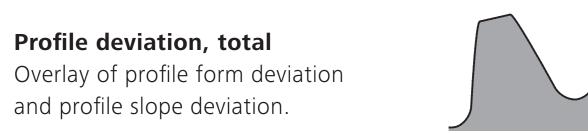
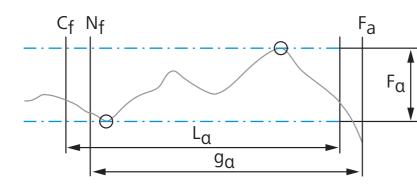
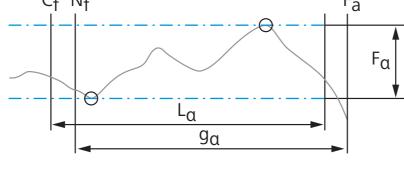
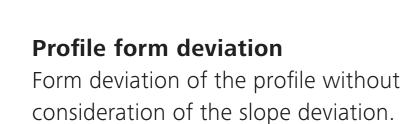
# **Profile**

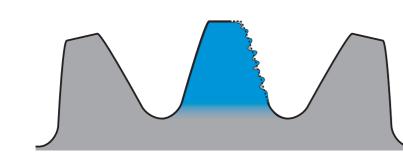
#### **Profile deviation, total** Overlay of profile form deviation

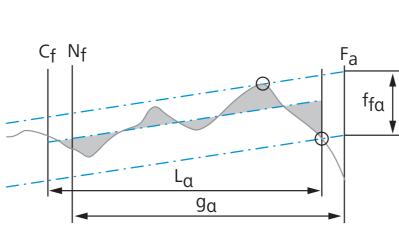


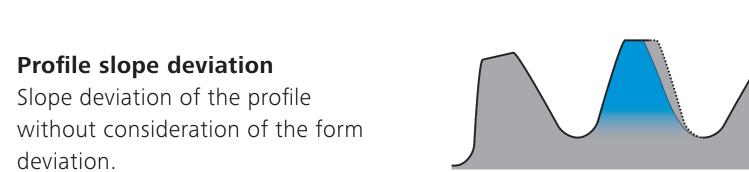


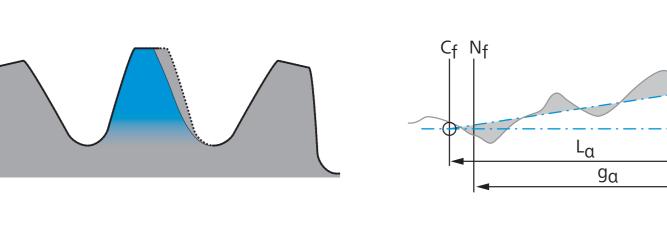








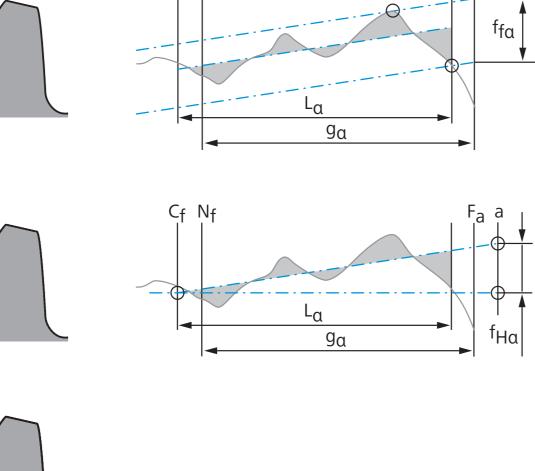




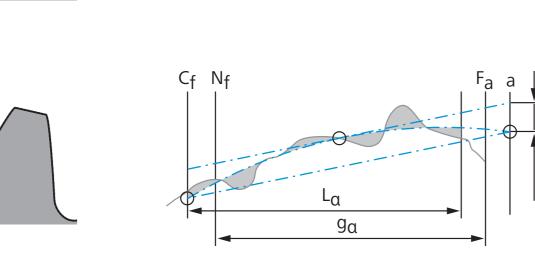
**Profile tip relief** Correction of the profile through material removal on the tooth tip. Avoids jamming with the mating gear under load.

