ABSOLUTE QUALITY / OUR PASSION

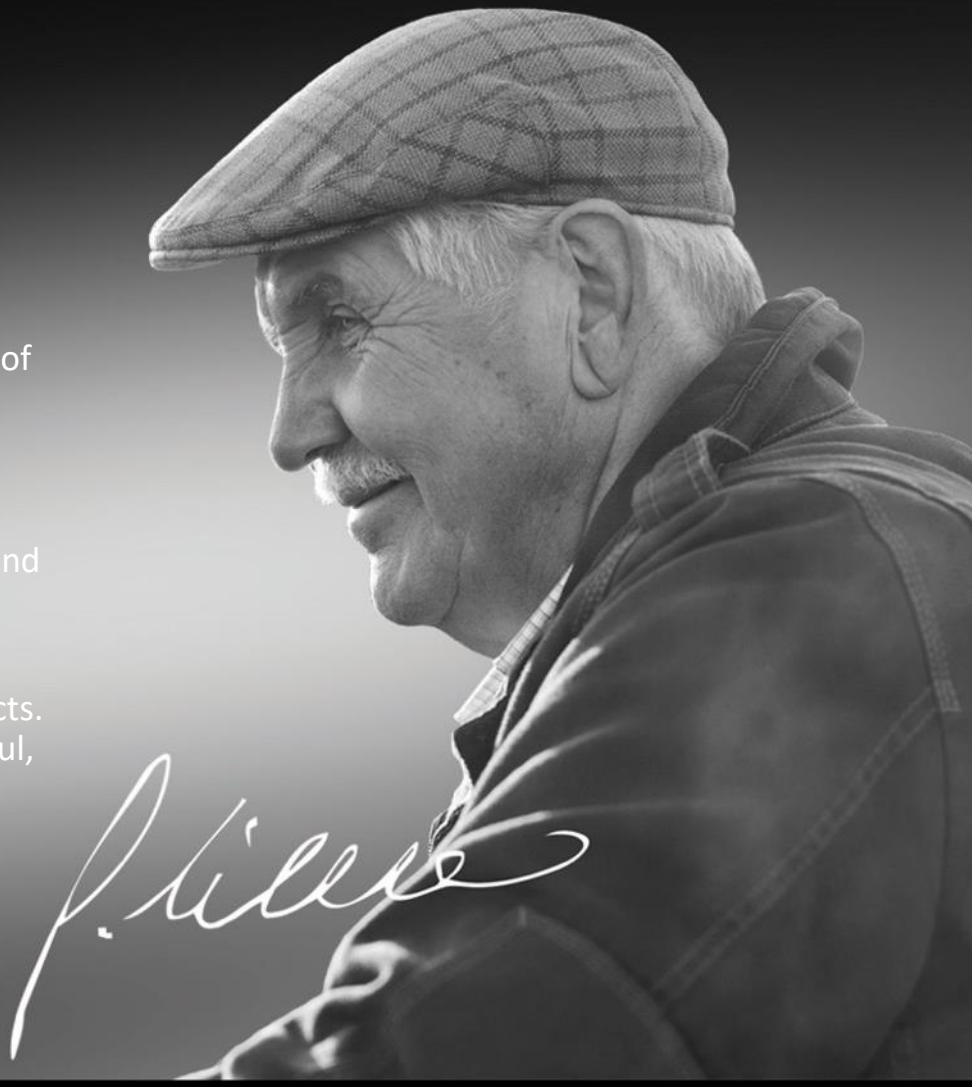
Lillbacka | FINN•POWER

Dreams became reality

Jorma Lillbacka, who grew up in the spacious nature of Ostrobothnia, has never gone with the flow. Already from childhood, Jorma has determinedly carried out his own dreams and built everything from powerful industrial machines to airplanes. Lillbacka's entrepreneurial spirit has made innovation, quality and service more than just words: they are a way of life.

Lillbacka Group is strongly Finnish company whose main pillar of operations is the high quality of products. For over 50 years Lillbacka has proven to be successful, creative and diverse.

At Lillbacka, dreams can indeed become reality.



Lillbacka | FINN•POWER

Lillbacka Powerco Oy

- Industrial grade crimping machine manufacturer
- FINN-POWER trademark for machines
- Over 50 years of manufacturing
- Family owned business
- High quality base of all manufacturing
- Creativity and innovation

