

STUDER WireDress®

LATEST GENERATION OF MACHINE
INTEGRATED DRESSING TECHNOLOGY
FOR METAL-BONDED GRINDING WHEELS

**FOR INTERNAL
AND EXTERNAL
GRINDING WHEELS**

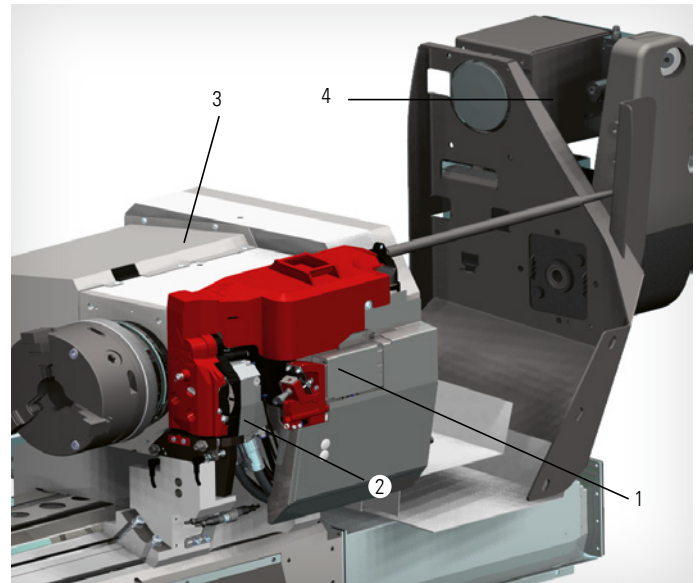
Diamond and CBN grinding wheels with electro-conductive bond can be dressed, profiled, and sharpened using wire EDM in the grinding machine.



STUDER WireDress® COMPONENTS

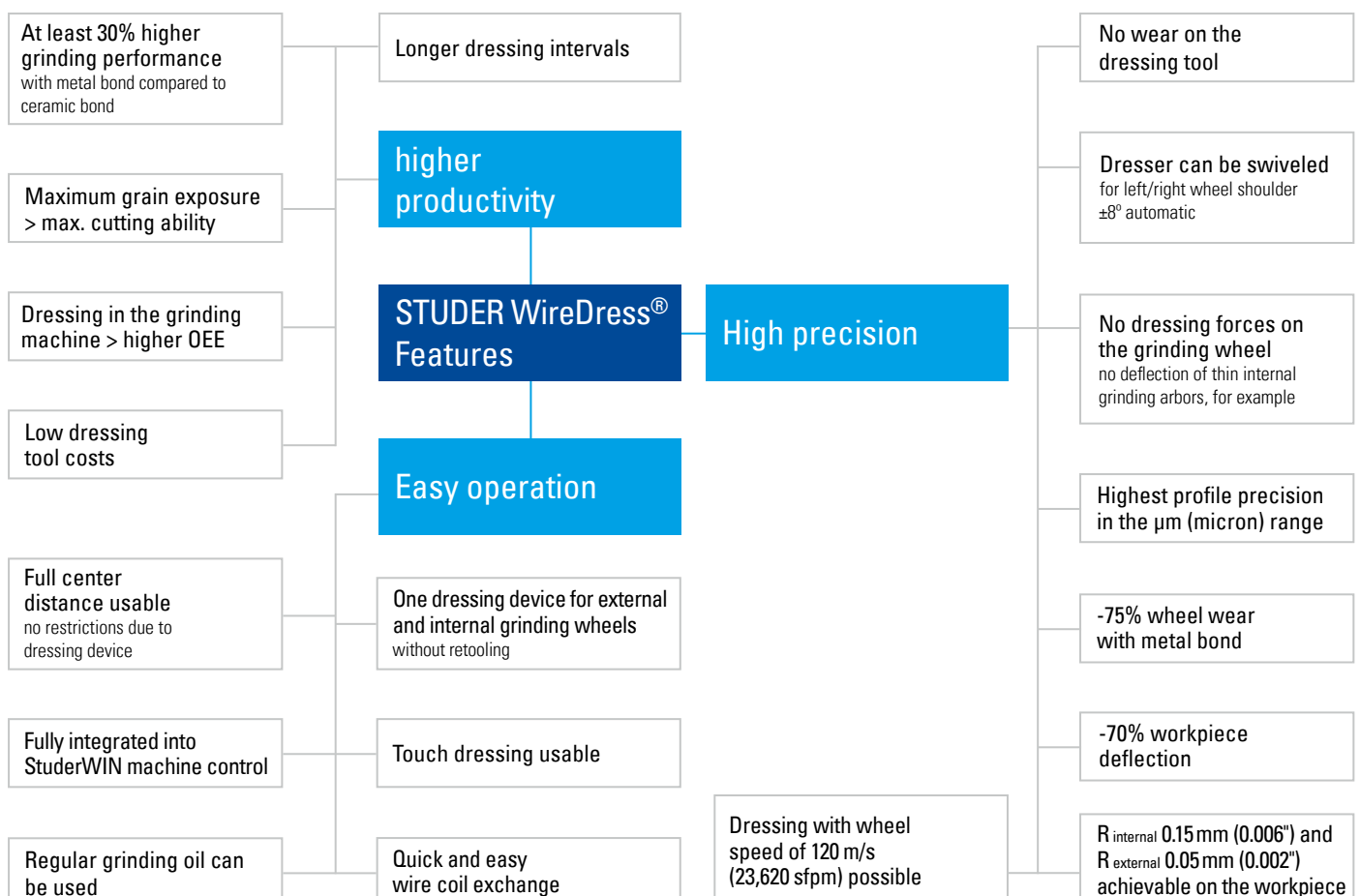
Grinding wheels with extremely hard abrasives such as diamond or CBN are used for grinding ceramics, carbide, and hardened steel. In previous grinding processes, such grinding wheels very often had a synthetic resin or ceramic bond. One way to increase precision and cost-effectiveness in these grinding applications is to use grinding wheels with a sintered metal bond. However, their use has been limited so far, as metal bonds can only be dressed to a very limited extent and have only average cutting performance.