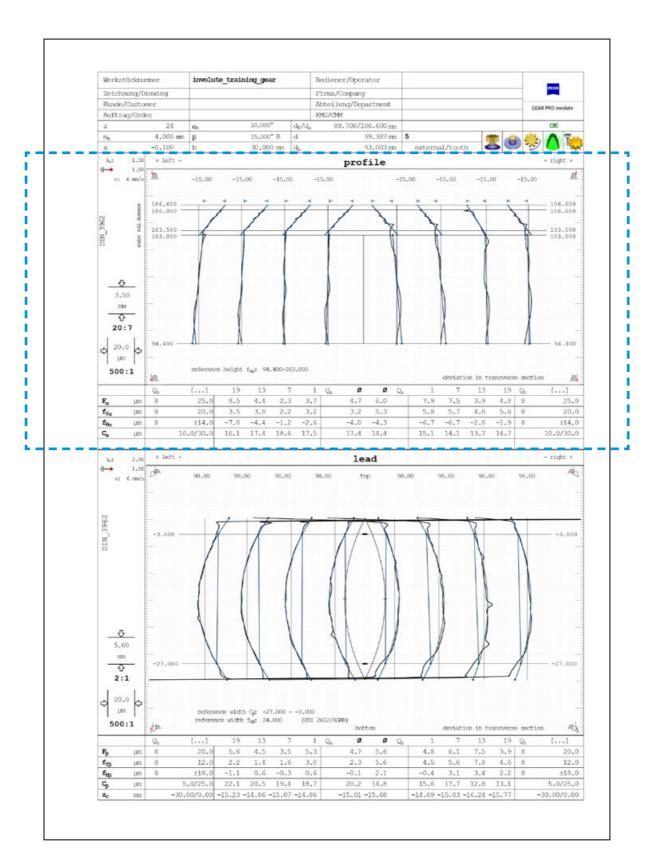
**Profile root relief** Correction of the profile through material removal on the tooth root Avoids jamming with the mating gear under load.

**Profile crowning** Correction of the profile through convex curvature over a defined range of the tooth height. Compensates for elastic deformations of the tooth under load.



<sup>L</sup>Cαa, min LCαf, min .





Root form circle

Start of profile evaluation Start of active profile

Tip form circle

Length of path of contact

**L**<sub>a</sub> Profile evaluation length **Laf** Profile root relief zone

**Lcaf** Length of profile root relief

**Lam** Middle profile zone of unmodified profile  $L_{\alpha a}$  Profile tip relief zone

**LCαa** Length of profile tip relief

# Helix

#### Helix deviation, total

Overlay of helix form deviation and helix slope deviation.

**Helix form deviation** 

Form deviation of the helix without consideration of the slope deviation.

Helix slope deviation

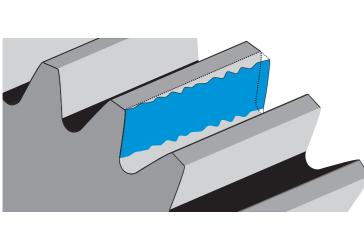
Slope deviation of the helix without consideration of the form deviation.

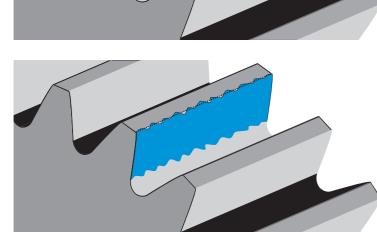
Helix end relief at datum face Correction of the helix through material removal on the flank ends of the datum face. Avoids jamming with the mating gear under load.

