

## CYLINDRICAL GRINDING

Grinding of tubes, pipes  
and other cylindrical parts

# VSM – Your specialist for cylindrical grinding

## Benefit from VSM's high-performing abrasives:

- > High stock removal per time unit
- > Extended service life and low set-up costs as a result
- > Consistent and reproducible surface finishes
- > Defined scratch patterns, roughness and gloss value
- > **VSM TOP SIZE** products achieve:
  - > Enhanced machining capacity
  - > A reduced temperature in the grinding area and because of this structural changes are avoided
- > The additional **VSM STEARATE** layer actively supports the grinding process and prevents chip adhesion

## With VSM you can rely on receiving:

- > High-performance products made in Germany
- > On-site application-based advice
- > Reliable delivery performance
- > Analyses of problems and preliminary tests in the VSM Technical Center
- > Expertise based on co-operating with more than 60 machine manufacturers worldwide
- > A global distribution network with subsidiaries and partners in more than 70 countries

## Your application

Tubes



Piston rods



Cylinders



Furniture



Architecture



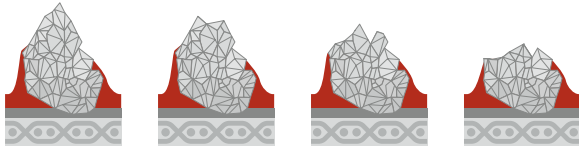
Containers



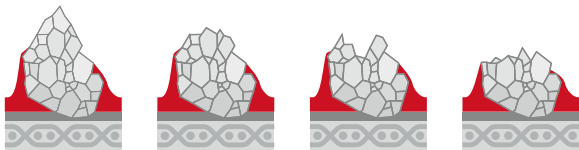
# The VSM self-sharpening concept

NEW

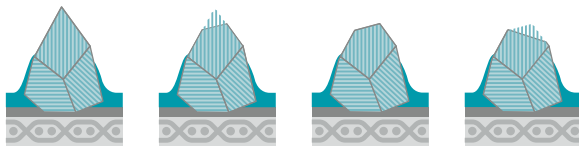
## VSM CERAMICS Plus (CER Plus)



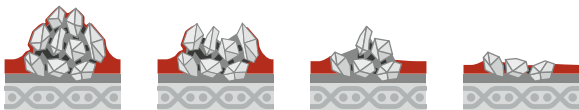
## VSM CERAMICS (CER)



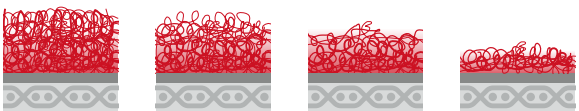
## VSM ZIRCONIA ALUMINA (ZA)



## VSM COMPACTGRAIN (COM)

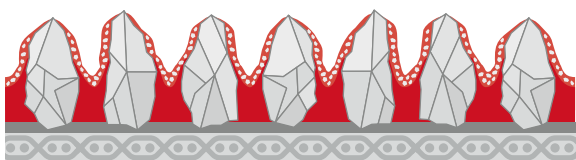


## VSM NON-WOVEN

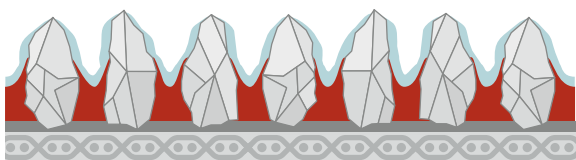


$t=0$  Grinding time

## VSM additional grinding-active layers



VSM TOP SIZE



VSM STEARATE

## For high stock removal

VSM abrasives with ceramic and zirconia alumina grains are the products we recommend when high stock removal rates are required. Continuous self-sharpening of the grain guarantees long-lasting high performance.

**VSM CERAMICS** are distinguished by their cool cutting characteristics. This enhances the service life of the abrasive. The risk of surface discoloration is considerably reduced.