3D-TULOSTAMINEN KÄYTÄNNÖN KOKEMUKSIA

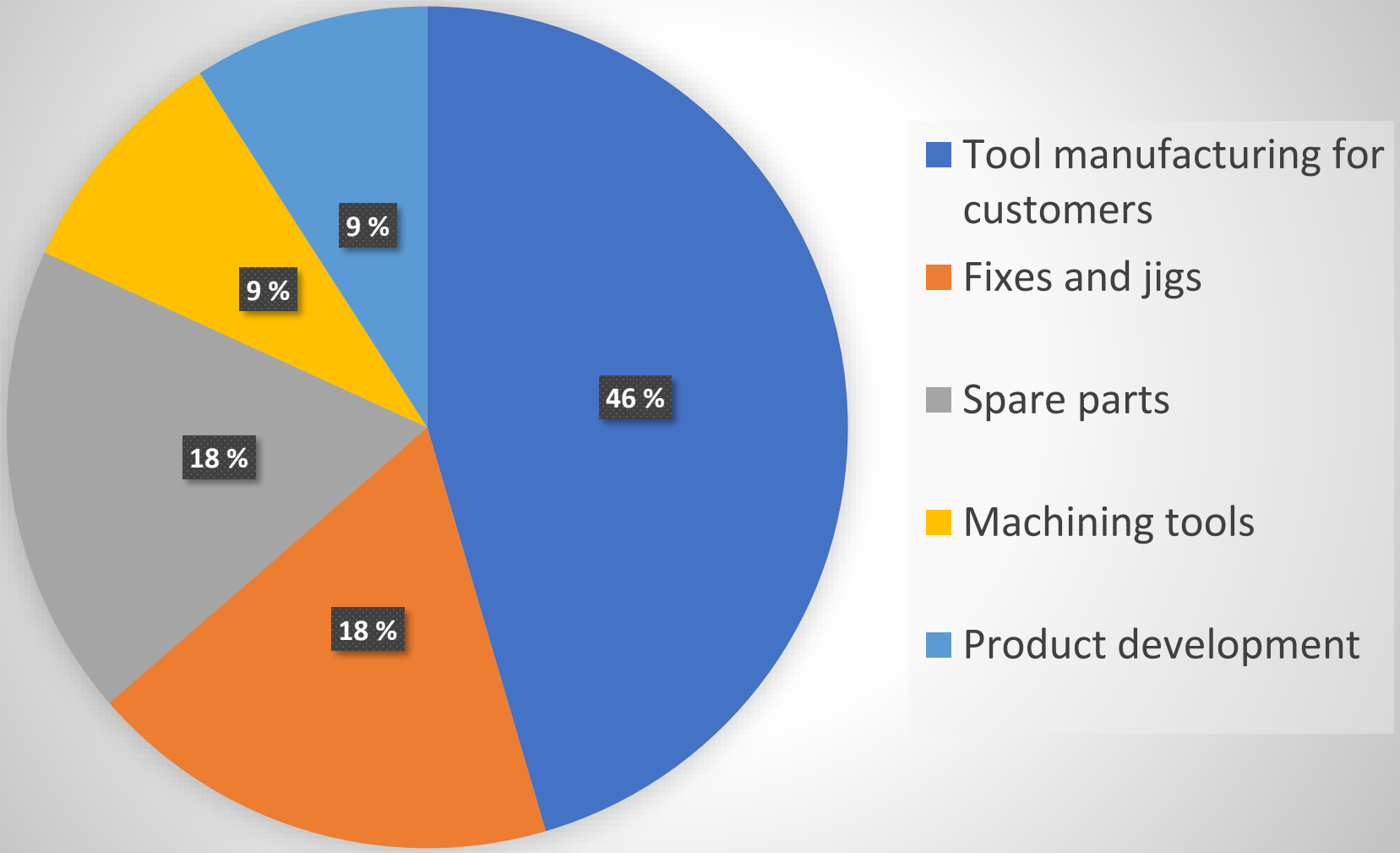
Heikki Koivisto
Lillbacka Powerco Oy

Lillbacka | FINN•POWER

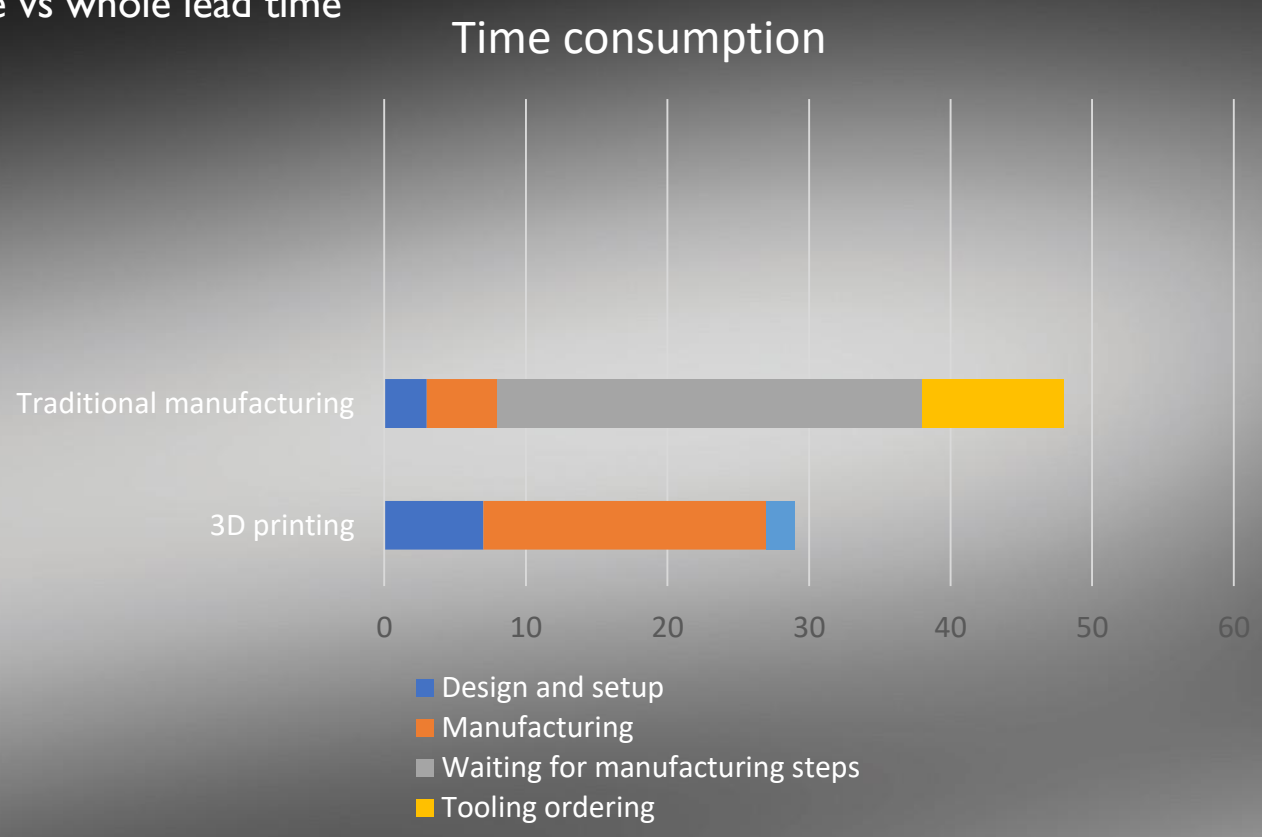
MITÄ OLEMME TEHNEET

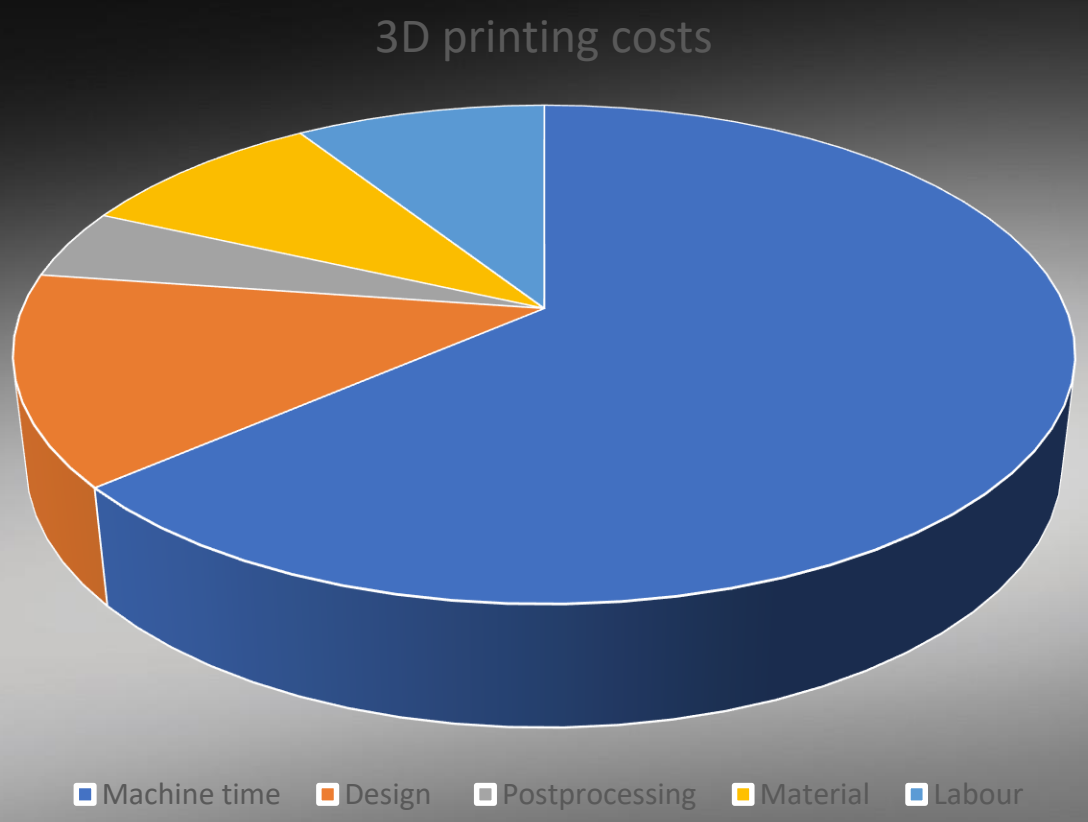
- Tulostin on ollut käytössämme nyt 1 vuoden ja 5 kuukautta
- Ensimmäisen vuoden aikana tulostimen laserille kertyi 3400 h paloaikaa
- Useita satoja 3D-tulostettuja osia
  - Jigejä
  - Koneistustyökaluja
  - Osia valmistamiimme tuotteisiin
  - Erikoistyökaluja koneisiimme
  - Suunnittelun pikamallinnuksia
  - Varaosia
  - Testikappaleita tutkimukseen
- Olemme opetelleet tekemään tulostamisesta kannattavaa bisnestä
  - Erilaisten suunnittelumenetelmien testausta ja oppimista
  - Laskentakaavojen luontia myynnin / suunnittelun tueksi
  - Materiaalien testausta ja tuntemusta käytännössä
  - Kappaleiden jälkikäsittelyn testausta

