



**OOSTDAM  
ENGINEERING**

**Re-engineering van (obsoleete OEM)  
onderdelen in de industrie**

Re-engineering van (**obsolete OEM**)  
onderdelen in de industrie

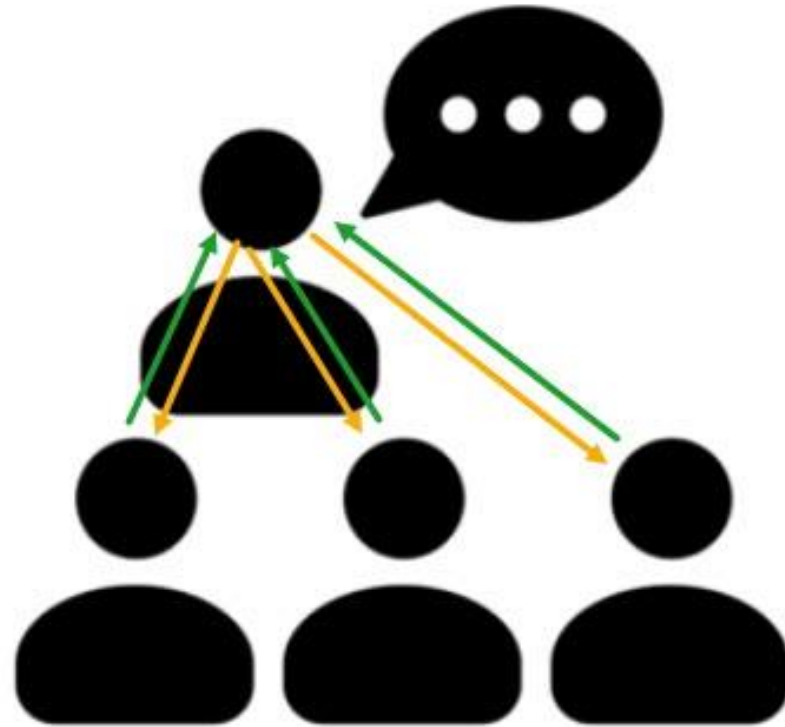
Reverse engineering van  
**niet leverbare** onderdelen

