

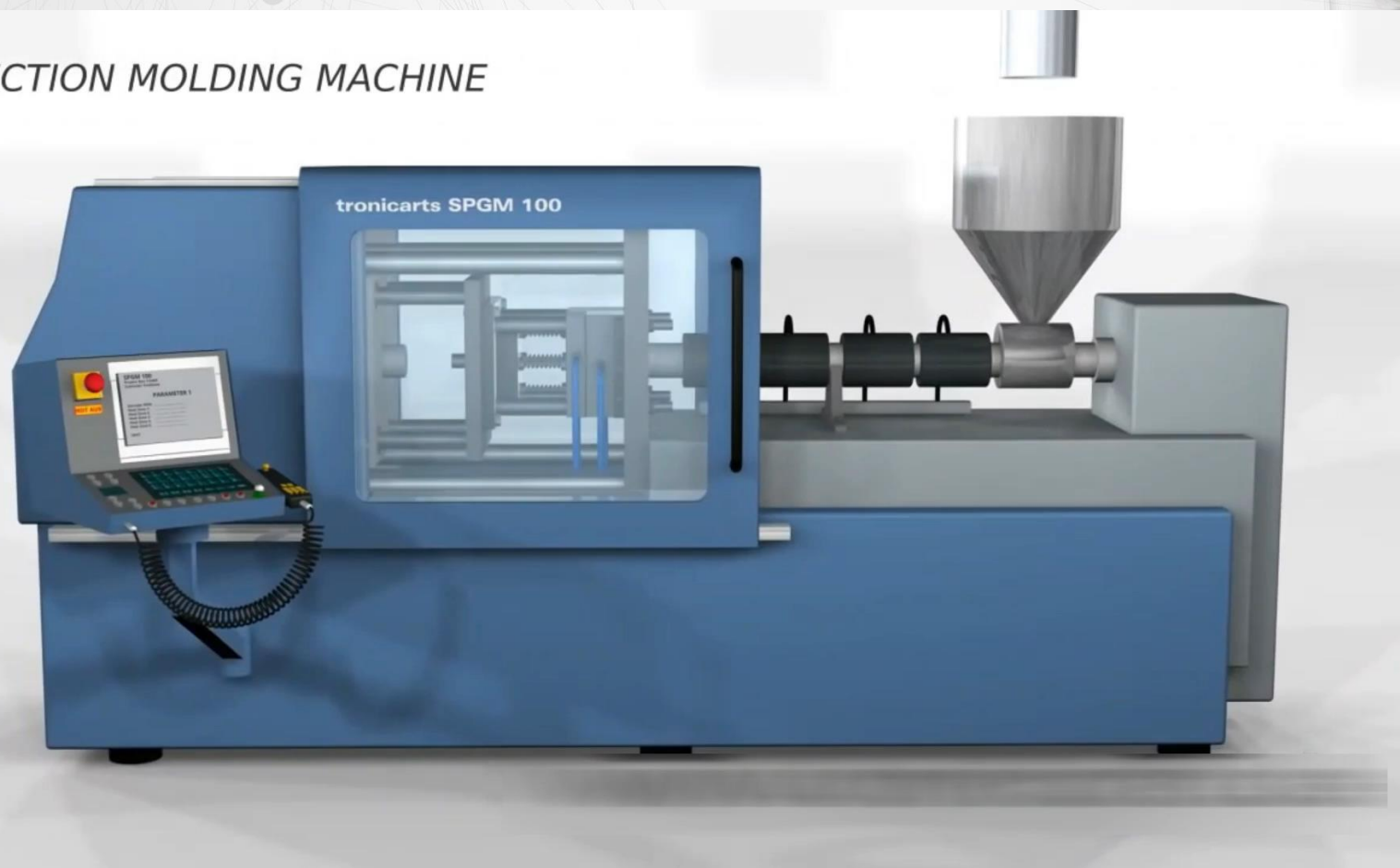


Optimizacija kanala za hlađenje kod alata za injekcionio brizganje metodom aditivne proizvodnje