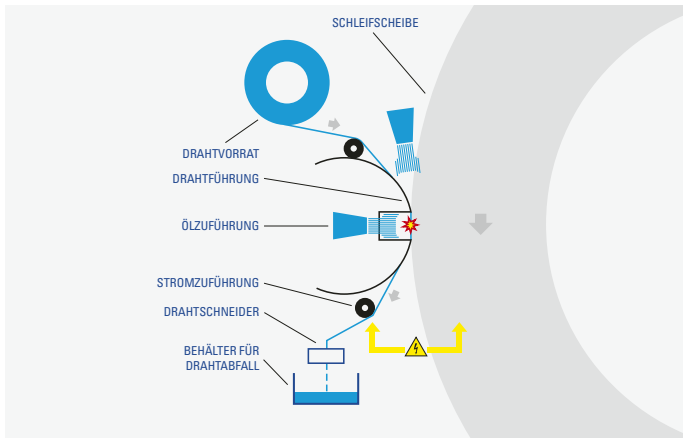
With the innovative STUDER WireDress® dressing technology, metal-bonded grinding wheels can now be conveniently dressed, i.e. profiled and sharpened, with maximum precision in the grinding machine at full working speed. This also gives the grinding wheel a high cutting ability with high grain clearance. WireDress is available as a dressing technology on the STUDER S22 and S41 cylindrical grinding machines.



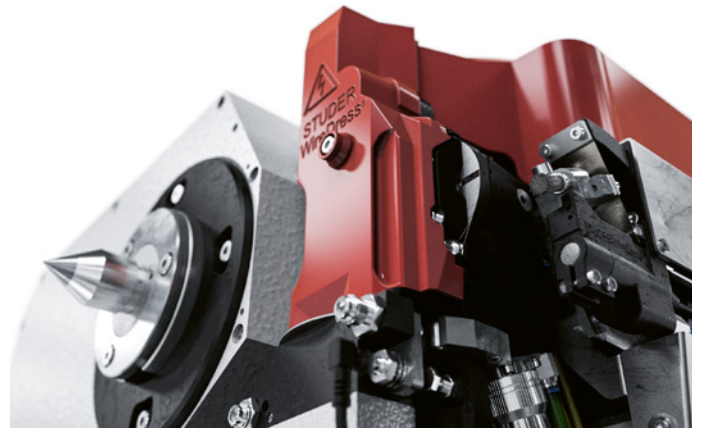
- 1 STUDER WireDress® Dressing unit in the T-slot table interface
- 2 Wire guide automatically swivels to 2 adjustable positions, max. $\pm 8^\circ$
- 3 Workhead
- 4 Wire supply module and wire cutter fixed to the machine table