# Reverse engineering

=

Haalt het ontwerp  
uit het voorwerp

# Interactieve lezing



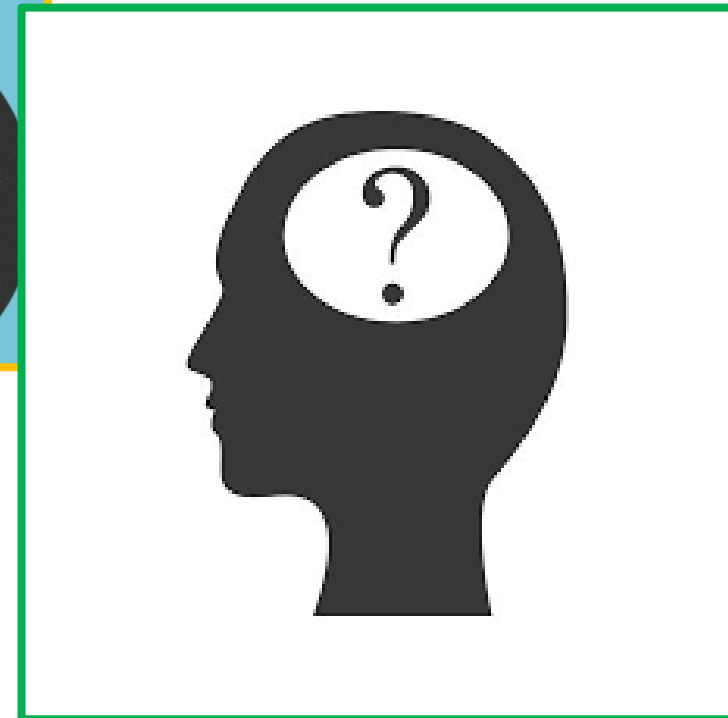


Theater

Kennis



Concreet  
probleem



Niet leverbaar

**Meeneempieltje**



Niet leverbaar





Niet leverbaar

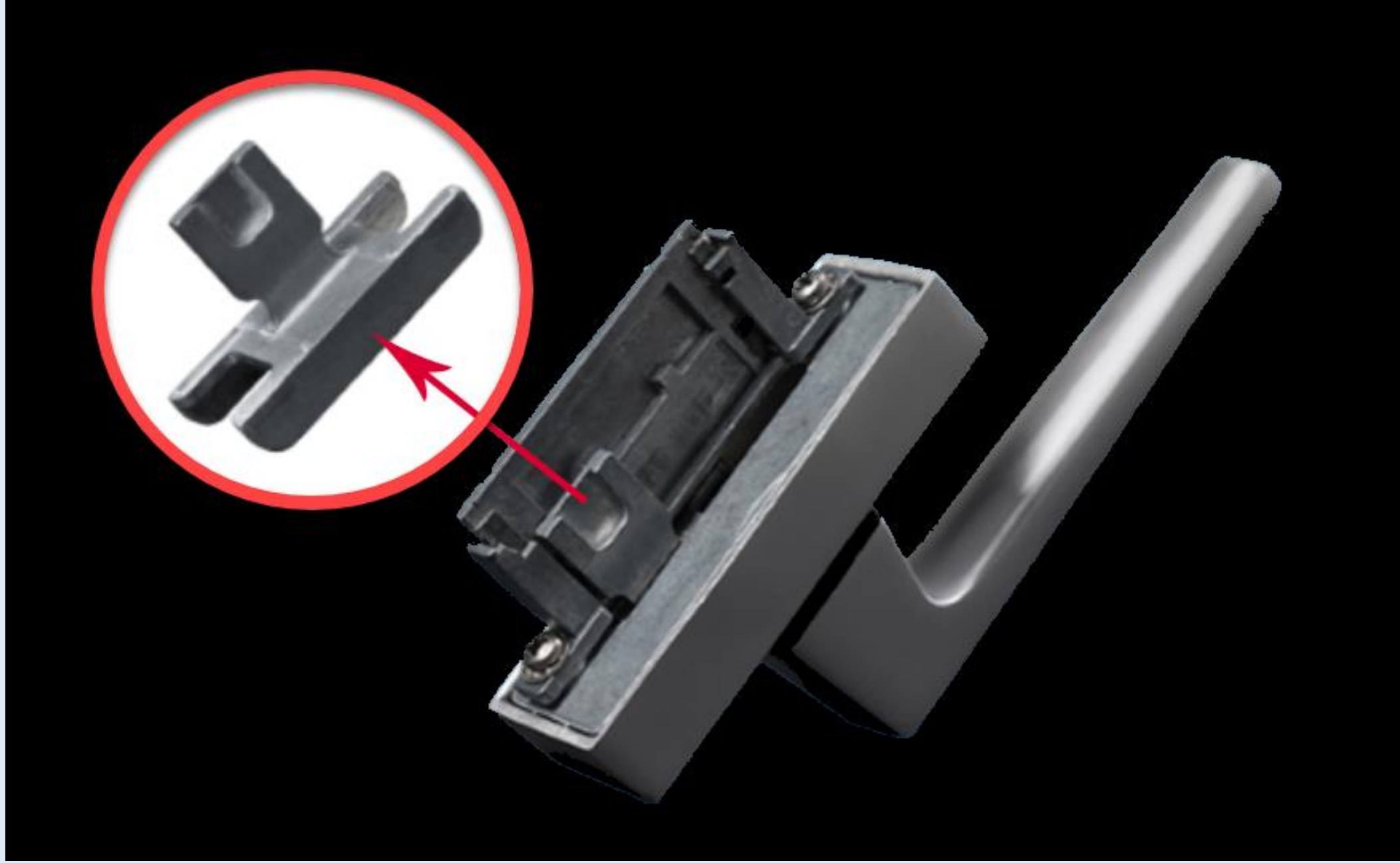




Niet leverbaar



Niet leverbaar



Niet leverbaar

# Meeneempieltje

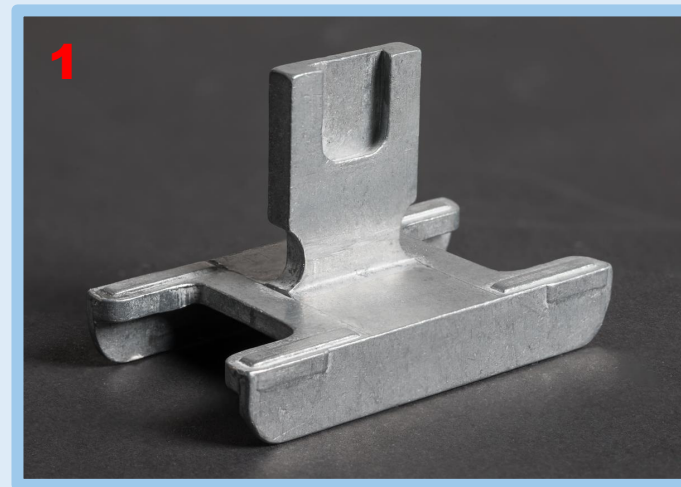


Niet leverbaar

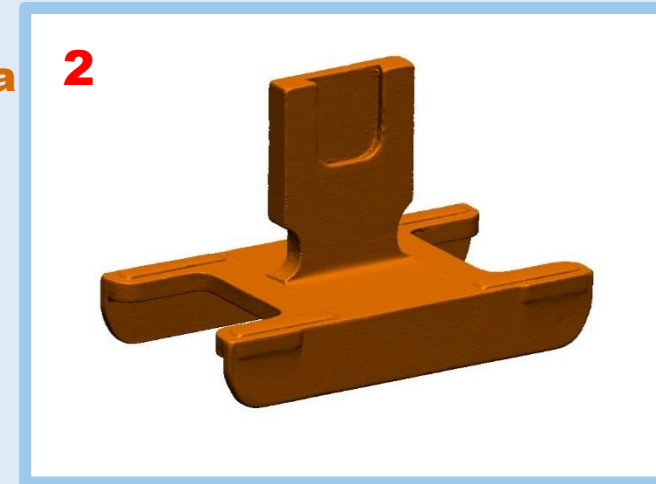


Productie

Niet leverbaar onderdeel



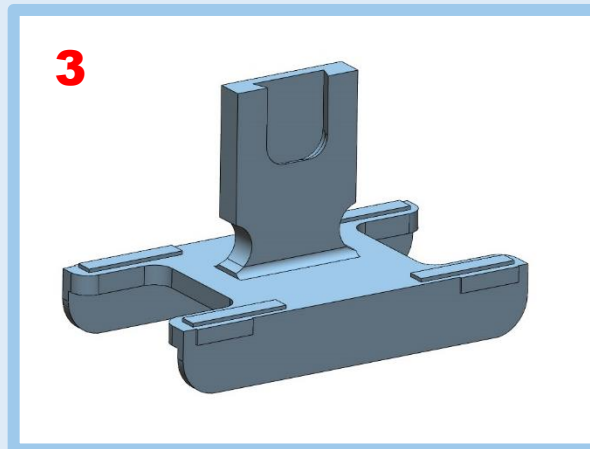
Scandata



Proto



3D CAD model



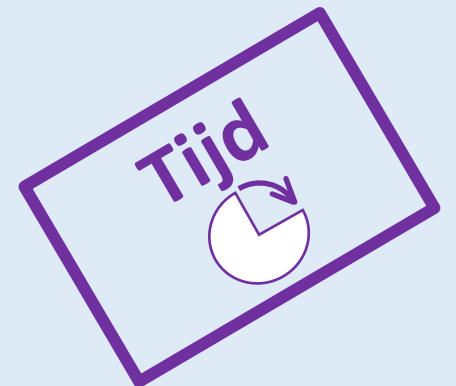
Techniek



Niet leverbaar

# Doorlooptijd voor Randstad

- **Opdracht:** 12-3-2018
- **Levering** 150 meeneempieltjes: 9-10-2018
- **Doorlooptijd:** 7 maanden

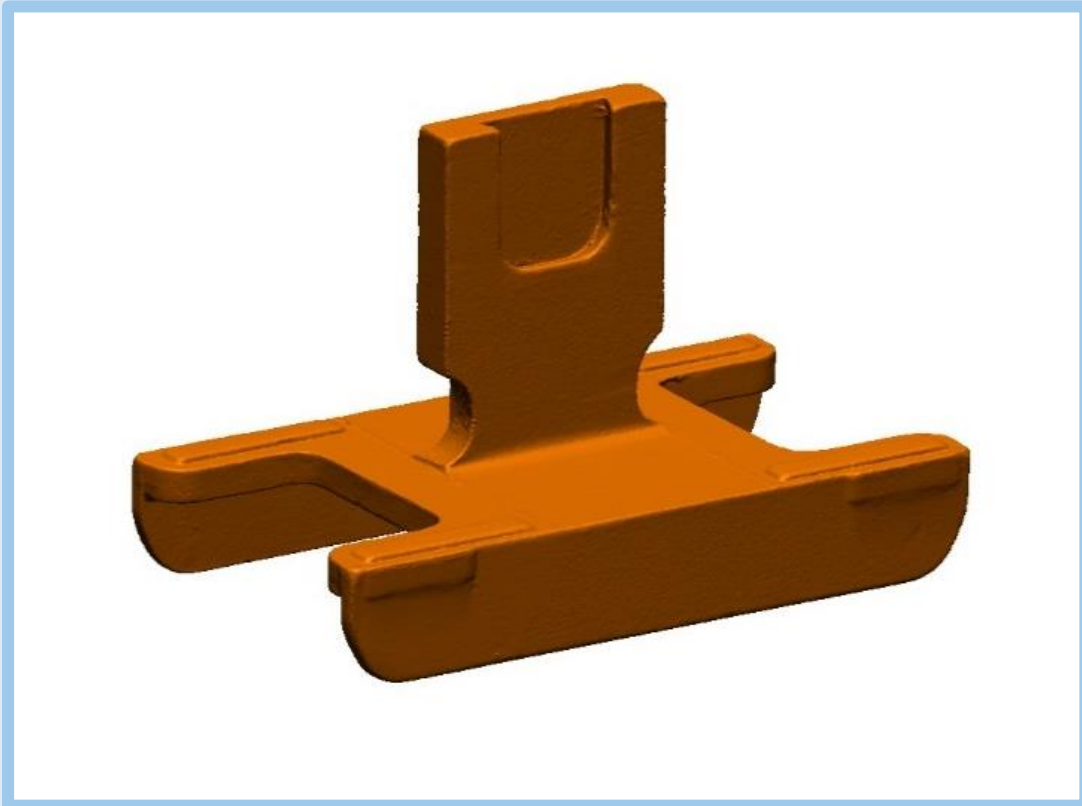


# Voordelen voor Randstad

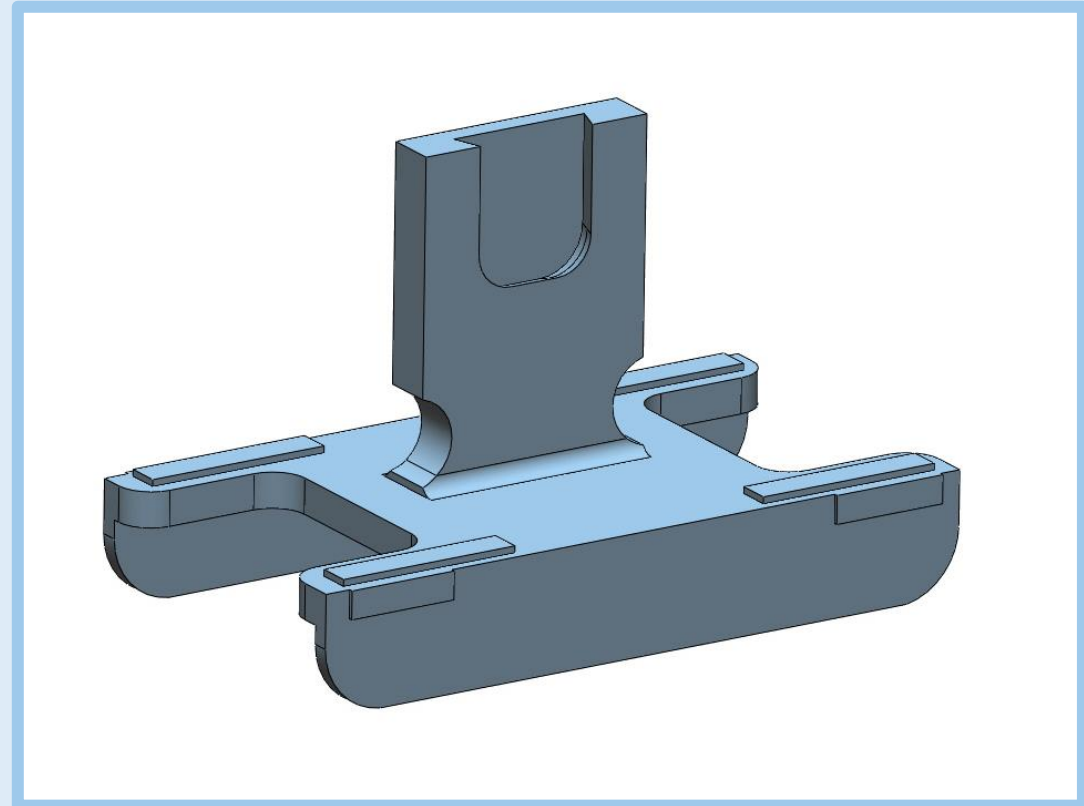
- **Beslag aanpassen**
  - **150st x €300** **€ 45.000**
- **Oostdam Engineering**
  - **150st x €75** **€ 11.250**
- **Voordeel Randstad** **€ 33.750**
- **Direct toepasbaar**
- **MVO**



