



Extrusion based AL-parts

Typical requirements / complexities

 **KIRCHHOFF**
AUTOMOTIVE

Materials, OEM-specific norms, Surfaces

▪ Typical alloys in KA - RFQ's / projects (Extrusions) :

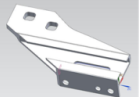
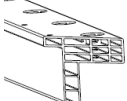
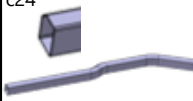
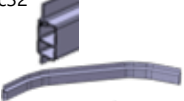
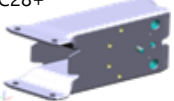
- 6005, 6063, 6060, 6082, 7108

▪ Customer-specific norms :

- BMW WS2002, DAIMLER DBL 4919, VW/Audi TL116

▪ Typical materials for KA-products :

Examples ([here : Volkswagen](#))

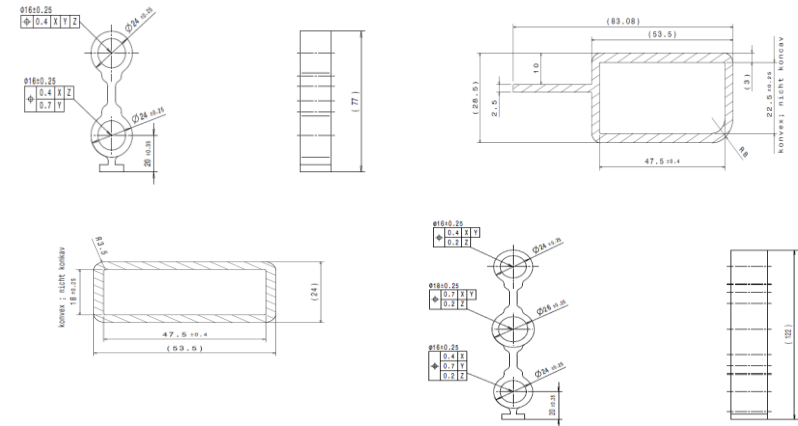
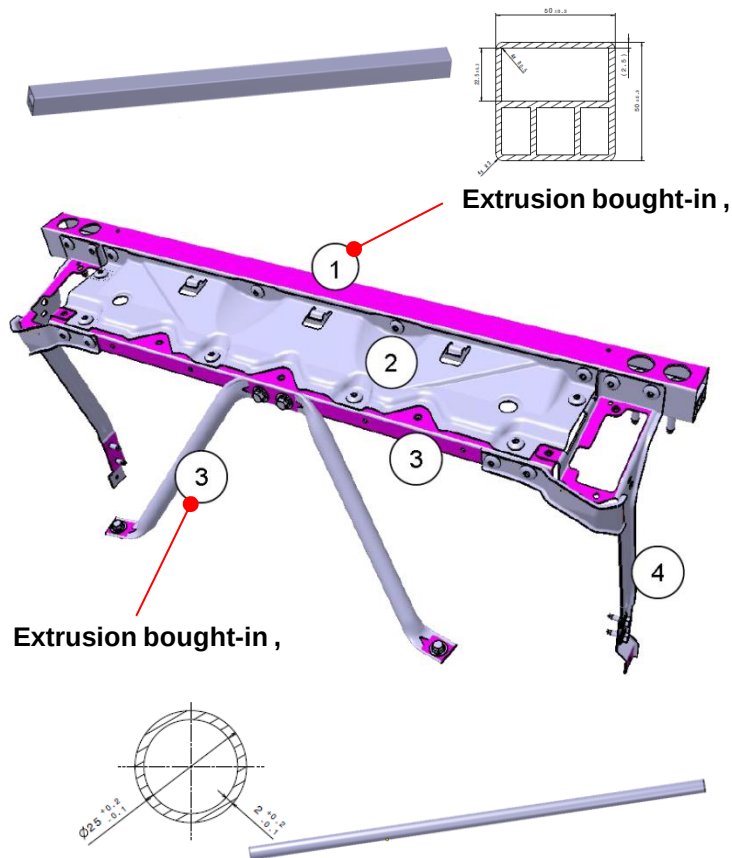
c20- 	c20 c24 	c20 c24 	c24 	c24 	c32 	c28- 	C28+ 
Straight, cut to length	Straight, Complex machined	Straight, Complex section, Machining	Bent, medium complex	Bent, High complex	Ultra high strength High complex. Lots of machining	High strength, Preciseness Devel.-intensive	Assembly, Preciseness, Dev.-intensive. Invest-intensive