Nusret Muharemović

Proces injekcionog brizganja

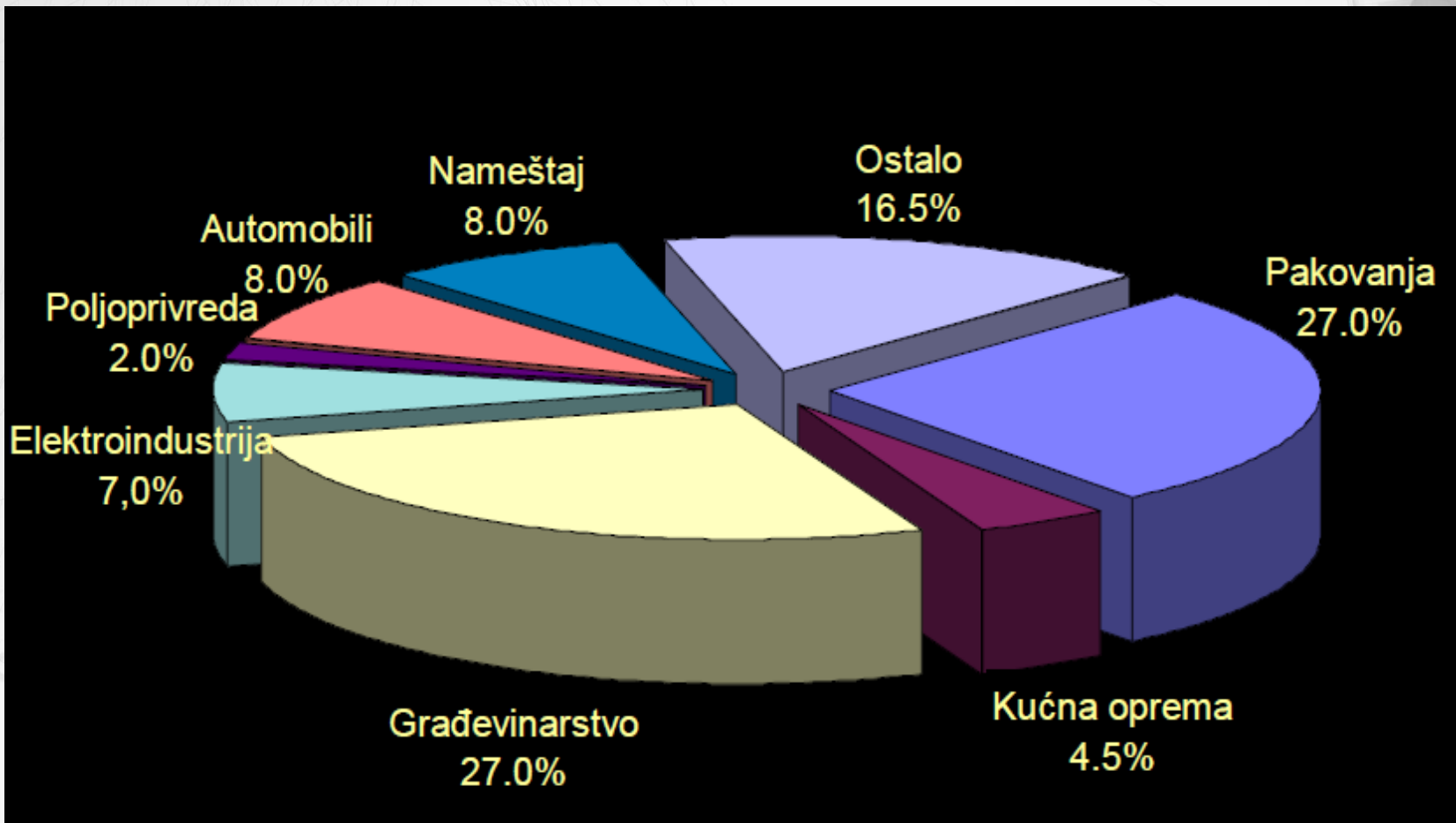
INJECTION MOLDING MACHINE



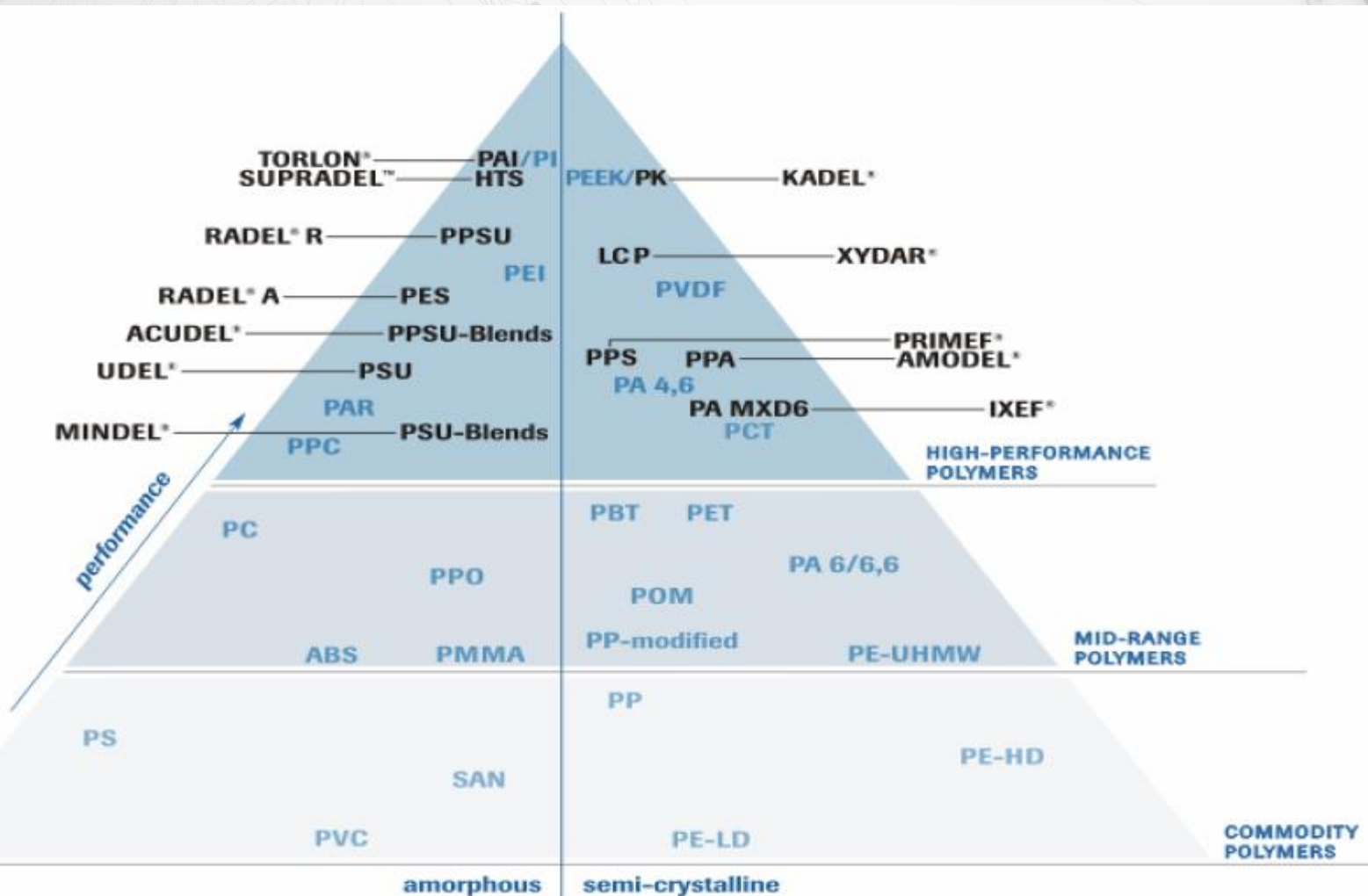
European
Commission

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Učešće polimera u industrijama