3D scan

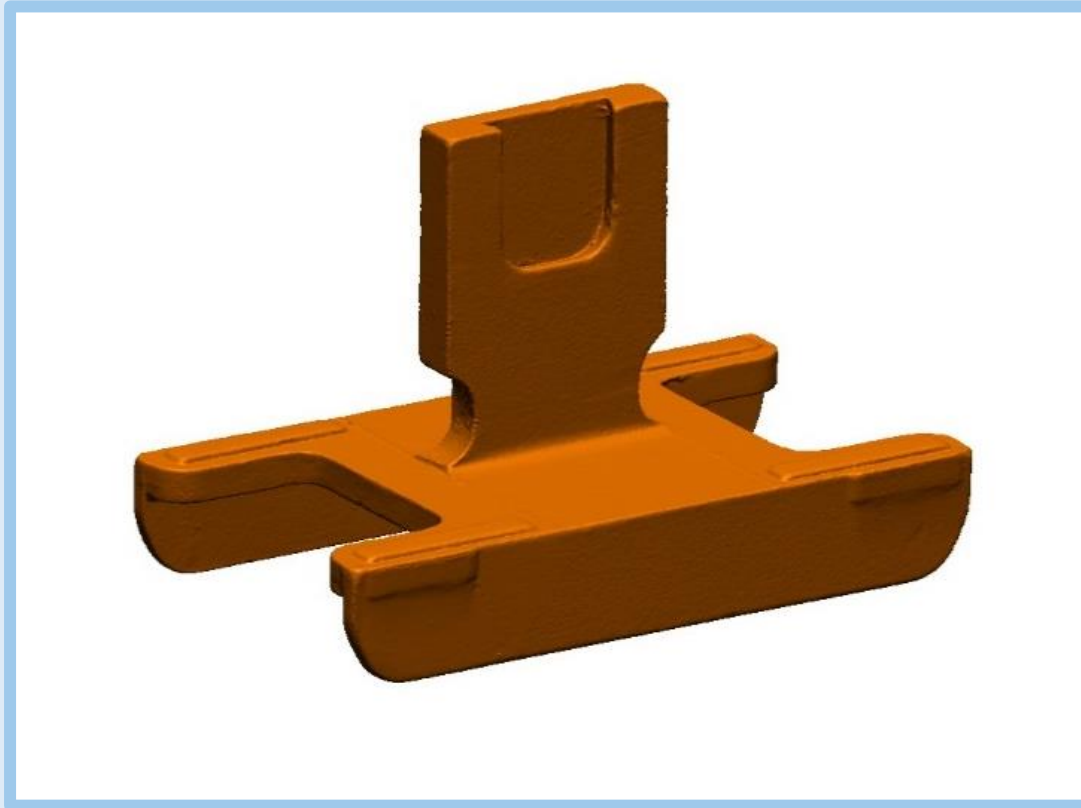


3D CAD model

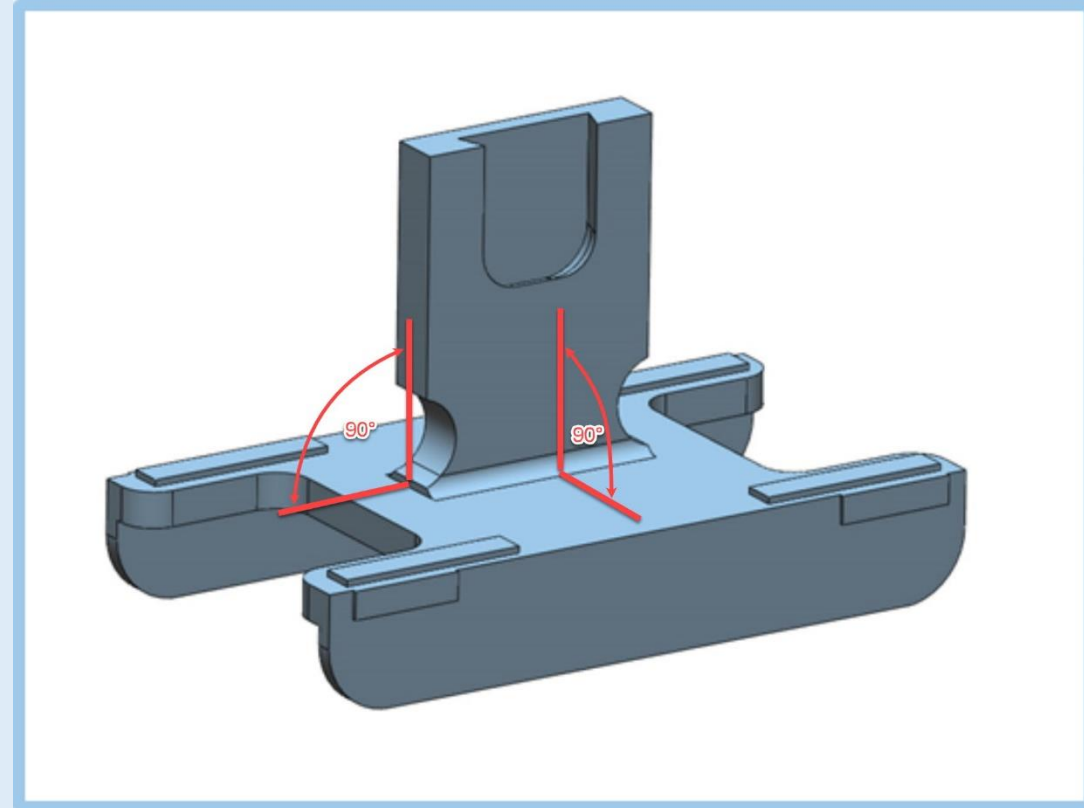


Zuiver 3D CAD model

3D scan



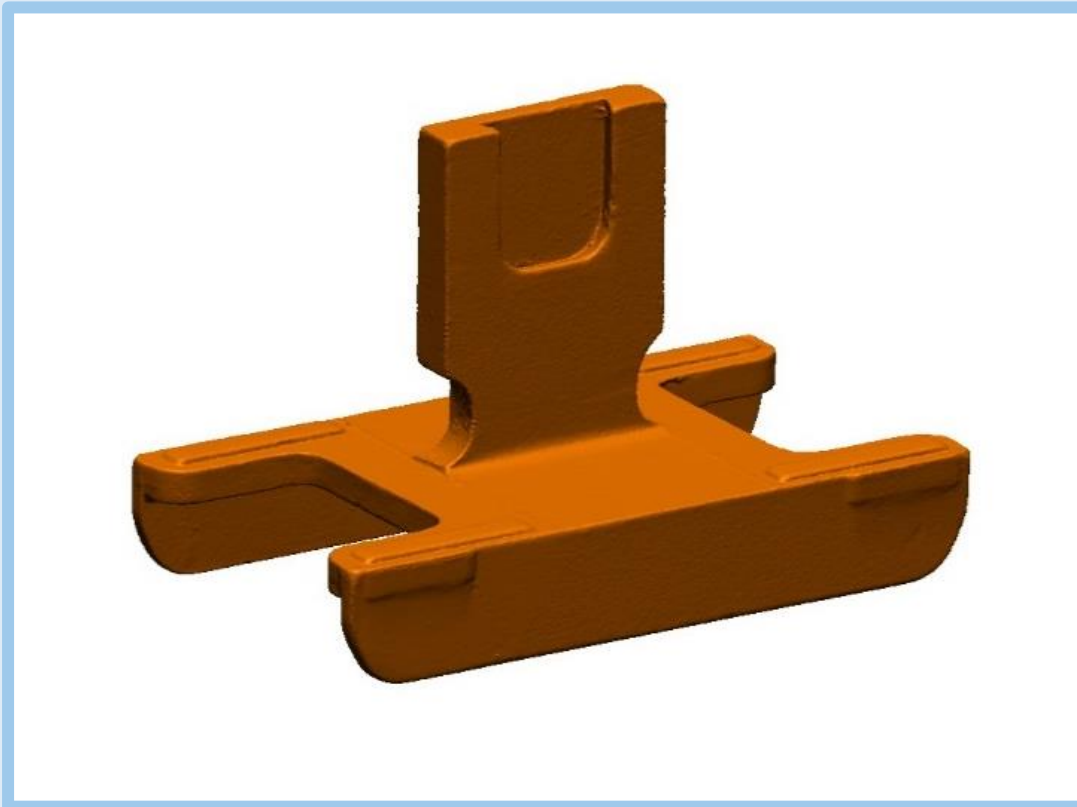
3D CAD model



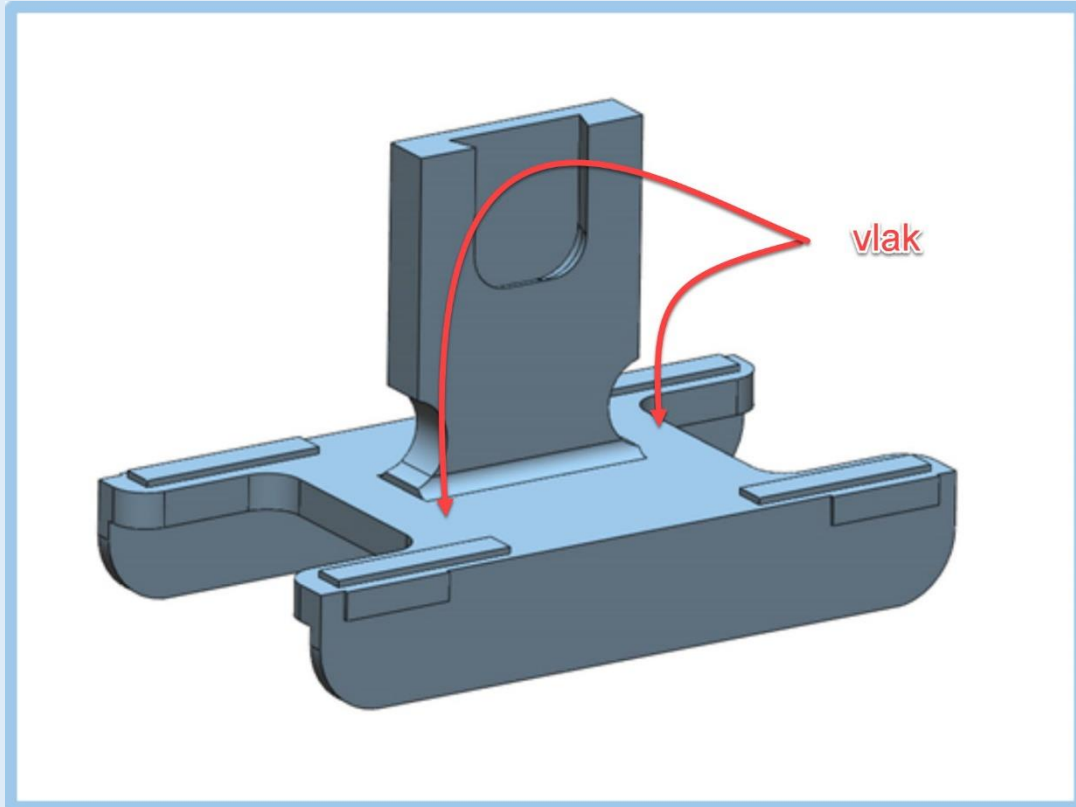
Zuiver 3D CAD model



3D scan

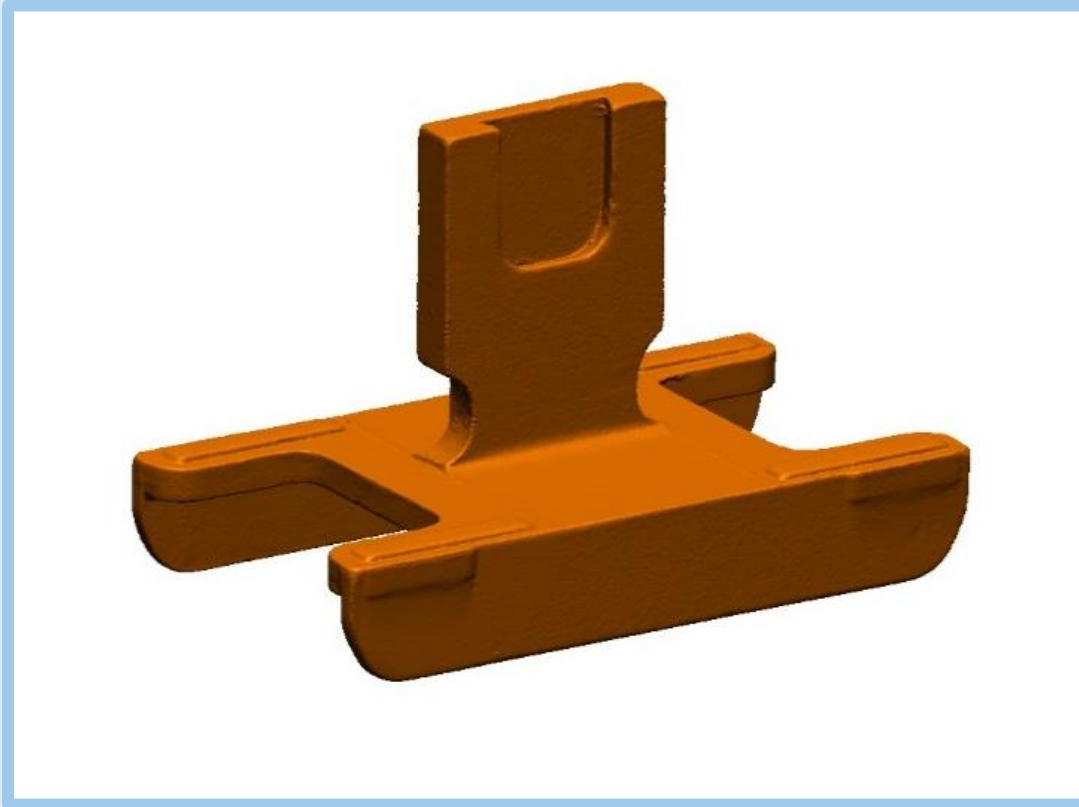


3D CAD model

