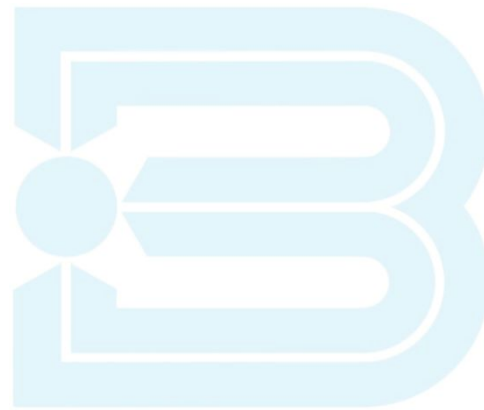




**BUHLMANN**

Reverse engineering



**BUHLMANN**

# AGENDA

## ☐ About reverse engineering

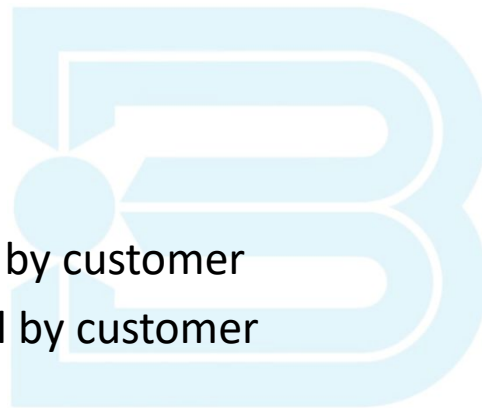
### ☐ Analysis

- ☐ 3 D Scanning
- ☐ 3 D drawing
- ☐ Material analysis

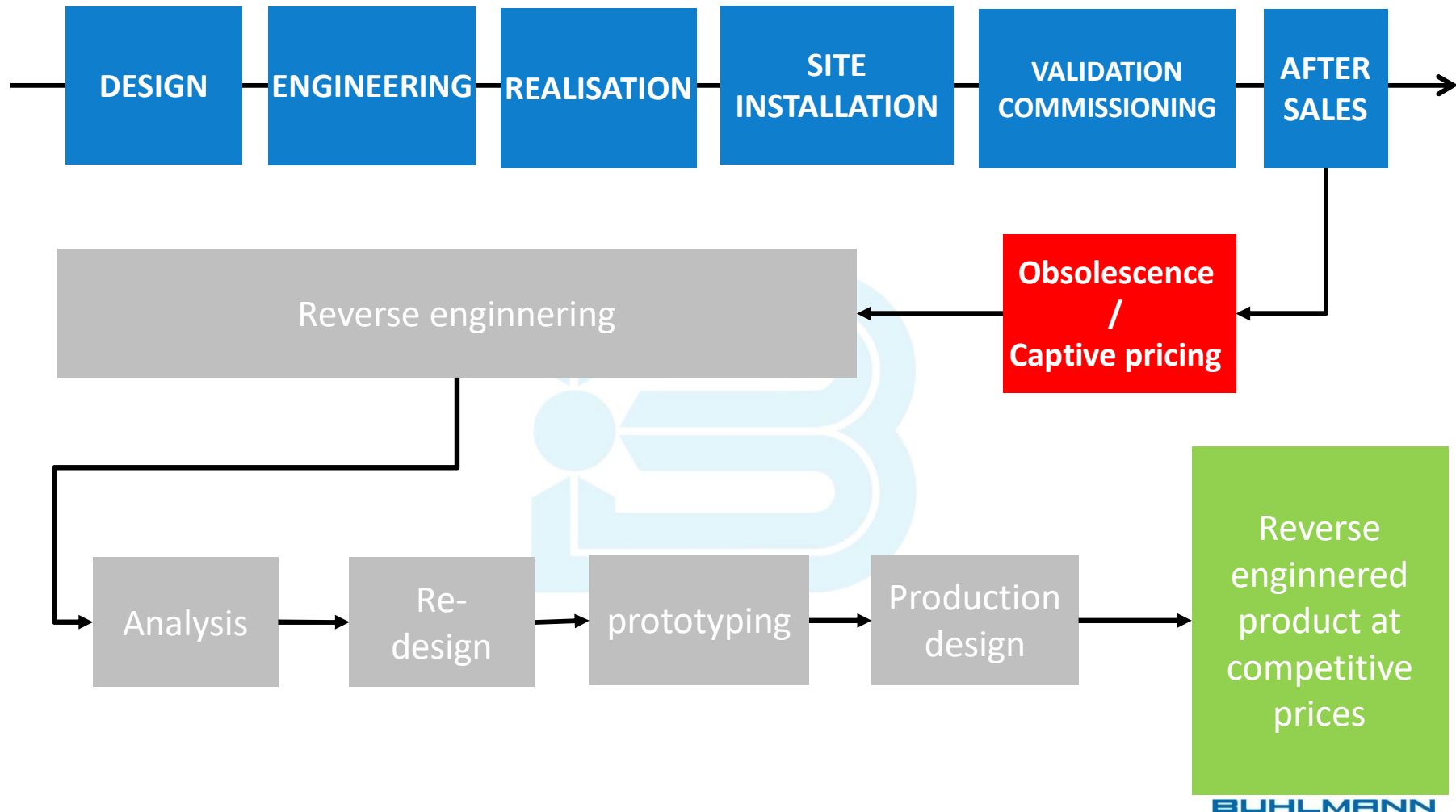
### ☐ Prototyping

- ☐ Concept approval by customer
- ☐ Real part approval by customer

### ☐ Series production



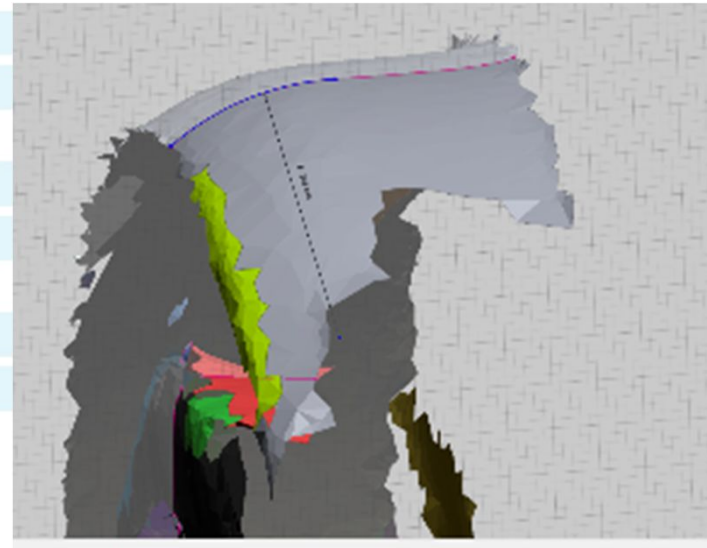
# ABOUT REVERSE ENGINEERING



# ANALYSIS

## □ 3-D scanning

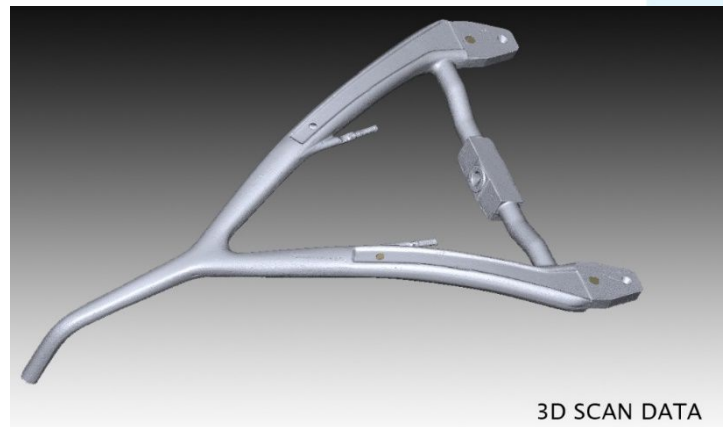
- Allows for digitalisation of external mechanical design



# ANALYSIS

## □ 3-D Drawing

- Based on the real mechanic part and a 3-D scan, a CAD file can be quickly produced and adapted



# ANALYSIS

## Material analysis

- We perform material analysis and mechanical characteristic analysis with authorized laboratories.

**IEB labs** sa/nv  
Registered office: Rue de la Roche 7 - 1470 Genappe - Belgium  
TVA: BE 080781905 CMC: BE30 7330 4571 9181

Report: AMV-1902011-1-01  
Member: 100045  
Registration N°: AMV

**Buhlmann n.v.**  
to the attention of Mr. Brice Buhlmann  
Herestraat 2C  
1930 Zaventem

Report n°: 3

Inspector: see enclosures  
Date of report: 18-02-19

Your references: IEB labs service reference  
Order: Matter handled by: A. Fiumi

**TEST REPORT**

Concern: Four "zerstörungsglied" as described in detail below.  
The tests were performed in the presence of Brice Buhlmann

**Designation of the articles subjected to the tests**

Test N°	Amount	Designation and dimensions	Mark
AMV 1	1	zerstörungsglied	R1
AMV 2	1	zerstörungsglied	R2
AMV 3	1	zerstörungsglied	T1
AMV 4	1	zerstörungsglied	T2

Results: Please find the test results in the enclosures.