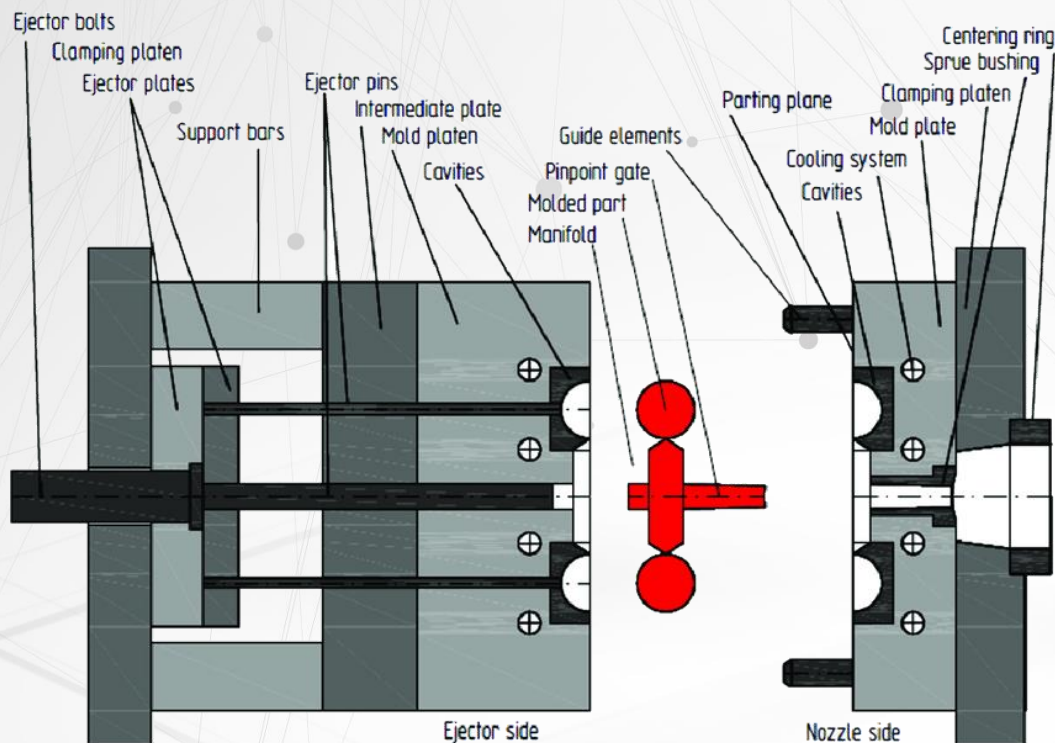
Vrste materijala



Proces injekcionog brizganja

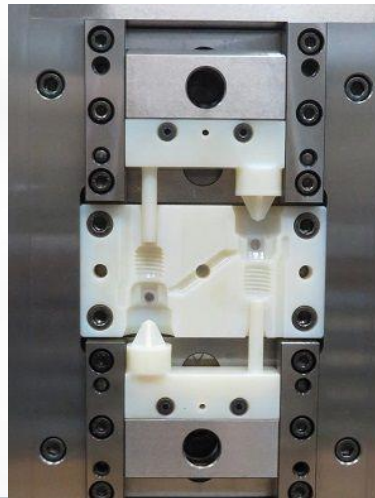
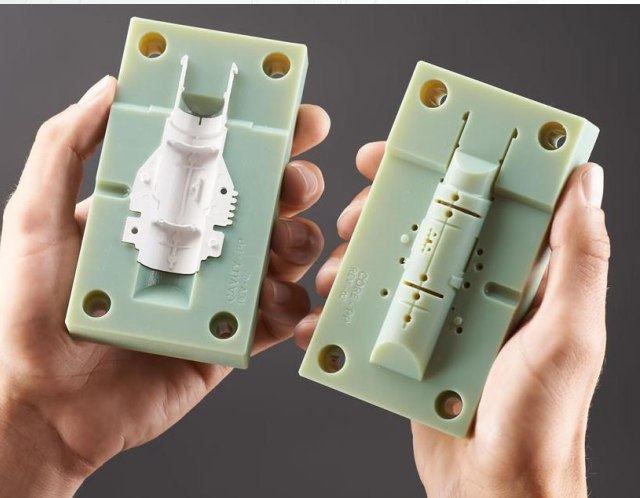
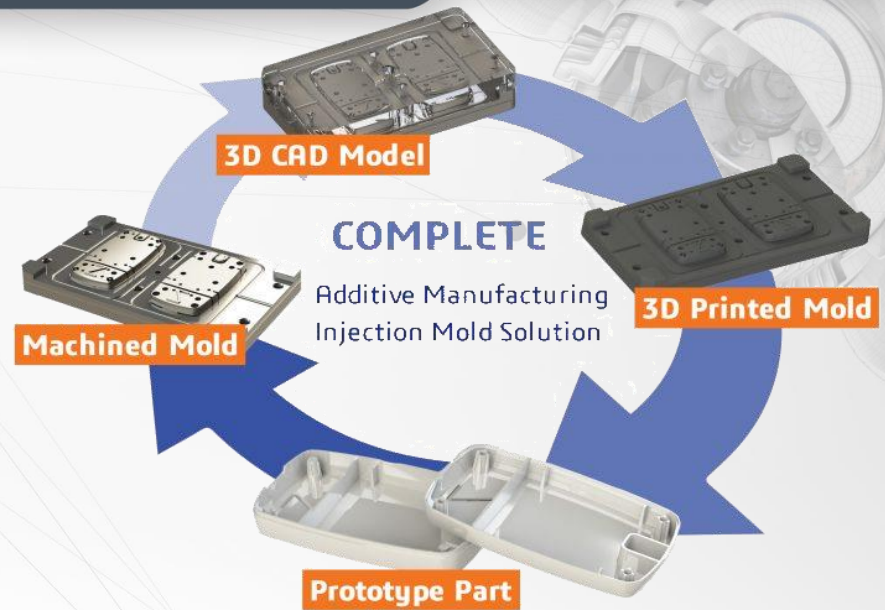


Alati za injekciono brizganje



Dijelovi alata za prototipnu proizvodnju

- Niska početna cijena
- Brza izrada
- Jednostavna i brza izmjena dizajna
- Obično ne zahtjeva dodatnu obradu
- Omogućavaju funkcionalne testove na realnim protipnim proizvodima

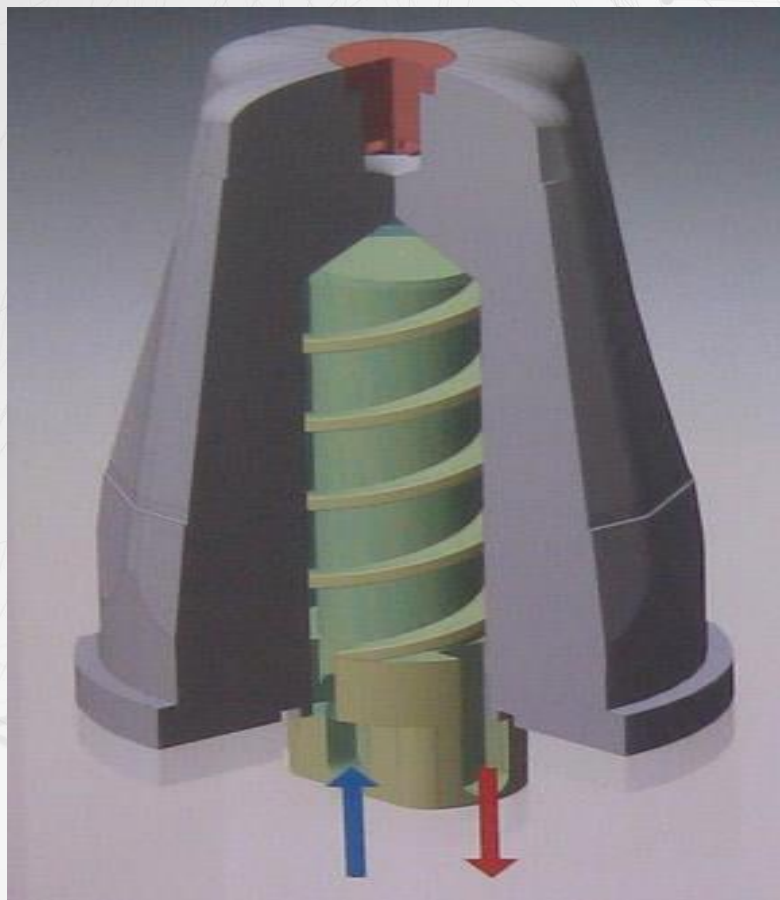


Dijelovi alata za serijsku proizvodnju

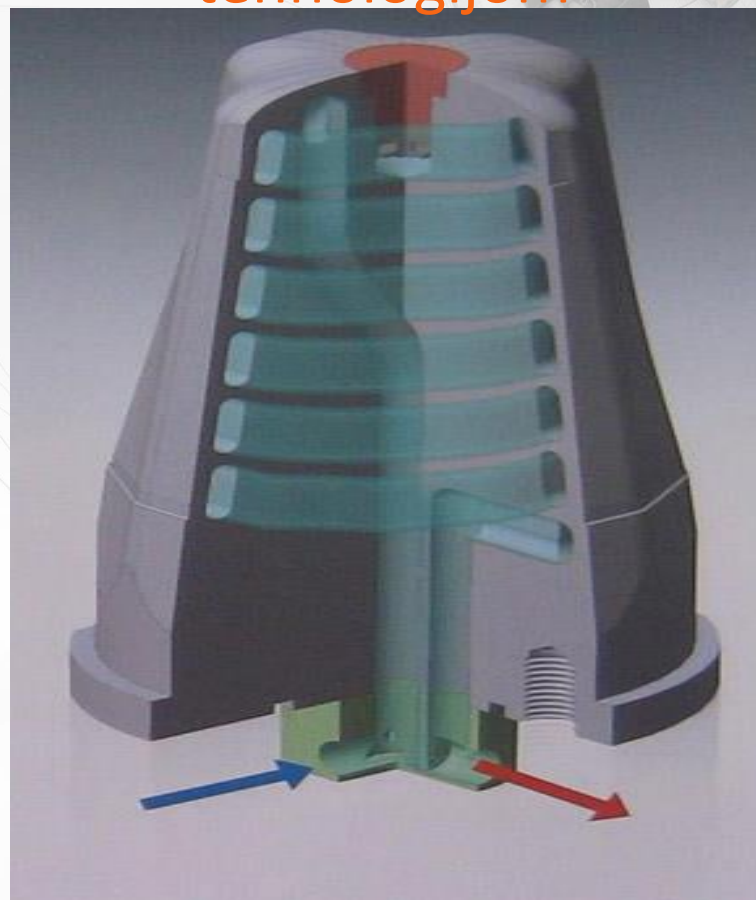
- Omogućavaju izradu kompleksnih struktura
- Brza izrade
- Visoki početni troškovi
- Skraćuju vrijeme hlađenja komada



