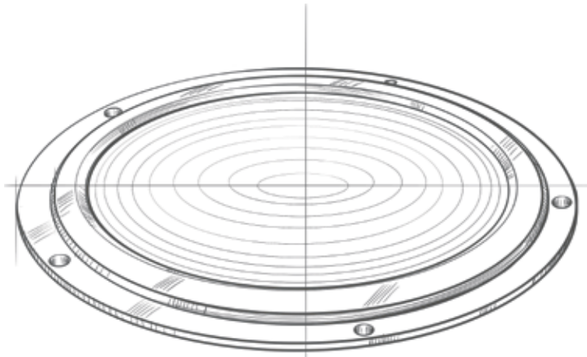
Case back

The **CNC machining of case backs** requires stringent precision, surface finish and process reliability. The decisive factors are as follows:

1. Choice of materials and their machinability
- Typical materials: Stainless steel (e.g., 316L), titanium, brass, bronze or precious metals
- Machinability: Stainless steel is tough and tends to harden – requires sharp tools, proper cooling and stable processes
- Titanium is lightweight but difficult to machine (high tool wear, poor heat dissipation)
- Brass is easy to machine, ideal for high-precision work and fine details

2. Precision and tight tolerances
- Micrometre tolerances are standard (e.g., ±5 µm)
- Temperature compensation and machine accuracy are crucial
- Machines with glass scales and temperature stabilisation are preferred

3. Tool selection and tool life
- Coated carbide tools (TiAlN, AlCrN) for hard materials such as stainless steel or titanium
- Monocrystalline diamond tools or CBN for precious metals or the highest surface finish requirements
- Tool life heavily depends on cooling, cutting parameters and material – short, controlled machining cycles are efficient



4. Cutting parameters and strategy
- Roughing with higher feed and lower depth of cut – with a focus on material removal
- Finishing with small depths of cut and fine feeds (often <0.05 mm/rev)
- Strategies like HSC (High Speed Cutting) and trochoidal machining can reduce wear and heat

5. Clamping technology and vibrations
- Highly precise clamping devices (e.g., zero-point clamping systems, vacuum chucks for flat parts)
- Reduced vibration through short overhangs, rigid construction and optimal number of cutting edges
- Minimal deformations are critical – especially with thin-walled bases

6. Cooling and lubrication
- Minimum quantity lubrication (MQL) for sensitive materials and small components
- Emulsion or oil mist cooling for stainless steel to improve heat dissipation
- For titanium, targeted high-pressure cooling and heat dissipation are particularly important

7. Surface quality and finishing
- Mirror-finish surfaces (Ra <0.2 µm) are often required
- Finishing work by polishing, laser engraving, ultrasonic cleaning or coatings (e.g. PVD)
- Strategies such as “drawing” the finish through targeted milling paths or tangential tool application

