



# 3DStep

Ison kokoluokan muovitulostus ja sovelluskohteet

Vesa Kananen, 3DStep Oy

Teemawebinaari: Komposiittien 3D-tulostus 9.12.2020

# Who we are



## Development partner for Additive Manufacturing

One of the leading service providers in industrial AM in the Nordic

Privately owned Finnish growth company

**Team:** 7 employees

**Established:** 2016, factory in Ylöjärvi



# References

Outotec

Valmet 

KONE

  
WÄRTSILÄ

ABB

NOKIA

FISKARS®

AVANT®

  
PILKINGTON

ThermoFisher  
SCIENTIFIC

@iLoQ

 OPTOFIDELITY

ABM COMPOSITE  
Access Composites

ATA  
GEARS

sako  
FINLAND

JOT  
automation

 PURSO®

 VTT

INWIDO  
Great Windows & Glass

RUAG  
Aerospace

# Why to use AM?



## New products

- Design new functionalities  
No restrictions of traditional manufacturing
- Make lighter and simpler  
Streamlined, more efficient products and processes
- Go to market faster  
Serial production without tooling

## Faster R&D

- Test your ideas without tooling  
Combination of AM and traditional manufacturing
- Make functional prototypes with different parameters  
Less iteration rounds
- Go to market faster  
Pilot production with AM

## Spare parts

- Reduce inventories  
Machined and casted parts made for need
- Shorten lead times  
Long lead time parts made for need
- Replace spareparts with better parts  
Continuous improvement

# Production



Prototypes 20%



End products 80%



# Production



## Metal printing

### SLM 280 HL Twin

Build volume 280 x 280 x 365mm<sup>3</sup>

- 316L
- AlSi10Mg
- 1.2709 Maraging
- Special materials

### EOS M 290

Build volume 250 x 250 x 325mm<sup>3</sup>

- Titanium Ti64
- NickelAlloy IN625/718/825

### Quality control

Heat treatments

Machining, polishing, coating



# Production



## Plastic printing

### HP Jet Fusion 4210

*Build volume 380 x 284 x 380mm<sup>3</sup>*

- PA12 polyamid



### SLS – Laser Sintering

*Max. build volume 650 x 330 x 560mm*

- PA2200 – PA12-polyamid
- PA3200GF – glass filled PA12
- ST PEBA2301 – elastic Shore D35
- Adsint PA11 ESD – conductive material
- Alumide – aluminum filled PA12
- PA2241/PA2210 – flame retardant materials



**Wide range of post-processings**

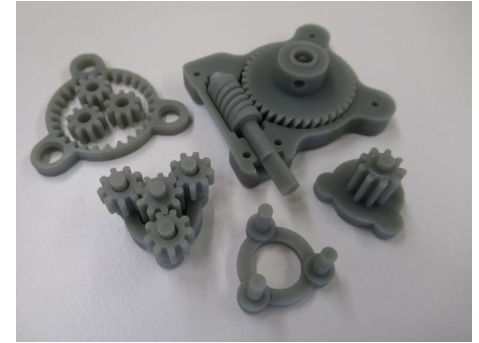
# Production



## Plastic printing

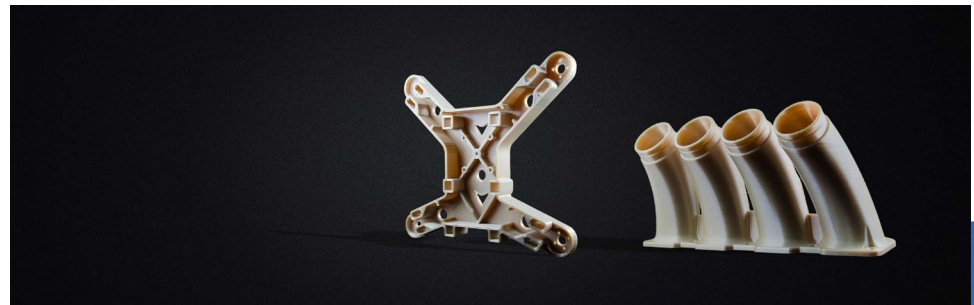
### SLA technology

- Small and accurate parts
- Materials for engineering and medical applications



### FDM technology

- Up to meter size parts
- Wide range of materials
  - NEW Ultrapolymers





# Other activities



## Design and engineering

- Re-engineering and 3D-print optimization
- Quick product development
- **3DStep team + Partner network**