Page: 1 / 2

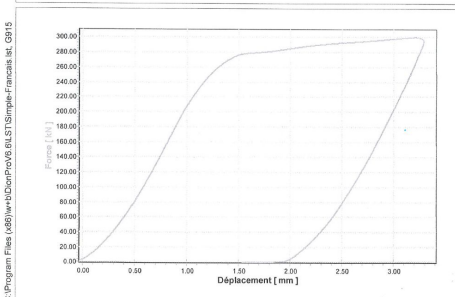
This report may only be integrally reproduced, unless authorisation of partial reproductions given by IEB labs.  
The test results here only bear on the articles submitted to the tests.  
The measurement uncertainty values are at your disposal upon request.  
Measurement uncertainty is not taken into account for the determination of conformity.  
The test samples are kept for maximum three months.

### Protocol d'essai

Commande:  
Numéro du Lot:  
Nom Client:  
Matériau:  
Opérateur:  
Coulée:  
Fournisseur:  
Etat de surface:  
Carte de contrôle:  
Humidité:

Date d'essai: 11.02.19  
Norme d'essai: EN ISO 6892-1:2009 B  
Type d'essai:  
Désignation Eprouvette:  
Numéro de l'éprouvette: AND 1 T1 300 KN

Description	Résultat
Diamètre $d_0$	10.00 mm
Section nominale $S_0$	78.54 mm <sup>2</sup>
Module d'élasticité $E$	0.00 GPa
Limite d'élasticité supérieure $R_{eH}$	— MPa
Limite d'élasticité inférieure $R_{eL}$	— MPa
0.20% Limite $R_p$	0.00 MPa
1.00% Limite $R_p$	0.00 MPa
0.50% Limite $R_p$	0.00 MPa
Contrainte max $R_m$	300.10 kN
Allongement $A$	— %
Striction $Z$	2.00 %



**BUHLMANN**

# Prototyping

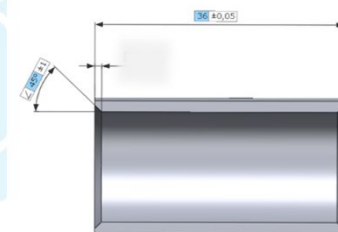
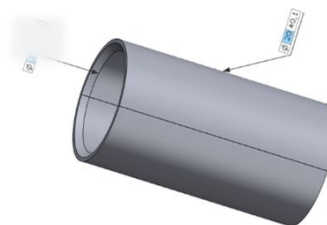
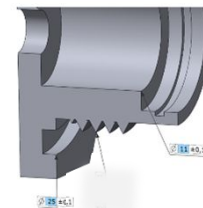
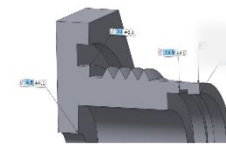
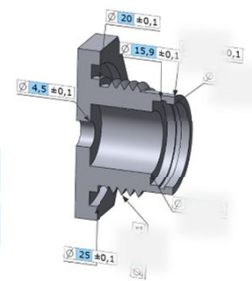
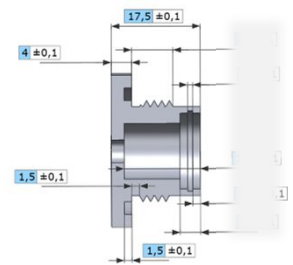
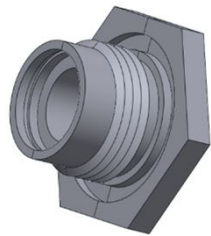
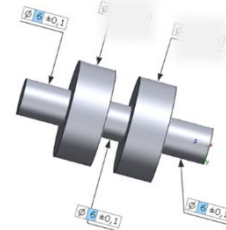
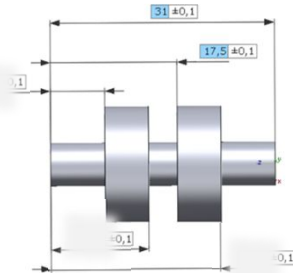
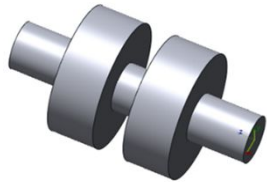
- ❑ We deliver prototypes based on approved analysis
  - **Analysis to be approved by customer**
    - Mechanical properties
    - Material properties
    - Geometry reproduced via 3d Scan and adapted via CAD drawing
  - **Prototype produced based on approved analysis**
    - Raw material selection
    - Machining
    - Finishing (heat treatments, paintings,...)
  - **Prototype to be tested and approved**
    - Lab testing
    - by customer