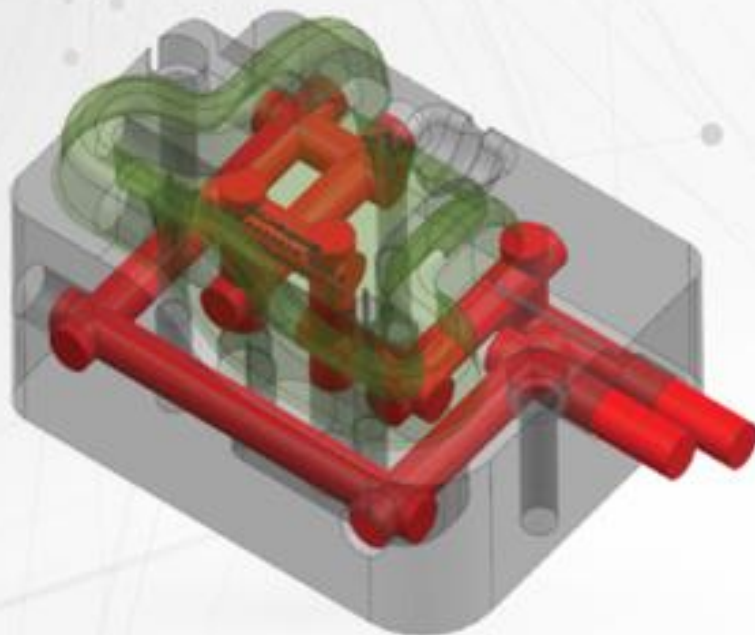
Insert alata



Insert alata proizveden aditivnom tehnologijom

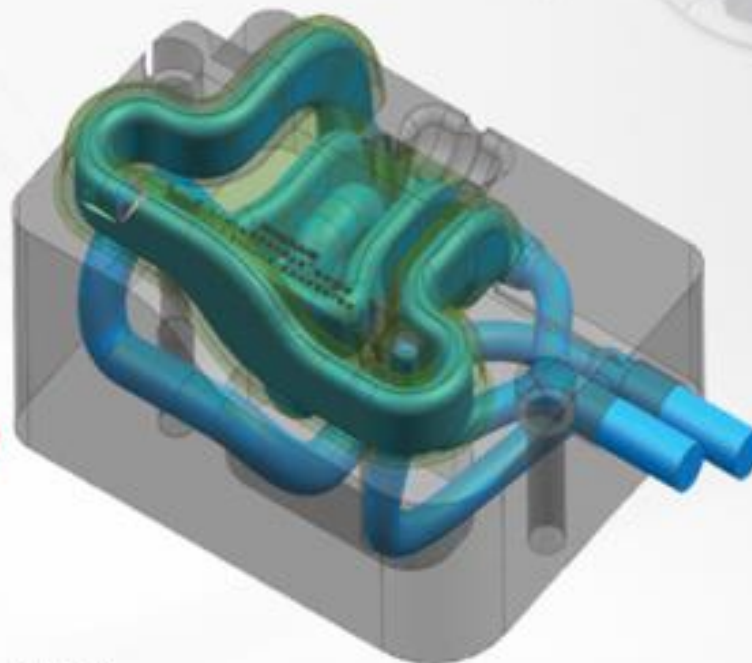


CONVENTIONAL MACHINED COOLING



Cooling Temperature
Range = 150°C

TruCool 3D PRINTED COOLING



Cooling Temperature

Reverzibilni inženjering

- Threadbend-koljeno 180°



