



Evolution in grinding.

Spring end  
grinding

... for all  
calibres.

using high-performance  
sintered aluminium oxide abrasives

# High-value sintered aluminium oxide abrasives

THELEICO company has developed products on a sintered aluminium oxide basis, especially for spring end grinding, together with new vitrified and resinoid bonding agent systems. The result is an optimised generation of grinding wheels having all advantages of sintered aluminium oxide. By using these sintered aluminium oxide abrasives it is possible to achieve a cool grinding operation, long dressing intervals, long wheel life and short grinding times.

combining top quality with thrift in spring end grinding

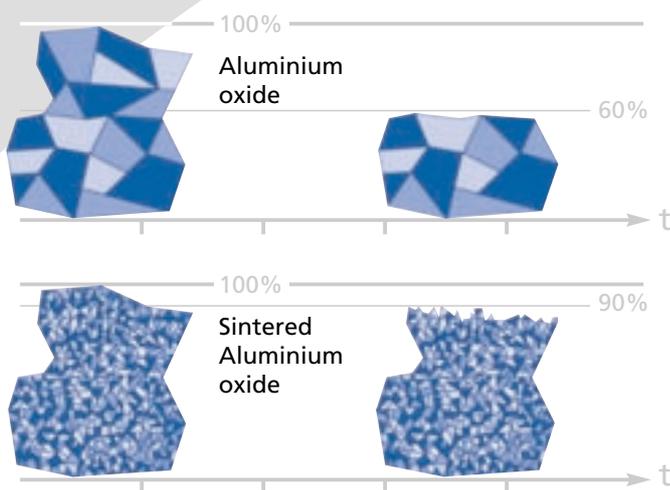
## Permanent self-sharpening

Sintered aluminium oxide abrasive grains by THELEICO company consist of microcrystallites with particle sizes in the sub-micron range. The microstructure which is present in each grain causes permanent liberation of micro cutting edges, dependent on the grinding pressure, and hence „self-sharpening“ of the abrasive grain. The grinding wheel remains permanently sharp. Besides spring end grinding, these extraordinary advantages are also to be observed in standard applications such as cylindrical grinding, surface grinding and internal grinding of hardened and high-alloy materials.

In this connection the use of sintered aluminium oxide grinding wheels has partly proven even more economical than using the super abrasives CBN and diamond, that are much more expensive.

## Clear advantages in grinding behaviour

When compared under the same conditions sintered aluminium oxide shows clear advantages over conventional aluminium oxide regarding abrasion and self-sharpening of the grain.



## Lower grinding pressure, longer wheel life

With respect to sintered aluminium oxide abrasives the splintering of the abrasive grain occurs at considerably lower grinding pressures.

Due to the essentially smaller crystallites lower grain proportions are removed unused from the process which increases wheel life considerably.

## Cool grinding operation, higher cutting speed

The peripheral cutting speed of about 35 m/s, which is normally used today, is primarily design rated for controlling the developing process heat. By using THELEICO sintered aluminium oxide grinding wheels with their distinctly cooler grinding operation, it is possible to increase peripheral speed up to 50 m/s, thereby achieving a further increase in cutting performance.



Applications



Evolution in grinding.

**20 - 60 %**  
reduction of  
process time

### Better grinding quality, not harmful to the environment

Permanent self-sharpening, lower grinding pressures and higher peripheral speeds result in an improved surface roughness with **low burr formation** on the springs ground. Moreover, the disposal of the cut and extracted material is simplified. The proportion of grinding wheel abrasion is minimised and the collected grinding dust can be melted back down again without difficulty.

### Tailor-made grinding wheels for your specific requirements

- In sintered aluminium oxide
  - vitrified bond
  - resin bond
  - with perforated grinding face, in compact design
  - for screwing on
  - glued to steel plates
- CBN design
  - galvanic bond

### Effective cost reduction

A comparison of time needed for grinding absorbing springs makes clear that the use of sintered aluminium oxide wheels is **more economical** than the use of conventional wheels.

**Grinding wheel:** 660 x 120 x 200 mm; perforated 178 - 198 springs in the loading plate, automatic feed  
**Spring material:** CrSi-steel,  
**Spring wire diameter:** 3,6 - 4,8 mm  
**Metal removal rate/spring:** 3,0 g - 5,8 g  
**No. of springs:** 360.000  
**Total stock removal:** 1516,3 kg

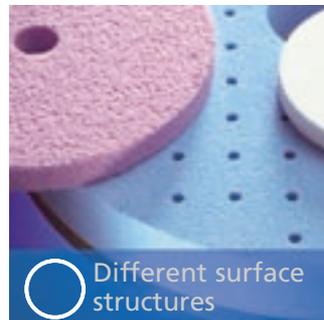
<b>Grinding wheel</b>	<b>Sintered alu. oxide</b> <b>27A 24-9 P 3 B 1205</b>	conventional alu. oxide 33A 20-1 N 3 B 1192
<b>Grinding time/loading plate</b>	<b>140 s</b>	200 s
<b>Dressing frequency</b>	<b>5</b>	30
<b>Dressing time</b>	<b>5 x 15 min = 75 min</b>	30 x 15 min = 450 min
<b>Time for wheel change</b>	<b>2 x 60 min = 120 min</b>	4 x 60 min = 240 min
<b>Machine running time</b>	<b>102,42 h</b>	153,17 h
<b>Q-ratio</b>	<b>1 : 13,1</b>	1 : 6,6



Range of springs



CBN spring end grinding



Different surface structures



CBN spring end grinding wheels



# THELEICO quality product range

## From the leading manufacturer

THELEICO company is Europe's leading manufacturer of grinding wheels for the spring industry. We offer you a reliable know-how, individual advice and economical solutions for all grinding problems.