▪ Surface preparation :

- Cleaning for bolted parts : Pressure air, Washing with hot water and soap
- Cleaning for welded parts : Pressure air, Washing alcalic or pickling
- For precise structure-welding : Pickling + passivation
- Preparation for adhesive bonding : Passivation according OEM-norms

Product examples

A) Extrusions cut to net length :



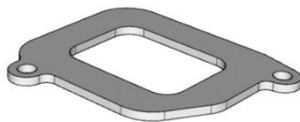
Examples

Special requirements:

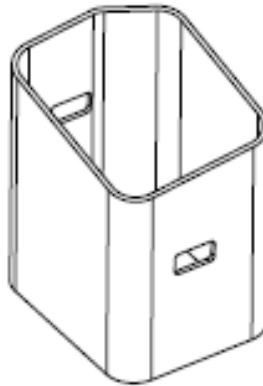
- Brushed ends
- Tight straightness- & distortion -tolerances
- OEM-specific material (e.g. Typ UA)
- Mult-axis milling

Product examples

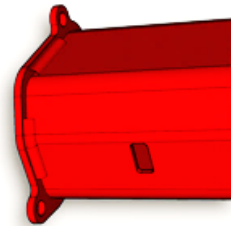
B) Crash relevant extrusions - cutting + milling :



Plates stamped
inhouse KA



Boxes bought-in



Weld assembly
inhouse KA

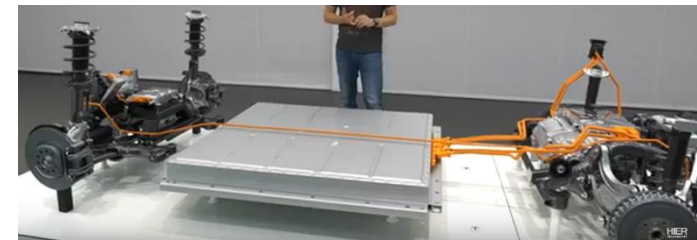
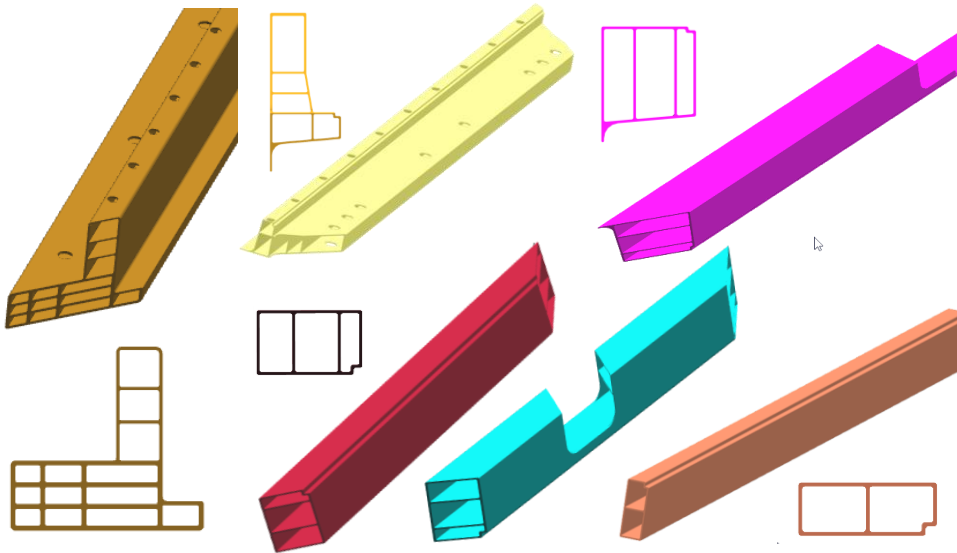


Special requirements :

- Tight straightnes - & wall thickness tolerance (e.g. +/-0,2mm)
- Ductile material (e.g. WS02002 TypB)
- Alcalic washing or passivation (for stable welding)
- Sometimes incl. Fastener-assembly