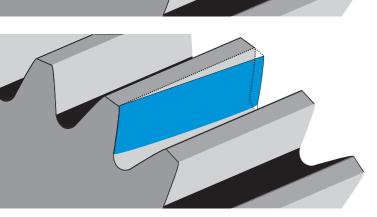
Helix end relief at non-datum

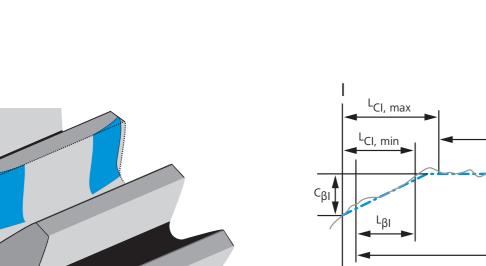
Correction of the helix through material removal on the flank ends of the non-datum face. Avoids jamming with the mating gear under load.

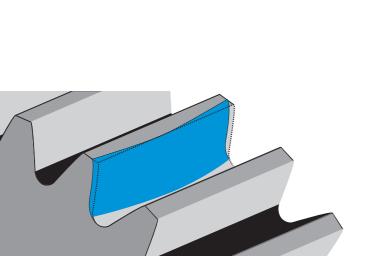
**Helix crowning** Correction of the helix through convex curvature over the face width. Compensates for elastic deformations of the tooth under load.