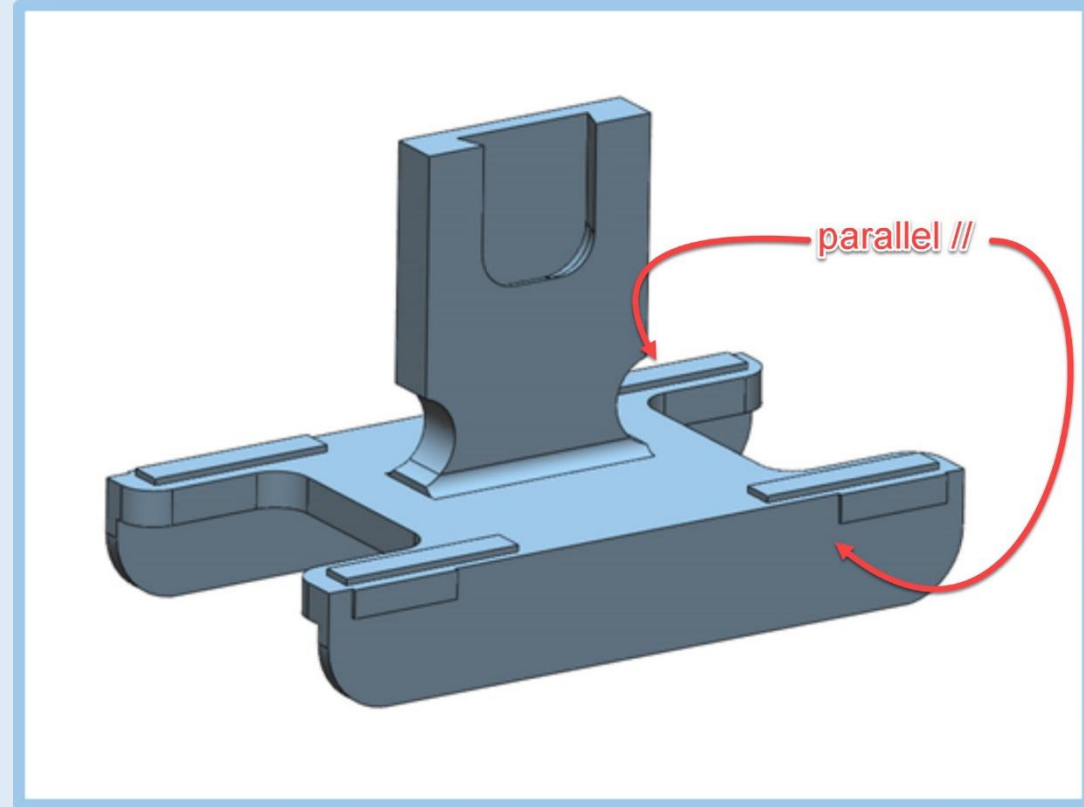


Zuiver 3D CAD model

3D scan

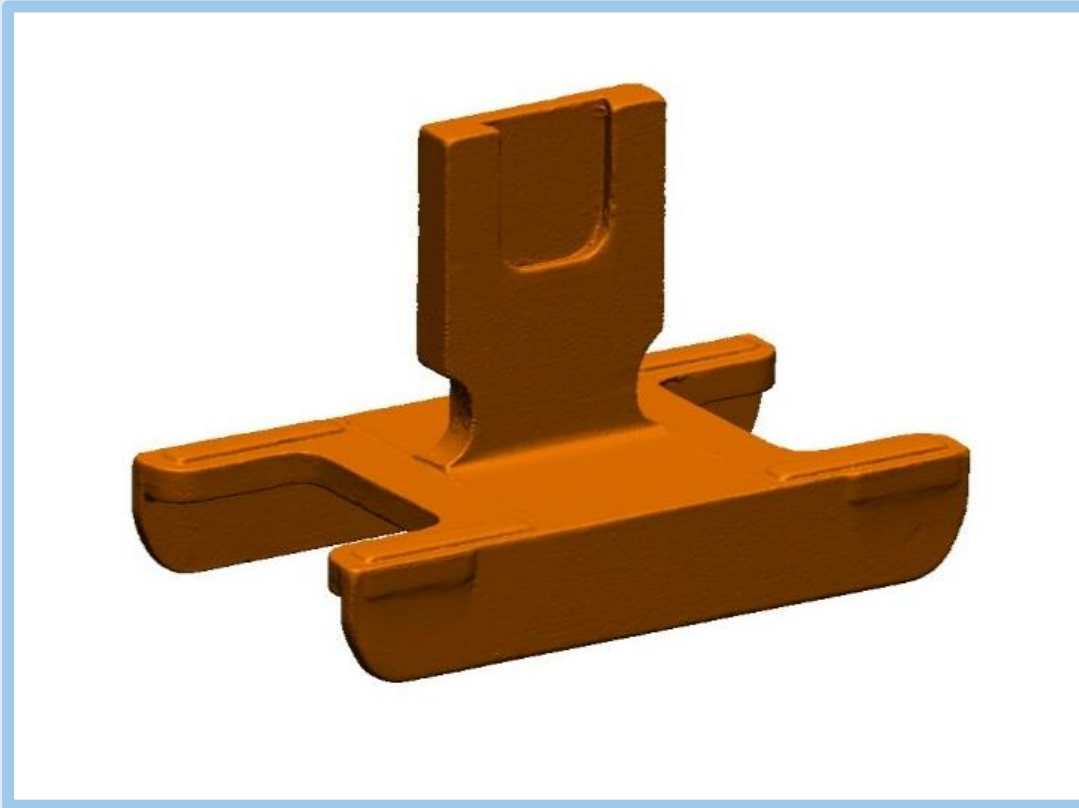


3D CAD model

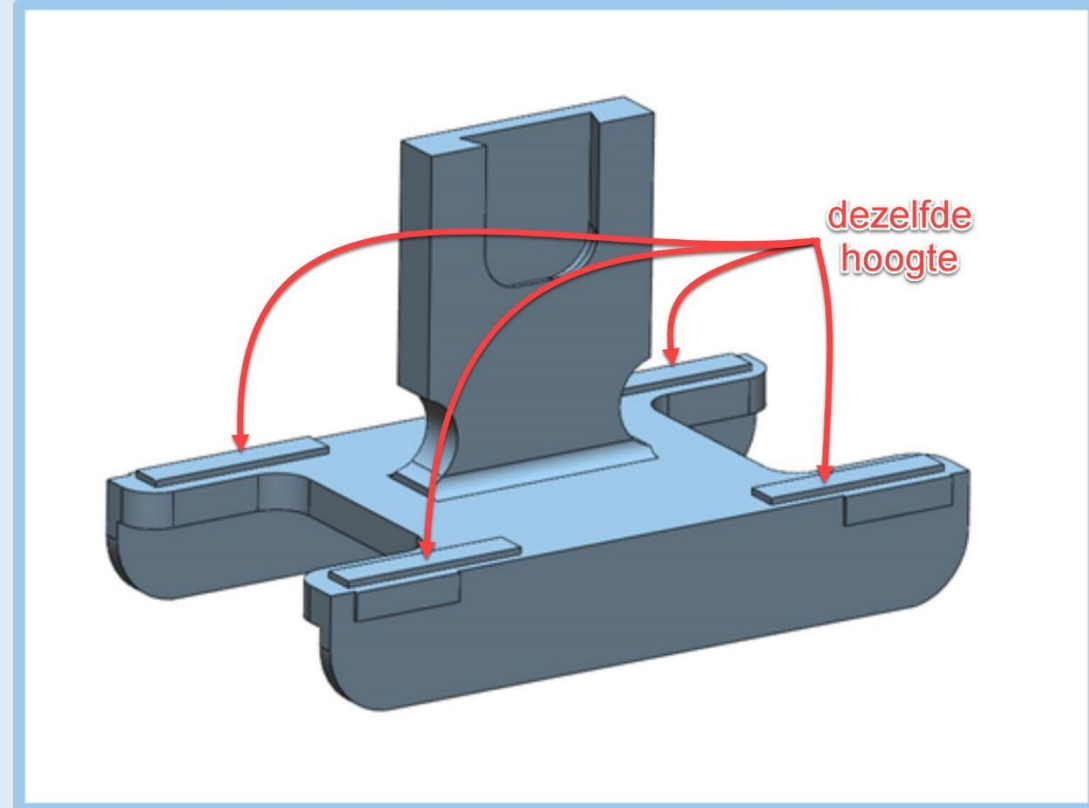


Zuiver 3D CAD model

3D scan



3D CAD model



Zuiver 3D CAD model

# Wanneer reverse engineering:

- **Niet** leverbaar onderdeel
- Minstens 30 jaar oud