## Extensive advice

We advise you in selecting the right grinding wheel for your application. Especially the dependency on technical requirements and economics in production have to be considered mostly under an individual aspect. You can rely on experience of over 75 years in grinding wheel manufacture.

## Optimum selection

Given our product range with all standard dimensions and qualities, an extensive stock and all possibilities for flexible and short-term manufacturing special productions, a best possible choice is ensured with a variety of alternatives.

## Quality down to the detail

It is the detailed assessment of all parameters involved in the grinding process which leads to an optimum product when manufacturing grinding wheels. In this connection, outstanding technological achievement is as important for THELEICO as economics and process safety. Consequently, a precise adjustment to the respective machines and the range of springs are always carried out.

Abrasive grain qualities, applications and design shapes



Wire  
Ø mm

Wheel type for low spring forces

Wheel type for high spring forces

### Steel qualities according to DIN EN 10270, part 1 and 2

	Wire Ø mm	Wheel type for low spring forces	Wheel type for high spring forces
Through-feed grinding	< 1,0	<b>CBN B 301</b> Cubic boron nitride galvanic bond	<b>CBN B 427</b> Cubic boron nitride galvanic bond
	< 1,5	<b>28A 46-1 O 3 VM</b> Sintered alum. oxide compact, vitrified bond	<b>28A 46-1 O 3 VM</b> Sintered alum. oxide compact, vitrified bond
	< 3,0	<b>27A 30-9 O 3 VM</b> Sintered alum. oxide perforated, vitrified bond	<b>27A 30-9 Q 3 VM</b> Sintered alum. oxide perforated, vitrified bond
Infeed grinding	< 3,0	<b>27A 24-9 P 4 B</b> Sintered alum. oxide perforated, resin bond	<b>225A 24-9 P 3 B</b> Sintered alum. oxide perforated, resin bond
	< 6,0	<b>27A 24-9 P 4 B</b> Sintered alum. oxide perforated, resin bond	<b>225A 24-9 Q 3 B</b> Sintered alum. oxide perforated, resin bond
	> 6,0	<b>27A 20-9 O 4 B</b> Sintered alum. oxide perforated, resin bond	<b>225A 20-9 O 3 B</b> Sintered alum. oxide perforated, resin bond

### Steel qualities according to DIN EN10270, part 3 and other stainless wire qualities

	Wire Ø mm	Wheel type for low spring forces	Wheel type for high spring forces
Through-feed grinding	< 1,0	<b>CBN B 301</b> Cubic boron nitride galvanic bond	<b>CBN B 427</b> Cubic boron nitride galvanic bond
	< 1,5	<b>27A 46-1 N 4 VM</b> Sintered alum. oxide compact, vitrified bond	<b>28A 36-9 Q 3 B</b> Sintered alum. oxide compact, resin bond
	> 1,5	<b>226A 30-9 N 12 B</b> Sintered alum. oxide compact, resin bond	<b>226A 30-9 O 12 B</b> Sintered alum. oxide compact, resin bond
Infeed grinding	< 3,0	<b>27A 24-9 O 3 B</b> Sintered alum. oxide perforated, resin bond	<b>27A 24-9 O 3 B</b> Sintered alum. oxide perforated, resin bond
	< 3,0	<b>226A 24-9 N 12 B</b> Sintered alum. oxide perforated, resin bond	<b>226A 24-9 O 11 B</b> Sintered alum. oxide perforated, resin bond
	> 3,0	<b>27A 24-9 O 4 B</b> Sintered alum. oxide perforated, resin bond	<b>27A 24-9 O 4 B</b> Sintered alum. oxide perforated, resin bond
	> 3,0	<b>226A 24-9 N 12 B</b> Sintered alum. oxide perforated, resin bond	<b>226A 24-9 O 11 B</b> Sintered alum. oxide perforated, resin bond
Unilateral	> 6,0	<b>34A 20-9 N 1 Mg</b> Semi-pure alum. oxide magnesite bond	<b>34A 20-9 N 1 Mg</b> Semi-pure alum. oxide magnesite bond

Unilateral grinding with fixture in prism on single-spindle machines - wet grinding

**Please contact us!**

Further information and product recommendations at [www.leisse.org](http://www.leisse.org)



**Th. Leisse GmbH & Co. KG**  
Schleifscheibenwerk  
Lagerstraße 3-5  
59872 Meschede, Germany  
P.O. Box 1554  
59855 Meschede, Germany  
Tel. +49 (0) 291/99 01 - 0  
Fax +49 (0) 291/99 01 - 28  
[info@leisse.org](mailto:info@leisse.org)  
[www.leisse.org](http://www.leisse.org)