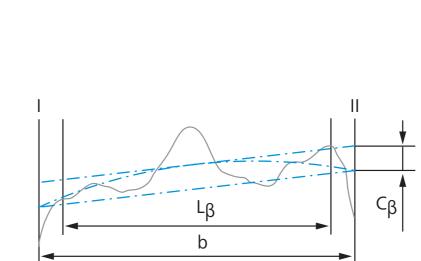


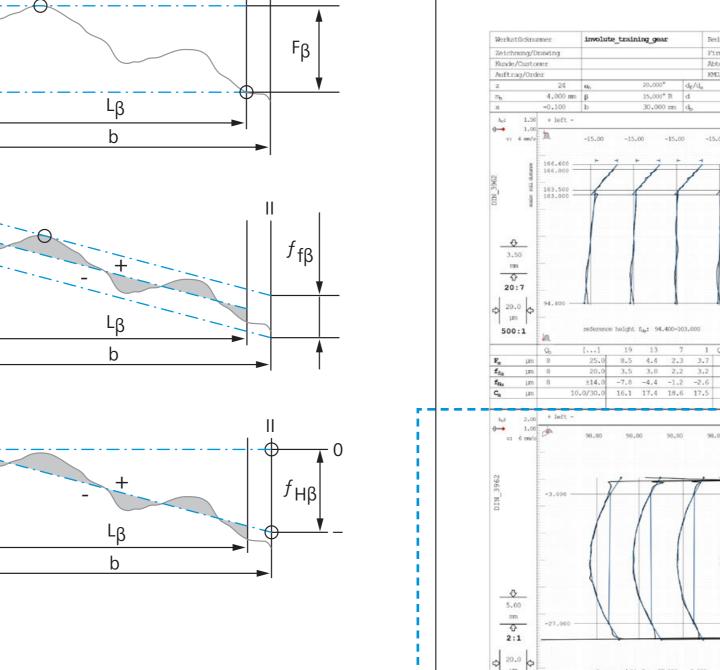


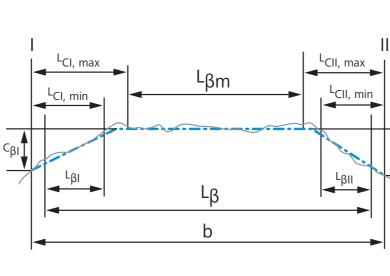


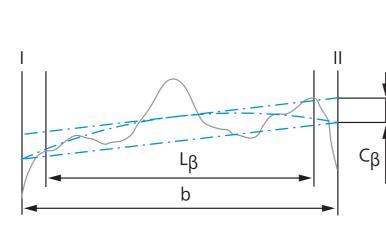


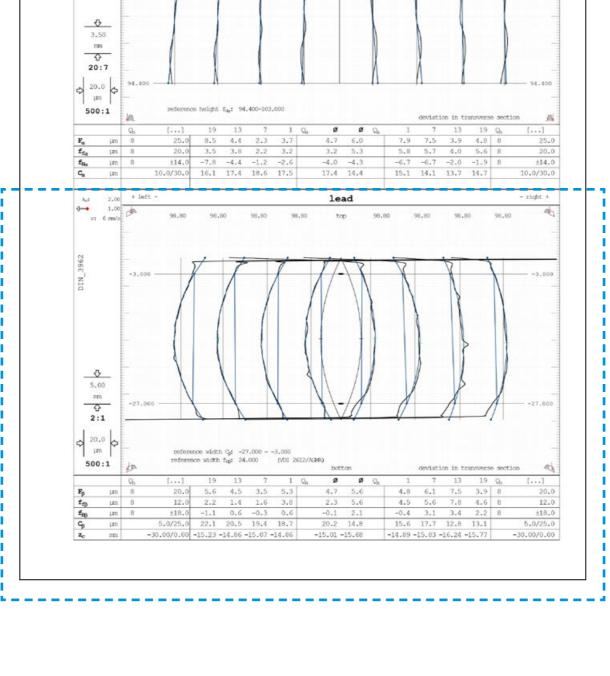












Datum face Non-datum face

Face width Helix evaluation length

Helix end relief zone (datum face) Length of helix end relief (datum face) Middle helix zone of unmodified helix

LRII Helix end relief zone (non-datum face) **LCII** Length of helix end relief (non-datum face)

### **Pitch**

# Cumulative pitch deviation, total

Single pitch deviation

Greatest unsigned positional

Adjacent pitch difference

all right (left) flanks.

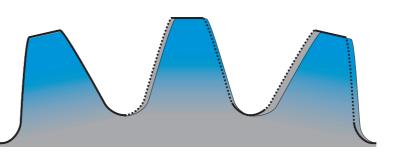
deviation of all individual right (left)

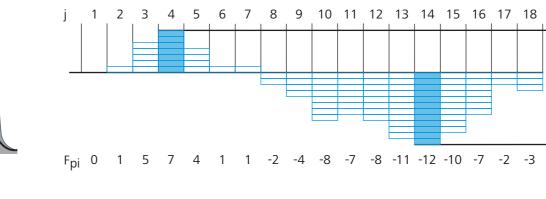
flanks to the preceding right (left)

