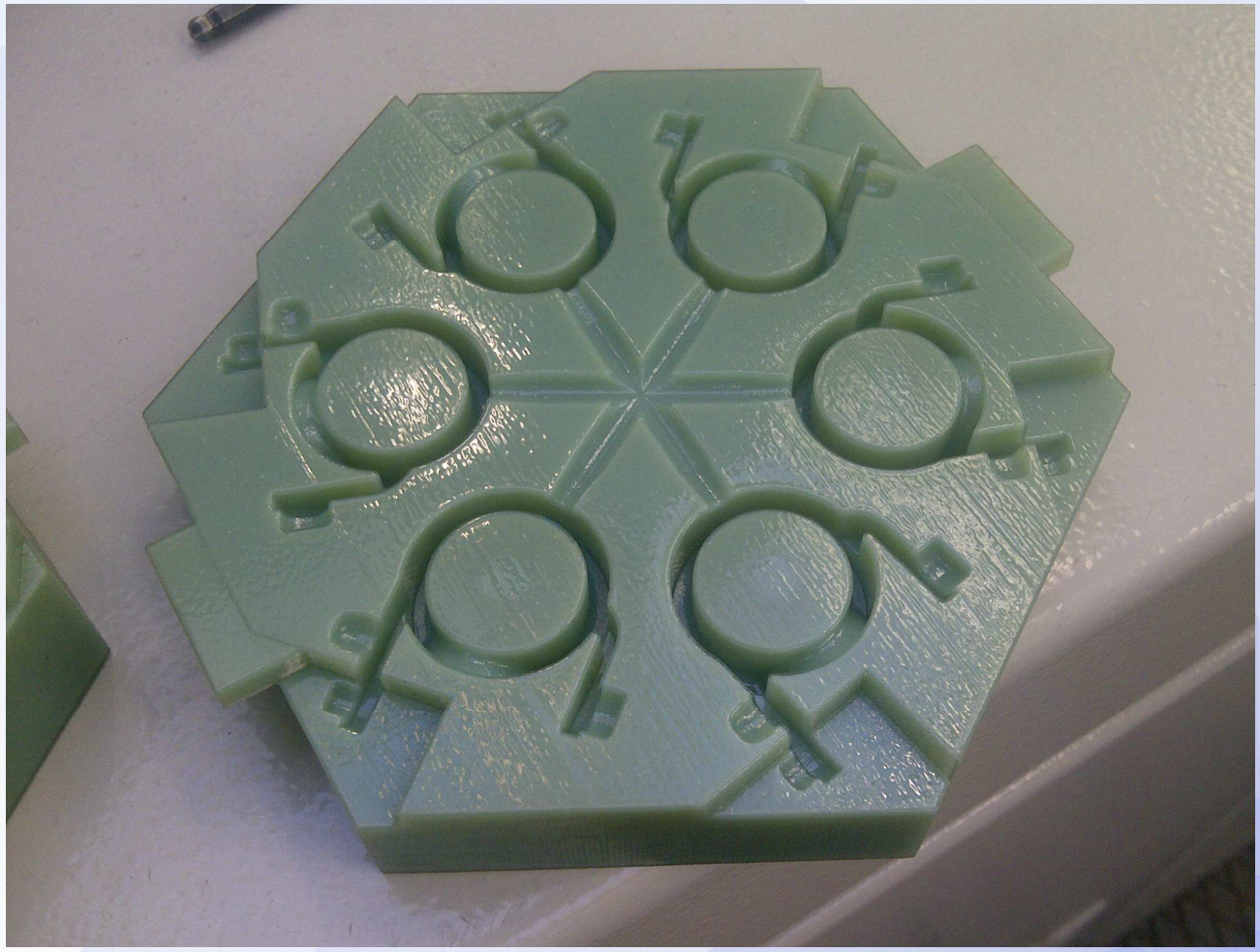


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RAPID MOLDING

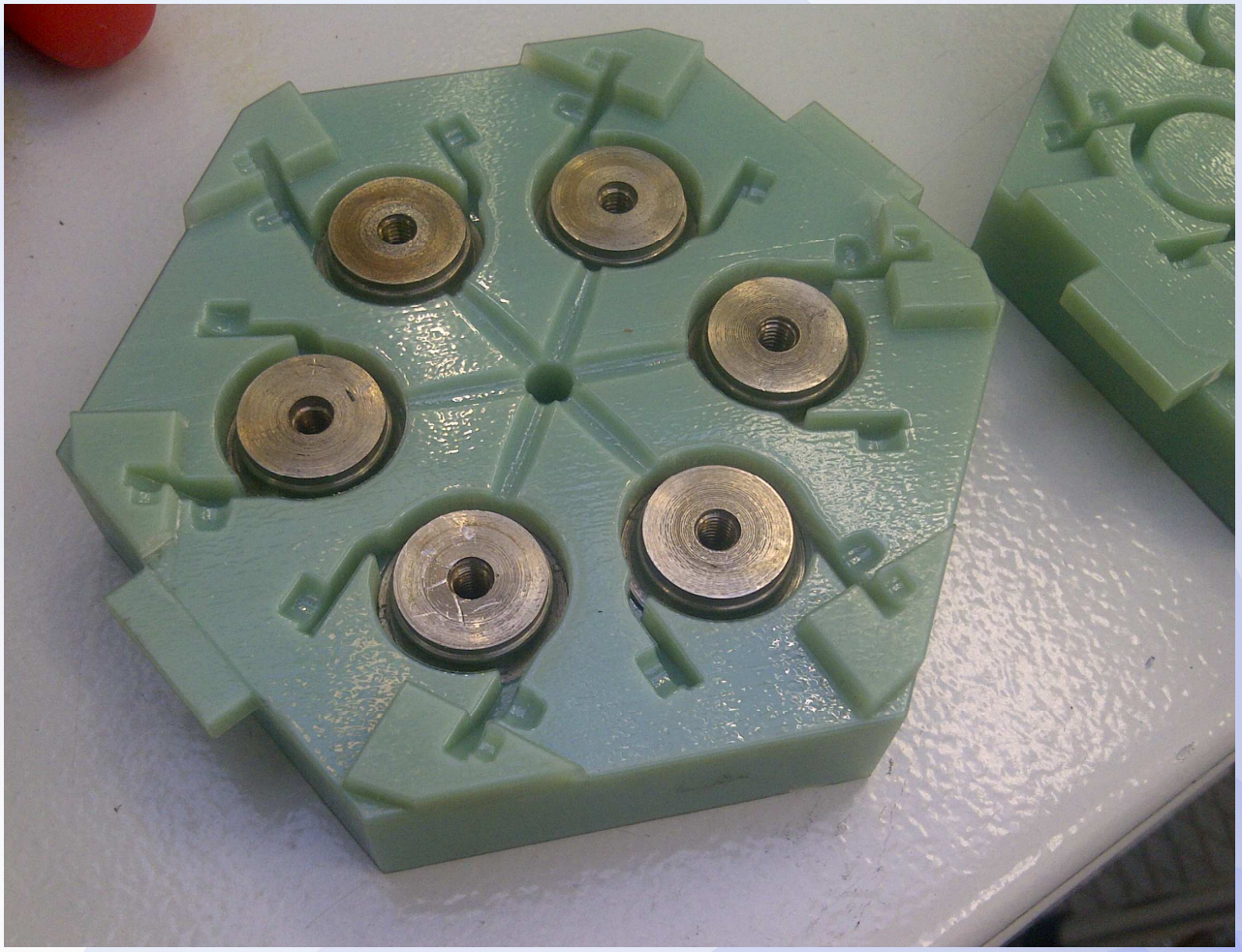
È addiritura possibile stampare direttamente la matrice senza passare dalla fresa



Nella foto uno stampo multifigura radiale
ABS Digitale, tramite tecnologia additiva POLIJET CONNEX