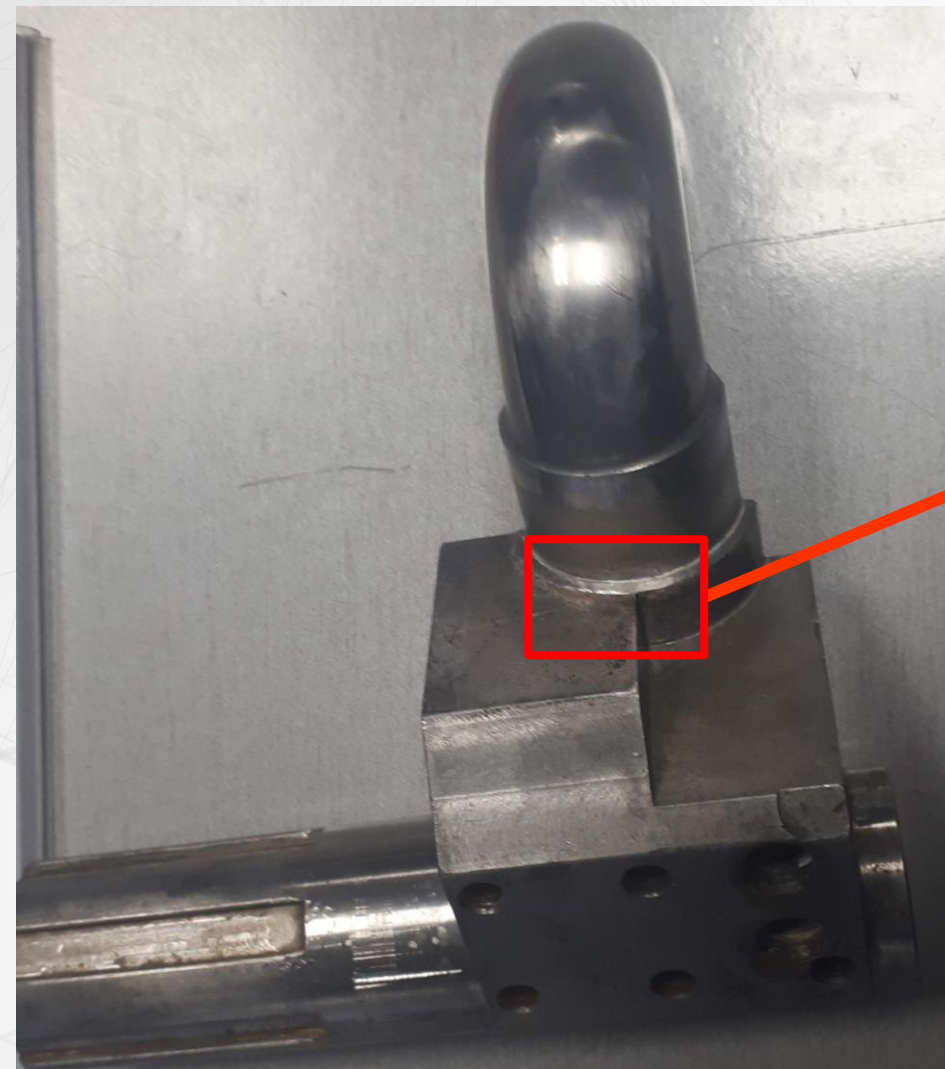
Reverzibilni inženjering

- Formirač unutrašnje forme



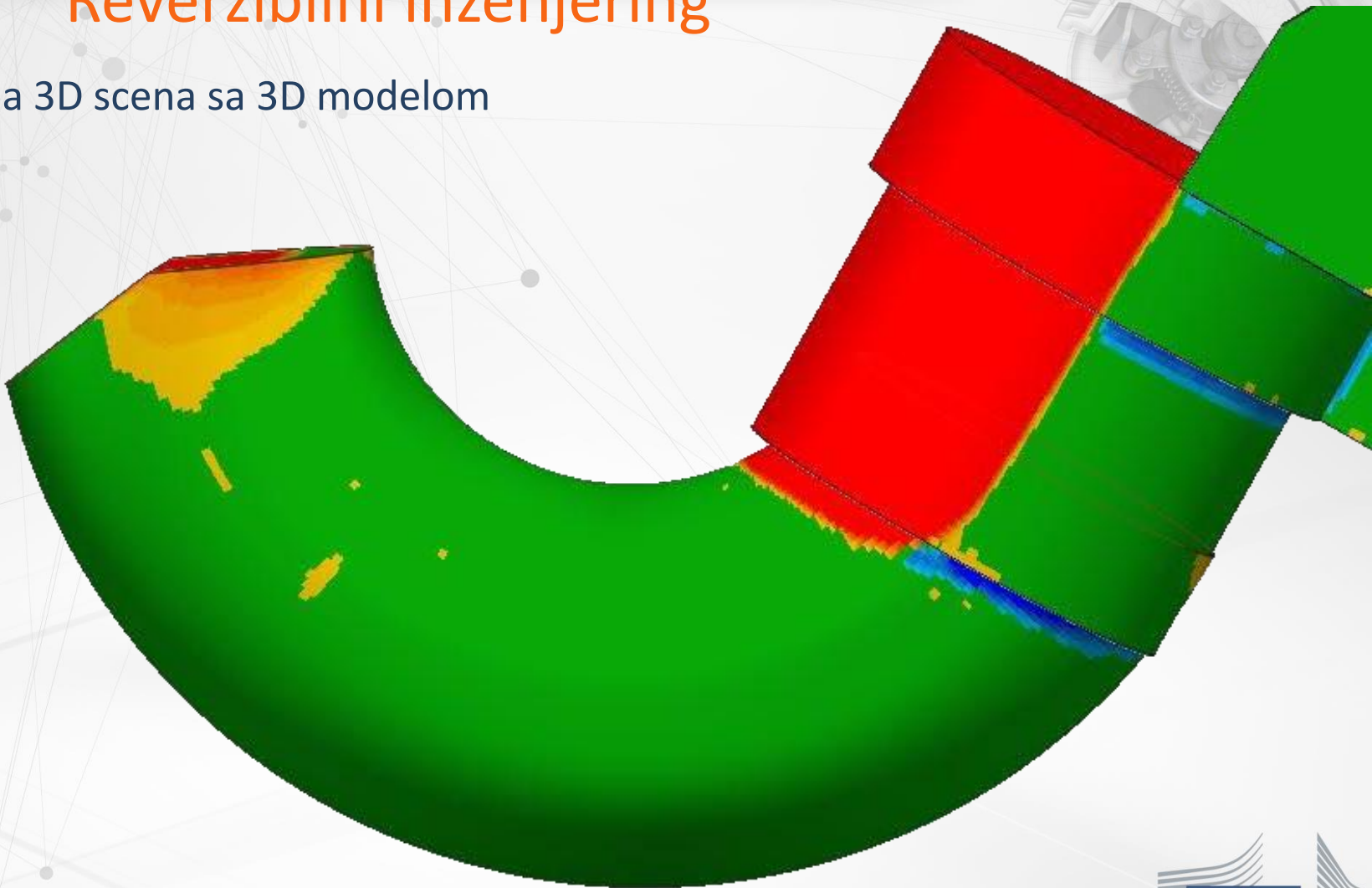
Reverzibilni inženjering

- Pukotina na formiraču unutrašnje forme



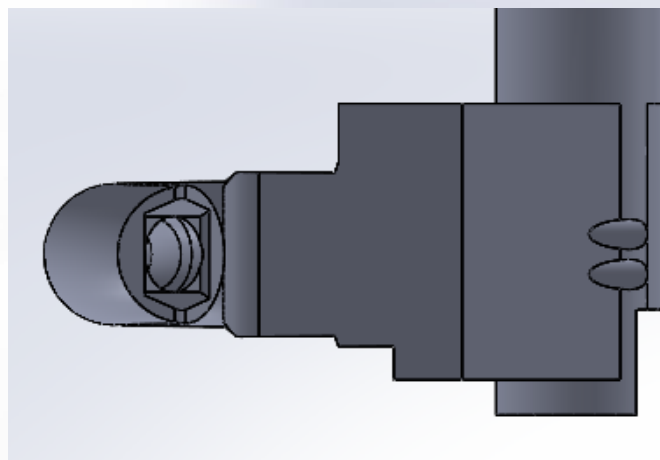
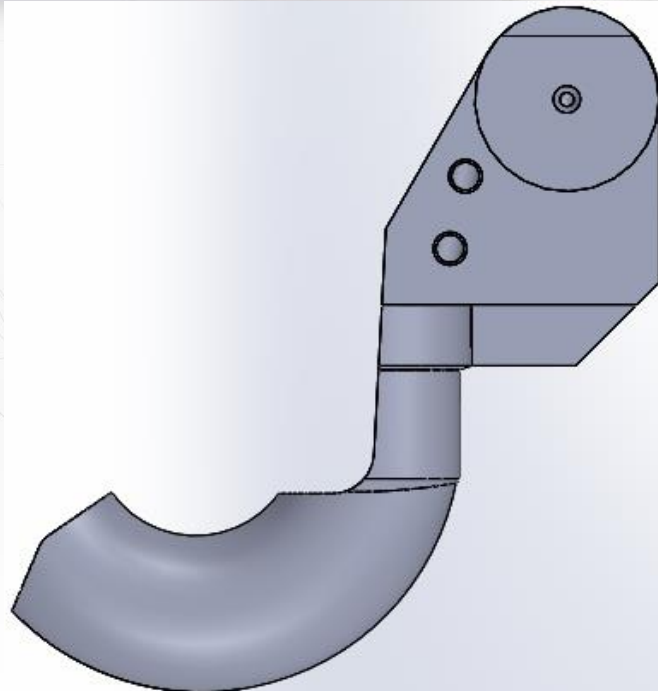
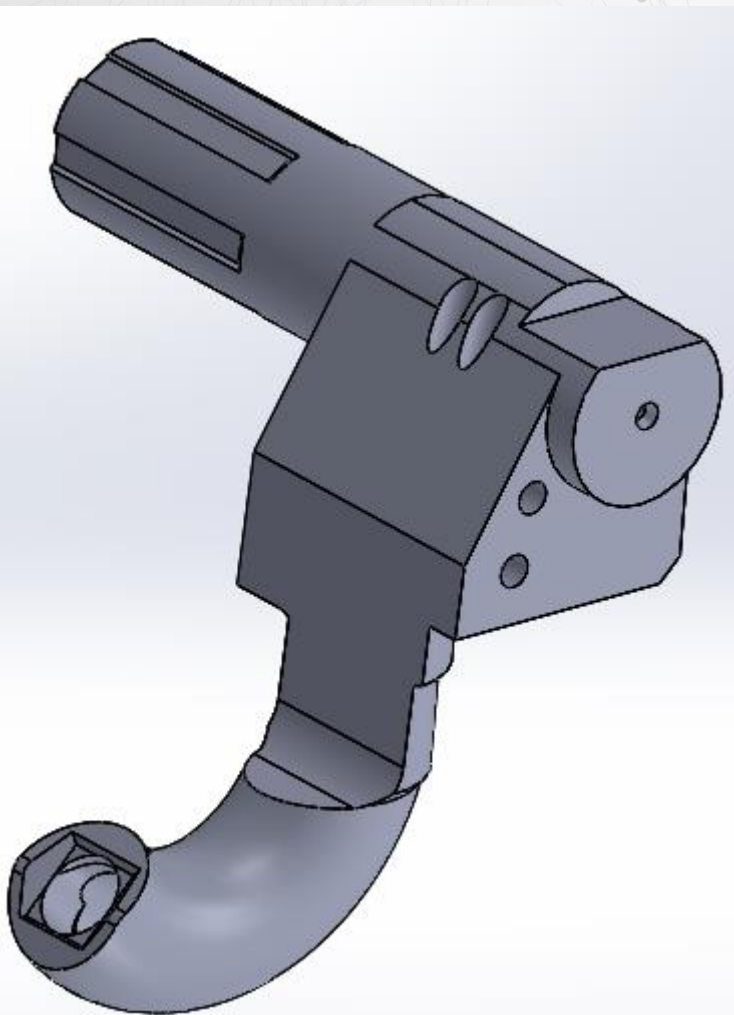
Reverzibilni inženjering