# Series production

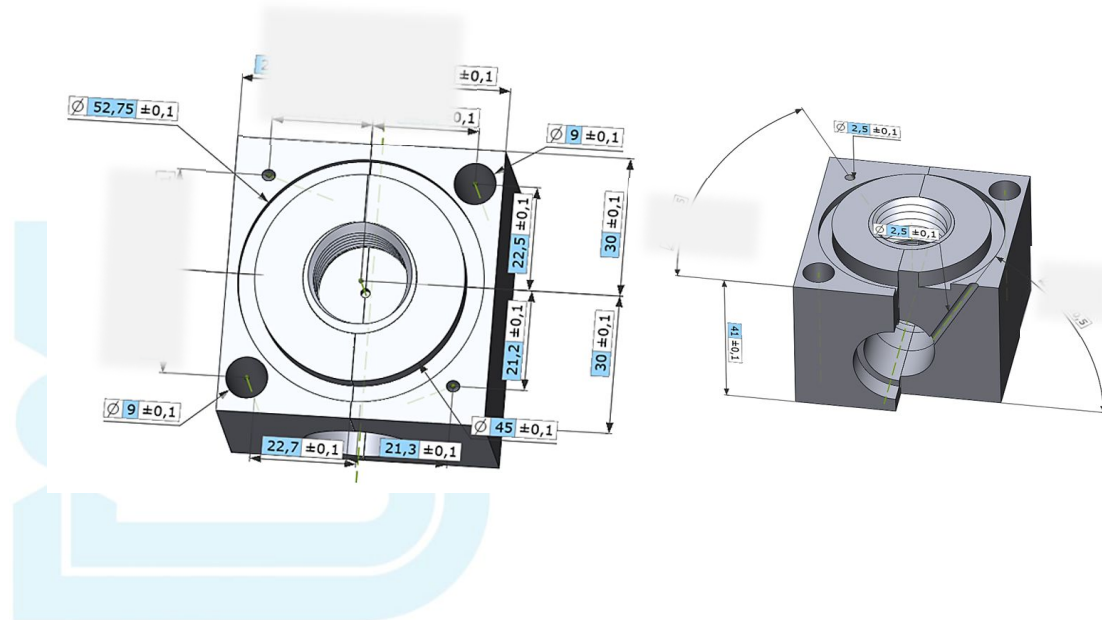
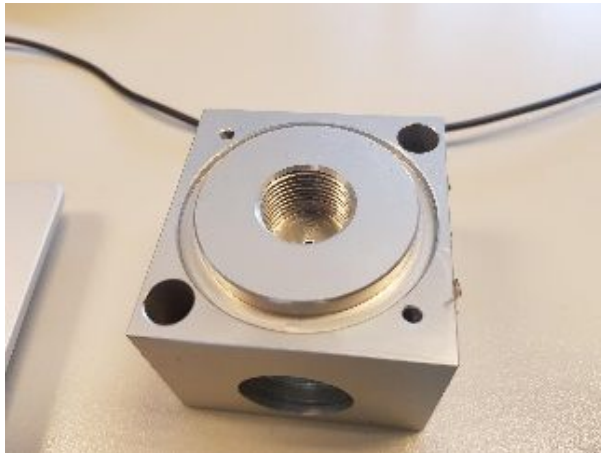
- We deliver series based on approved prototype
  - **Prototype to be approved by customer**
  - **Production based on approved Prototype**
  - **First serie to be tested and approved by**
    - Lab testing (samples)
    - Customer
  - **Production in Belgium by long term partners with long standing experience in mechanical production.**

