

**GRINDING
TECHNOLOGY
FOR THE
BEARING
INDUSTRY**

TYROLIT

TYROLIT – The System Provider For The Bearing Industry

The bearing Industry is one of the key markets to TYROLIT.

The TYROLIT bearing industry team is prepared to provide solutions for all your bearing issues.

Our specialists will provide a systems approach with the latest in product technology, specifically developed for the bearing industry, utilizing the Grinding Simulation Software and Data Acquisition Analysis. This provides a scientific approach to process optimization.

Our scope of supplies covers grinding tools for virtually every operation needed in the production of bearings and components. Product specifications covering bearing steels, exotic high alloyed steels for the aircraft industry and ceramics.

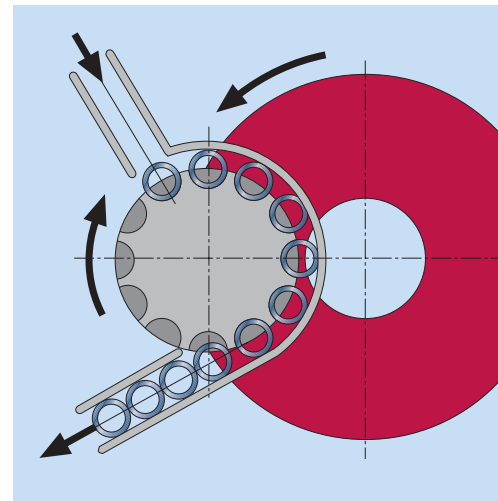
Continuous improvement is TYROLIT's philosophy for our customer processes and our own product development. TYROLIT's Research and Application Engineering Team is motivated to develop product technology for the future needs of our customers.

Face grinding of bearing rings and rollers

Double side face grinding of rings and rollers

| PRODUCT | PROPERTIES |
|---|--|
| Alo resin bonded Sintered Alo resin bonded | high output, more parts per dress for high demands on productivity |

Specials: vitrified bonded wheels
CBN vitrified and resin bonded



Face grinding with cup wheels

| PRODUCT | PROPERTIES |
|------------------|-----------------------------------|
| Alo resin bonded | high output, good surface quality |

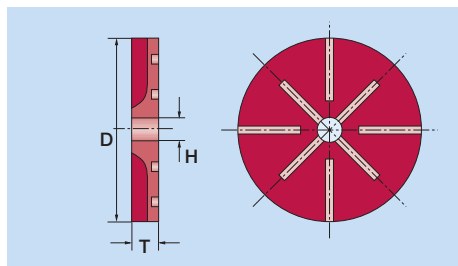
Specials: cup wheels with two rims for roughing and finishing

Grinding tools

Grinding discs type 36ST

Special design:

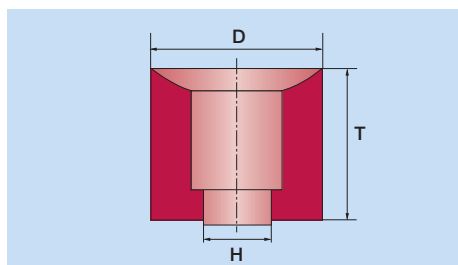
- Slots, perforation, coolant holes
- Grinding rings type 37ST



Cup wheels type 5ST

Special design:

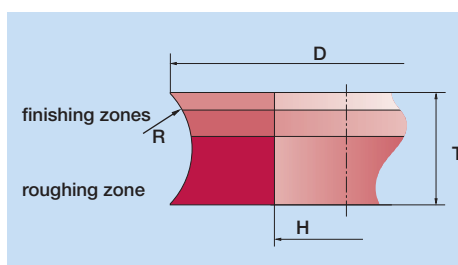
- Radius profile for taper rollers
- Modler type wheel with two layers (rough-/finish grinding)



Straight wheels type 1 - S

Special design:

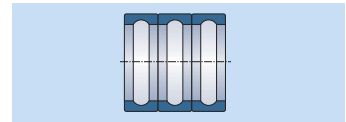
- Radius profile for taper rollers
- Sandwich wheel with 3 layers (rough-/semi finish-/finish grinding)



Centerless grinding of bearing rings, rollers and needles

Through-feed grinding of rings

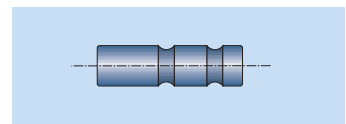
| PRODUCT | PROPERTIES |
|----------------------|---|
| Alo vitrified bonded | high through-feed speed, better roundness, low waviness of rings |