- Uporedba 3D scena sa 3D modelom



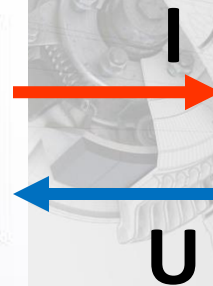
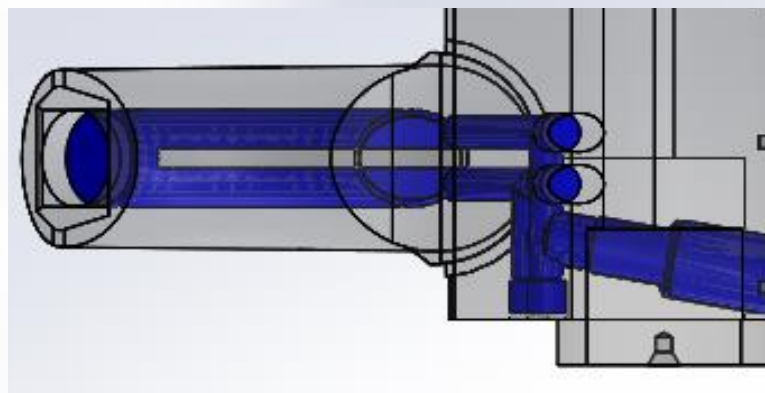
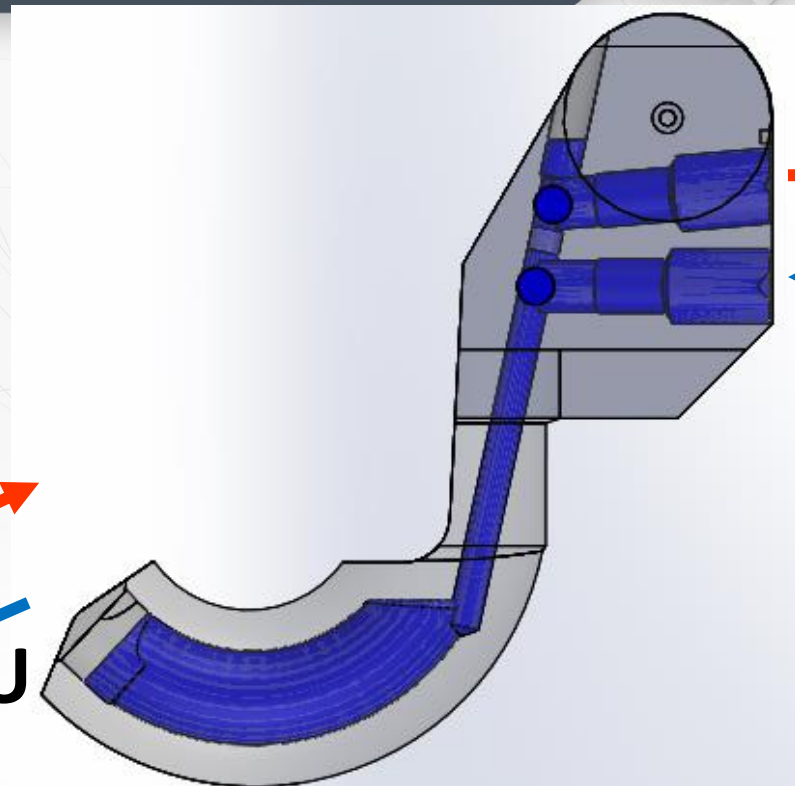
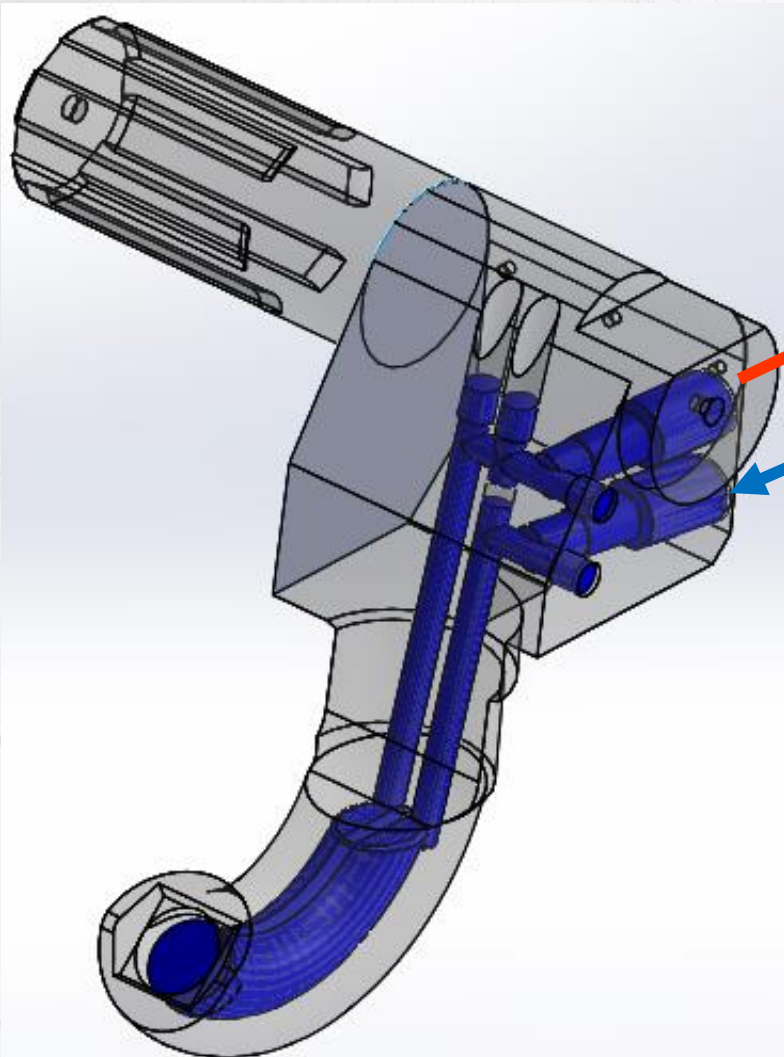
Reverzibilni inženjering