Usage of metal AM machine

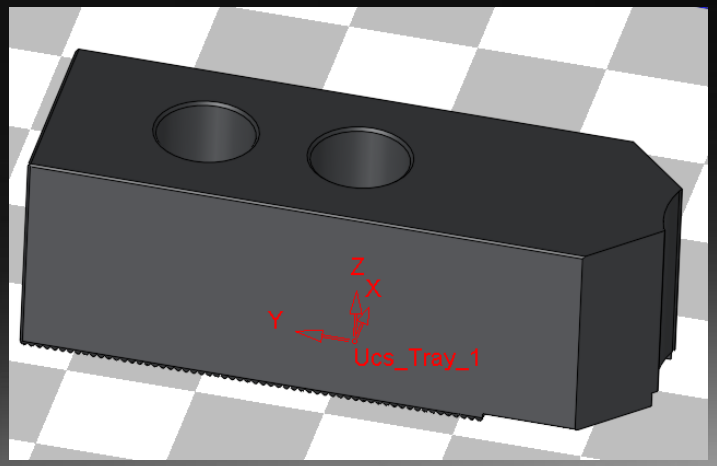


- Manufacturing time vs whole lead time

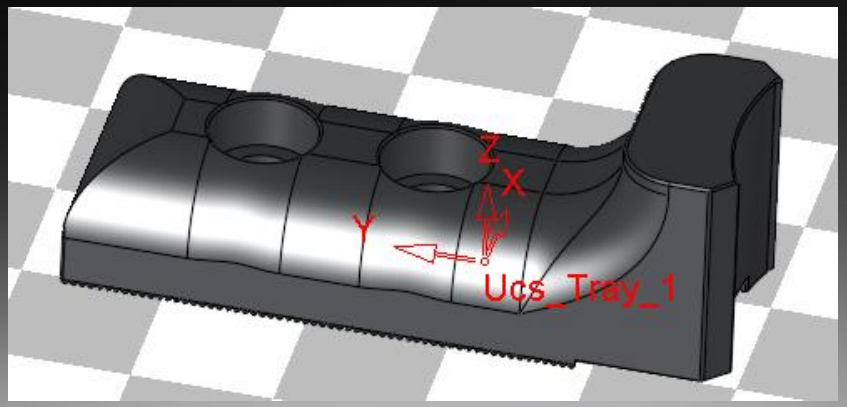



3D printing costs
Machine time
Design
Postprocessing
Material
Labour

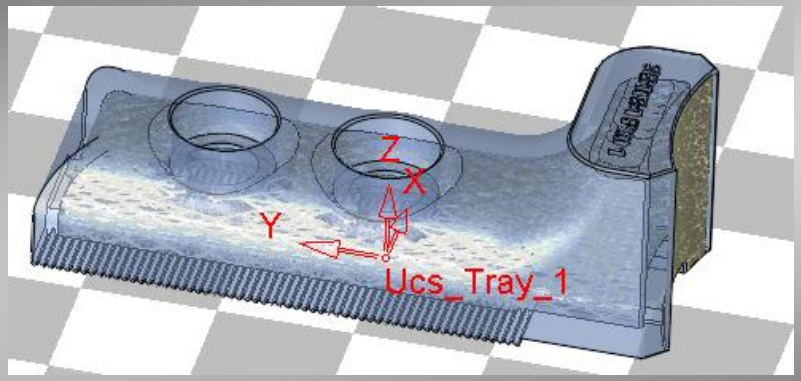
Suunnittelun vaikutus 3D-tulostamiseen



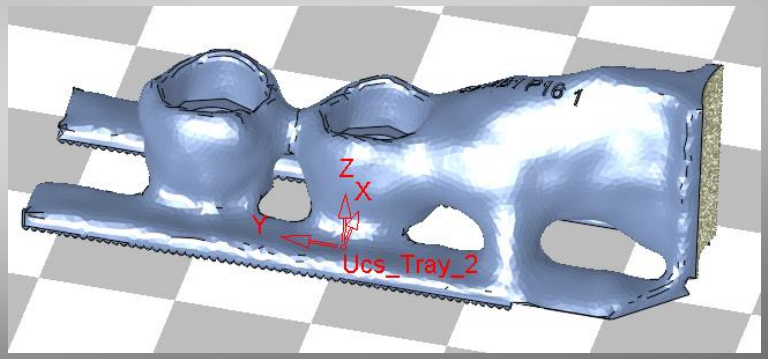
166 cm3 = 1 328 g