Product examples

D) Battery-case-profiles (extrusions cutting + milling + drilling + passivation) :



Specific requirements for Battery cases (EV) :

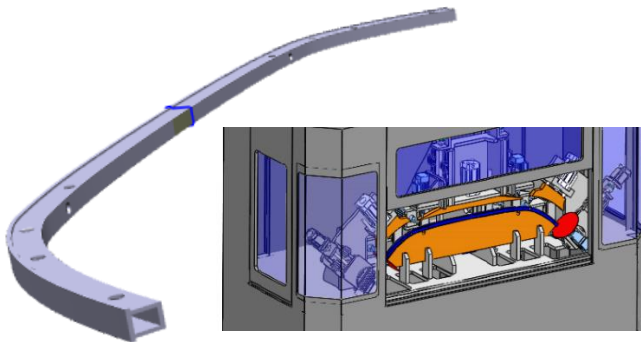
- Very long → large multi-axis milling
- High volumes & diverse versions
- Invest in special milling/machining equipments
- Volume flexibility
- Passivation, Cleanliness requirements

• Special topics for battery cases

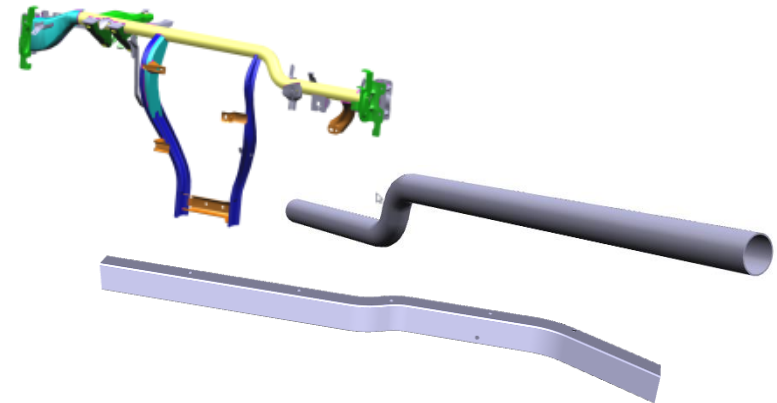
- Precise sealant flanges (leakage free)
- Dynamic development phases, with many design loops and late changes
- High invest !

Product examples

D) Extrusions NC-bending + Cutting + Milling :



crash element (pedestrian protection)



Instrument panel carrier tubes

Special requirements for bent structure-parts :

- Precise contours and hole-locations
- Partly includes assembly of fasteners
- Flexible bending → Special machines

Special requirements for crosscarbeams :

- Tight radii , high forming-degrees (special mandrells needed)
- Tight tolerance along the part and in weld-zones
- Special equipments (sometimes incl. stretch bending)