RAPID MOLDING

È possibile aggiungere inserti per costampaggio o gestione dei sottosquadri



Nell'esempio rame beriglio

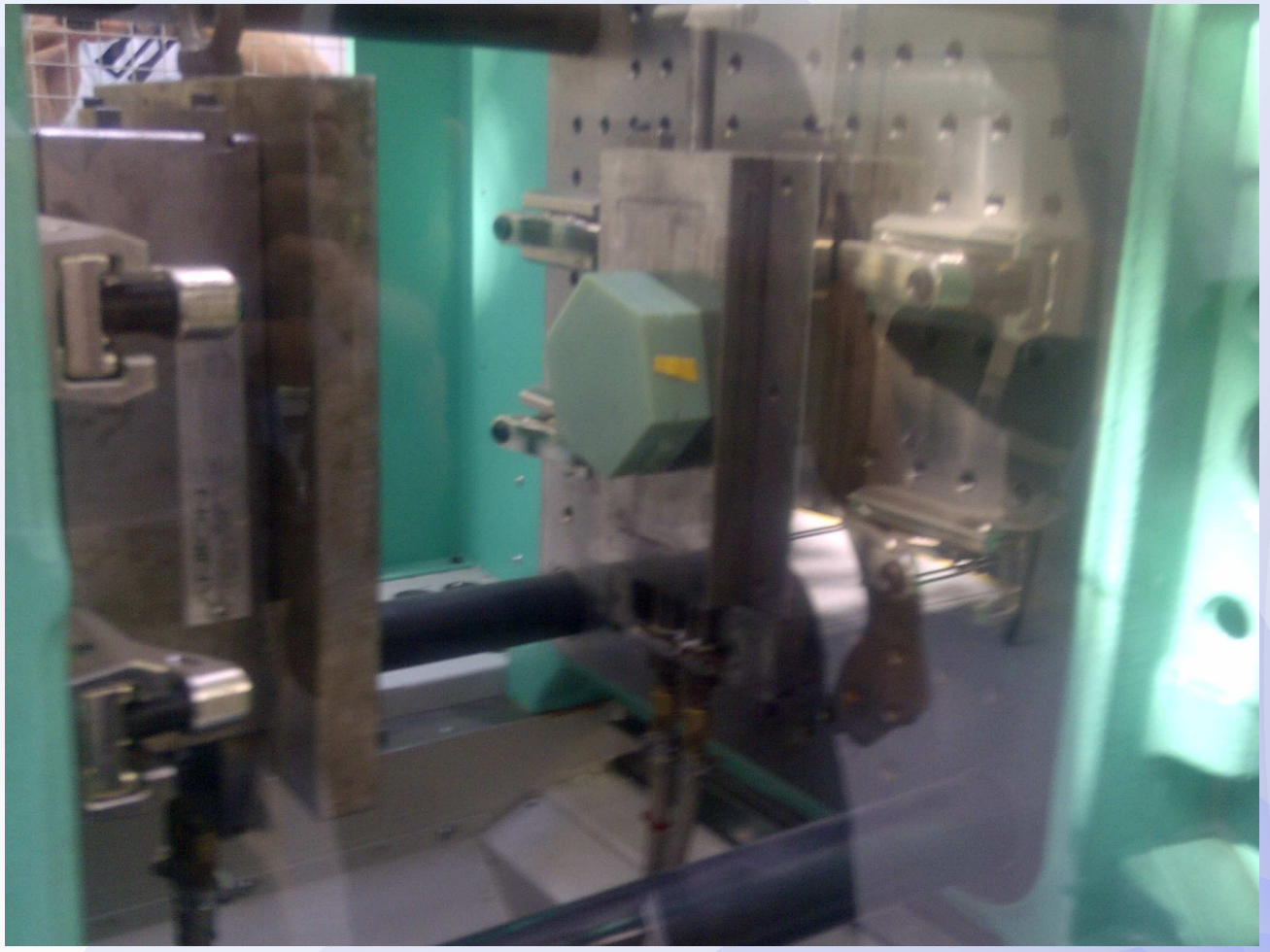
RAPID MOLDING

Iniezione in piccola pressa

Bassa pressione

Bassa velocità (1 stampata per ciclo)