Machining

2 SEALING LATCH MACHINING

SANDVIK coromant

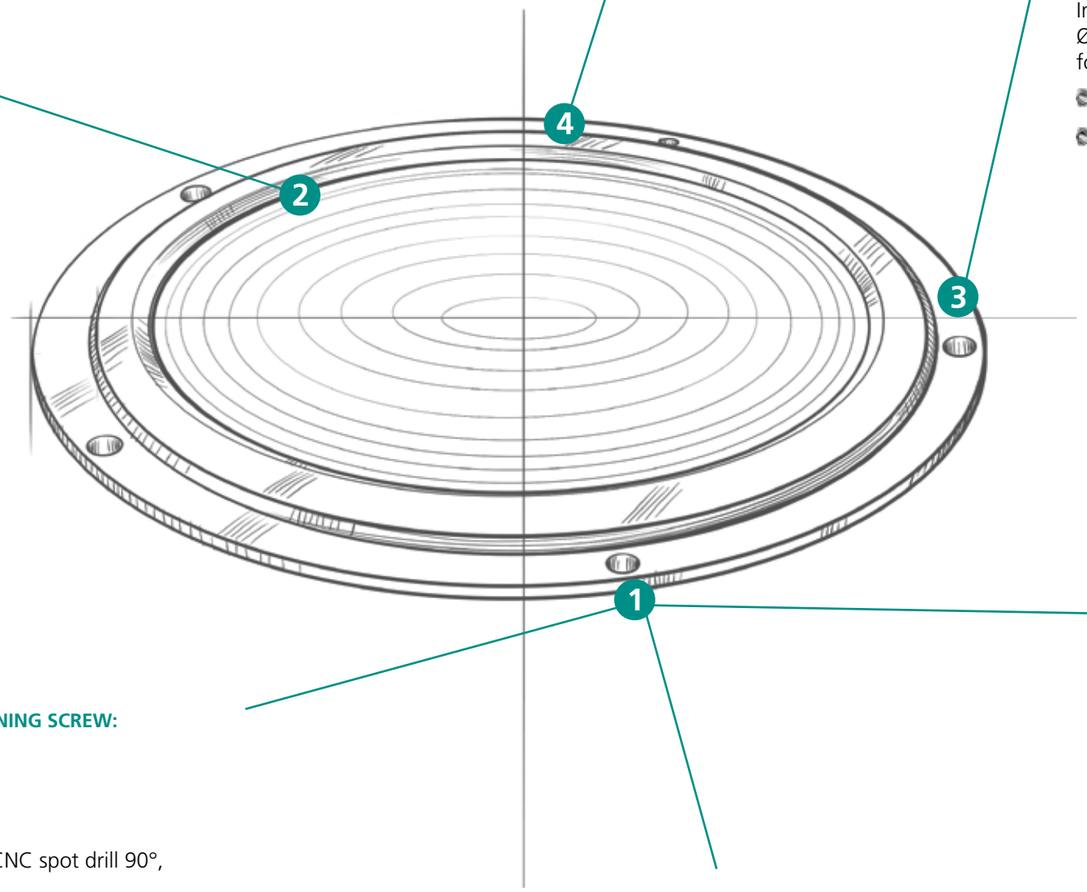
CoroCut XS

External machining in small-parts production

APPLITEC SWISS TOOLING

TOP-Watch 742SF

Various grooving and micro-turning operations



4 FULL-DEPTH THREAD MILLS

DC THREADING TECHNOLOGY

Thread mill GF6110VS-EX-SP

in accordance with NIHS 60-30

3 MICRO DRILLING IN DIFFICULT-TO-MACHINE MATERIALS

DIXI polytool

Twist drill 1137

Optimised for lead-free brass, polished clamping grooves: Improved chip evacuation, tapered core thickness from Ø 0.5 mm, reduced cutting forces, 140° tip: minimal burr formation at hole exit

1 HOLE FOR FASTENING SCREW: MICRO-DRILLING

SANDVIK coromant

CoroDrill 862 PCD

Offers longer tool life than solid carbide drills, suitable for challenging materials such as platinum and ceramic greenware, from Ø 0.3–3.0 mm

SANDVIK coromant

CoroDrill 462 XM

Versatile multi-material drilling with external cooling, from Ø 0.03–3.0 mm

SANDVIK coromant

CoroDrill 862-GM-X2BL

Optimised multi-material, external coolant, solid carbide, from Ø 0.3–3.0 mm

SANDVIK coromant

CoroDrill 862-GM-X2BM

Optimised multi-material, internal coolant, solid carbide, from Ø 1.0–3.0 mm

1 HOLE FOR FASTENING SCREW: SPOT DRILLING

magafor

Magaforce 819-D

Solid carbide micro CNC spot drill 90°, from Ø 0.3–2.5 mm

APPLITEC SWISS TOOLING

Micro-Line

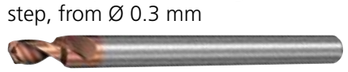
Solid carbide micro CNC spot drill 60°/90°, with various special coatings