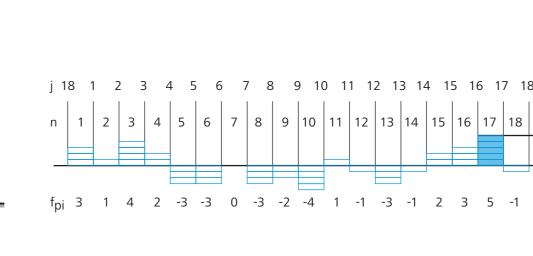
Greatest unsigned difference of all

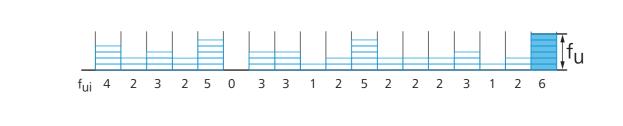
individual single pitch deviations of

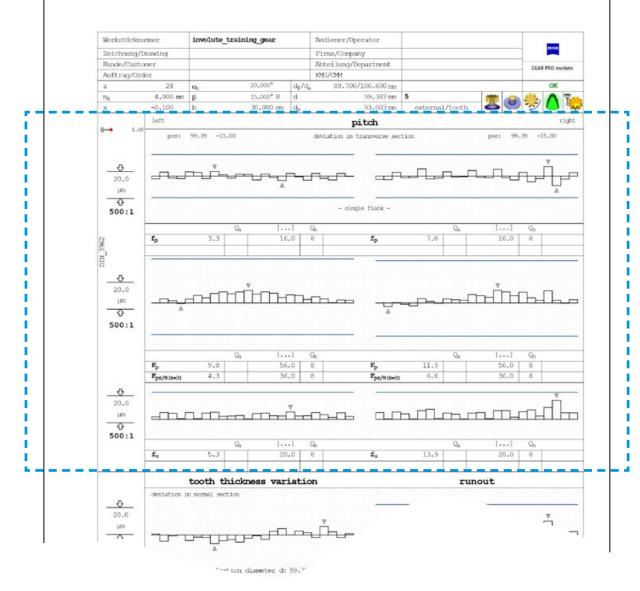
Range of the positional deviation of all right (left) flanks to the nominal position, with the flanks being analyzed independently.











# Radial runout

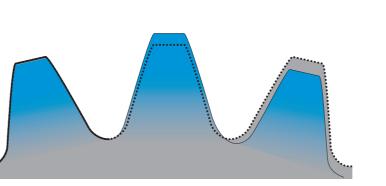
flank.

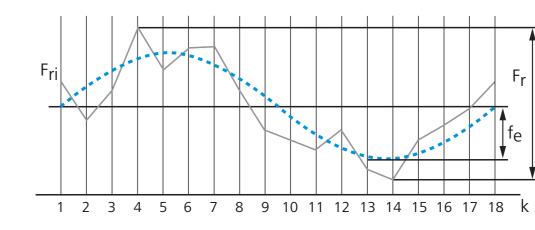
#### Radial runout deviation Range of the radial positional

deviation of all gaps. Measured by placing a measuring sphere on both flanks of all gaps.



Eccentricity of the gearing to the reference system axis (bore/shaft).





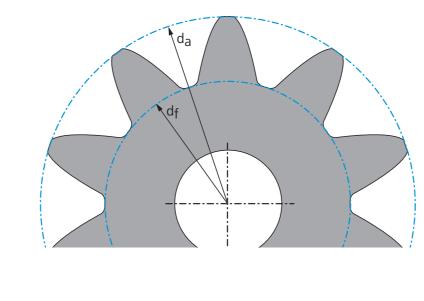
# Diameter

#### Tip circle diameter

Greatest (smallest) diameter of an external gear (internal gear) at the tooth tip.

#### **Root circle diameter** Smallest (greatest) diameter of an

external gear (internal gear) at the tooth root.