Basse Temperature



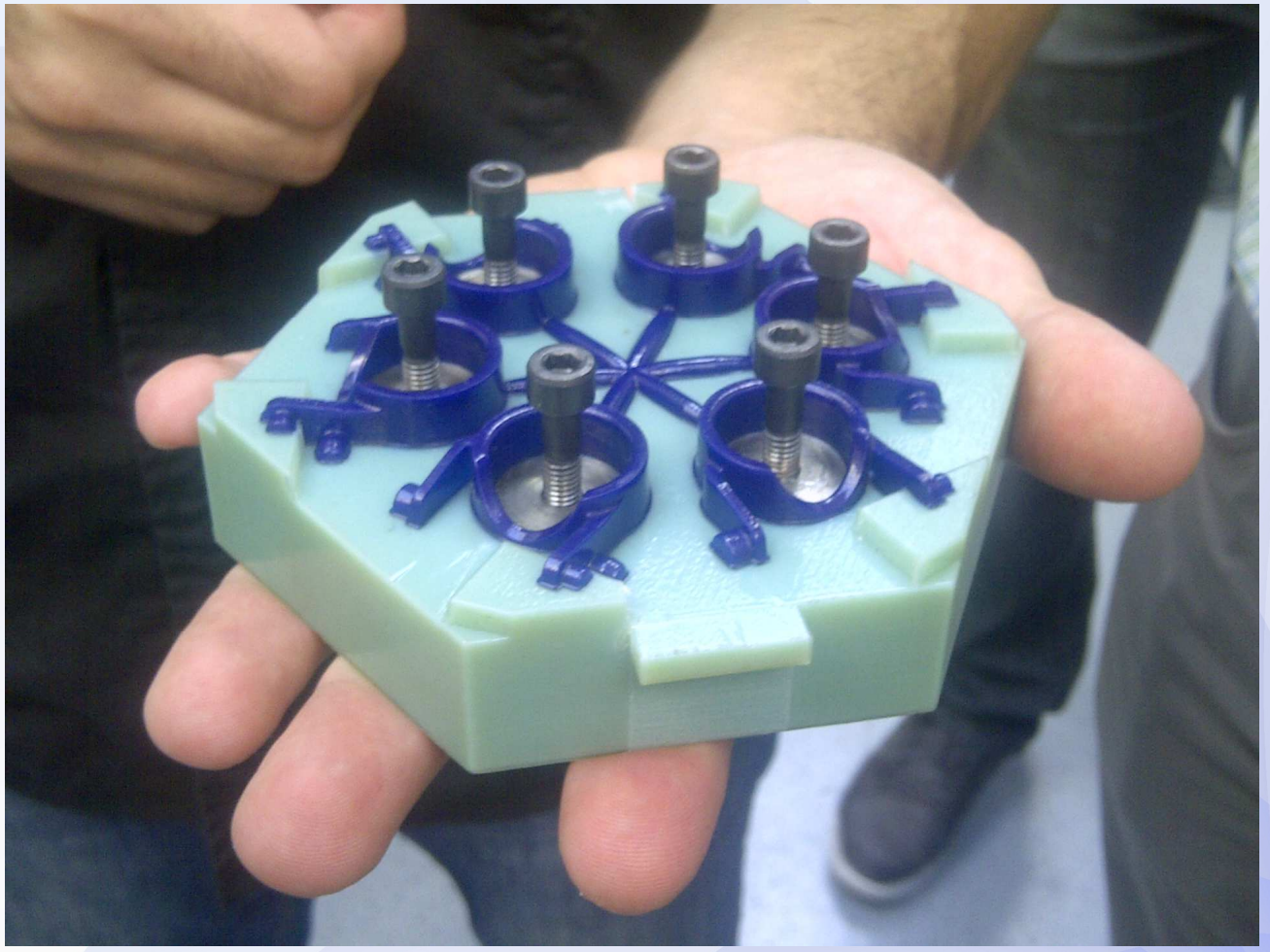
RAPID MOULDING

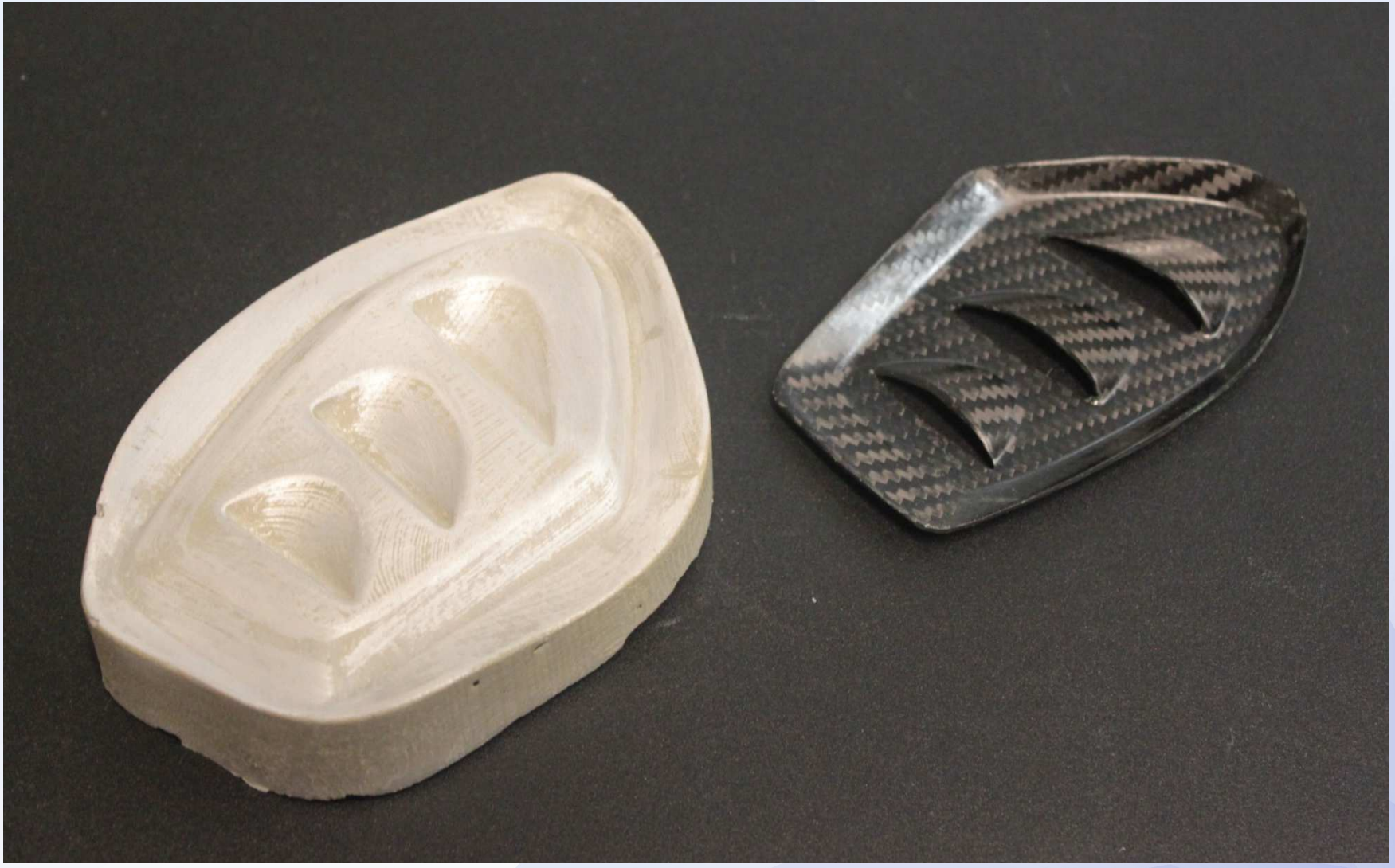
Risultato finale:

Piccola preserie

Estrazione Manuale

<u>Tecnopolimeri funzionali</u>





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Grazie per l' attenzione!

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