- Nauwkeurig 0,1-0,01mm
- **Complex** qua vorm (=dubbel gekromd)









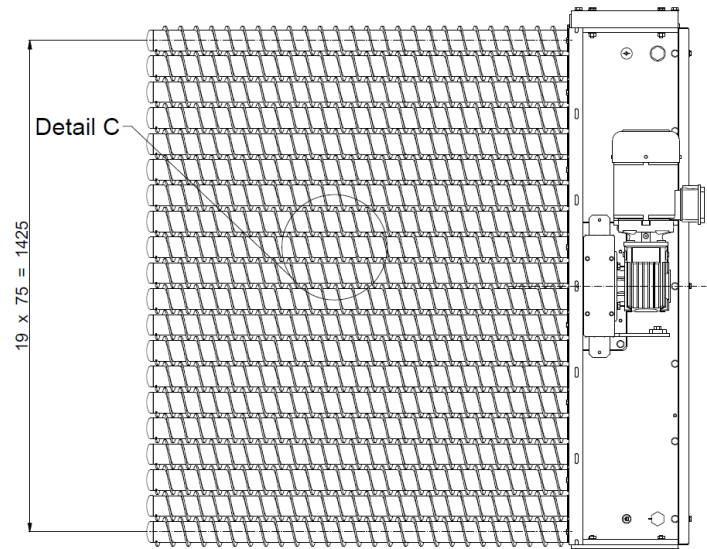
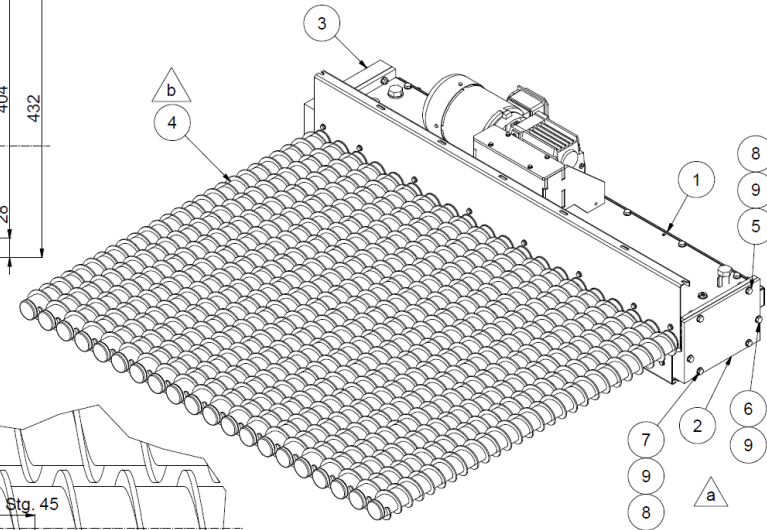
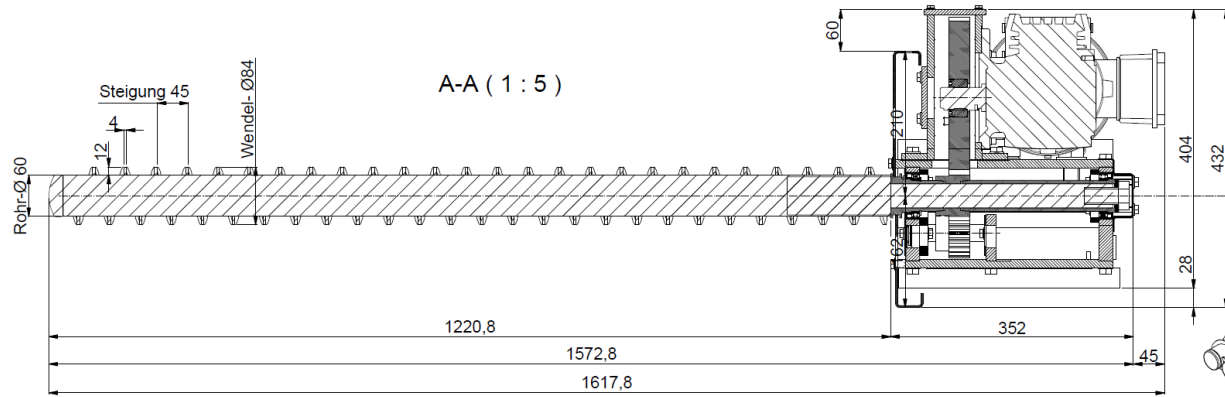
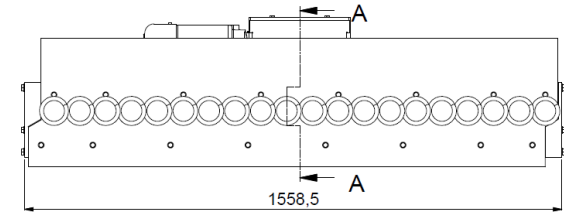
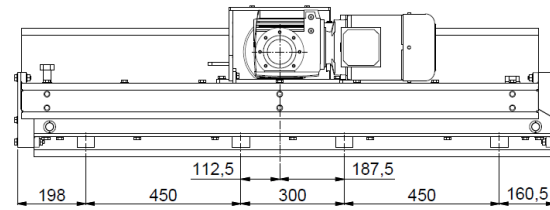
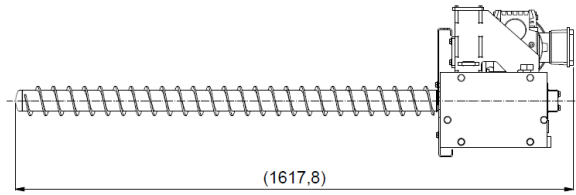