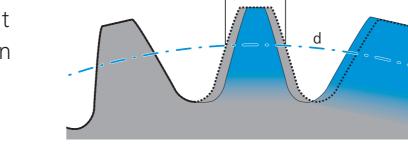
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20.0 µm 10 500:1	A <sub>e</sub>	12.7	Q <sub>h</sub>	28.0	Q <sub>h</sub> 8	0.038	[]	20.6 5.0 May Ø7.00	00 M <sub>eK</sub>	54.266	5
20.0 µm	A <sub>0</sub> max	-0.038 -0.031	Q <sub>n</sub> [] !AE,	28.0	Q <sub>h</sub> 8 1AE <sub>u</sub> max	0.038 0.045	0.050 -0.050	20.6 5.0 M <sub>ex</sub> Ø7.00 0 \$\frac{1}{2}\$	M <sub>ck</sub>	54.266 54.278	[. 5 5 5
20.0 µm	A <sub>0</sub> max	-0.038 -0.031	Q <sub>h</sub> [] !AE <sub>t</sub>	28.0	Q <sub>h</sub> 8 1AE <sub>u</sub> max	0.038 0.045	0.050 -0.050	20.6 5.0 M <sub>ex</sub> Ø7.00 0 \$\frac{1}{2}\$	M <sub>ck</sub>	54.266 54.278	5 5
20.0 µm	A <sub>0</sub> max min	12.7 -0.038 -0.031 -0.044	Q <sub>6</sub> [] !AE <sub>6</sub> 0.050 -0.050 E <sub>8</sub> 5.992 6.042	28.0	Sh 8 1AE <sub>b</sub> max min	0.038 0.045 0.028 6.613 6.619	0.050 -0.050 6.574 6.624	20.6 5.0 M <sub>ex</sub> Ø7.00 0 \$\frac{1}{2}\$	M <sub>cK</sub> max min	54.266 54.278 54.258	
20.0 µm	A <sub>0</sub> max min	-0.038 -0.031 -0.044 5.954	Q <sub>b</sub> [] !AE, 0.050 -0.050 E <sub>b</sub> 5.992 6.042 5.942	28.0	S IAE <sub>n</sub> max min	0.038 0.045 0.028	0.050 -0.050 6.574 6.624 6.524	20.6 5.0 M <sub>rk</sub> Ø7.00 0 \$0.23 M <sub>rk</sub> Ø7.00	MgK max min 00 MgK max min	54.266 54.278 54.258	5 5 [. 10
20.0 µm	A <sub>0</sub> max min S <sub>8</sub> max	-0.038 -0.031 -0.044 5.954 5.961	Q <sub>6</sub> [] !AE, 0.050 -0.050 E <sub>8</sub> 5.992 [] circ	28.0	Qh 8 1AE <sub>0</sub> max min E <sub>n</sub> max min	0.038 0.045 0.028 6.613 6.619 6.603	0.050 -0.050 6.574 6.624	20.6 5.0 Max Ø7.00 O S S S S S S S S S S S S S S S S S S	MgK max min 00 MgK max min	54.266 54.278 54.258 108.532 108.543	[. 10 10
20.0 µm	A <sub>0</sub> max min S <sub>8</sub> max	12.7 -0.038 -0.031 -0.044 5.954 5.961 5.948 30.696	Q <sub>b</sub> [] !AE <sub>c</sub> 0.050 -0.050 E <sub>b</sub> 5.992 6.042 5.942 [] cix 30.700	[] 28.0	Qh 8 1AE <sub>0</sub> max min E <sub>n</sub> max min	0.038 0.045 0.028 6.613 6.619 6.603	0.050 -0.050 6.574 6.624 6.524	20.6 5.0 Max Ø7.00 O S S S S S S S S S S S S S S S S S S	MgK max min 00 MgK max min	54.266 54.278 54.258 108.532 108.543 108.525	10 10 10 10
20.0 µm	A <sub>p</sub> max min S <sub>s</sub> max min	12.7 -0.038 -0.031 -0.044 5.954 5.961 5.948 30.696 30.703	Q <sub>b</sub> [] !AE <sub>c</sub> 0.050 -0.050 -0.050 E <sub>s</sub> 5.992 6.042 5.942 [] circ 30.700 30.750	28.0	Qh 8 IAE <sub>0</sub> max min E <sub>a</sub> max min	0.038 0.045 0.028 6.613 6.619 6.603 106.574	0.050 -0.050 6.574 6.624 6.524	20.6 5.0 Max Ø7.00 O S S S S S S S S S S S S S S S S S S	MgK max min 00 MgK max min 00 00 00 00 00 00 00 00 00 00 00 00 00	54.266 54.278 54.258 108.532 108.543 108.525 108.532 108.532	[ 10 10 1- 10
20.0 µm	A <sub>0</sub> max min S <sub>8</sub> max min	12.7 -0.038 -0.031 -0.044 5.954 5.961 5.948 30.696	Q <sub>b</sub> [] !AE <sub>c</sub> 0.050 -0.050 E <sub>b</sub> 5.992 6.042 5.942 [] cix 30.700	28.0 28.0 28.0 28.0 28.0 28.0 28.0 28.0	Ch 8  IAE <sub>0</sub> max min  E <sub>0</sub> max min	0.038 0.045 0.028 6.613 6.619 6.603	0.050 -0.050 6.574 6.624 6.524	Max Ø7.00	M <sub>E</sub> K max min 00 M <sub>M</sub> R max min	54.266 54.278 54.258 108.532 108.543 108.525	5 [.