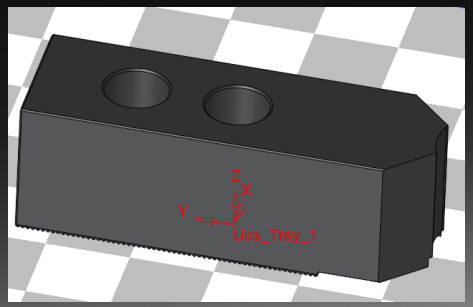
95 cm3 = 760 g

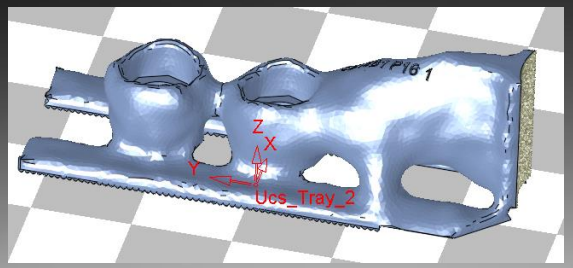


66 cm3 = 528 g



47 cm3 = 376 g
30% of the original



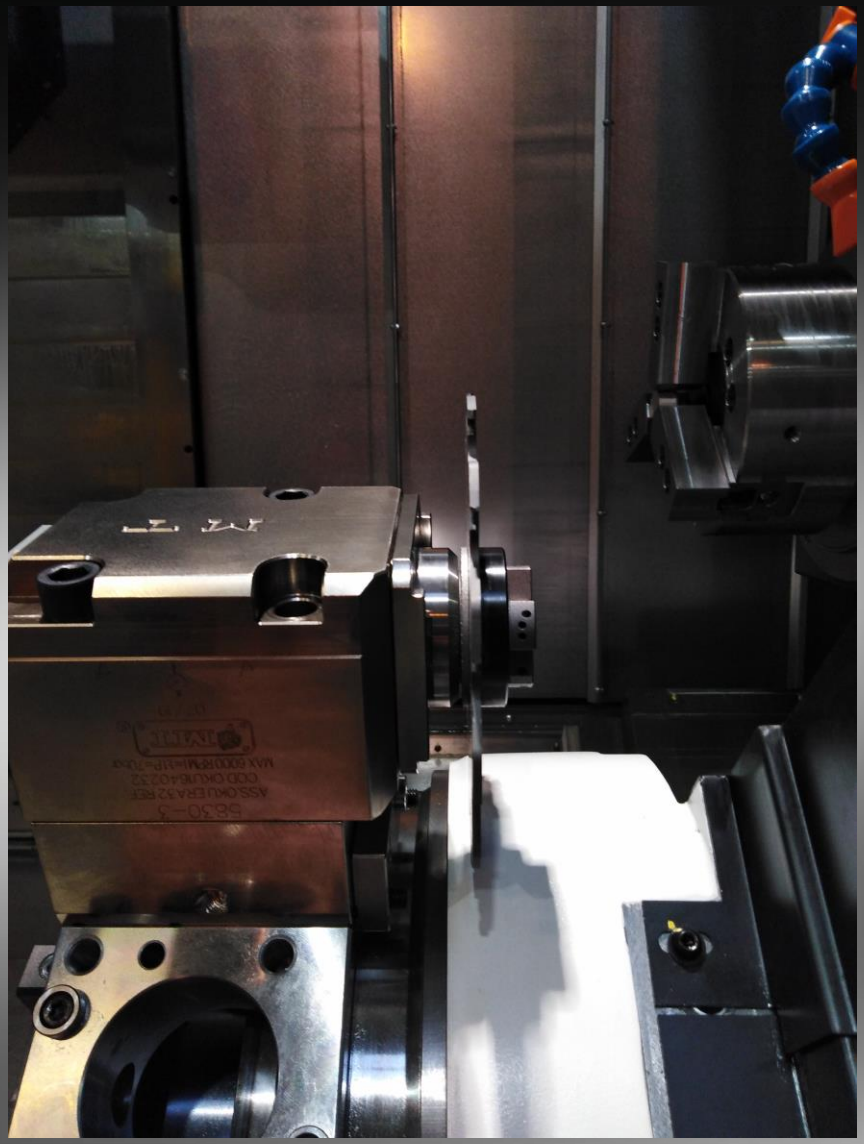


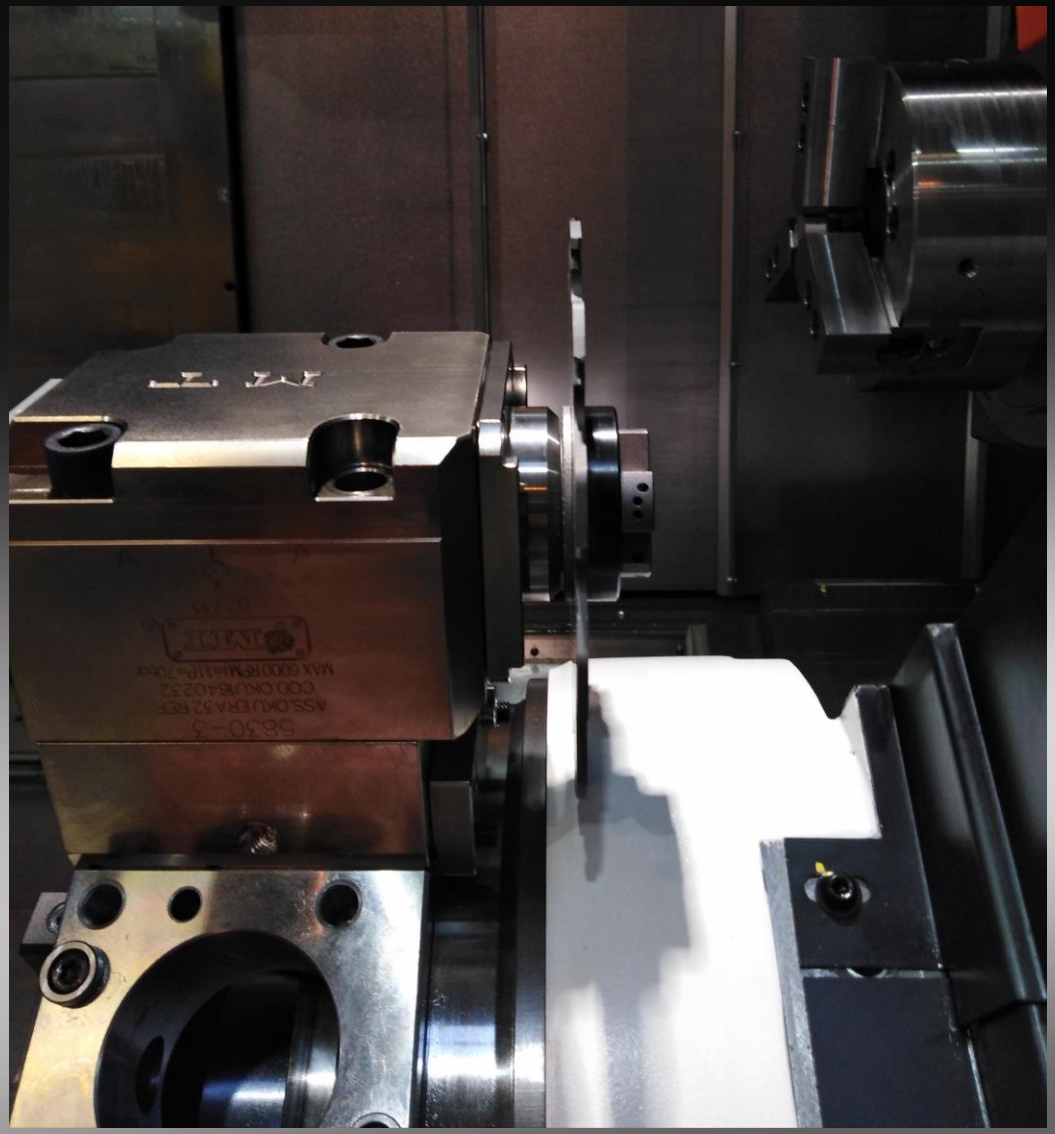
Mass	1300g -> 330 g	-70%
Time	22h -> 10h	-55%
Cost	520 € -> 220 €	-60%

Sovellusesimerkki

Iso ongelma monitoimisorvissa:

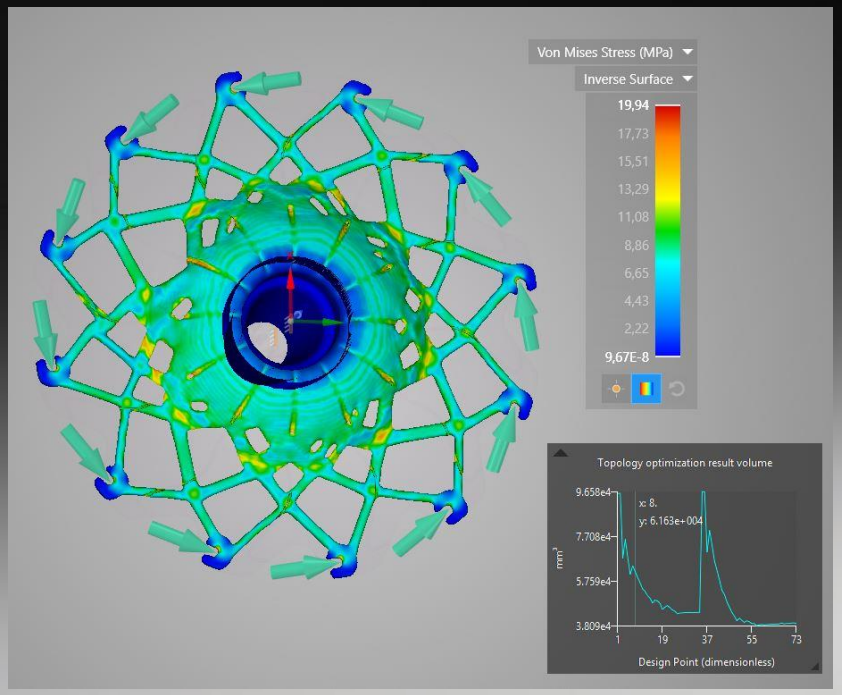
Työkalu ei mahdu pyörimään vaihtajassa ja valmistajilta ei löydy mitään ratkaisua

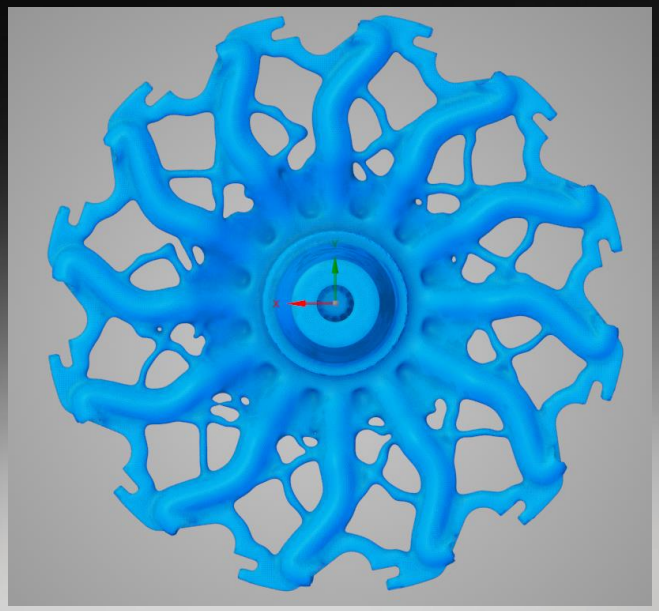


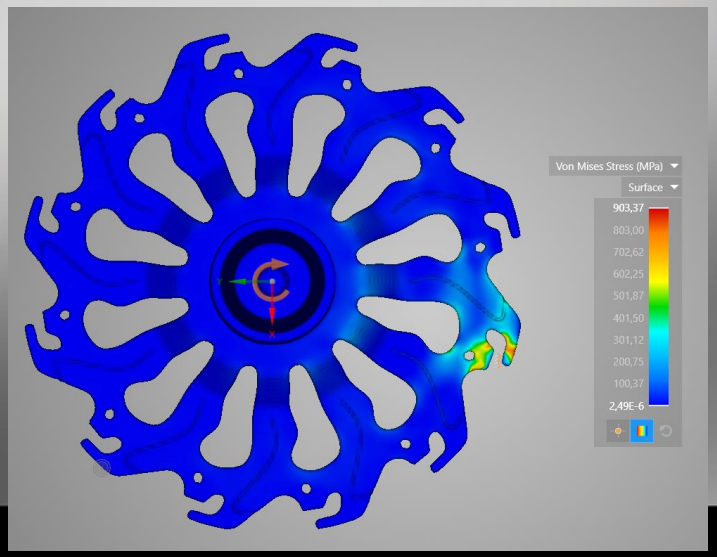


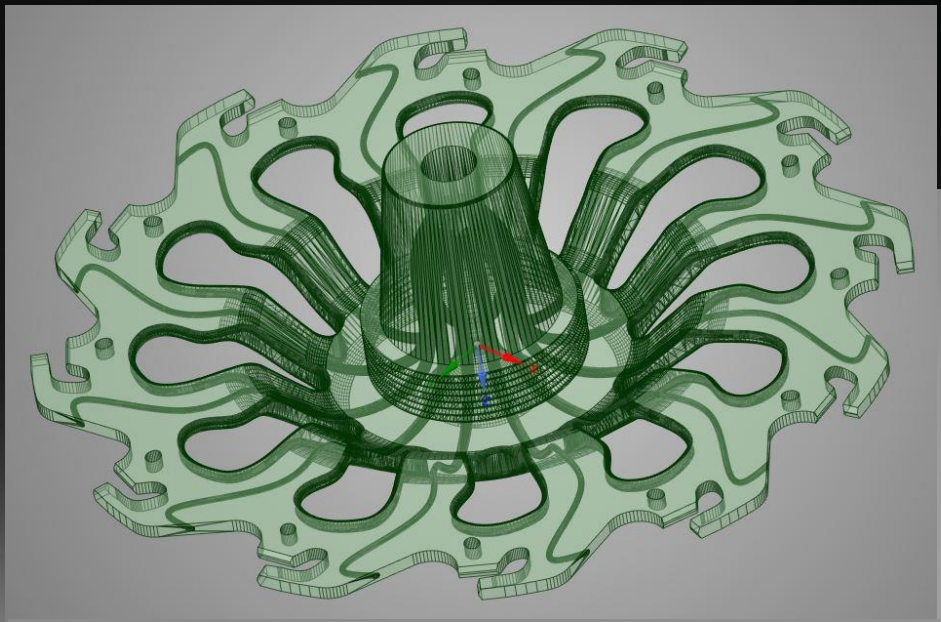
Vaihe 1
uusi kapeampi integroitu työkalunpidin