The new **VSM CERAMICS Plus** makes machining of extremely hard surfaces easier. The fracture behaviour of the abrasive has been considerably improved, which enhances the service life even more.

## For perfect surface finishes

**VSM COMPACTGRAIN** describes an abrasive granulate which is composed of numerous individual abrasive grains. A uniform stock removal rate and a consistent roughness across the entire life of the product and an extremely long service life are the most impressive characteristics of the **VSM COMPACTGRAIN** series. **VSM NON-WOVEN** perfectly follows the shape of a workpiece. This produces premium surface qualities which can easily be reproduced.

For applications involving the dry machining of stainless and high-temperature steels we recommend using **VSM TOP SIZE** products. Additional layers with grinding additives can further improve the cutting performance of VSM abrasives whilst reducing the workpiece temperature in the contact area considerably.

The use of **VSM STEARATE** leads to an increase in productivity when machining wrought alloys (NF metals). This effect is achieved by effectively preventing clogging of the abrasive.

# Grinding of tubes and bars



Grinding of longitudinally welded tubes



Centerless grinding of tubes and bars



Cylindri  
using h



For large  $\varnothing$



For small  $\varnothing$

## Recommended products

	VSM series	Grain type	Grit size
Stock removal ↑	XK885Y	CER Plus	20–120
	XK850X	CER	36–80, 120
	KK815Y	ZA	36–100
	ZK713X	ZA/AO	24–320
	XK789X	COM (CER)	60, 80
	KK718X	COM (AO)	60–600
Surface finish ↓	CK748X	COM (SIC)	80–400
	CK772T	COM (SIC)	80–1200

## Recommended products

	VSM series	Grain type	Grit size
Stock removal ↑	XK880Y	CER Plus	20–120
	XK760X	CER	24–120
	ZK713X	ZA/AO	24–320
	XK786X	COM (CER)	60, 80, 120
	KK718X	COM (AO)	60–600
	KK712X	COM (AO)	80–600
Surface finish ↓	CK748X	COM (SIC)	80–400
	CK917C	CORK (SIC)	800
	KV707X	Non-woven (AO)	coarse–fine
	KV707X	Non-woven (SIC)	very fine

## Recommended products

	VSM series	Grain type	Grit size
Stock removal ↑	XK880Y	CER Plus	20–120
	XK760X	CER	24–120
	ZK744X	ZA	36–80
	XK789X	COM (CER)	60, 80
	KK712X	COM (SIC)	80–600
	CK748X	COM (SIC)	80–400
Surface finish ↓	CK918X	COM (SIC)	240–1200
	CK917C	CORK (SIC)	800
	KV707X	Non-woven (AO)	coarse–fine
	KV707X	Non-woven (SIC)	very fine

## Legend

DA VSM DIAMOND  
 CER Plus VSM CERAMICS Plus  
 CER VSM CERAMICS  
 ZA VSM ZIRCONIA ALUMINA

COM (CER) VSM COMPACTGRAIN CERAMICS  
 COM (AO) VSM COMPACTGRAIN ALUMINIUM OXIDE  
 COM (SIC) VSM COMPACTGRAIN SILICON CARBIDE  
 AO VSM ALUMINIUM OXIDE

SIC VSM SILICON CARBIDE  
 Non-woven (AO) VSM NON-WOVEN ALUMINIUM OXIDE  
 Non-woven (SIC) VSM NON-WOVEN SILICON CARBIDE  
 CORK (SIC) VSM CORK SILICON CARBIDE

VSM SILICON CARBIDE  
 VSM NON-WOVEN ALUMINIUM OXIDE  
 VSM NON-WOVEN SILICON CARBIDE  
 VSM CORK SILICON CARBIDE

# Wire grinding



Local grinding of tubes and bars  
hand-held machines



## Recommended products

M series	Grain type	Grit size
885T	CER Plus	36, 40, 60, 80, 120
870X	CER	24–120
850X	CER	36–80, 120
870F	CER/AO	60–400
713X	ZA	24–320
772J	COM (AO)	80–1200
772T	COM (SIC)	80–1200
711T	AO	50–500
721X	SIC	24–600
707X	Non-woven (AO)	coarse–fine
707X	Non-woven (SIC)	very fine