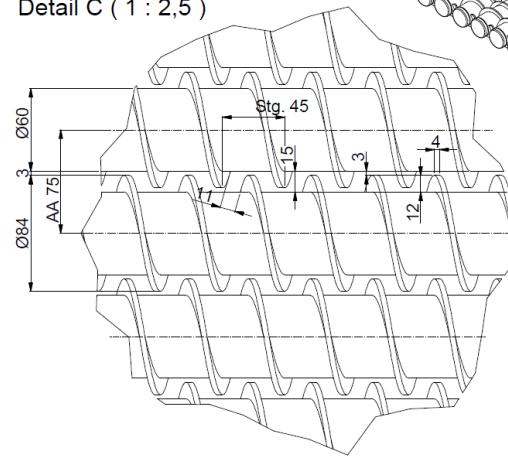




| Pos | Anz | Art./Zeichnungsnummer     | Bezeichnung  | Material       | Länge     | Breite   | Höhe     | Masse    |
|-----|-----|---------------------------|--|----------------|-----------|----------|----------|----------|
| 1   | 1   | 09032-5200-V6-011-000     | Feinsplitter-Modul mit Strömräder                      |                | 1500,0 mm | 350,0 mm | 412,0 mm | 343,0 kg |
| 2   | 1   | 09032-5200-V6-100-033     | Abdeckung-Gebriekabekasten, rechts                     | Aluminium      | 312,5 mm  | 216,0 mm | 48,0 mm  | 5,0 kg   |
| 3   | 1   | 09032-5200-V6-100-037     | Abdeckung-Gebriekabekasten, links                      | S235JR         | 312,0 mm  | 216,0 mm | 48,0 mm  | 16,1 kg  |
| 4   | 20  | 09032-V4-02-100-000-RH    | Feinsplitterwelle Ø60, Steigung 45                     | S235JR         | 1542,8 mm | 84,0 mm  | 84,0 mm  | 13,8 kg  |
| 5   | 4   | VBT-SKS-10-040-8-8-VZ-933 | Sechskantschraube DIN 933 - M10x40-8.8, Stahl verzinkt | Stahl verzinkt |           |          |          | 0,0 kg   |
| 6   | 4   | VBT-SKS-10-070-8-8-VZ-933 | Sechskantschraube DIN 933 - M10x70-8.8, Stahl verzinkt | Stahl verzinkt |           |          |          | 0,1 kg   |
| 7   | 4   | VBT-SKS-10-075-8-8-VZ-933 | Sechskantschraube DIN 934 - M10x75-8.8, Stahl verzinkt | Steel, Mild    |           |          |          | 0,1 kg   |
| 8   | 8   | VBT-SKM-10-VZ             | Sechskanmutter DIN 934 - M10 - Stahl verzinkt          | Stahl verzinkt |           |          |          | 0,0 kg   |
| 9   | 20  | VBT-USC-125-10-VZ         | Scheibe DIN 125 - A 10,5 - Stahl verzinkt              | Stahl verzinkt |           |          |          | 0,0 kg   |



Detail C ( 1 : 2,5 )



Getriebeöl: CLP 220; pro 10mm  
 horizontale Füllhöhe 3,675 Ltr  
 Flächendichtmittel: Loctite 573 /  
 Loctite 574

Hauptabmessungen: 1558,5 x 1617,8 x 432,0

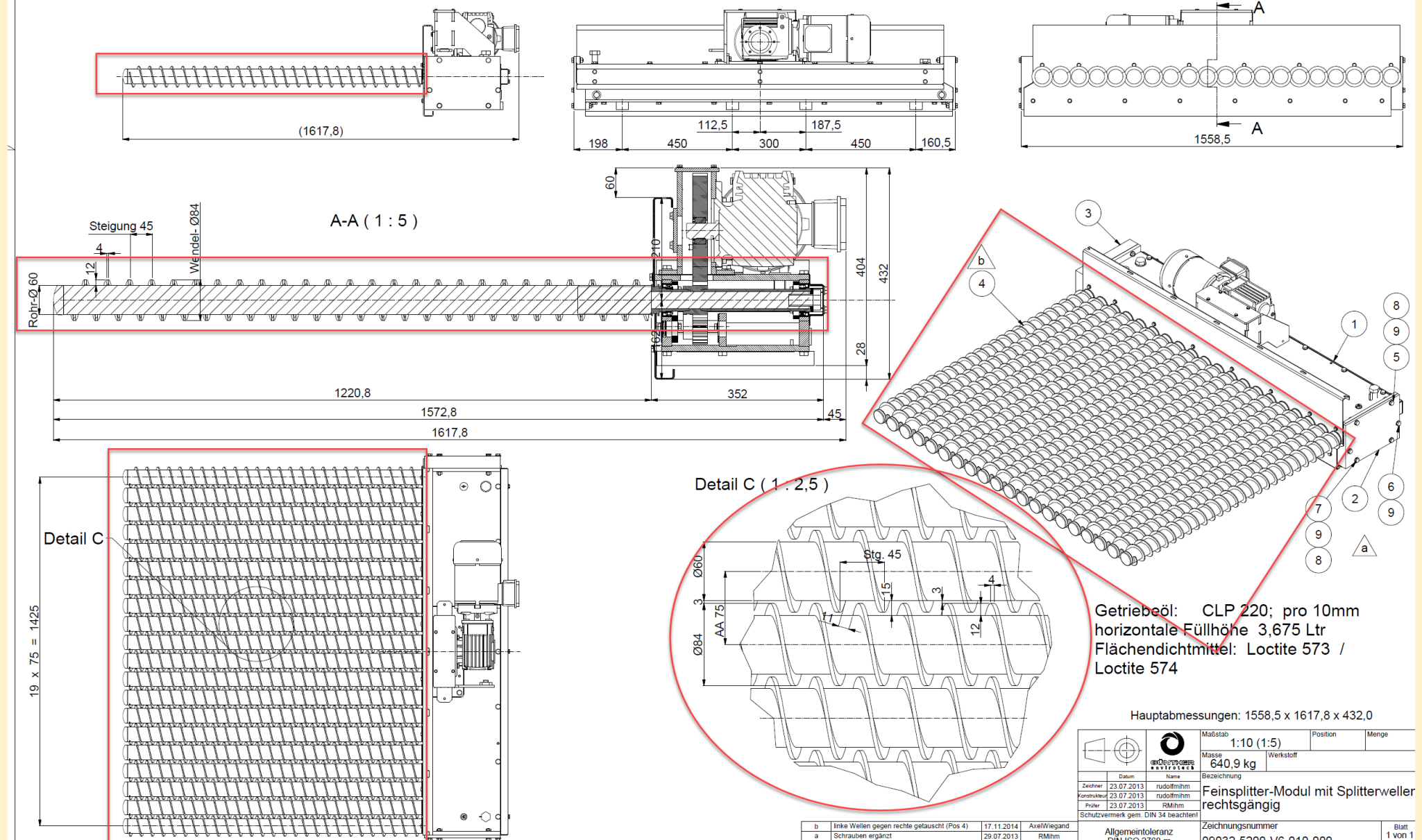
|   |            |            |           |       |
|---|------------|------------|-----------|-------|
|   | Maßstab    | 1:10 (1:5) | Position  | Menge |
|   | Masse      | 640,9 kg   | Werkstoff |       |
| Bezeichnung<br><b>Feinsplitter-Modul mit Splitterwellen, rechtsgängig</b> |            |            |           |       |
| Zechner   | Datum      | Name       |           |       |
| Konstrukteur  | 23.07.2013 | rudolfmhm  |           |       |
| Prüfer  | 23.07.2013 | RM/mhm     |           |       |
| Schutzvermerk gem. DIN 34 beachten!                                       |            |            |           |       |

|     |   |            |             |   |                        |
|-----|---|------------|-------------|---|------------------------|
| b   | linke Wellen gegen rechte getauscht (Pos 4) | 17.11.2014 | AxelWiegand | Zeichnungsnummer<br>09032-5200-V6-010-000 | Blatt<br>1 von 1<br>A2 |
| a   | Schrauben ergänzt                           | 29.07.2013 | RM/mhm      |   |                        |
| Rev | Änderung                                    | Datum      | Name        |   |                        |

Kurzbezeichnung ewendo: Feinsplitter-Modul mit Splitterwellen, rechtsgängig 1558,5x1617,8x432,0 /

C:\Work\Design\05-Maschin\09032-Splitter\5200-Feinsplitter\06-Zusammenbau\000-Zusammenbau\09032-5200-V6-010-000.dwg

| Pos | Anz. | Art./Zeichnungsnummer     | Bezeichnung  | Material       | Länge     | Breite   | Höhe     | Masse    |
|-----|------|---------------------------|--|----------------|-----------|----------|----------|----------|
| 1   | 1    | 09032-5200-V6-011-000     | Feinsplitter-Modul mit Sonnenrad                       |                | 1500,0 mm | 350,0 mm | 412,0 mm | 343,0 kg |
| 2   | 1    | 09032-5200-V6-100-033     | Abdeckung-Getriebekasten, rechts                       | Aluminium      | 312,5 mm  | 216,0 mm | 48,0 mm  | 5,0 kg   |
| 3   | 1    | 09032-5200-V6-100-037     | Abdeckung-Getriebekasten, links                        | S235JR         | 312,0 mm  | 216,0 mm | 48,0 mm  | 16,1 kg  |
| 4   | 20   | 09032-V4-02-100-000-RH    | Feinsplitterwelle Ø60, Steigung 45                     | S235JR         | 1542,8 mm | 84,0 mm  | 84,0 mm  | 13,8 kg  |
| 5   | 4    | VBT-SKS-10-040-8-8-VZ-933 | Sechskantschraube DIN 933 - M10x40-8-8, Stahl verzinkt | Stahl verzinkt |           |          |          | 0,0 kg   |
| 6   | 4    | VBT-SKS-10-070-8-8-VZ-933 | Sechskantschraube DIN 933 - M10x70-8-8, Stahl verzinkt | Stahl verzinkt |           |          |          | 0,1 kg   |
| 7   | 4    | VBT-SKS-10-075-8-8-VZ-933 | Sechskantschraube DIN 933 - M10x75-8-8, Stahl verzinkt | Steel, Mild    |           |          |          | 0,1 kg   |
| 8   | 8    | VBT-SKM-10-VZ             | Sechskantmutter DIN 934 - M10 - Stahl verzinkt         | Stahl verzinkt |           |          |          | 0,0 kg   |
| 9   | 20   | VBT-USC-125-10-VZ         | Scheibe DIN 125 - A 10,5 - Stahl verzinkt              | Stahl verzinkt |           |          |          | 0,0 kg   |