1 HOLE FOR FASTENING SCREW: MICRO STEP DRILLING

SANDVIK coromant

CoroDrill Dura 862

Micro step drill for drilling and chamfering in one step, from Ø 0.3 mm



Finishing

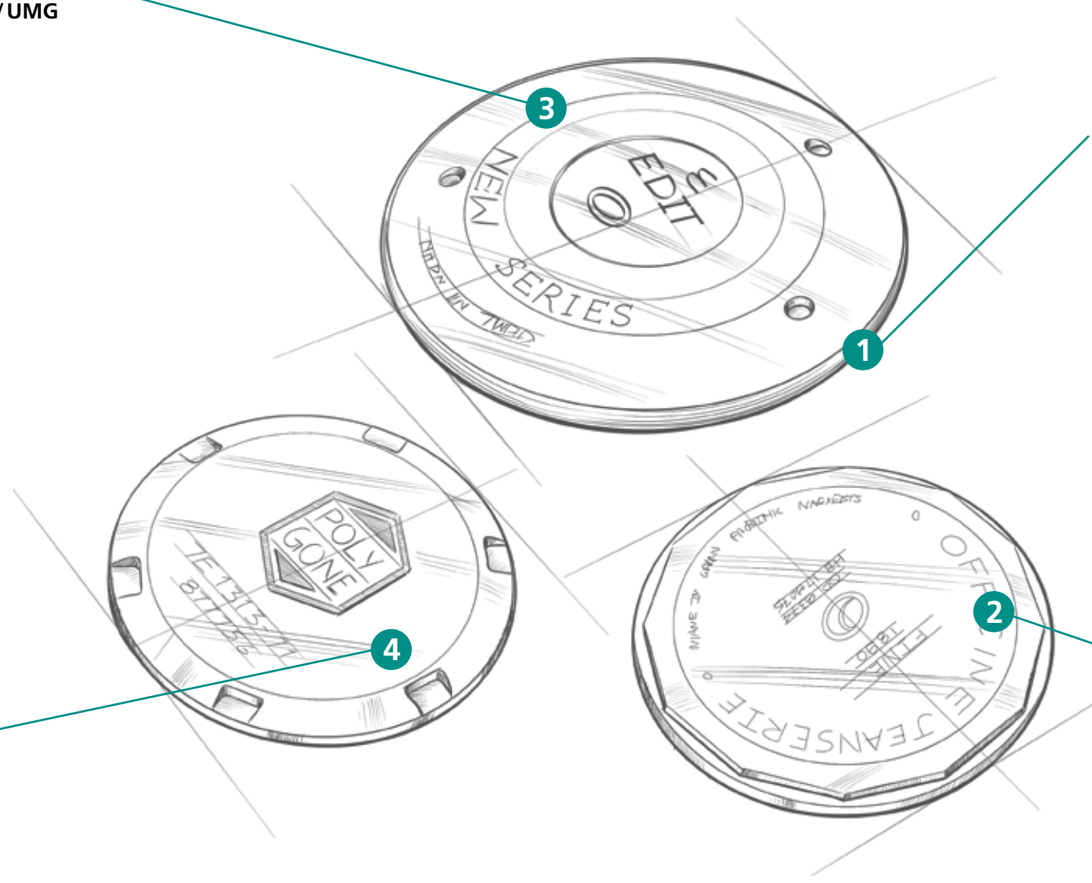
3 HIGH-GLOSS ENGRAVING WITH SOLID CARBIDE

FUTURO

Solid carbide engraver's cutter type RSG / UMG
Reinforced solid carbide engraver's cutter
Ø 0.1 mm / Ø 0.2 mm, coated or uncoated

APPLITEC SWISS TOOLING

Micro-Line
Engraving tools for universal use, available in various designs and coatings



1 MULTI-OPERATION MACHINING

magafor

MAGAFOR MULTI-V
Chamfering, deburring, drilling, engraving, available in various angles 90° / 40° / 60° / 120°, from Ø 0.1 mm

4 MATTE ENGRAVING WITH PCD

DIXI polytool

Engraving burin 70070-PCD
High-end PCD engraving burin, specially designed for matte engraving with ¾ geometry

DIXI polytool

Engraving burin 70170-PCD
PCD engraving burin, specially designed for matte engraving

2 FINE ENGRAVING

APPLITEC SWISS TOOLING

DLC engraving burin
Special thin-film DLC coating for an extra-sharp cutting edge