Wire descaling



## Recommended products

VSM series	Grain type	Grit size
XK885Y	CER Plus	20–120
XK870X	CER	24–120
XK760X	CER	24–120
KK815Y	ZA	36–100
KK715X	ZA	24–80
ZK713X	ZA/AO	24–320
KK718X	COM (AO)	60–600
KK834X	COM (AO)	80–240
CK748X	COM (SIC)	80–400

Stock removal ↑  
Surface finish ↓

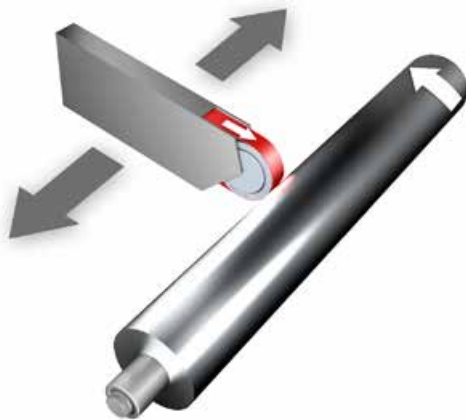
# Grinding of cylindrically-shaped workpieces



Cylindrical grinding of piston rods and cylinders and grinding between centres



Cylindrical grinding of rollers during roller pass



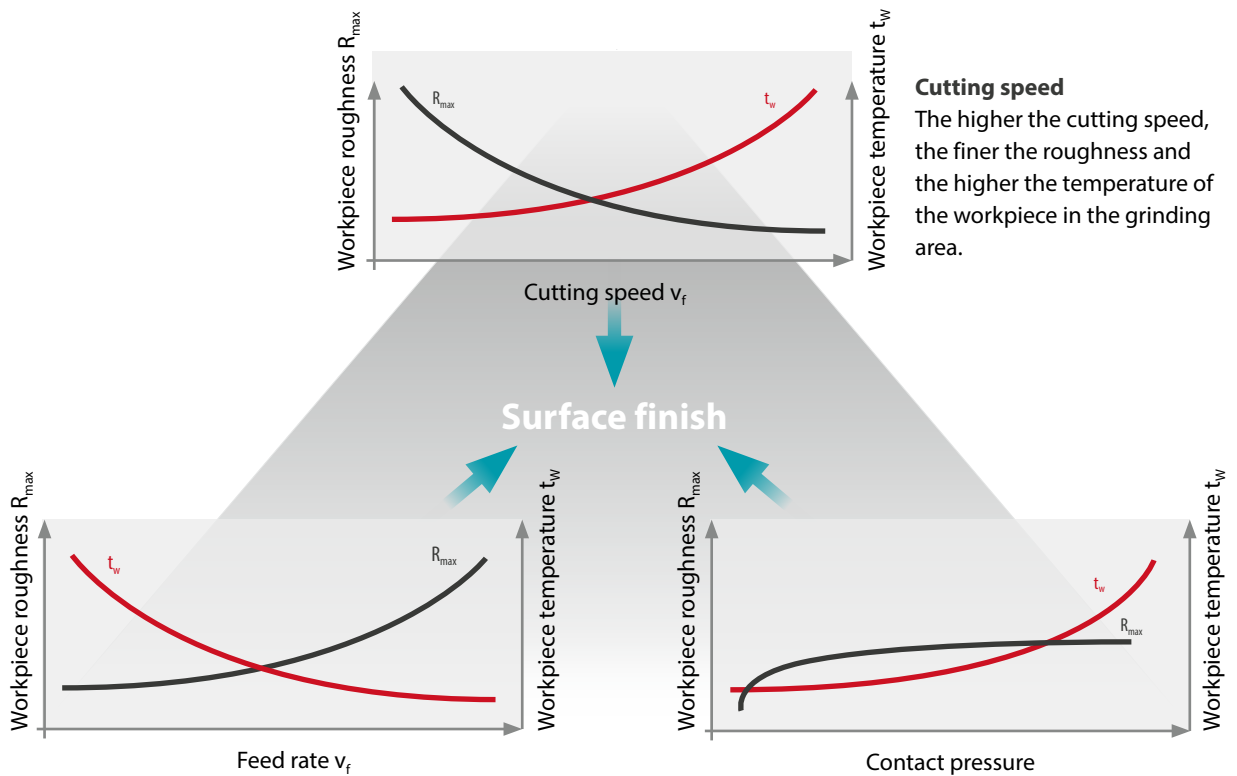
## Recommended products

	VSM series	Grain type	Grit size
<span style="color: red;">↑</span> Stock removal             <span style="color: blue;">↓</span> Surface finish	DA930X	DA	46, 64, 91, 126, 251, 357 (µm)
	XK885Y	CER Plus	20 – 120
	XK760X	CER	24 – 120
	ZK713X	ZA	24 – 320
	XK786X	COM (CER)	60, 80, 120
	KK718X	COM (AO)	60 – 600
	KK712X	COM (AO)	80 – 600
	CK748X	COM (SIC)	80 – 400
	CK772T	COM (SIC)	80 – 1200
	KK711Y	AO	36 – 500
	KV707X	Non-woven (AO)	coarse – fine
	KV707X	Non-woven (SIC)	very fine

## Recommended products

	VSM series	Grain type	Grit size
<span style="color: red;">↑</span> Stock removal            <span style="color: blue;">↓</span> Surface finish	DA930X	DA	46, 64, 91, 126, 251, 357 (µm)
