



PRECISION WIRE

Complex shapes — all grades  
Flat and profile

ZAPP



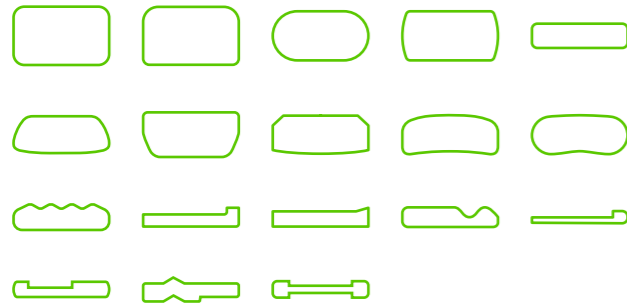
# FLAT WIRE: OUR SPECIALTY FOR DECADES

Our flat wire products permit the finest dimensional and stability tolerances to be achieved with regard to specified annular curvatures and straightness. They can also be supplied in the form of a single core without welds, thereby optimizing subsequent processing. Depending on requirements, we supply plain or coated surfaces, hardened or colored.




### Size range

Width 0.5 - 17 mm (0.02 - 0.67")  
Thickness 0.1 - 4 mm (0.004 - 0.16")  
Individual tolerances

### Choice of profile geometries

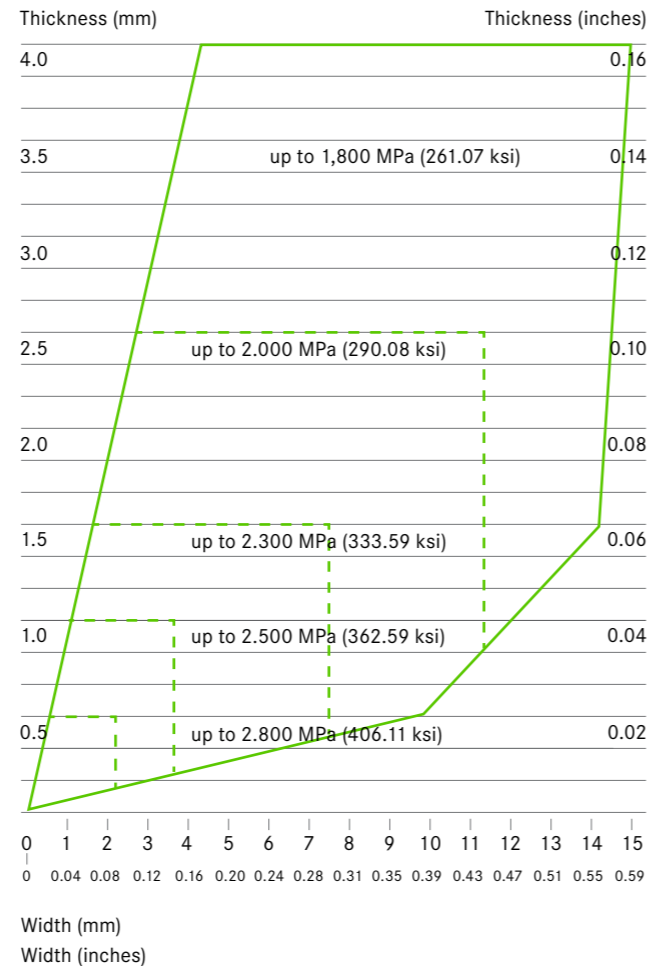


### Flat wire edge treatment

-  Flat rolled: rounded narrow sides
-  Flat rolled: round narrow sides
-  Flat rolled: rounded edges

### Product range with flat rolled cross-sections

### Tensile Strength Limits



# PROFILE: COMPLEX SHAPES – ALL GRADES

Our »near net shape« profiles minimize machining costs and effort. With over 5,000 different profiles available, we speed up the idea generation process – from small triangular profiles with side lengths of 0.3 mm (0.01") to flat profiles of 63 x 6.35 mm (2.48 x 0.25"), all custom-made to your drawings. Utilizing a wide range of shaping technologies such as drawing and rolling, we can cold-form even the most complex profile shapes.

For precise measurements, we employ both mechanical and opto-electronic scanning. We deliver our products in rings, on coils, or in bars up to 9,000 mm (354") according to your specifications. Our tool-room, equipped with the latest CNC processing machines, stores 12,000 tools, ensuring time efficiency and on-time delivery.