Specials: wheels sets with combination of vitrified and resin bonds

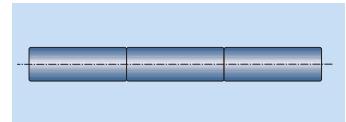
Plunge grinding of bearing shafts and spherical rollers

| PRODUCT | PROPERTIES |
|----------------------|---|
| Alo vitrified bonded | better profile retention, short grinding time |

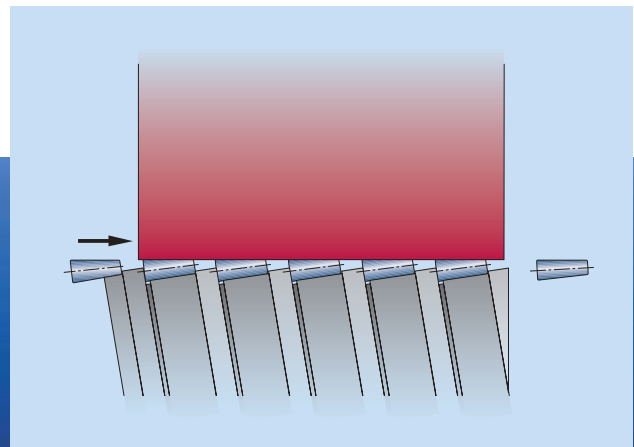
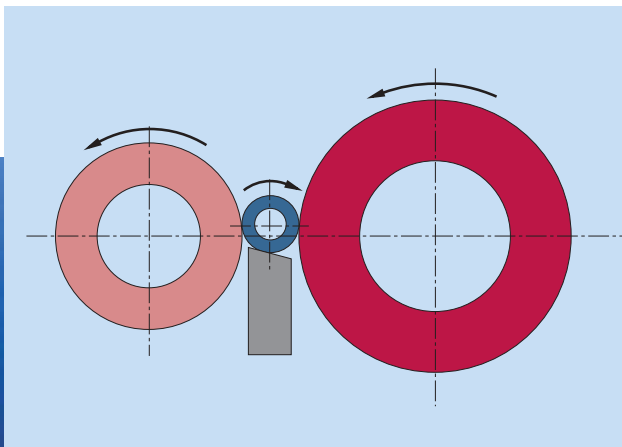


Through-feed grinding of cylindrical rollers

| PRODUCT | PROPERTIES |
|------------------------------|---|
| Alo and SIC vitrified bonded | high through-feed speed, specially for rough grinding |
| Alo resin bonded | good surface quality, specially for finish grinding |



Specials: CBN vitrified and resin bonded for steel materials
diamond resin bonded for ceramic materials

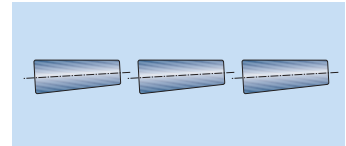




Through-feed grinding of taper rollers

| PRODUCT | PROPERTIES |
|-------------------|---|
| Alo rubber bonded | stable through-feed system as compared to the steel control wheel |

Specials: resin bonded wheels



Control wheels

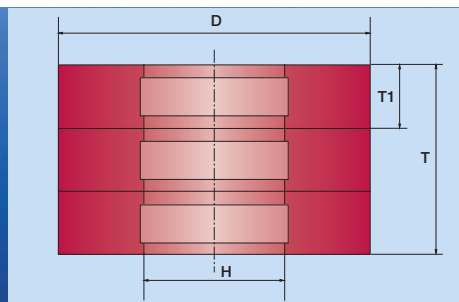
| PRODUCT | PROPERTIES |
|-------------------|-------------------------------------|
| Alo rubber bonded | controls the feeding and supporting |

Grinding tools

Grinding wheel type 1

Special design:

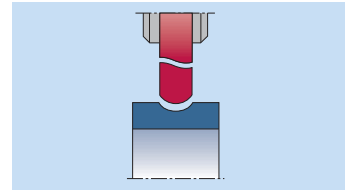
- With recess type 5 or 7
- Set wheels made of X-parts
- Set wheels with taper aligning for plunge grinding



Race grinding of inner and outer rings

Inner ring race grinding

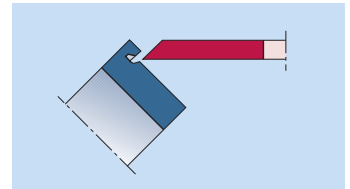
| PRODUCT | PROPERTIES |
|---|--|
| Alo vitrified bonded Sintered Alo vitrified bonded | better profile retention, short grinding time for higher demands on productivity |



