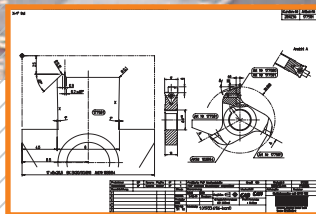
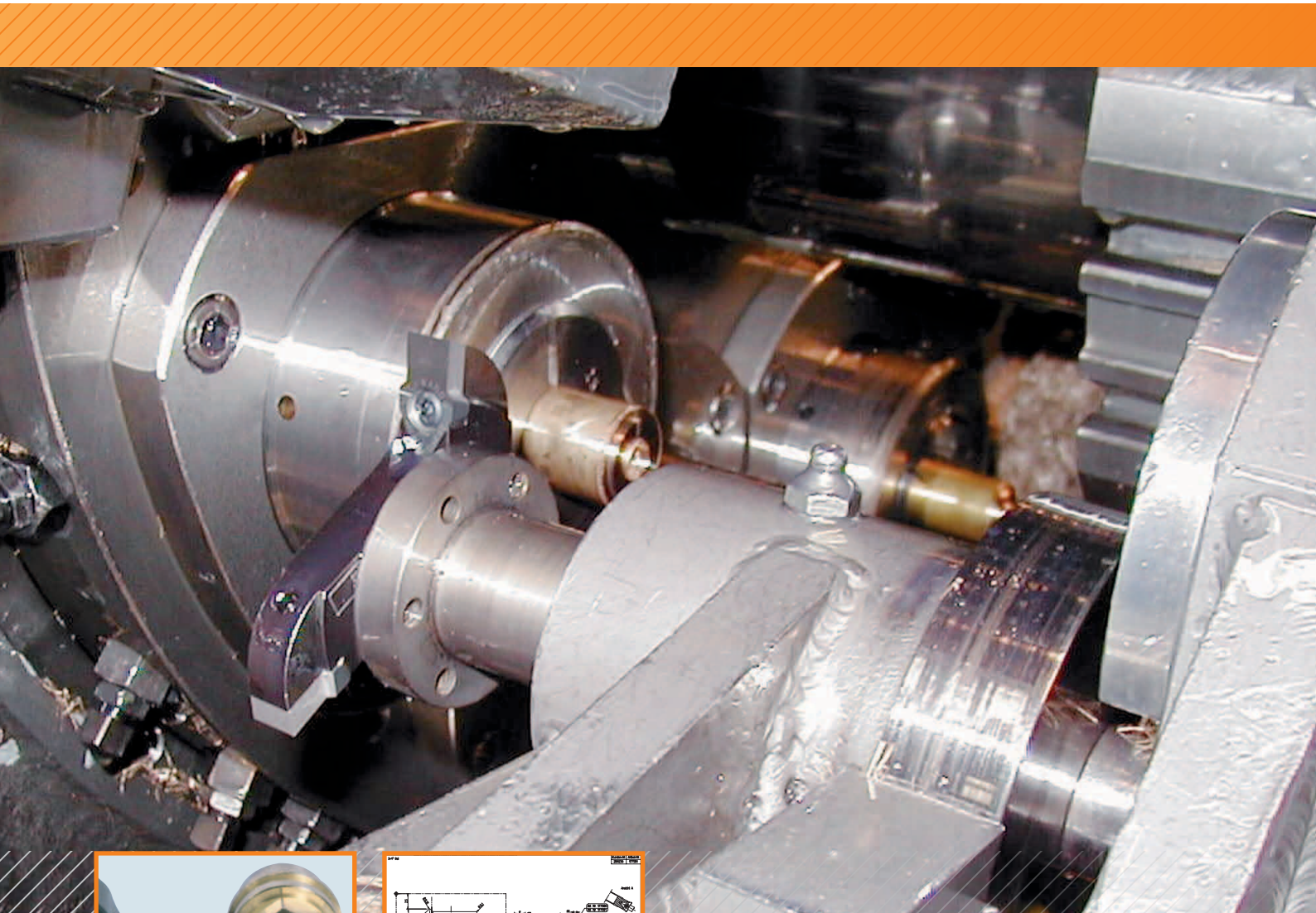


Machining technology

# Polygon Turning



**Schwannog**

## Cost efficient manufacturing on the lathe: Efficient Flats through Polygon Turning!

When it comes to turned parts, particularly in the fittings and hydraulics industry, machining of flats is a time-consuming process.

This time factor is associated with a huge expense.

Specializing in insertable form tool systems, Schwanog has designed an impressive solution which drastically reduces costs.

Using the Schwanog polygon system, flats can be produced directly on the lathe using polygon cutters and eliminating the time-consuming milling process.

### Application:

Using a polygon turning attachment or a tool spindle operating in sync, Polygon turning is used for parts made from non-ferrous metals i.e. brass, aluminum and steel i.e. 12L14. The radial plunging procedure also allows flats being machined behind the collar. Axial, longitudinal turning is used to create long flats.



### Description of process:

When polygon turning, the part and cutter head turn in the same direction. The cutter head generally rotates at twice the speed of the part, with each cutting edge turning a pair of opposite flats on the part. This means that the number of flats produced during polygon turning is twice the amount of the cutting edges.

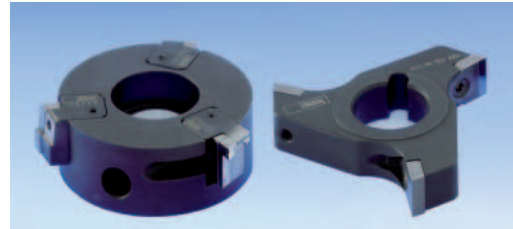
### Flats:

Any number of flats can be produced with the Schwanog polygon turning system. Due to the complexity of the subject, we recommend contacting us to discuss your part in detail.