### Size range

Width 0.4 - 63.50 mm (0.016 - 2.5")  
Thickness 0.25 - 34 mm (0.01 - 1.34")

### Forms of profiles

Square, hexagon, octagon, key bar  
Special profiles according to customer specification

### Finishes

Drawn to profile, specially rolled, rolled to profile  
Cross and longitudinal shaping  
Profiles made of faultlessly ground rolled rods  
Finishes depend on material, shape and tensile strength

### Surface finishes

Dull, bright, very bright, bonderized  
Lowest roughness values

### Tolerances

EN 10278  
Tightest tolerances depending on geometry on request

### Straightness

Minimal deviation depending on product form by agreement

### Edge finishes

Special edge finishes for profile bars

### Quality standards

Annealed, cold-hardened according to EN 10088-3, ISO 5832-1  
Closer mechanical, technical or physical properties by agreement

### Forms of delivery (EN 10278)

Bars in manufactured lengths, stock lengths, precise lengths can be supplied up to 9,000 +/- 5 mm (354.3" +/- 0.2")

Spools to EN 60264-2-1

Packet wrapped coils

Special spools of 10 - 2,000 kg (22 - 4,400 lbs)

Chamfered or sawn bar ends

Forms of delivery depend on the cross-profile

### Standards

Primarily used standards: DIN 17850/SEW 470/EN 10095/  
EN 10088-3/ISO 5832-1/ASTM F138







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»Our customers receive the exact profile they ordered from me.«

»In the profile section, there are 17 tandem mills, and I alternately operate five of them. My responsibilities include everything from setup and adjustment to production and final inspection. Tandem mills are complex machines requiring precise coordination of multiple rolling stands to work in perfect sync. This demands both routine and extensive experience to ensure each profile is produced with micron-level precision. I have honed this expertise over more than 30 years at Zapp.

My goal is to ensure that every profile leaving our facility meets the highest standards of perfection, ensuring our customers' satisfaction.«