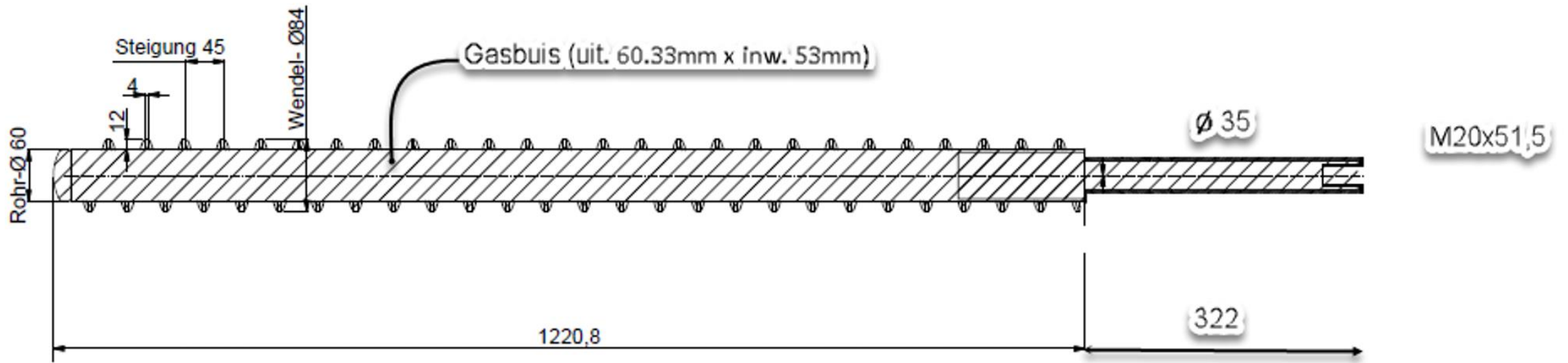
Getriebeöl: CLP 220; pro 10mm horizontale Füllhöhe 3,675 Ltr  
 Flächendichtmittel: Loctite 573 / Loctite 574

Hauptabmessungen: 1558,5 x 1617,8 x 432,0

|  |  |  |           |       |
|--|--|--|-----------|-------|
|  |  | Maßstab<br>1:10 (1:5)  | Position  | Menge |
|  |  | Masse<br>640,9 kg  | Werkstoff |       |
| Bezeichnung<br>Feinsplitter-Modul mit Splitterweller rechtsgängig  |  |  |           |       |
| Datum<br>23.07.2013<br>Zeichner<br>rudolfmihm<br>Konstrukteur<br>rudolfmihm<br>Prüfer<br>23.07.2013<br>Schutzvermerk gem. DIN 34 beachten! |  | Zeichnungsnummer<br>09032-5200-V6-010-000  |           |       |
| Blatt<br>1 von 1<br>A2   |  | Kurzbezeichnung evendo: Feinsplitter-Modul mit Splitterwellen_rechtsgängig 1558_5x1617_8x432_0 |           |       |

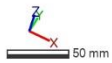
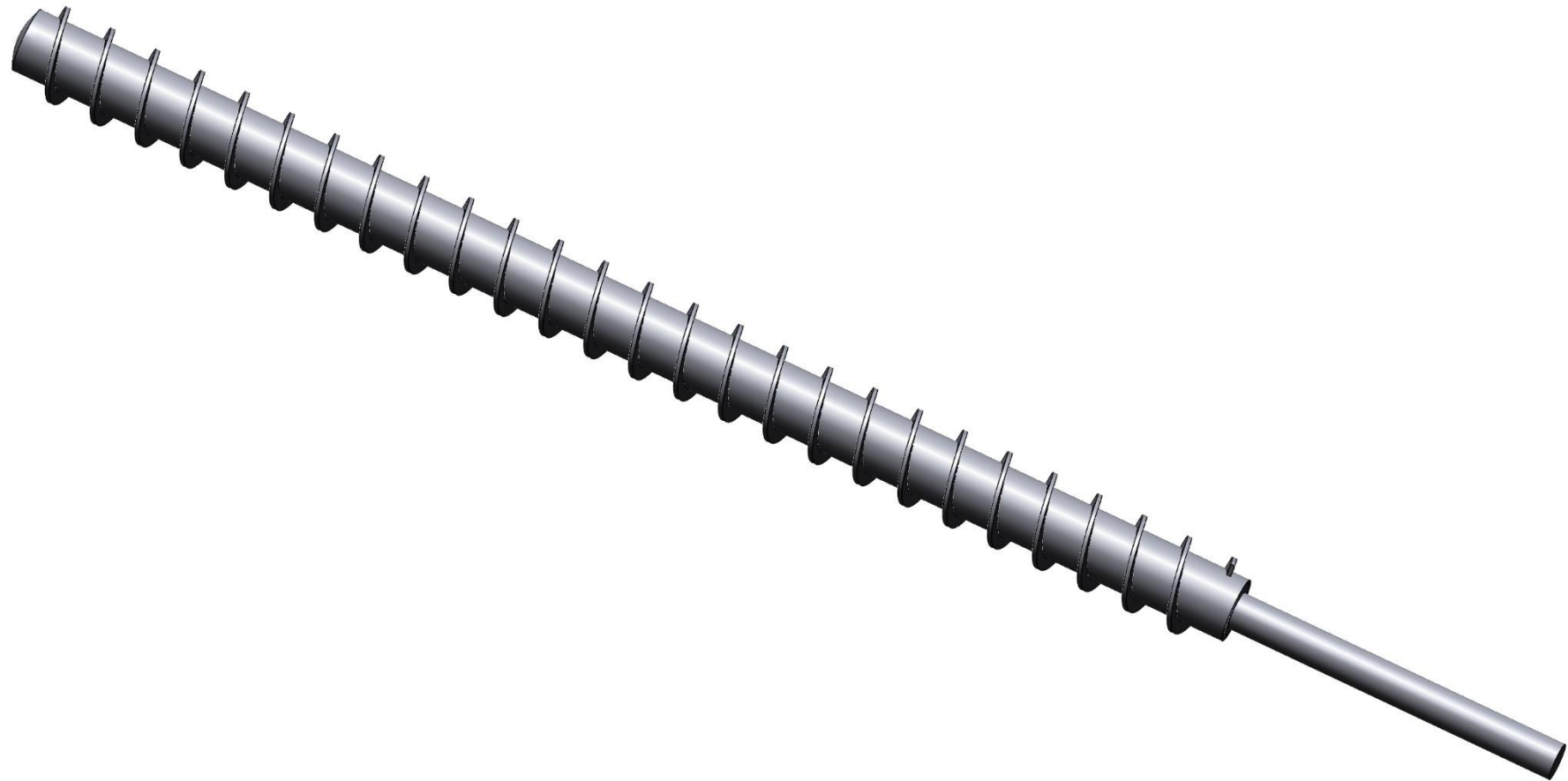
| Rev | Änderung                                    | Datum      | Axiel/Wiegand |
|-----|---|------------|---------------|
| b   | linke Wellen gegen rechte getauscht (Pos 4) | 17.11.2014 | Axiel/Wiegand |
| a   | Schrauben ergänzt                           | 29.07.2013 | RMhmm         |