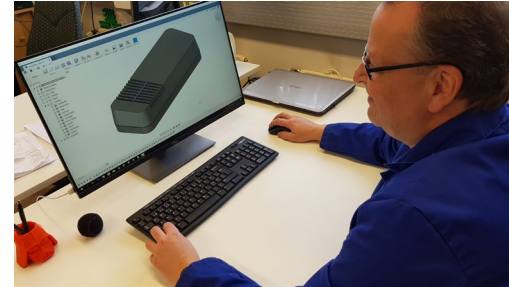
## Tailored trainings

- 3DStep provides powerful learning solutions for utilizing 3D printing.
- Company specific trainings
- Different levels of courses for the experts

## Research and development

### Active projects:

- Digital and physical immersion in imaging and surgery (DPI).
- *Smart Magnets for Accelerator Research And Diagnostic Data Infrastructure (SMARAGDI).*

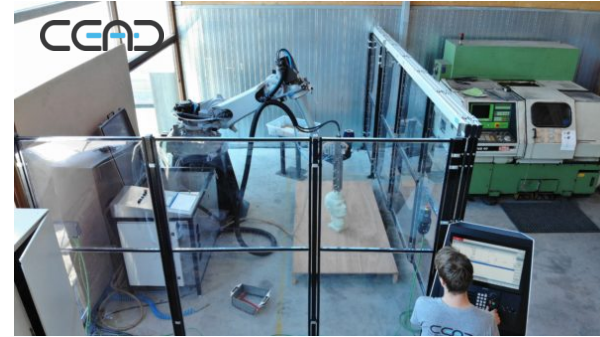


# Large scale 3D-printing

Traditional: 1m x 1m x 1m



Robot arm: 2m x 1m x 1,5m



Gantry type: 5m x 4m x 2m



Large Scale Belt type: (5m x 3m x 50m)?



# Large scale 3D-printing

- Finishing with CNC milling after 3D-printing



CEAD

# Large scale 3D-printing

Wide range of materials:

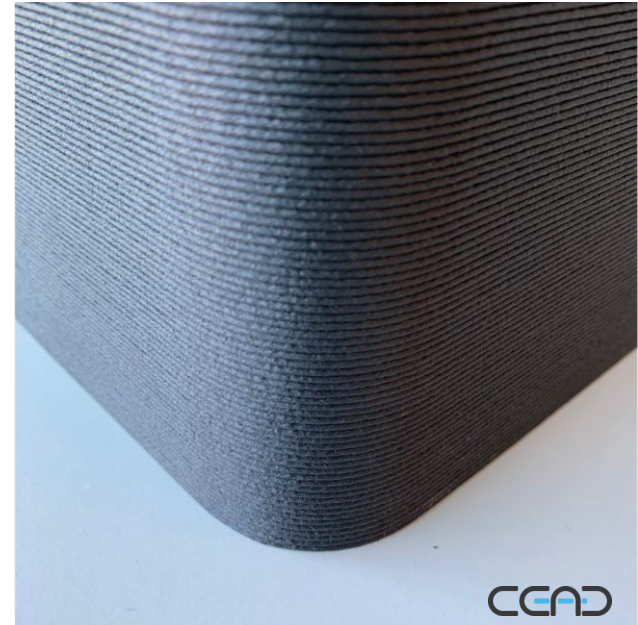
- PLA + WF
- PP + 50%GF
- ABS + 50%CF
- PEEK + 30%CF
- ...