- Konačni 3D model



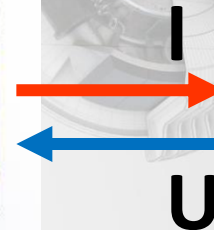
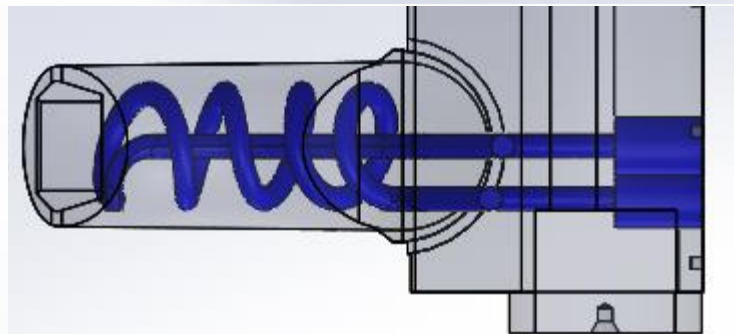
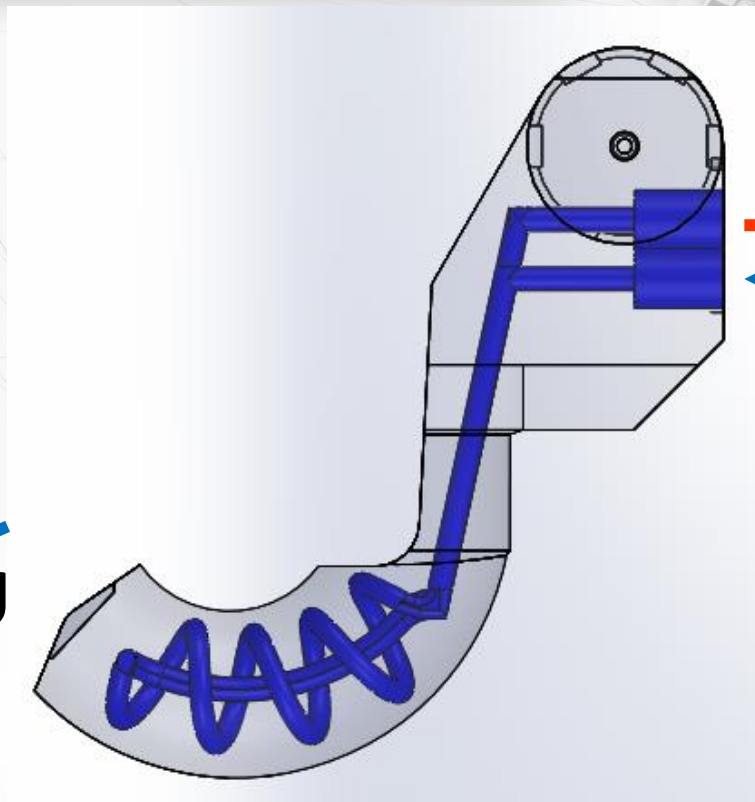
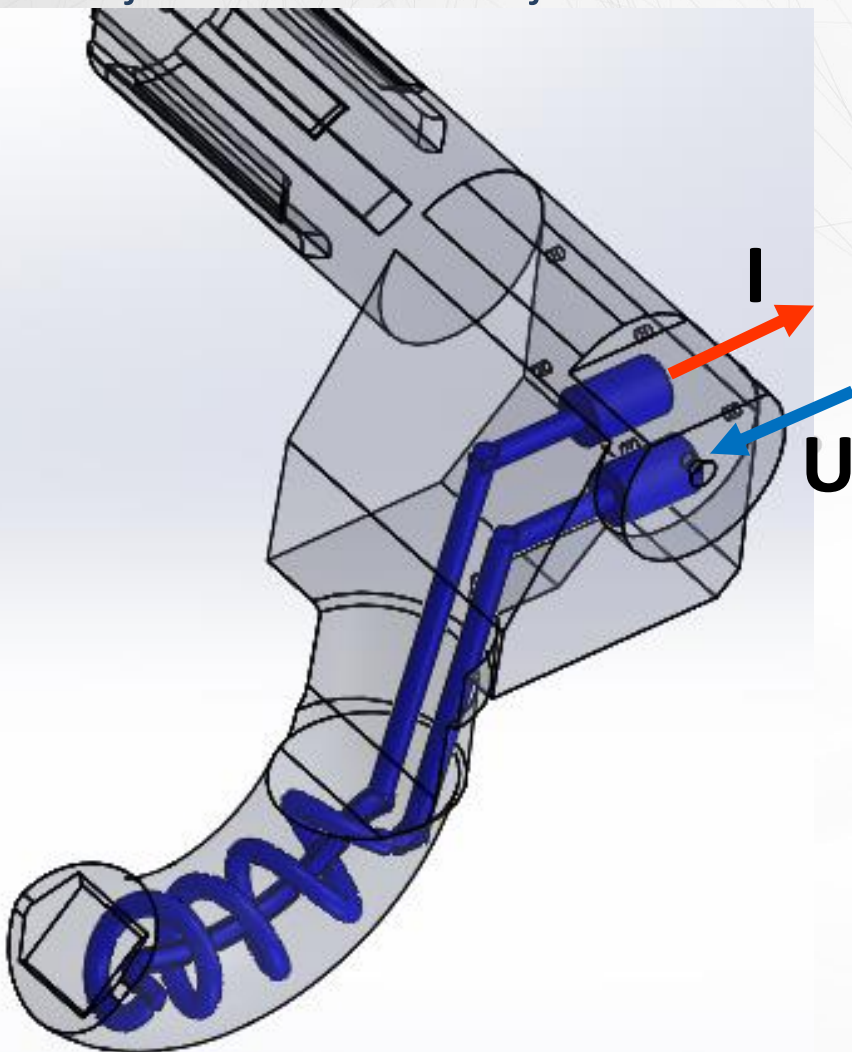
Konvencionalni način

- Problem sa izvedbom hlađenja



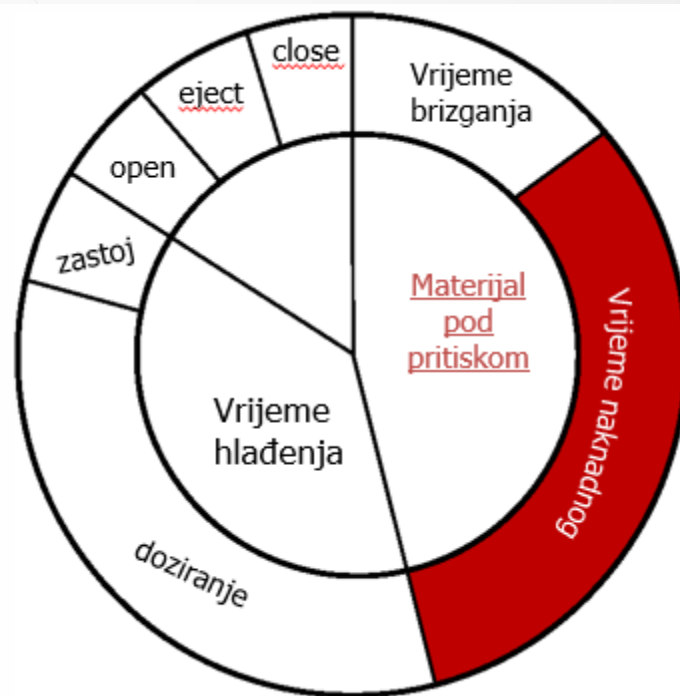
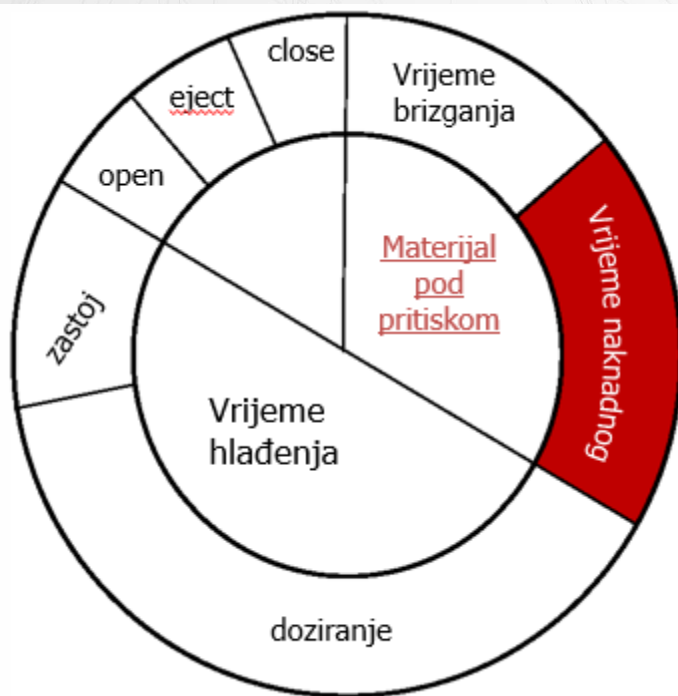
Optimizacija kanala