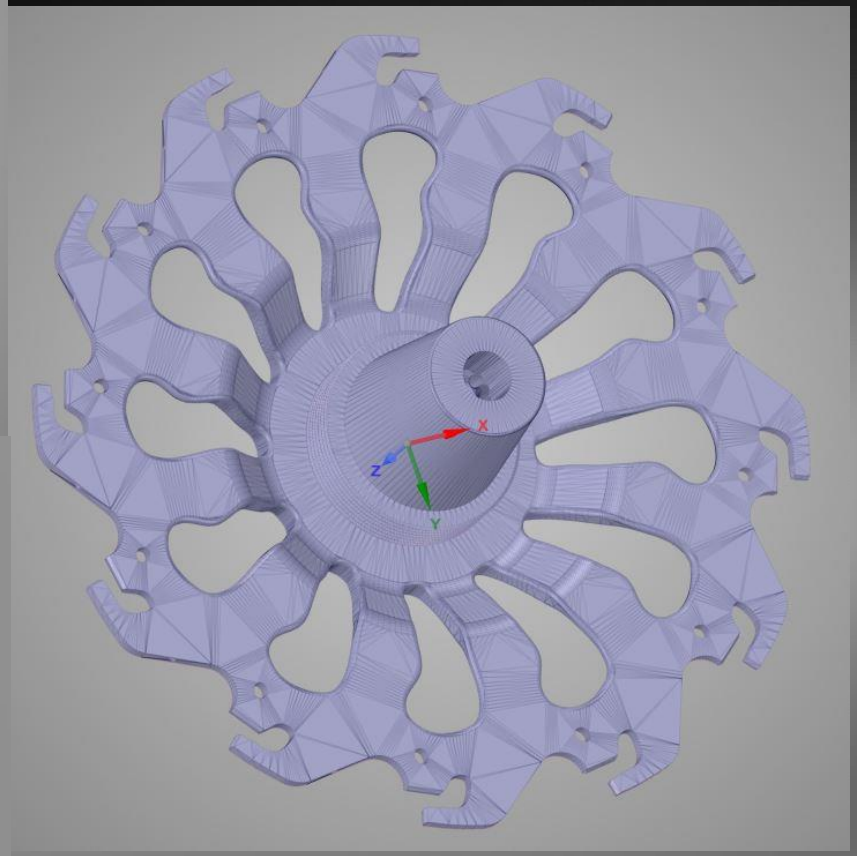
Vaihe 1 ei riitä. Uudelleensuunnittelu.










X
Z
Y

Lopputulos:
ongelma on ratkaistu

- Uusi terä mahtuu pyörimään vaihtajassa
- Terän leikkuulinja siirtyi 35 mm

Saadut muut edut:

- Leikkuuneste suoraan terän läpi oikeaan kohtaan
- Terän kiinnittämiseen ei tarvita muita osia (ennen 6, nyt 1)
- Halvempi kuin alkuperäiset osat
- Voidaan käyttää vakioteräpaloja