PERFORMANCE FEATURES OF STUDER WIREDRESS® TECHNOLOGY





Principle diagram of wire electrical discharge dressing using STUDER WireDress®

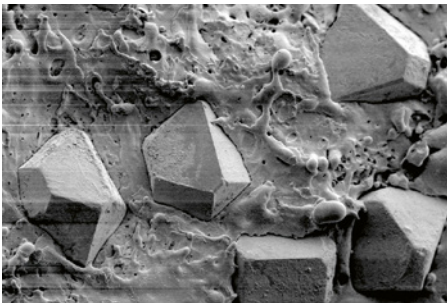


STUDER WireDress® Dressing unit

The dressing process is based on the basic principles of wire electrical discharge machining. Wire erosion selectively removes the grinding wheel bond – the properties of the abrasive grain remain unaffected. Due to the nature of the process, a dielectric, i.e., a grinding oil (no water-based emulsions), is required. There is no mechanical contact between the wire as the dressing tool, the grain, or the bond. With metal-bonded grinding wheels dressed in this way, it is possible to increase productivity by at least 30% compared to grinding with synthetic resin or ceramic bonds, depending on the application. In addition, this precise dressing process, in combination with the performance parameters of the metal bond, such as high dimensional stability,

enables workpieces with very demanding geometries, to be reproducibly produced, which was previously impossible or uneconomical.

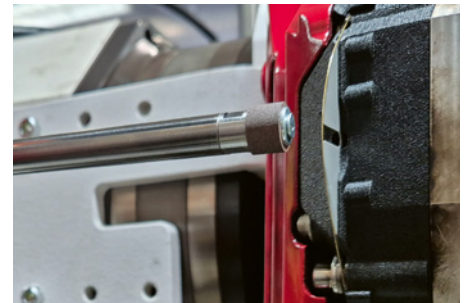
STUDER WireDress® technology opens up new grinding technology possibilities, especially for internal grinding applications. Dressing the most complex wheel profiles at full grinding speed (up to 60,000 rpm) results in a significant increase in achievable precision and process stability. Thanks to the contact-free and force-free dressing process, even extremely long and slim internal grinding mandrels can be dressed without deflection. The system allows up to two internal and external grinding tools to be combined in one machine configuration.



Excellent grain exposure

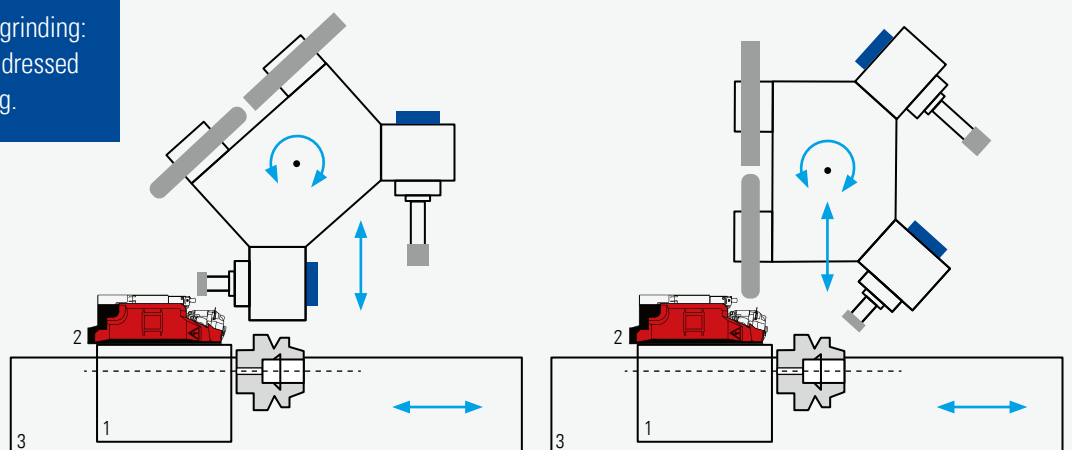


Efficient dressing of complex profiles



Dressing slim internal grinding mandrels without deflection

Combined external and internal grinding:
Up to four grinding tools can be dressed
in one machine without retooling.