Specials: CBN vitrified bonded for steel materials
 diamond vitrified bonded for ceramic materials
 elastic bonded wheels for low surface roughness

Inner ring rib grinding (TRB, CRB)

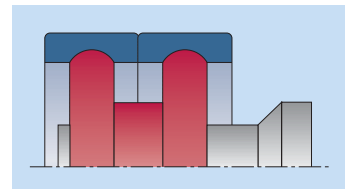
| PRODUCT | PROPERTIES |
|---|--|
| Alo vitrified bonded Sintered Alo vitrified bonded | better cutting ability, short grinding time for higher demands on productivity |



Specials: sulphur impregnation for longer dressing cycles

Outer ring race grinding

| PRODUCT | PROPERTIES |
|---|--|
| Alo vitrified bonded Sintered Alo vitrified bonded | better profile retention, short grinding time for higher demands on productivity |

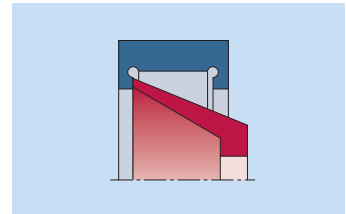


Specials: CBN vitrified bonded for steel materials
 diamond vitrified bonded for ceramic materials
 elastic bonded wheels for low surface roughness



Outer ring flange grinding (CRB)

| PRODUCT | PROPERTIES |
|---|---|
| Alo vitrified and resin bonded | better cutting ability, short grinding time |
| Sintered Alo vitrified and resin bonded | for higher demands on productivity |



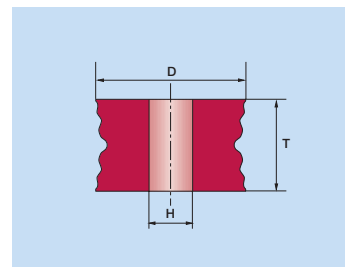
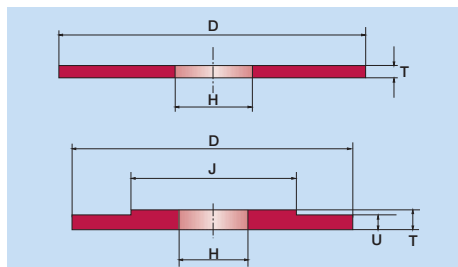
Specials: sulphur impregnation for longer dressing cycles
 CBN resin bonded for steel materials
 diamond resin bonded for ceramic materials

Grinding tools

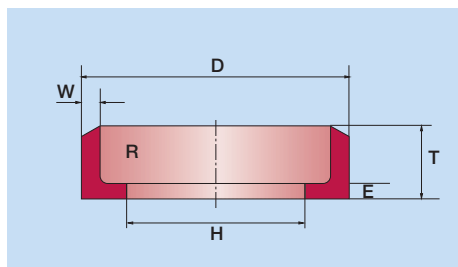
Grinding wheel type 1LB

Special design:

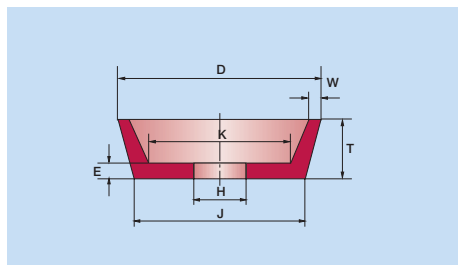
- For high speed grinding wheels up to 125 m/s
- All different types of profiles
- Type 38LB, 39LB with thicker core
- Type 5LB with recess



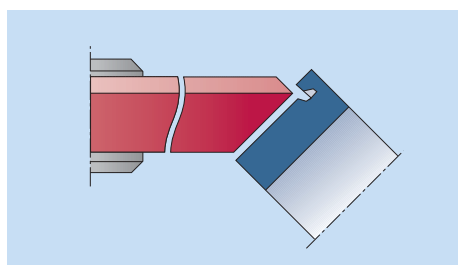
Cup wheels type 6F for spherical outer rings:



Cup wheels type 11 for flange grinding:



Special types for flange and race grinding:

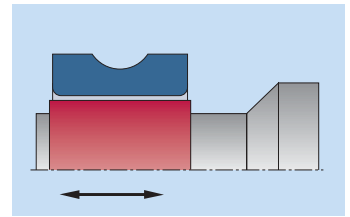




Bore grinding

Bore grinding of inner rings

| PRODUCT | PROPERTIES |
|-------------------------------|--|
| Alo vitrified bonded | better profile retention, shorter grinding time for higher demands on productivity |
| Sintered Alo vitrified bonded | |
| CBN vitrified bonded | for smaller rings and optimized process |