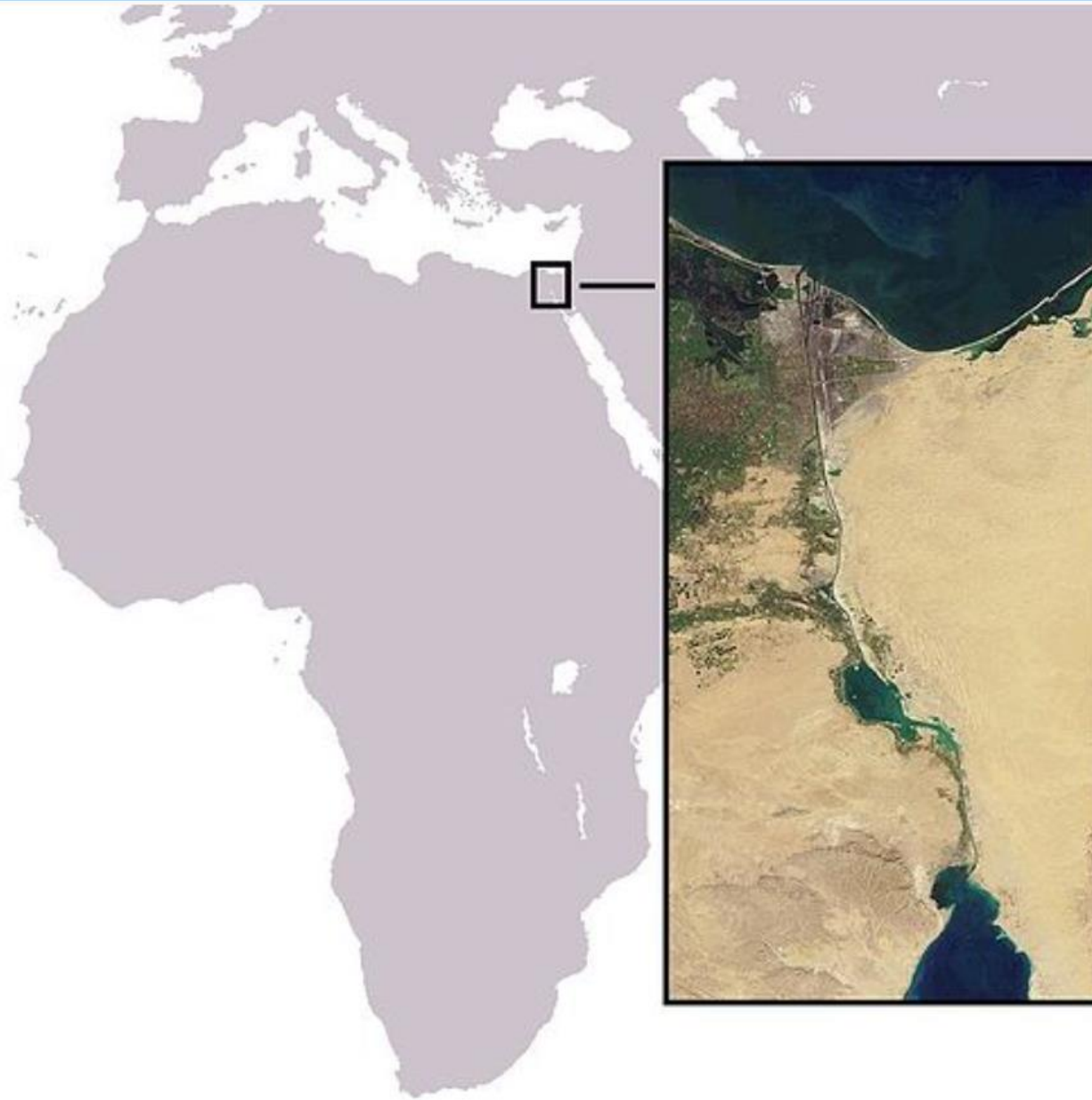






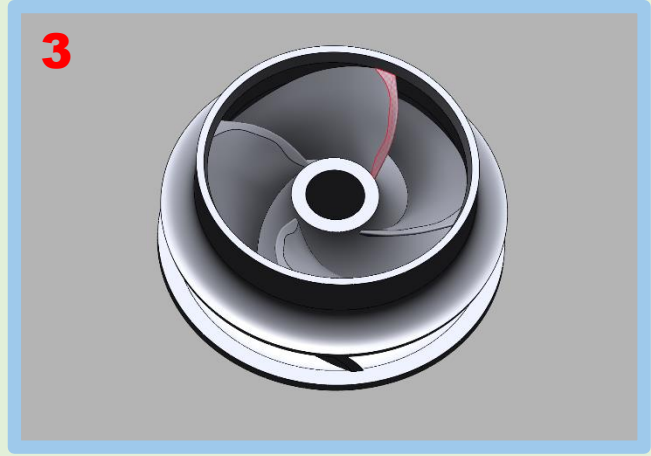


# Suezkanaal

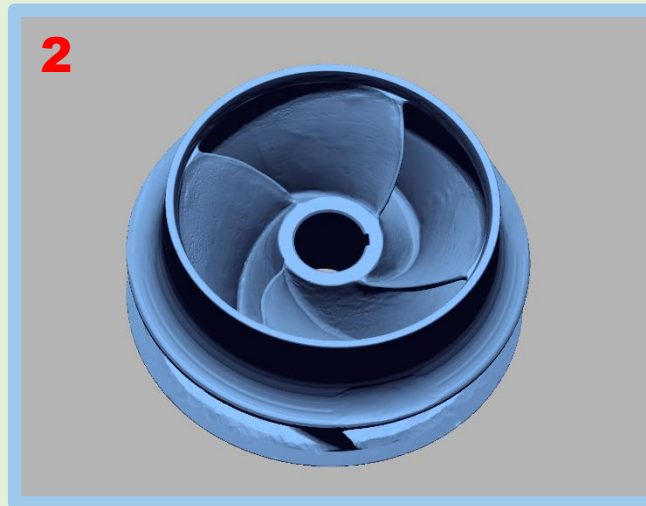


# Namaken van onderdelen

## 3D CAD model



## Scandata

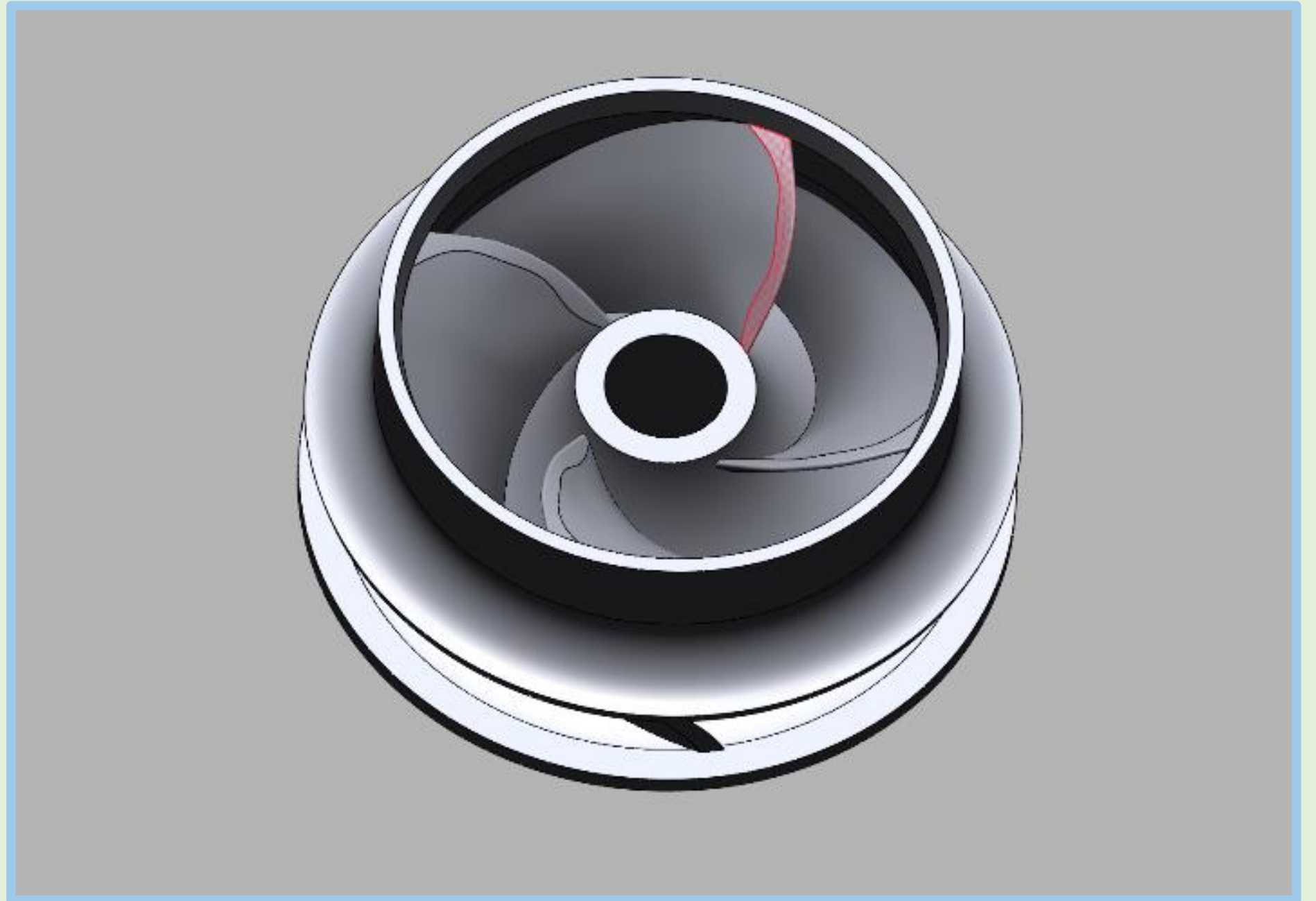


## Niet leverbaar onderdeel





Namaken van onderdelen



# Doorlooptijd voor waaier

- **Opdracht:** **18-9-2018**
- **Levering:** **24-10-2018**
- **Doorlooptijd:** **1mnd en 6dgn**

# Wie?

- 1) **Hoofd technische dienst**
- 2) Maintenance manager
- 3) Plant manager
- 4) werktuigbouwkundige
- 5) techneuten



(of beter problemen)

# Vragen?

(of beter problemen)



Vragen  
???

(of beter problemen)

(of beter problemen)

Zou uit deze lezing een opdracht kunnen komen?

Graag **ja**/**nee** in de chat 😊

# Antwoorden:

- 10 lezingen per jaar:
  - LinkedIn
  - Maillijst,
- [OostdamOostdamengineering.nl](http://OostdamOostdamengineering.nl)
- [maarten@OostdamEngineering.nl](mailto:maarten@OostdamEngineering.nl)