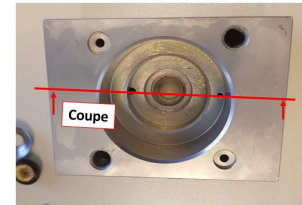
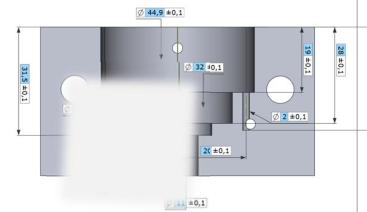
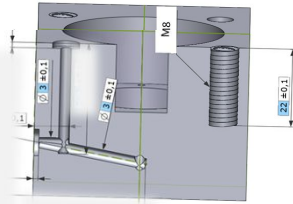
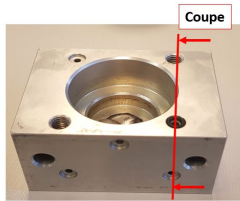
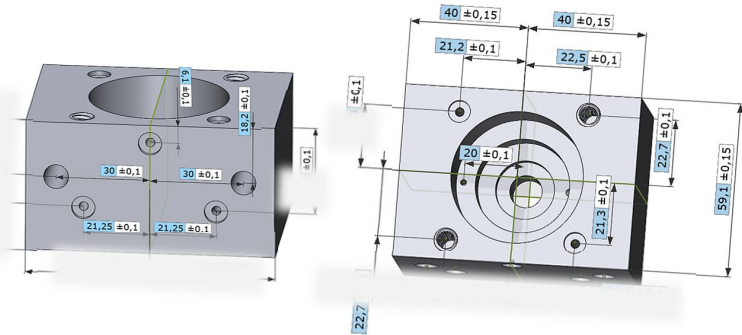


# Realization Example

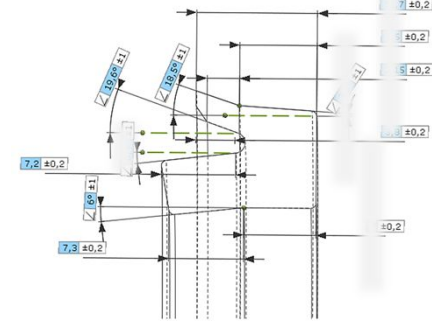
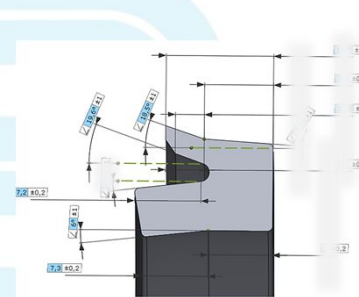
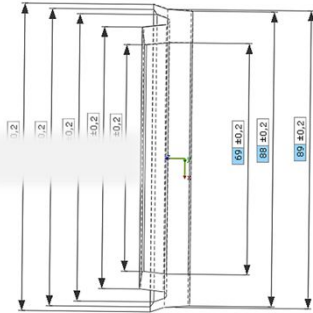
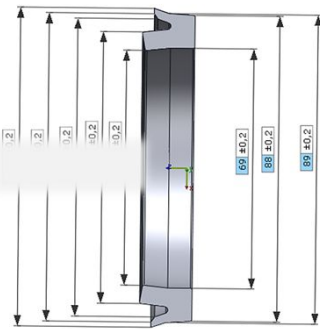


# Realization Example

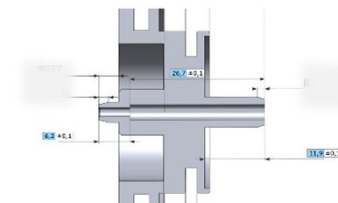
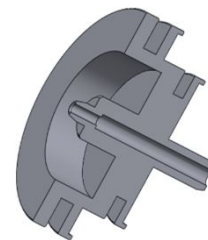
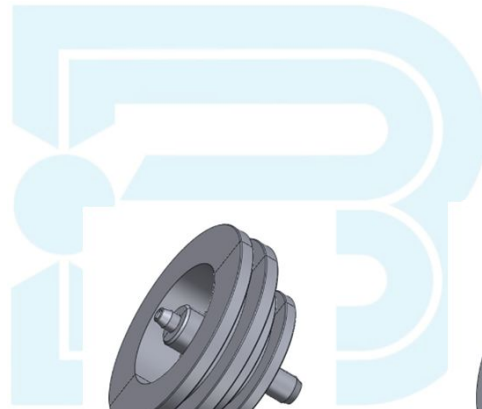
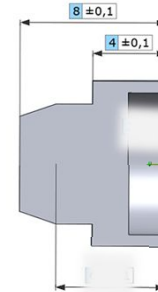
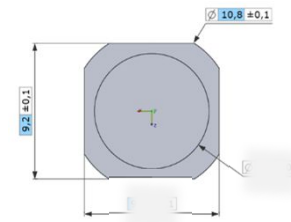
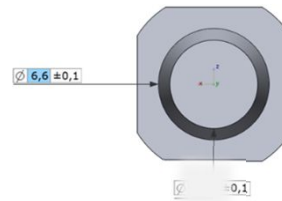