- Idejna izvedba hlađenja

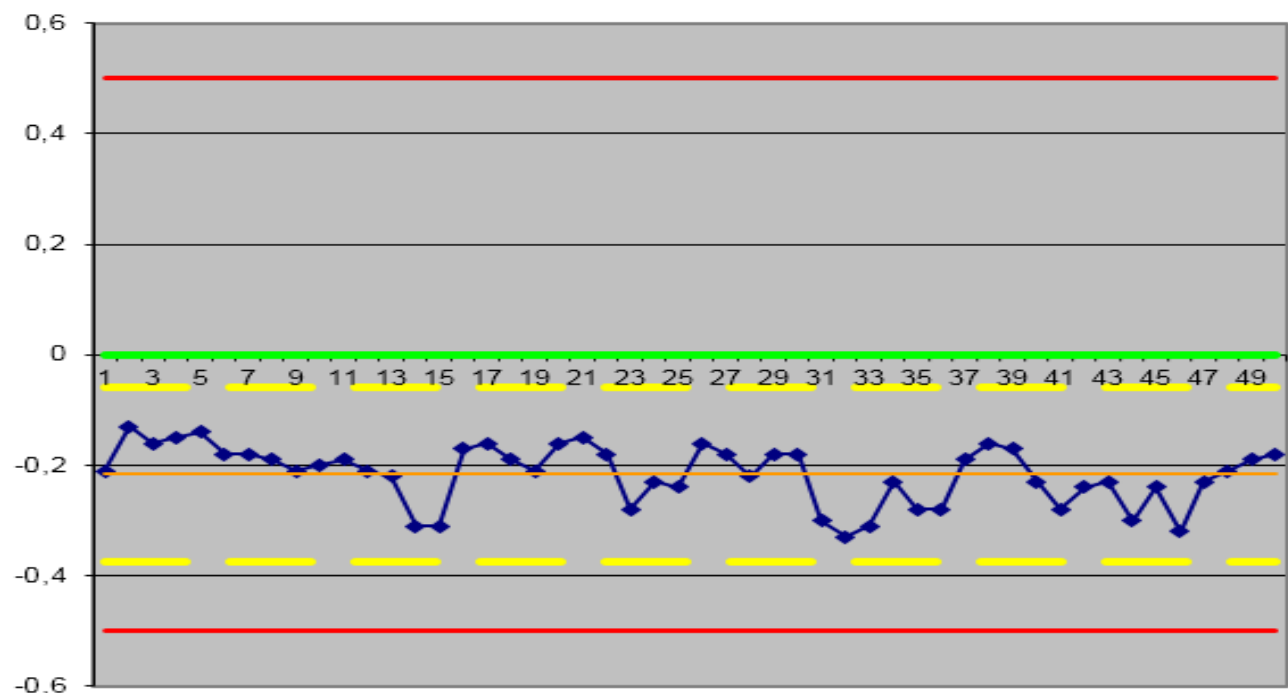


Proizvodni ciklus na alatu sa klasičnim kanalima za hlađenje

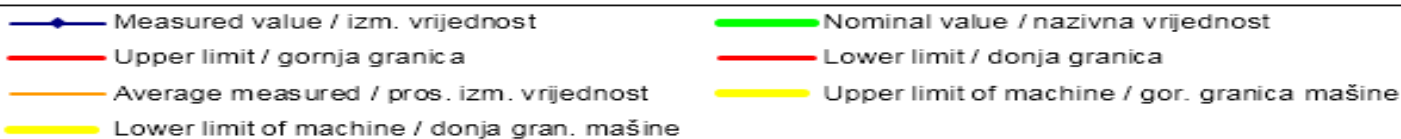
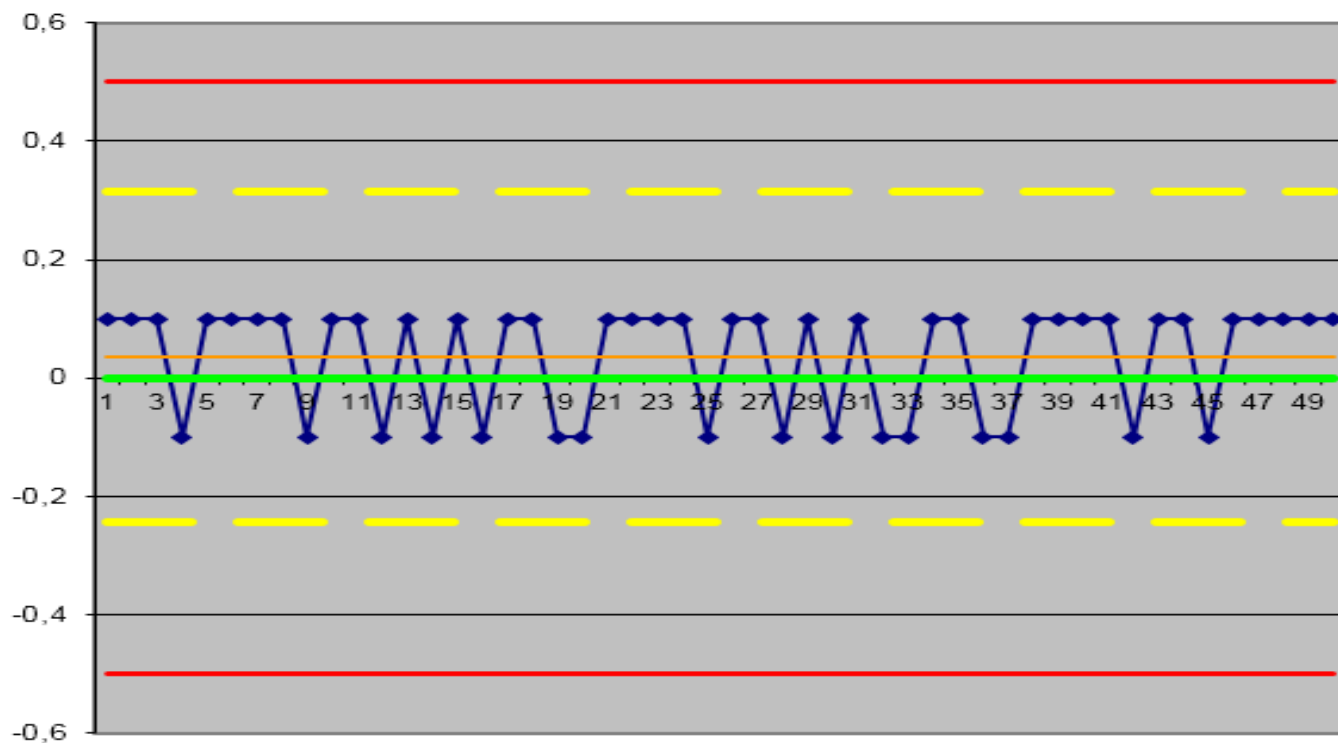
Proizvodni ciklus na alatu sa kanalima za hlađenje proizvedeni aditivnom tehnologijom



Stabilnost procesa _standardni kanali za hlađenje



Stabilnost procesa _sa kanalima za hlađenje proizvedeni aditivnom tehnologijom



Zaključak:

Inserti alata proizvedeni aditivnom tehnologijom imaju prednosti:

1. Skraćenje proizvodnih ciklusa, smanjenje troškova proizvodnje
2. Stabilnost geometrije otpreska
3. Ravnomjernija raspodjela temperature na kalupu što produžuje vijek eksploatacije alata



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The framework programme
for research and innovation

734455 (A_MADAM) - MSCA-RISE
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Topic: MSCA-RISE-2016
Unit: REA/A/03

A hand holding a black pen is shown writing the words 'Thank you!' in a cursive script. The background of the writing area is a light gray with a network of thin lines and dots, suggesting a digital or technical theme.

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