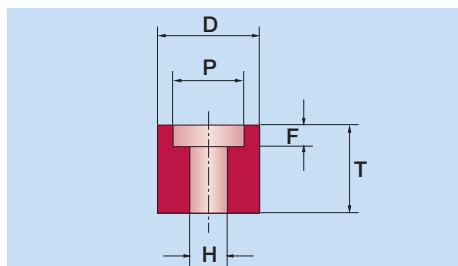
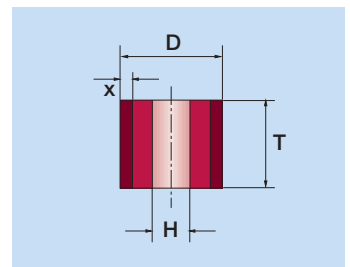
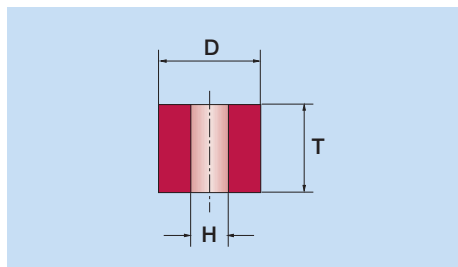
Specials: sulphur impregnation for longer dressing cycles
diamond resin bonded for ceramic materials

Grinding tools

Straight grinding wheels type 1

Special design:

- Type 5 with recess
- Type 1A8, 1A1 for CBN wheels

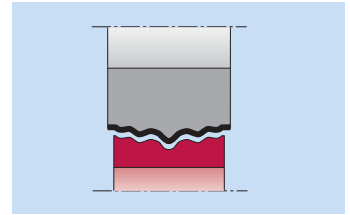


Dressing

Full profile dressing rollers

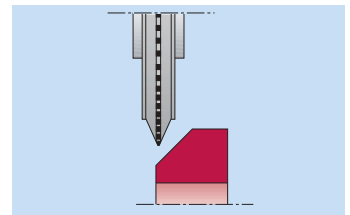
| PRODUCT | PROPERTIES |
|--|--|
| High precision reverse plated diamond roller | higher productivity, short dressing time |

Specials: reinforced corners



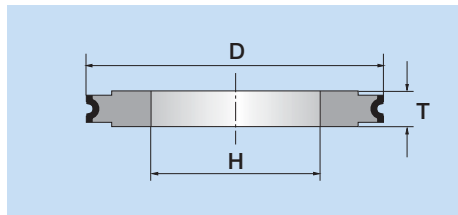
Dressing rollers for NC dressing

| PRODUCT | PROPERTIES |
|---------------------------------------|--|
| dressing roller set from diamond logs | better flexibility, different profiles are produced with the same tool. New roller concept for longer life |