**Thomas Kijas**  
Process Mechanic  
Schwerte location, Germany

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# CHOICE OF MATERIALS

Zapp brand name europe	EN DIN	AISI	UNS	Other designations/ trade names
<b>Selected Carbon Steels/ Low Alloyed Steels</b>				
Ergste <sup>7)</sup> 1.0611	1.0611	-	G10640	C62D
Ergste 1.0613	1.0613	-	G10690	C68D, SAE-No. 1069
Ergste 1.0617QC	1.0617	-	G10740	C72D, SAE-No. 1074
Ergste 1.0715	1.0715	-	~G12130	11SMn30
Westig <sup>7)</sup> 1.0759EA	~ 1.0759	-	~G10650 +S +Pb +Si	70SPb20, A60Pb
Westig 1.1268EA	~ 1.1268	-	-	Mh 97 (A100Pb)
Ergste 1.2243	1.2243	-	~G92590, ~H92590	61CrSiV5
Westig 1.2833EB	1.2833	~ AISI W2	~ T72302	100V1
<b>Ball Bearing Steels</b>				
Ergste 1.3505ER	1.3505	-	~G52986	100Cr6
<b>Ferritic Stainless Steels for Solenoid Applications</b>				
Ergste 1.4003IA	1.4003	-	S40977, S40977	X2CrNi12
Ergste 1.4003IB, ID	~ 1.4003	-	S41003	X2CrNi12
Ergste 1.4005IA, IH, ID	~ 1.4005	AISI 416	S41600	~X12CrS13
Ergste 1.4016IM, IH	1.4016	AISI 430	S43000	X6Cr17
Ergste 1.4105IB	~ 1.4105	-	-	~X6CrMoS17
Ergste 1.4105IL, IT	1.4105	AISI 430F	-	X6CrMoS17; 430FR
Ergste 1.4105IM, IU	1.4105	AISI 430F	S43020	X6CrMoS17
Ergste 1.4105IQ	~ 1.4105 (+Cu)	-	-	-
Ergste 1.4113IL	1.4113	AISI 434	S43400	X6CrMo17-1
Ergste 1.4113IM, IU	1.4106	-	-	-
Ergste 1.4114IU	1.4114	XM-34	S18200	X6CrMoS19-2
Ergste 1.4511IA, IH	1.4511	AISI 430	S43000	X3CrNb17
<b>Martensitic Stainless Steels</b>				
Ergste 1.4005IU	1.4005	AISI 416	S41600	X12CrS13
Ergste 1.4006YH	1.4006	AISI 410	S41000	X12Cr13
Ergste 1.4021, YA, YB	1.4021	AISI 420, 420A	S42000	X20Cr13
Ergste 1.4024	1.4024	~ AISI 410	~ S41000	X20Cr13
Ergste 1.4028YC, YN	1.4028	AISI 420, 420B	S42000	X20Cr13
Ergste 1.4028MO	1.4028	AISI 420, 420X (+Mo)	S42026	X30Cr13
Ergste 1.4031YA	~ 1.4031	AISI 420	S42000	~X39Cr13
Ergste 1.4031YC, YE	1.4031	AISI 420, ~420X	S42000	X39Cr13
Ergste 1.4034YS, YE, YK	1.4034	AISI 420, 420C	S42000	X39Cr13
Ergste 1.4034YN	1.4034	-	-	-
Ergste 1.4035YU	1.4035	AISI 420C (+S)	-	X46CrS13
Ergste 1.4037YR	1.4037	AISI 420	S420020	X65Cr13
Ergste 1.4057YE <sup>6)</sup>	1.4057	AISI 431	S43100	X17CrNi16-2
Ergste 1.4057YN	1.4057	~ AISI 431	-	X17CrNi16-2
Ergste 1.4104, YU	1.4104	~ AISI 430F	~ S43020	X14CrMoS17
Ergste 1.4108 <sup>6)</sup>	1.4108	-	-	X30CrMoN15-1
Ergste 1.4112YE <sup>6)</sup> , YL	1.4112	-	-	X90CrMoV18
Ergste 1.4112YA	~ 1.4112	-	-	~X90CrMoV18
Ergste 1.4120YT	1.4120	-	-	X20CrMo13
Ergste 1.4122YA, YN, YL	1.4122	-	-	X39CrMo17-1
Ergste 1.4123YN <sup>6)</sup>	1.4123	AISI 420 Mod	S42000, S42025	X40CrMoVN16-2, X15TN <sup>5)</sup>
Ergste 1.4125YC, YE <sup>6)</sup>	1.4125	AISI 440C	S44004	X105CrMo17
Ergste 1.4197YU	1.4197	AISI 420F Mod	-	X20CrNiMoS13-1
Ergste 1.4418YB	1.4418	-	-	X4CrNiMo16-5-1