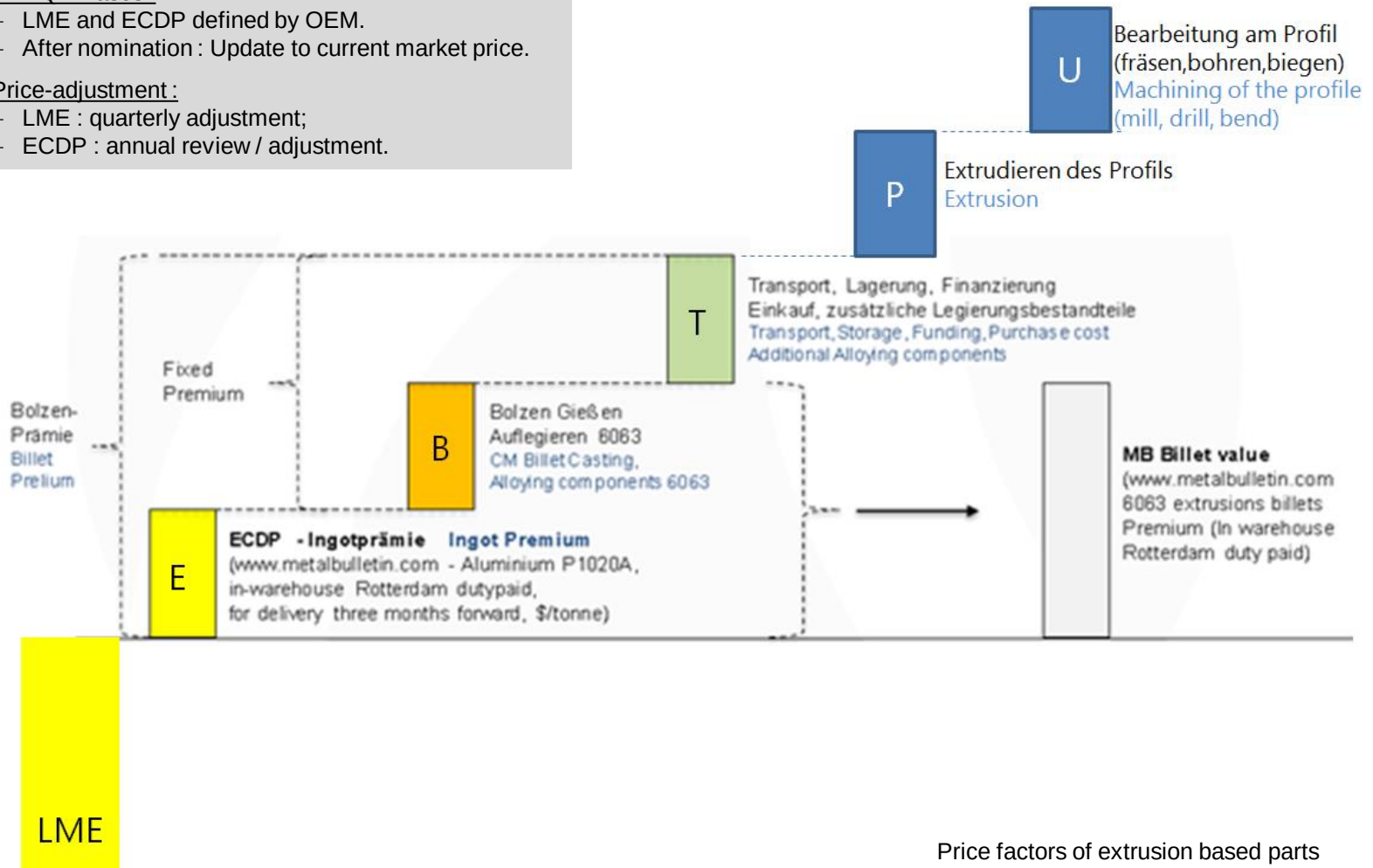
Extrusion cost Terms

In RfQ-Phases :

- LME and ECDP defined by OEM.
- After nomination : Update to current market price.

Price-adjustment :

- LME : quarterly adjustment;
- ECDP : annual review / adjustment.



Price factors of extrusion based parts

How the Co-work starts

Early Involvement

- Requests for info (RFI) → Concept competition (Challenges) → Request for Quote (RFQ)