Pellet extruder

Possible to add continuous fiber

Nozzle size ~2-15mm

Max output ~12kg/hr



# Applications



- Chairs printed from UPM Formi



# Applications

- Concrete molds for more innovative shapes



# Applications

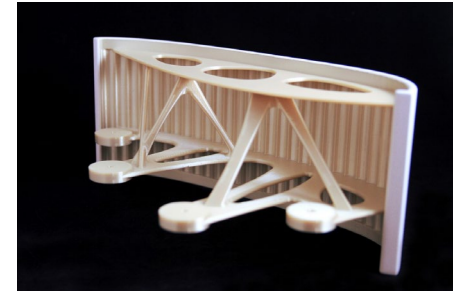
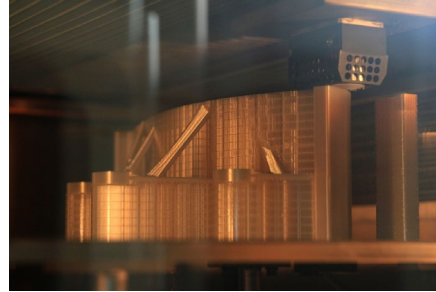
- Molds for fiber lamination
- Baseframes that are reinforced with fiber lamination



# Applications



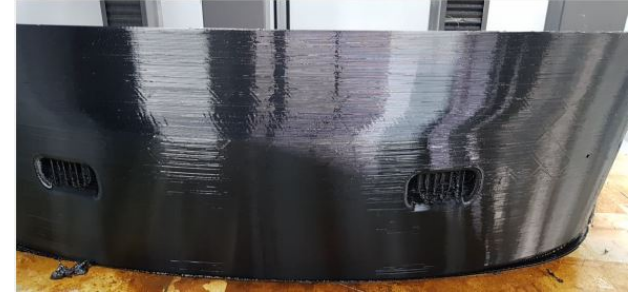
- Aircraft retrofit interior part
- Printed from aviation certified material
- Finishing and painting traditionally





# Applications

- Tram bumper
- Printed from the material that meets the EN45545 standard for any area of a railway vehicle
- Finishing and painting traditionally



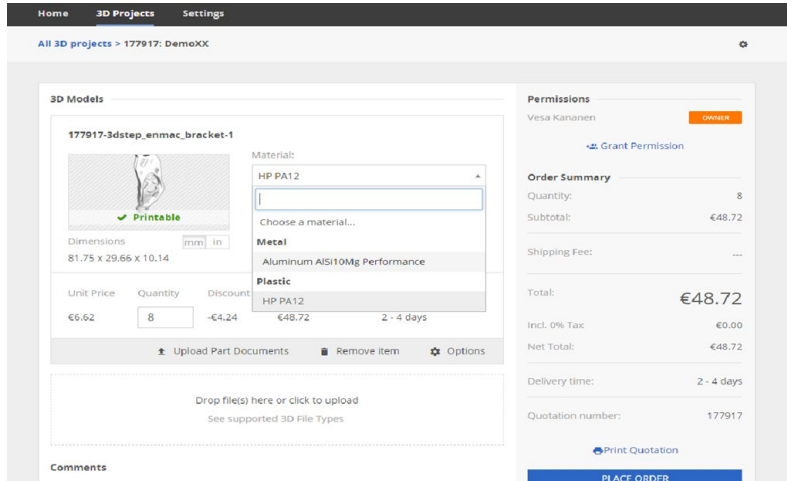
## Online ordering tool:

Contact:

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The screenshot displays the 3DStep online ordering tool interface. The main content area shows a product listing for '177917-3dstep\_enmac\_bracket-1'. The product is marked as 'Printable' and has dimensions of 81.75 x 29.66 x 10.14 mm. The material selection dropdown is open, showing options for 'Metal' (Aluminum AlSi10Mg Performance) and 'Plastic' (HP PA12). The unit price is €6.62, the quantity is 8, and the discount is -€4.24. The total price is €48.72 with a lead time of 2-4 days. The interface includes a 'Permissions' section for Vesa Kananen, an 'Order Summary' table, and a 'Comments' section.

Unit Price	Quantity	Discount	Material	Price	Lead Time
€6.62	8	-€4.24	HP PA12	€48.72	2 - 4 days

Order Summary	
Quantity:	8
Subtotal:	€48.72
Shipping Fee:	---
<b>Total:</b>	<b>€48.72</b>
Incl. 0% Tax:	€0.00
Net Total:	€48.72
Delivery time:	2 - 4 days
Quotation number:	177917