Zapp brand name	EN DIN	AISI	UNS	Other designations/ trade names
<b>Martensitic Stainless Steels</b>				
Ergste 9.9440YA	-	AISI 440A	S44002	-
Ergste 9.9440YL	-	~ AISI 440A	-	-
<b>Austenitic Stainless Steels</b>				
Ergste 1.4301FC, PA, PT, PV, PW	1.4301	AISI 304	S30400	X5CrNi18-10
Ergste 1.4301VD	1.4301, 1.4307	AISI 304, AISI 304L	S30400	X5CrNi18-10
Ergste 1.4303SA	1.4303	AISI 305	S30500	X4CrNi18-12
Ergste 1.4305	1.4305	AISI 303	S30300	X8CrNiS18-9
Ergste 1.4305UA, UB	1.4305	~ AISI 303	~ S30300	X8CrNiS18-9
Ergste 1.4306LU	1.4306	AISI 304/AISI 304L	S30400/S30403	X2CrNi19-11/X5CrNi18-10
Ergste 1.4310FA, FB, FD, FE <sup>6)</sup> , FI, FV, FK <sup>9)</sup> , FT <sup>9)</sup> , FP <sup>10)</sup> , VA <sup>11)</sup>	1.4310	AISI 301/302	S30200	X10CrNi18-8
Ergste 1.4369AA	1.4369	-	-	X11CrNiMn19-8-6
Ergste 1.4370WA	1.4370	-	-	X15CrNiMn18-8
Ergste 1.4374SN	1.4374	~ AISI 202	~ S20200	X8CrMnNi18-9-5
Ergste 1.4401PA	1.4401	AISI 316	S31600	X5CrNiMo17-12-2
Ergste 1.4401SB	1.4401	AISI 316	S31600	X5CrNiMo17-12-2
Ergste 1.4404LB	1.4404	AISI 316L	S31603	X2CrNiMo17-12-2
Ergste 1.4404UA	~ 1.4404 (+S); 1.4598	-	-	X2CrNiMoCuS17-10-2
Ergste 1.4427UA	~ 1.4427	-	-	X12CrNiMoS18-11
Ergste 1.4435PM	1.4435	-	-	X2CrNiMo18-14-3
Ergste 1.4439LN	1.4439	-	-	X2CrNiMo17-13-5
Ergste 1.4441LA <sup>6)</sup> , LN <sup>6)</sup>	1.4441	~ AISI 316L	S31673	X2CrNiMo18-15-3, ~316LVM
Ergste 1.4472RN, High N	1.4472	-	S31675	X4CrNiMnMo21-9-4; Alloy 734 Rex 734 <sup>TM1)</sup>
Ergste 1.4539LN, LW	1.4539	-	N08904	X1NiCrMoCu25-20-5, 904L
Ergste 1.4541TA, TB, TS	1.4541	AISI 321	S32100	X6CrNiTi18-10
Ergste 1.4567, LC	1.4567	-	S30433	X3CrNiCu18-9-4, XM-7
Ergste 1.4570UA	1.4570	-	S30331	X6CrNiCuS18-9-2
Ergste 1.4571LU, TA	1.4571	AISI 316Ti	S31635	X6CrNiMoTi17-12-2
Ergste 1.4578SC	1.4578	-	-	X3CrNiCuMo17-11-3-2
Ergste 1.4598UA	1.4598	-	-	X2CrNiMoCuS17-10-2
Ergste 1.4828ZA	1.4828	-	-	X15CrNiSi20-12
Ergste 1.4845	1.4845	AISI 310S	S31008	X8CrNi25-21
Ergste 1.4961PW	1.4961	~ AISI 347H	~ S34709	X8CrNiNb16-13
Ergste 1.4872ZA	1.4872	-	-	X25CrMnNiN25-9-7
Ergste 1.4980TA	1.4980	-	S66286	X6NiCrTiMoVB25-15-2
Ergste 9.9200GA	-	-	-	-
Ergste 9.9201FN	1.4372	AISI 201	S20100	X12CrMnNiN17-7-5
Ergste 9.9244PC	-	-	-	UGI 244
Ergste 9.9253ZA	-	-	-	-
Ergste 9.9910GA/1RK91, Nanoflex	9.9910	-	S46910	-
<b>Nickel-Free Austenitic Grades</b>				
Ergste 1.3816CN	1.3816	-	-	X8CrMn18-18
Ergste 9.9007CN	-	-	S29225	-
<b>Stainless Steels Ferritic-Austenitic</b>				
Ergste 1.4362	1.4362	-	S32304	X2CrNiN23-4
Ergste 1.4462	1.4462	-	S31803	X2CrNiMoN22-5-3
Ergste 1.4462XA, Springflex	1.4462	-	S31803	X2CrNiMoN22-5-3

1) Rex 734<sup>TM</sup> is a product and trademark of ATI Allicac.

2) MP35N<sup>®</sup>, Nimonic<sup>®</sup>, Inconel<sup>®</sup> and Monel<sup>®</sup> are trademarks of SPS Technologies, LLC in the EU and the U.S.A.

3) L605<sup>®</sup> is a product and registered trademark of SPS Technologies, LLC in the EU.

4) Haynes<sup>®</sup> 25 Alloy is a registered trademark of our contracted manufacturer Haynes International, Inc., Kokomo, Indiana, U.S.A.

5) X15TN is a registered trademark of Aubert Duval

6) ESR

7) Ergste, Ergitan, Ergiloy and Westig are registered trademarks of Zapp AG.

Carbon steels for special applications in cold-rolled and hardened versions can be supplied to order. We welcome inquiries as per JIS and GOST.

8) 12R10, 9) T302, 10) 11R51, 11) 11R1HV

# PRECISE PROFILES

More than 4,000 geometries go into creating a profile Zapp Precision Metals GmbH, the specialist for precision profiles and flat wires offers more than 4,000 geometries for all industries and is a renowned supplier of eyeglass rim profiles and fret wires for guitar and model rail tracks.