Werkstücknunner involute\_training\_gear

# **Tooth thickness**

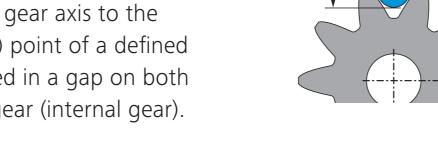
#### **Tooth thickness**

Arc length of the distance of a right to a left flank in a transverse section plane on the reference diameter.



#### **Radial dimension** over/between one ball

Radial distance of the gear axis to the outermost (innermost) point of a defined measuring sphere fitted in a gap on both flanks of an external gear (internal gear).



#### MdK Diametral dimension over/between two balls MdR Diametral dimension over/between two pins

Greatest outermost (smallest innermost) distance of two defined measuring spheres/pins (cylinder) fitted in two opposing gaps on both flanks of an external gear (internal gear).

Distance of two parallel measuring planes

k teeth (gaps) of an external gear (internal

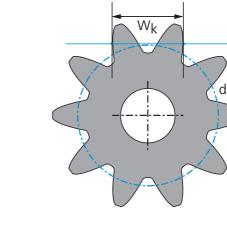
gear) and also lie in a tangential plane on

that intersect a right and left flank over

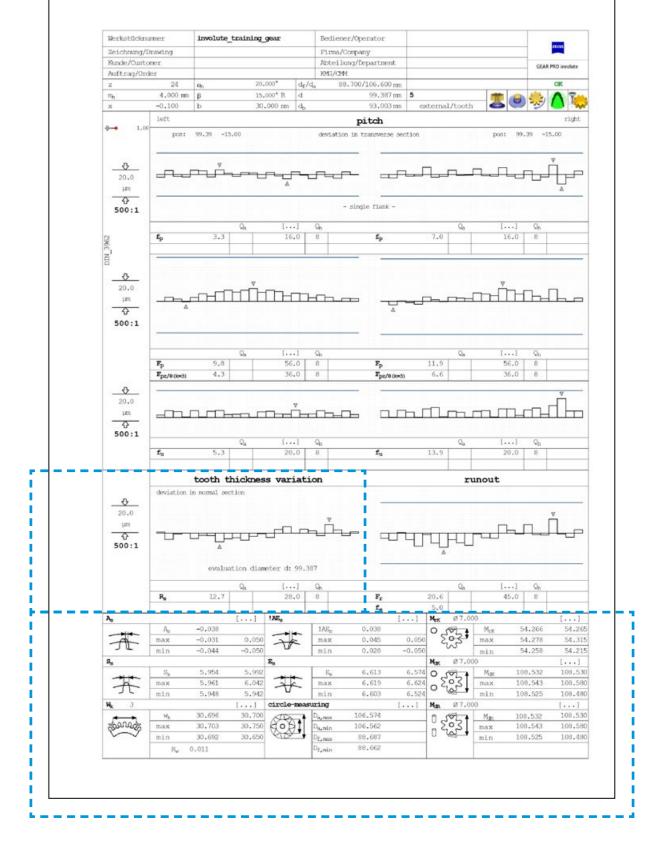
**Base tangent length over** 

k teeth (gaps)

the base circle.



- i Individual value
- **k** Tooth/gap number
- **d** Reference diameter **dB** Base diameter
- **DM** Diameter of the measuring ball/pin (cylinder)



# ZEISS Gear Metrology

