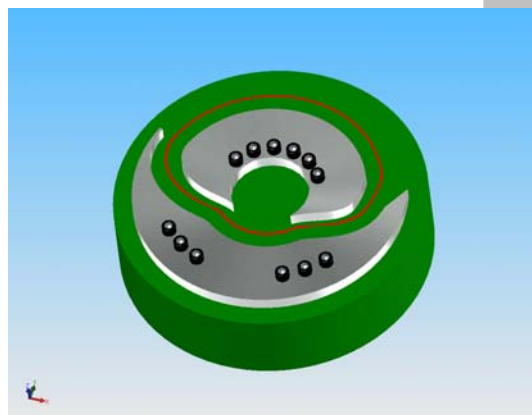
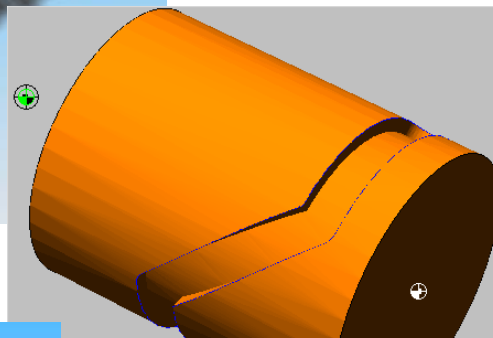
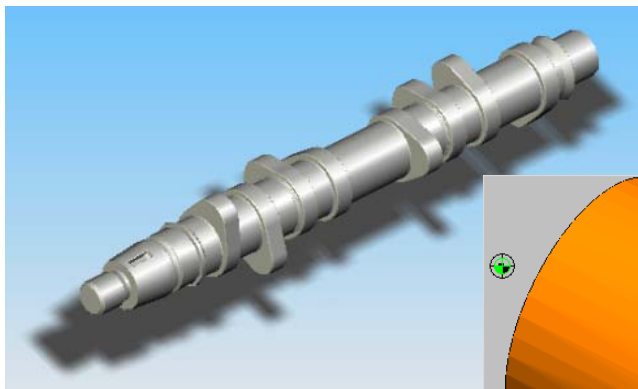


EXAPT modules for machining of curve profiles

offer adaptable solutions on the way from a motion diagram to the NC machining of profile cams and especially for the following types of problem:

- Determination of curves under consideration of kinematic requirements and here especially also calculation of curve transitions, e. g. types of sinusoidal, elliptical or circular form under consideration of manufacturing conditions
- Transfer of primary data from kinematic calculation systems, semi-manual calculations or measuring pick-ups
- Data transfer in form of point tables, formulas or interpolated curves
- Analysis of curve characteristics considering exposed points like reversal, min-/max-, basic points and similar
- Curve preparation like smoothing, CNC-oriented interpolation, checking of tolerance conditions to gain the manufacturing quality, manufacturing-related segmentation of curve areas
- Derivation of procedure-specific tool paths - axial, radial or orthogonal to the determined profile - and process conditions for machining
- Conversion of an unfolded view of a curve onto a cylindrical face
- Reduction of the NC data volume by suitable interpolation procedures or use of the CNC subroutine technique
- Display of the preparation as required with 2D or 3D modelling techniques
- Adaptability to the engineering-surroundings as well as the organizational, system-technical and manufacturing-technical basic conditions



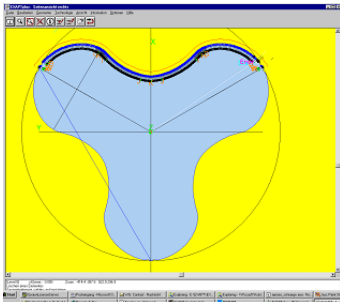
Examples with rough sequence for curve profile machining from the primary data to the result with different solution requirements

Fan rotor

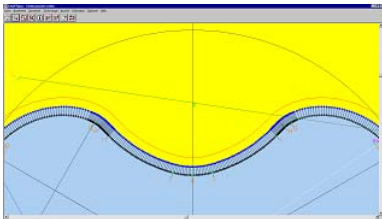
Koordinatentabelle für Gebälbe-Rotorprofil (Auszug)

I	X	Y	K
1	0.000000	-395.600000	0.000000e+00 A1
2	3.558296	-395.559968	2.284113e-02
3	7.115156	-395.457472	4.570954e-02
4	10.669071	-395.234317	6.863265e-02
5	14.218645	-394.949909	9.163820e-02
6	17.762404	-394.584255	1.147544e-01
7	21.298992	-394.137557	1.380099e-01
8	24.826655	-393.609256	1.614844e-01
9	28.344235	-392.999932	1.850584e-01 C2
10	32.583991	-392.154237	2.139498e-01
11	36.804123	-391.189761	2.452394e-01
12	41.002043	-390.106457	2.798611e-01
13	45.175154	-388.904350	3.082594e-01
14	49.320882	-387.583431	3.341295e-01
15	53.436530	-386.143678	3.556731e-01

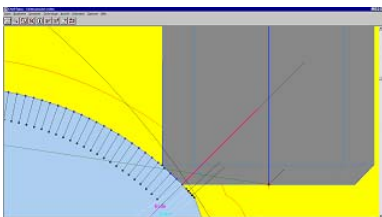
The coordinate table from the engineering contains the primary data for the determination of a rotor profile, this is the starting data for the NC-program generation



Transfer of the geometry data for fan-rotor profile
Selection of a 120 degrees sector
Display of the coordinate data (points, exposed points marked with letters, vectors)
Profile analysis with display of the vectors



Preparation of the profile geometry for the machining
Segmentation in machining sections rotary milling, line milling...