	XK885Y	CER Plus	20 – 120
	XK850X	CER	36 – 80, 120
	XK760X	CER	24 – 120
	ZK744X	ZA	36 – 80
	XK789X	COM-CER	60, 80
	CK748X	COM-SIC	80 – 400
	CK918X	COM-SIC	240 – 1200
	KK711Y	AO	36 – 500
	KV707X	Non-woven (AO)	coarse – fine
	KV707X	Non-woven (SIC)	very fine

# Grinding parameters



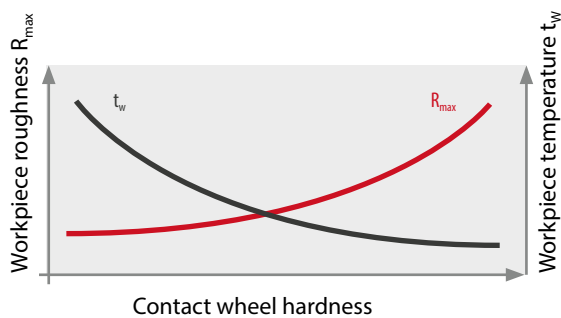
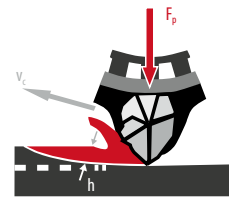
## Feed rate

The higher the feed rate, the deeper the roughness, and the lower the temperature of the workpiece in the grinding area.

## Contact pressure

The higher the contact pressure, the higher the temperature of the workpiece because of the penetration of the abrasive grains into the workpiece. There is hardly any change in the roughness of the workpiece.

$F_p$  = Contact pressure  
 $v_c$  = Cutting speed  
 $h$  = Chip thickness



## Contact wheel hardness

The harder the contact wheel, the deeper the roughness and the lower the temperature of the workpiece in the grinding area.



**Surface Type** (coating)  
 metal, rubber, synthetic material  
**Hardness** °Shore A  
**Serration** shape, land to groove ratio  
**Metal body**

# A worldwide leader in abrasives.



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