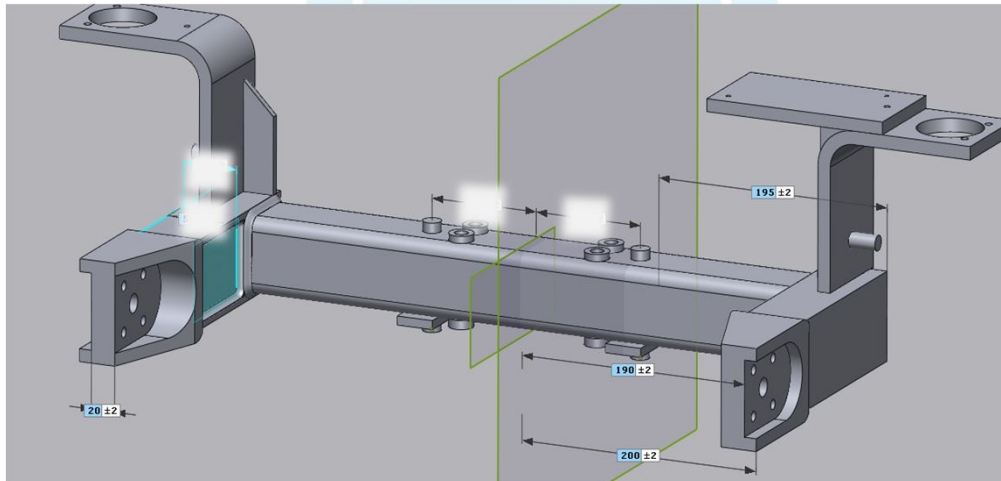
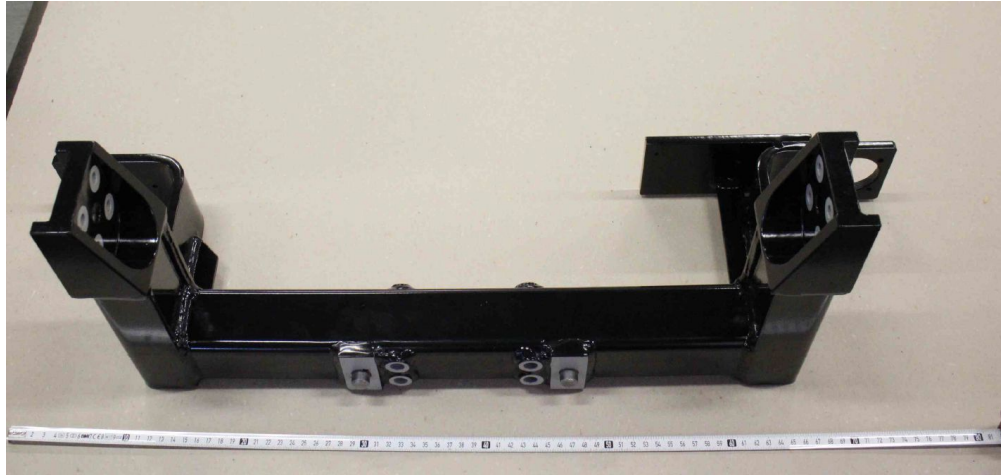
# Realization Example

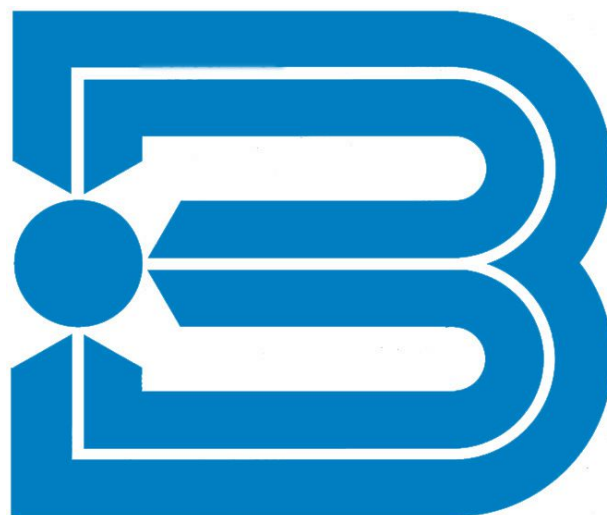


# Realization Example



# Realization Example





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