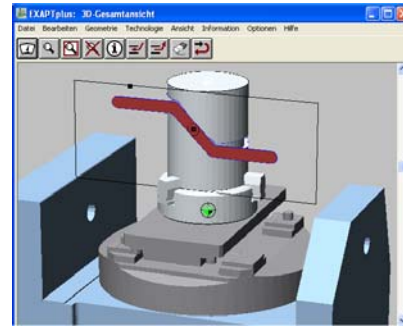


Determination of the operating conditions for the tool for rotary milling
Consideration of the given machining tolerance
Display of the tool position to the profile during machining

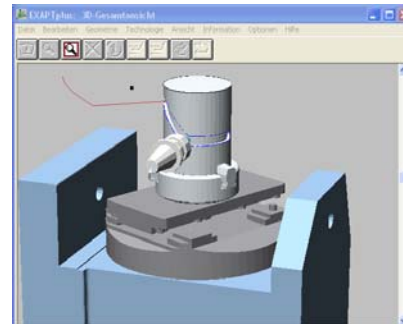


Pre-machined fan rotor with visible machining marks resulting from the different machining operations (rotary milling, line milling concave/convex)

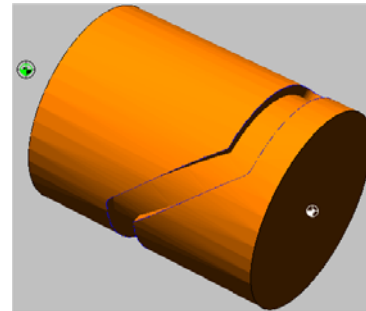
Steering on a cylinder face



Conversion of an unfolded view to a steering groove profile



Milling of steering groove profile with machine-oriented relation to the motion axes



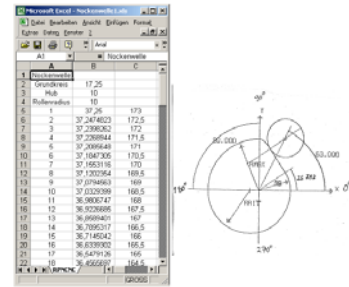
Performance features

The solutions are each based on a request-responsive configuration of EXAPT-modules. The optimized embedding into the engineering chain was brought in as EXAPT-service.

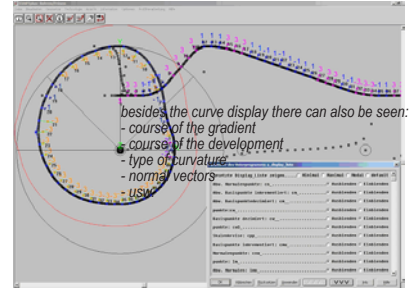
The preparation of the primary data for the profile curves by EXAPT offers the following advantages to the user:

- the powerful functions of all EXAPT-systems are available to get manufacturing orientation and machining quality
- the whole performance spectrum of the EXAPT-systems can be used profitably by high connectivity
- the user stays in his environment for the NC-programming for all usual machining processes as he is familiar to do

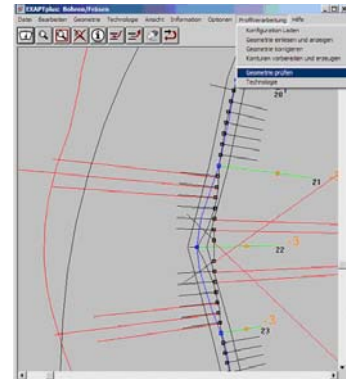
Camshaft



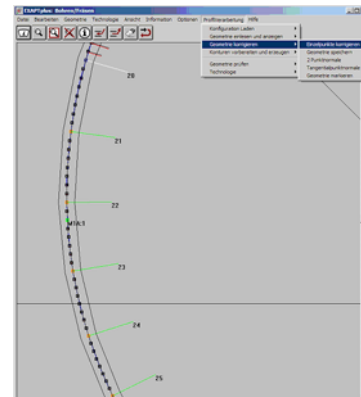
Depending on the part function the coordinate tables have different contents and formatting schemes. The read-in procedures for the EXAPT-systems are flexibly adaptable.



Display of extensive results of a profile analysis



The geometry check reveals a point of discontinuity at position 22 that results from a wrong transfer of measuring values.



Alternative functions for correction of the profile geometry are available.
The example shows how the profile course has been smoothed by shifting the dislocated point.