TULOSTETTUJA OSIA

JIGEJÄ

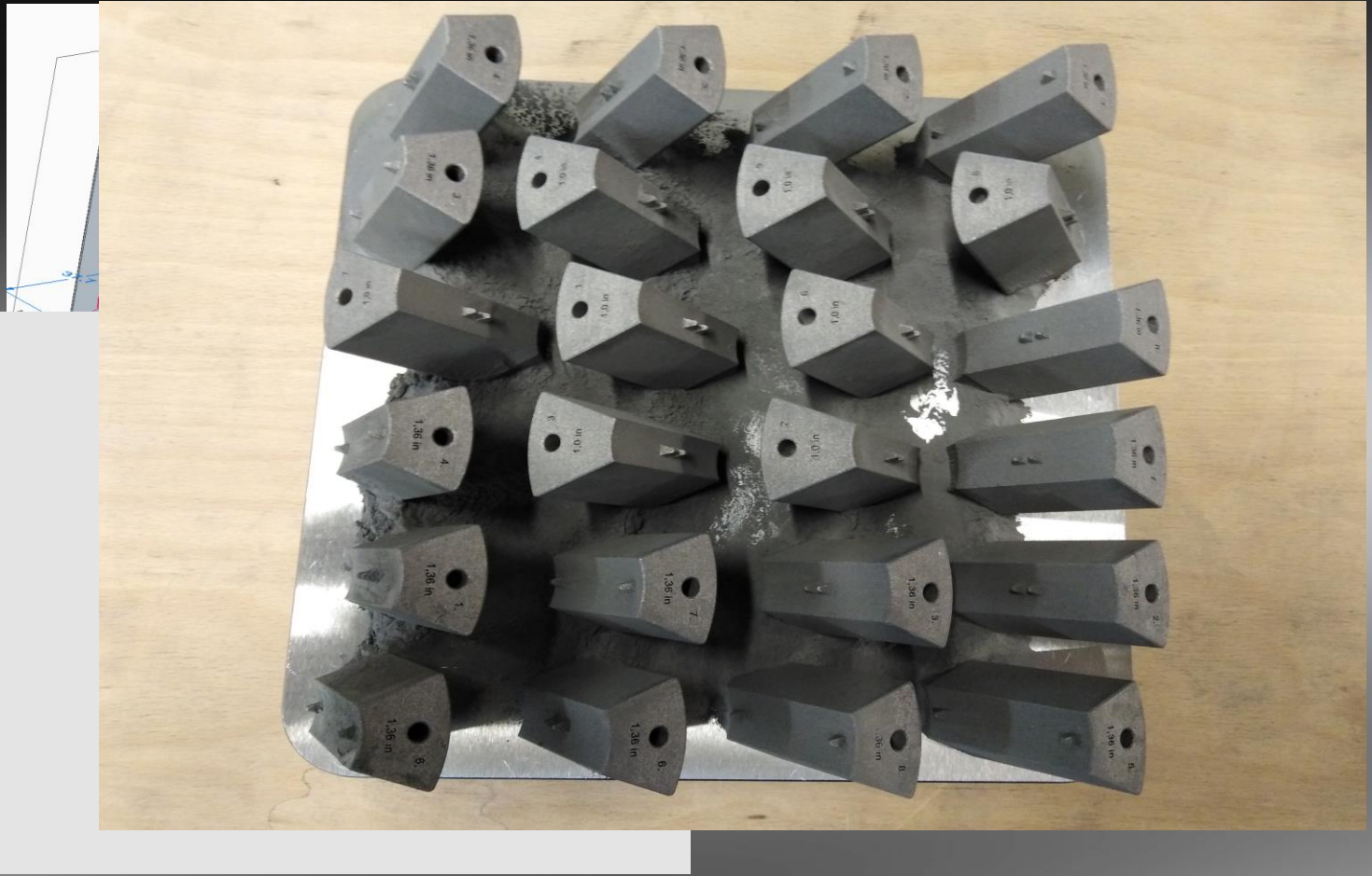
TULOSTETTUJA OSIA

Mechanical Properties [1,2]

MEASUREMENT	CONDITION	METRIC		
		AS-BUILT	AGEING 1	AGEING 2
Ultimate strength (MPa | ksi)	ASTM E8M			
Horizontal direction - XY Vertical direction - Z		1230 ± 70 1220 ± 20	2210 ± 30 2120 ± 30	2260 ± 30 2160 ± 90
Yield strength Rp0.2% (MPa | ksi)	ASTM E8M			
Horizontal direction[4] - XY Vertical direction[5] - Z		1080 ± 90 1090 ± 50	2125 ± 30 2030 ± 60	2180 ± 40 2070 ± 80
Elongation at break (%)	ASTM E8M			
Horizontal direction - XY Vertical direction - Z		13 ± 2 13 ± 2	5 ± 2 5 ± 2	5 ± 2 2 ± 1
Hardness, Rockwell C	ASTM E18	35 ± 3	55 ± 3	55 ± 3
Impact toughness[6] (J | ft-lb)[3]	ASTM E23	64 ± 5	8 ± 2	7 ± 2

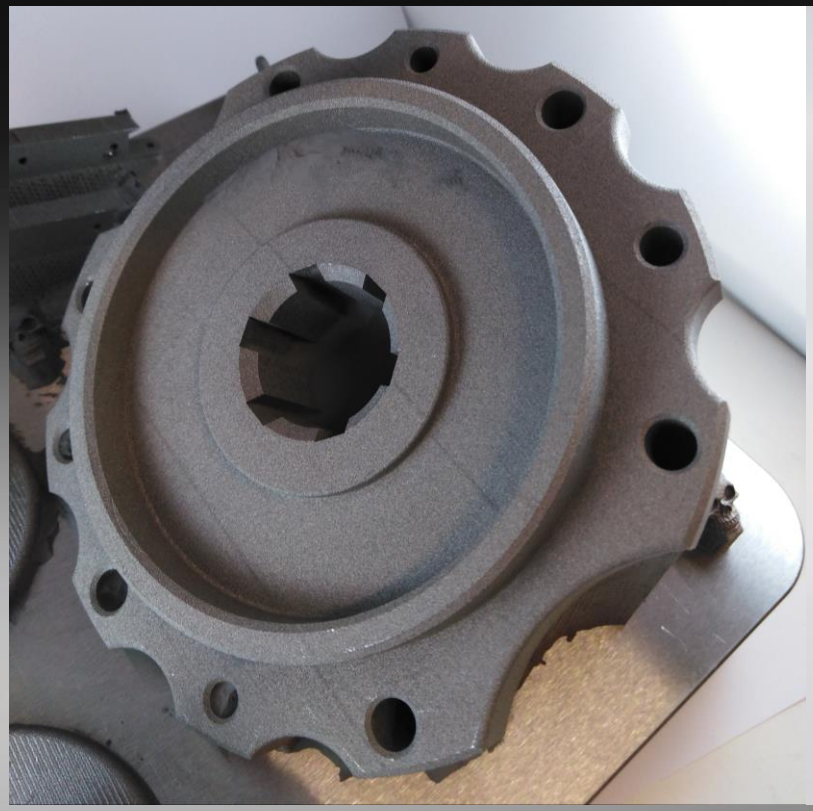
OSIA, JOISSA VAADITAAN LUJUUTTA

TULOSTETTUJA OSIA



Nastaleuka

TULOSTETTUJA OSIA



Varaosia

TULOSTETTUJA OSIA

Tarttujia / aputyökaluja

KIITOS!