### Dimensions and Tolerances

With profile thicknesses of 0.04 - 4 mm (0.0016 - 0.16") and profile widths of 0.04 - 10.00 mm (0.016 - 0.39"), (in the ratio 1/10), we are your ideal partner for close tolerances, if you have special requirements regarding geometries, dimensions and tolerances.

### Wide choice of material

You can choose from a wide range of materials e.g. Monel, stainless steel, titanium, heat treatable alloys and others. We supply you with Zapp Profile's »Super Finish« for optimized further processing. Repolishing and the scrap rate can be minimized thanks to this surface.

### Flexibility

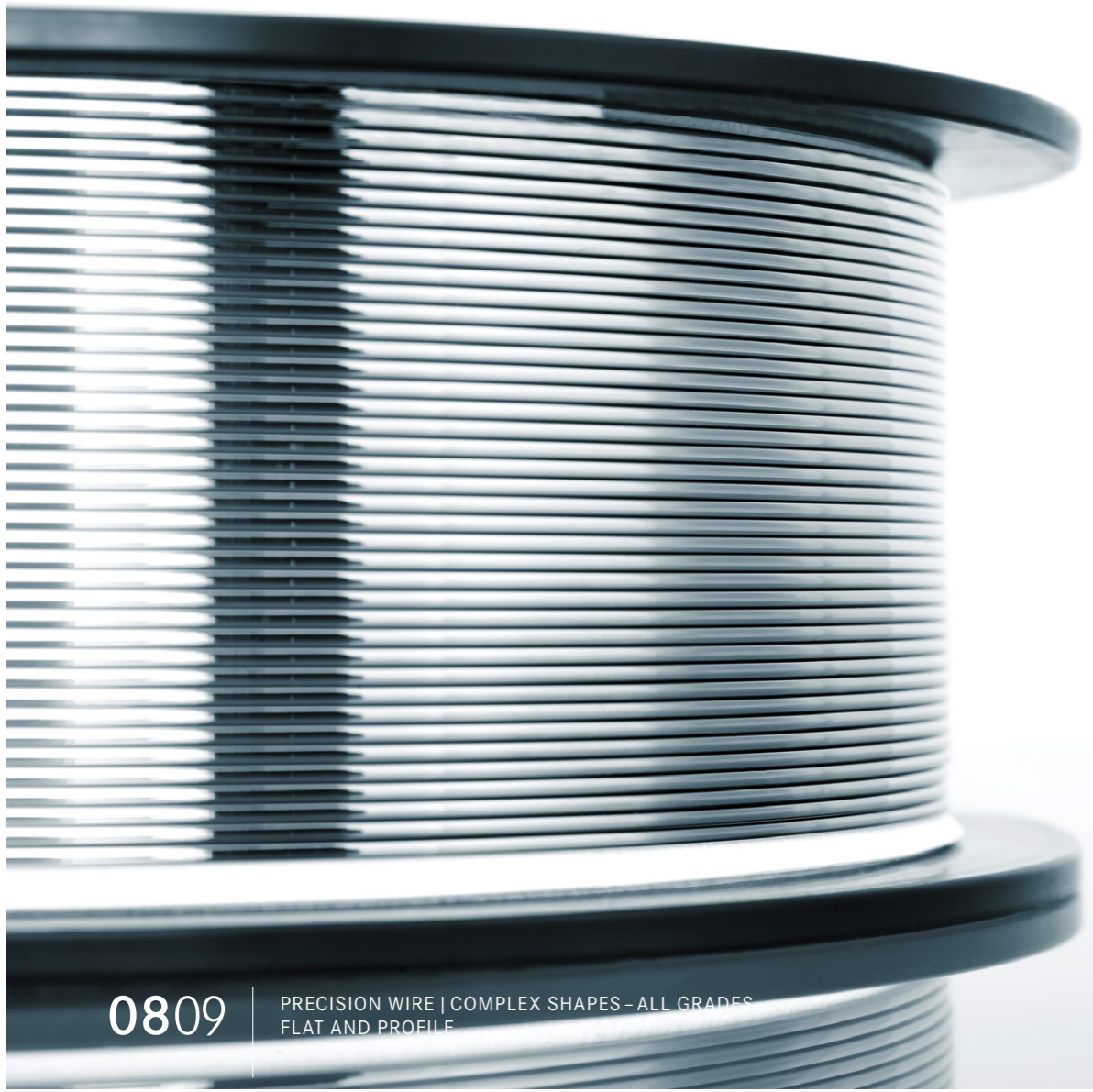
With our own in-house tooling department, we provide our clients with a thorough product feasibility check and can realize new geometries within the shortest possible time, at a reasonable cost, for any industry and application. Your demand is our inspiration.