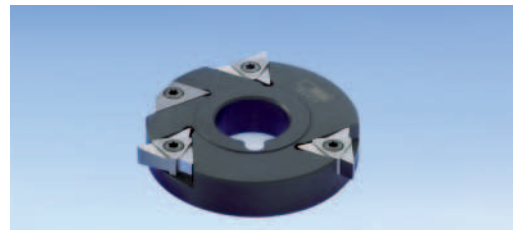
### Info:

Depending on the outside (SK) diameter, the flat width and the amplification ratio, the flats are produced with a negligible degree of crowning.

**Schwanog will find the most cost-effective solution to suit your needs.**



Polygon turning with the Schwanog PWP system: for plunging.



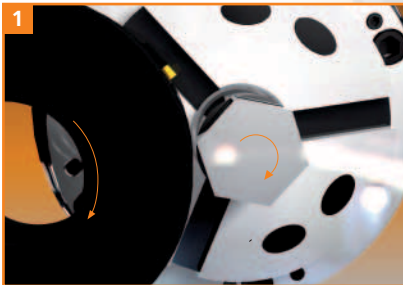
Polygon turning with the Schwanog WEP system: for plunging and longitudinal turning.

Cutter head is also available in heavy metal.

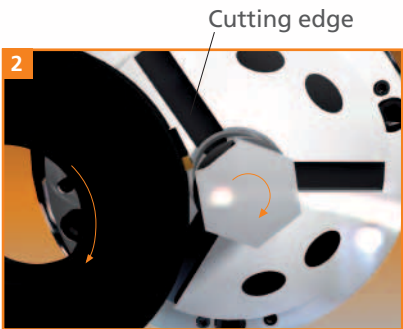
### Advantages:

- Flats are produced directly on the lathe in a single process.
- Elimination of milling process
- Polygon turning is quicker than milling.
- Integrated production on a single machine increases process reliability.
- Schwanog polygon system cuts costs drastically.

# Production sequence



1 Tool and part rotate in the same direction.



2 Start position (tool engagement) tool starts cutting.

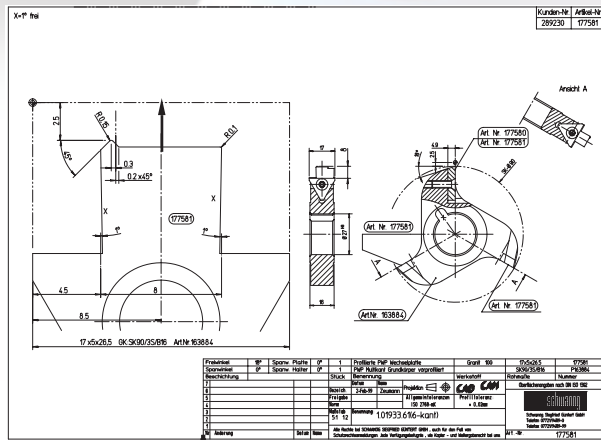


3 Flat is being produced.

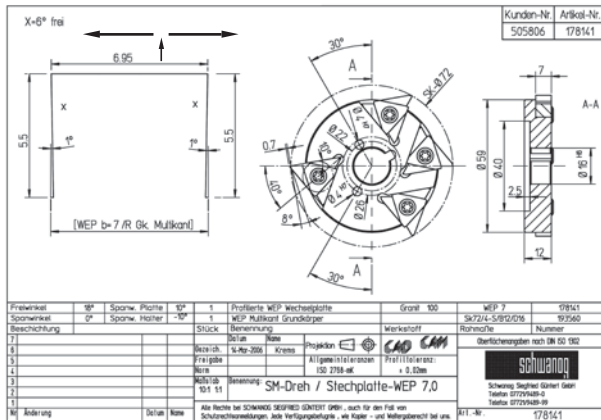


4 Tool disengages.

## Plunging (radial) procedure



## Longitudinal (axial) turning (Plunge turning also possible)



# Insertable tooling system.

## Recommended cutting speeds and feeds

Amplification ratio 2:1  $V_{C\text{total}} = V_{C\text{tool}} + V_{C\text{component}}$

$$V_{C\text{tool}} = 2 \cdot \frac{d_{\text{tool}} \cdot \pi \cdot n_{\text{main spindle}}}{1000} \quad V_{C\text{tool}} = \frac{d_{\text{width across flats}} \cdot \pi \cdot n_{\text{main spindle}}}{1000}$$

Materials	Aluminum	Brass	Free cutting steel	Alloys
<b>Plunging</b>				
Cutting speed $V_{C\text{total}}$ in m/min.	700	600	400	300
Feed rate in mm/rev	0,08	0,05	0,03	0,01
<b>Längsschlagverfahren</b>				
Cutting speed $V_{C\text{total}}$ in m/min.	1100	900	550	400
Feed rate in mm/rev	0,15	0,1	0,05	0,03



OD grooving



ID grooving



OD whirling



ID Whirling tools



Thread milling cutter



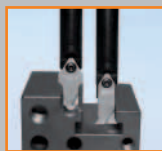
Polygon cutting



Serration



Form drilling



Form milling



Shave Tools



Rotary transfer machines



Selector system

Polygon turning is one of twelve application areas for which Schwanog offers top solutions in regard to quality and efficiency.