Onboarding Process

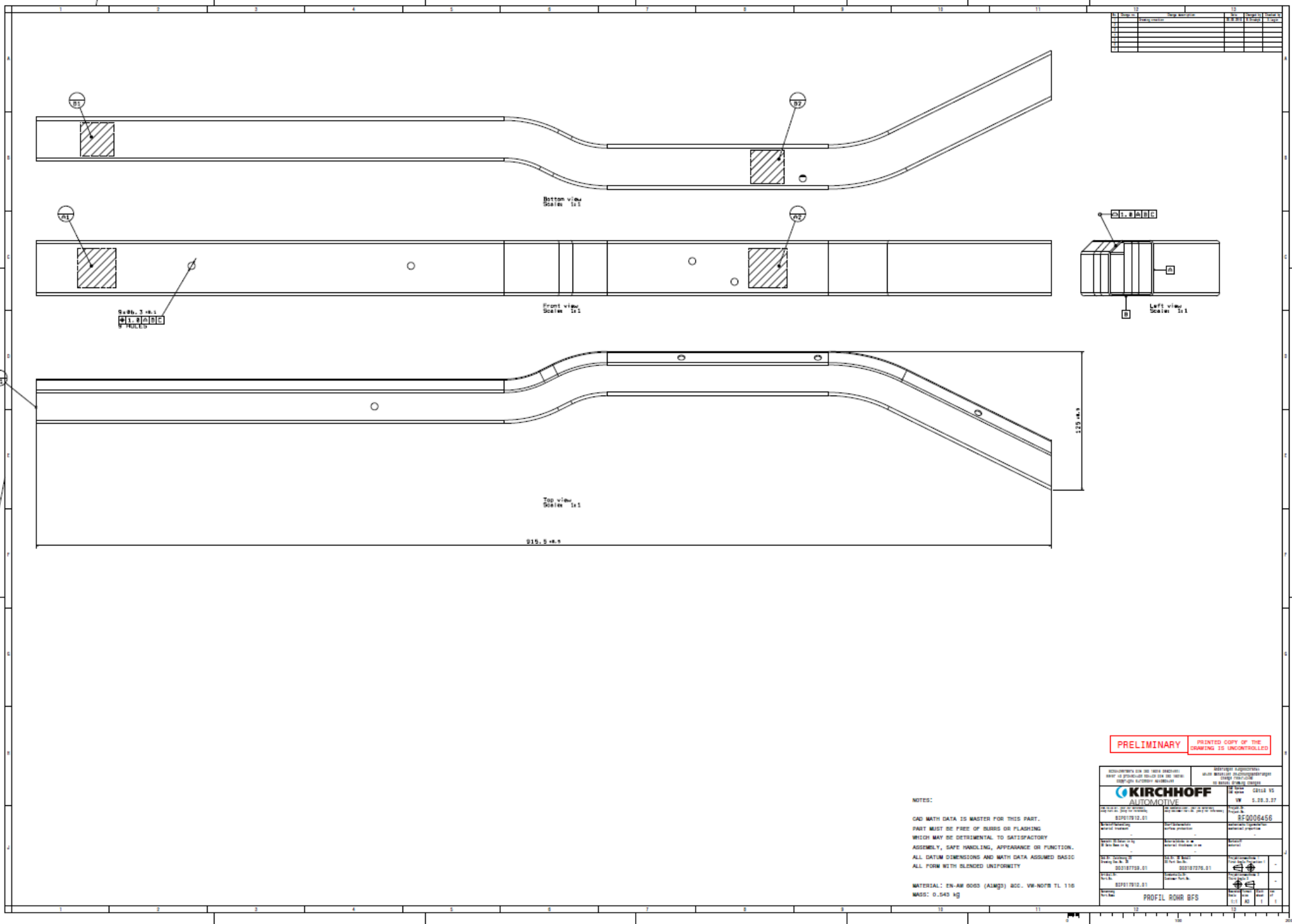
- Registration and self portrait in SeSS (Pool4Tool / JAGGER)

Frame contract agreement

- Basic contract, General Terms & Conditions (for all projects)
- Project specific appendices, Tooling-contract
- Guidelines (Quality, Logistics, Inform.-safety)

Prototyping

- Early Sample-builds, or early functional proto-builds



NOTES:

CAD MATH DATA IS MASTER FOR THIS PART.
PART MUST BE FREE OF BURRS OR FLASHING
WHICH MAY BE DETRIMENTAL TO SATISFACTORY
ASSEMBLY, SAFE HANDLING, APPEARANCE OR FUNCTION.
ALL DATUM DIMENSIONS AND MATH DATA ASSUMED BASIC
ALL FORM WITH BLENDED UNIFORMITY

MATERIAL: EN-AW 6063 (ALMgSi) ACC. VW-NORM TL 116
MASS: 0.543 kg

PRELIMINARY		PRINTED COPY OF THE DRAWING IS UNCONTROLLED	
KIRCHHOFF AUTOMOTIVE			
PART NO.: 81017912.01		PART NAME: 81017912.01	
REV.: 01		REV.: 01	
DATE: 01.01.2023		DATE: 01.01.2023	
DRAWN BY: 81017912.01		DRAWN BY: 81017912.01	
CHECKED BY: 81017912.01		CHECKED BY: 81017912.01	
APPROVED BY: 81017912.01		APPROVED BY: 81017912.01	
MATERIAL: EN-AW 6063 (ALMgSi)		MATERIAL: EN-AW 6063 (ALMgSi)	
MASS: 0.543 kg		MASS: 0.543 kg	
PROFIL ROHR BFS		PROFIL ROHR BFS	