# SELECTION OF ALLOYS FOR EYEGLOSS RIM PROFILES INDUSTRY

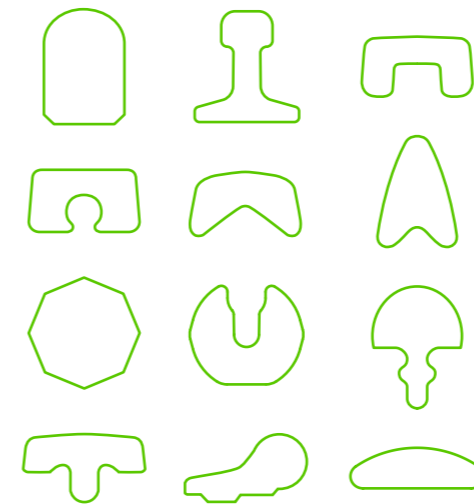
Zapp Material	DIN	AISI
<b>Stainless Steel</b>		
Ergste 1.4016	1.4016	AISI 430
Ergste 1.4303	1.4303	AISI 305
Ergste 1.4305	1.4305	AISI 303
Ergste 1.4310	1.4310	AISI 301, AISI 302
Ergste 1.4404LB	1.4404LB	AISI 316L
<b>Pure Titanium and Titanium Alloys</b>		
Titan Grade 2	3.7035	-
Ti3A12.5V	3.7195	-
Beta Titan 15.333	Not standardized	-
<b>Copper Based Materials</b>		
CuNi12Zn24	2.0730	-
CuNi18Zn20	2.0740	-
<b>Nickel Based Materials</b>		
NiCu30Fe (Monel <sup>2)</sup> )	2.4360	-
<b>Precipitation Hardening Alloys</b>		
CuNi11Sn6	Not standardized	-

1) Ergste® is a registered tradename of Zapp AG.

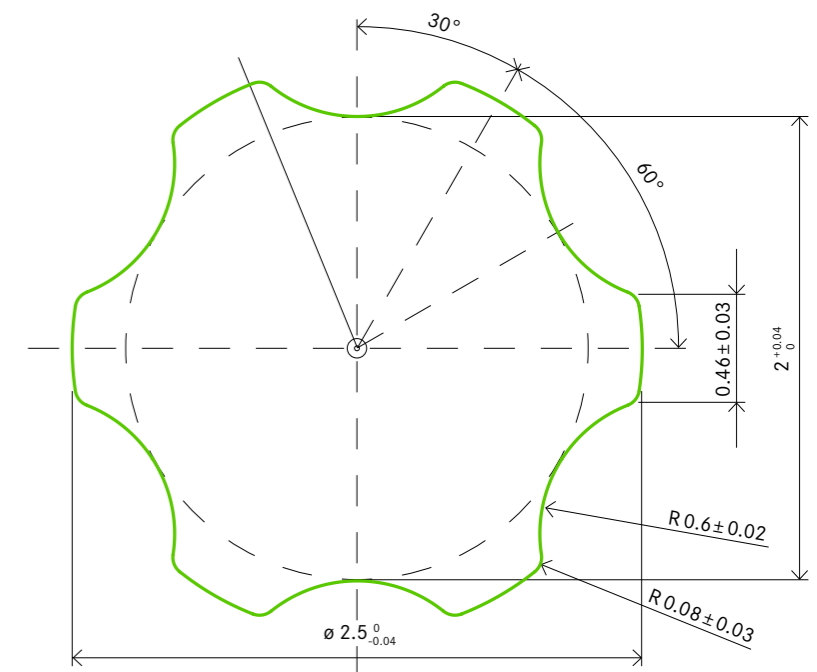
2) Monel® is a registered trademark of SPS Technologies, LLC in the EU and the U.S.A.



### Selection of profile designs



### Checkpoint for hardness testing





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