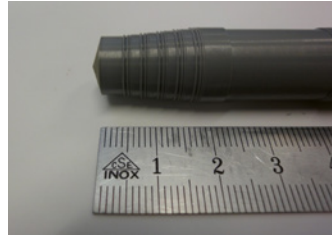


- 1 Workhead
- 2 WireDress unit
- 3 Z-axis

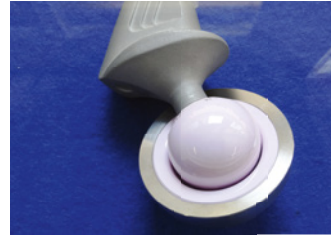
APPLICATION EXAMPLES FOR VARIOUS WORKPIECES AND MATERIALS



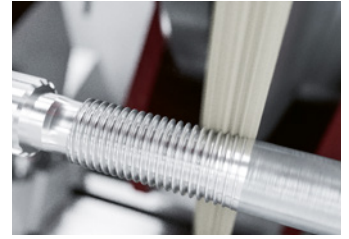
Carbide, cutting tools



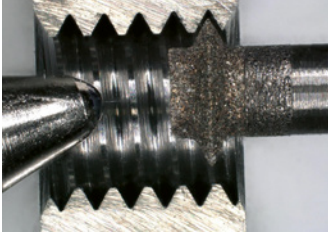
SiN ceramics



Ceramics, medical technology



Hard steel, threads



Miniature thread gauge ring



Deep grooves, toolmaking

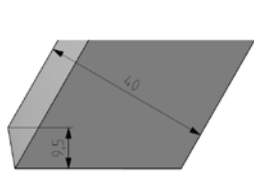


Hard steel, ball screw nut

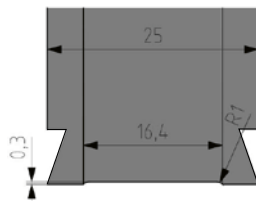


Carbide, bearing sleeve

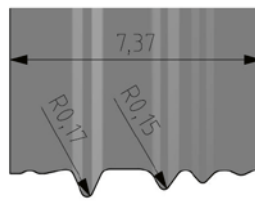
EXAMPLE: SELECTED WHEEL PROFILES



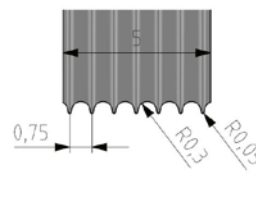
30° plunge angle with shoulder



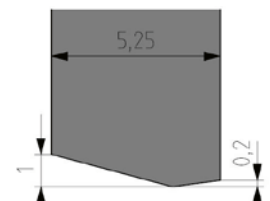
Undercut or relieved wheel



Profile for thread taps



Fine thread



Peel grinding

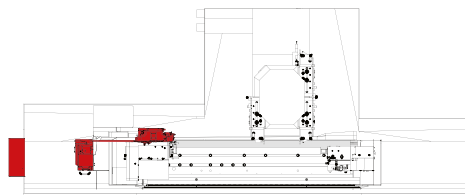
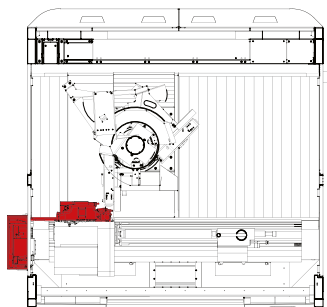
The STUDER WireDress® system is installed as a customer-specific option on the table interface. It also includes a wire cutter integrated

within the machine and an additional external electrical enclosure.

S22

S41

Arrangement of the WireDress system in the machine



Grinding wheels	Requirements for STUDER WireDress®: Steel body with electro-conductive bond. External grinding dia. 400 to 500 mm (16" to 20") / All common internal grinding wheels with electro-conductive bond and internal grinding arbor	
Usable center distance	up to 720 mm (28.3") (S22)	up to 1600 mm (63") (S41)
Wheelhead	All standard variants External grinding, up to 2× external grinding + 2× internal	
Dressing wire	Special high-performance EDM wire STUDER DressWire	
Installation plan	For STUDER WireDress®, an additional electrical enclosure is required next to the machine, with a footprint of approx. W 1 m (39.4") × D 0.6 m (23.6") × H 1.2 m (47.2")	