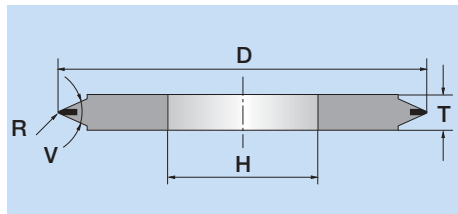


Dressing tools

Reverse plated rollers REX



M-dress rollers RMG

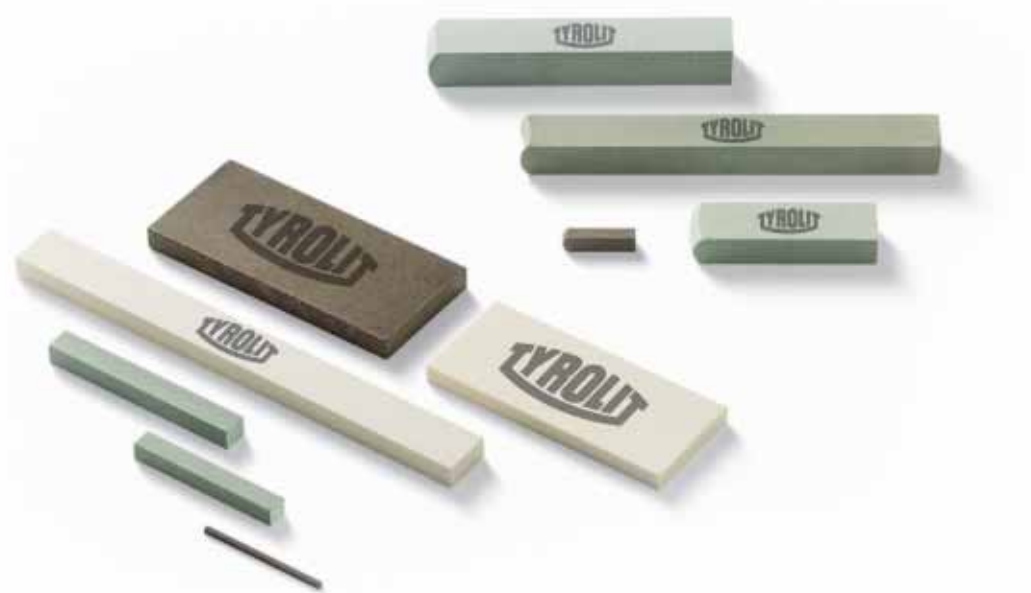
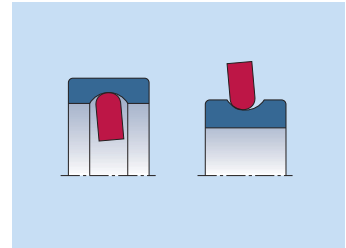


Superfinishing

Superfinishing of rings or rollers on single-station machine

| PRODUCT | PROPERTIES |
|----------------------|---|
| Alo vitrified bonded | better material removal, good surface quality with fine grit size |
| SIC vitrified bonded | better surface quality |
| CBN vitrified bonded | long stone life, for small rings or special steel materials |

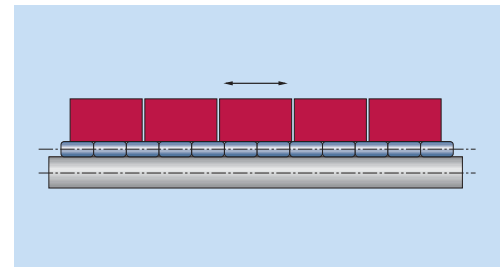
Specials: paraffin or sulphur impregnation for higher material removal rates
mixtures of Alo and SIC



Superfinishing of rings or rollers on multi-station machine

| PRODUCT | PROPERTIES |
|---|---|
| Al ₂ O ₃ vitrified bonded | better material removal, mainly for the first station(s) |
| SiC vitrified bonded | better surface quality, mainly for the last station(s) |
| mixture of Al ₂ O ₃ and SiC, vitrified bonded | combines advantage of both (surface finish and material removal), for all stations but last |
| Tyrolit "Jade" vitrified bonded | for very low surface roughness, only for final station |
| Al ₂ O ₃ resin bonded with graphite | for very low surface roughness, mainly for last station of multi-station machines |

Specials: paraffin or sulphur impregnation for higher material removal rates
 CBN vitrified bonded for small rings or special materials

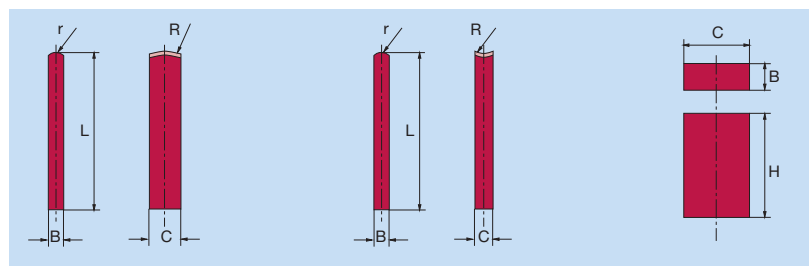


Grinding tools

Superfinishing stone type 54SCH

Special design:

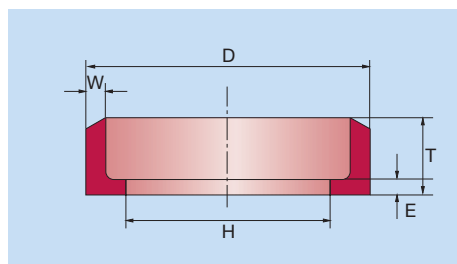
- With profile to match the race
- With profile to match the roller shape
- Stone blocks type 54SCHP to be cut to size



Rings and cup wheels type 5460, 5420, 6

Special design:

- With profile for spherical rings





ISO 9001:2000
VDA 6.4
ISO 14001

Nr. 265/1
Nr. 004/1
Nr. 162/1

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