



We reserve the right to make technical changes in the interests of improve

## Specimen grinding machine PSM2000-15 Tensile specimens from sheet metal

Video: [https://www.youtube.com/watch?v=Zvvs6FIX\\_KY](https://www.youtube.com/watch?v=Zvvs6FIX_KY)

- On the market since 1967, constantly evolving (generation 15)
- Unrivalled quality: Dimensional accuracy (parallelism)  $\leq 0.02\text{mm}$  (!)
- Excellent sample edges for R+N value determination ( $< 5.0$  RZ roughness)
- Tensile test  $< 3$  minutes testable (punching + grinding)  $< 300/\text{coat}$  ( $> 300$  see PSM2000-A)
- Can also be used for parallel strips (pipe stiffeners, tapes, etc.)

Sample grinding machine PSM2000 Generation 15

For flat tensile specimens made of sheet metal (0.1 - 14 mm)

Sheet Metal Tensile Specimen Preparation - "We Know-How"!

For sheet metal tensile specimens according to DIN / EN / ISO6892 (DIN 510125) ASTM, JIS, AFNOR or others

**For grinding punched, laser-cut tensile specimens:** The basic prerequisite for obtaining correct, reproducible test results is the good quality of the tensile specimen. Punching is the most economical way of producing specimens, provided it is possible to remove the work-hardened edge zone of the test specimen cleanly and quickly. **If the work hardening is not removed (standardised according to ISO 6892 and others), Rp0.2 yield strength can be increased (wrong) by up to 20%.**

**Grinding of tensile specimens that have been cut by laser or water jet:** Due to the further development of steels, high-strength sheets with strengths of up to 1,500 or even 1,800 MPa are increasingly being used in industry and particularly in automotive construction (B-pillars, frame parts). Tensile specimens are not usually cut out of these high-strength sheets by punching. Alternatively, the tensile specimen is cut using a laser beam. Cutting the specimen with the laser beam melts the edges, which significantly changes the material properties in the heat-affected zone (damage for 3 mm thick sheets: approx. 0.3 - 0.5 mm per side). In addition, the flank quality of the tensile specimens produced with laser and waterjet cutting is not standardised, resulting in up to 1/3 less elongation. In addition, the cut with the water jet is made at right angles to the tensile direction, is very rough and usually conical. These errors lead to incorrect results, which cannot be compensated for even by the best (gold-plated) tensile testing machine.

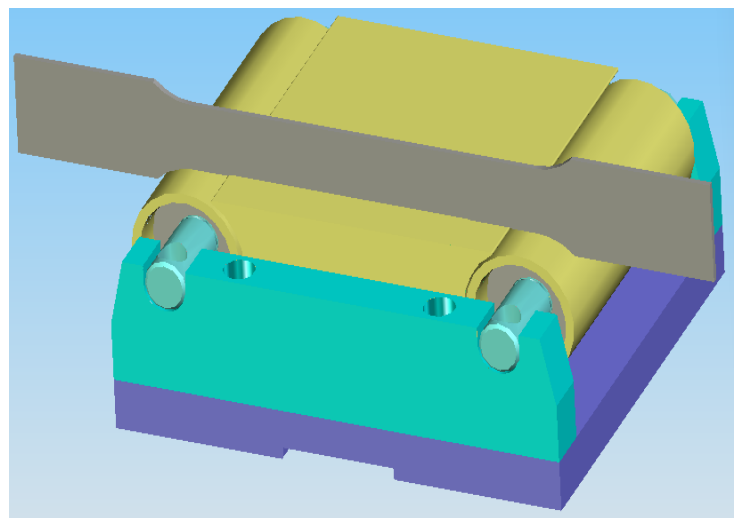
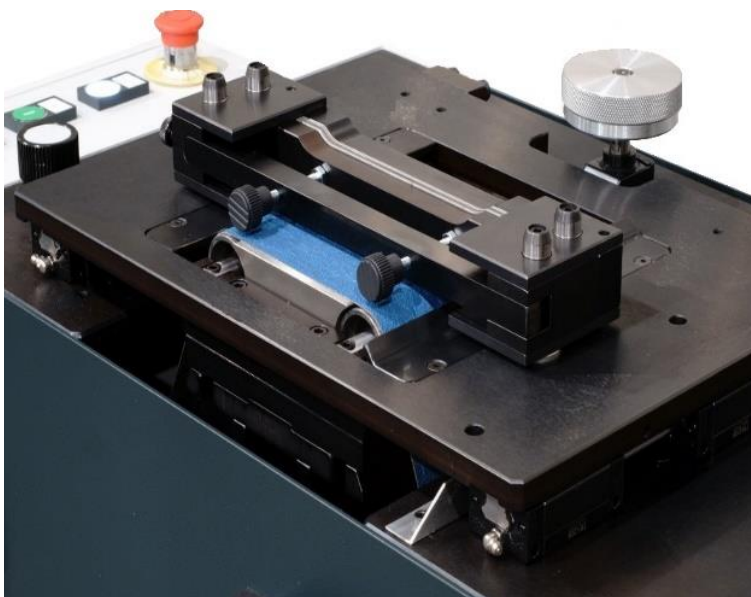
The removal of edge damage (in the case of stamping: the work-hardened edge zone) by grinding with the PSM2000 has been tried and tested for all steel grades since 1967. Grinding with the PSM2000 is recognised as the only suitable and standard-compliant finishing method for the boron-alloyed steels used in form hardening / press hardening (e.g. 22MnB5). Milling cutters fail with these extremely tough sheets right from the first use!

The design of the sample grinding machine, which has been known since 1967, has been continuously improved. It makes it easy (even for semi-skilled workers) to produce absolutely parallel specimens with a high surface quality in a minimum of time. The guaranteed parallelism of the samples is  $>0.02$  mm (as recommended by the IDDRG International Deep Drawing Research Group).

### Centre specimen crack guaranteed within $L_0$ / $L_e$ (cutting of the extensometer)

Do you need to use a probe arm extensometer to centre the sample crack? In general, this measure is **not** necessary (especially for soft grades) as a central specimen crack typically occurs after grinding. However, the harder a specimen is, the more critical is the bending influence of the tensile testing machine/clamping fixtures, for example. In order to provoke a central specimen break, the PSM2000 can be designed for centrally tapered grinding on request: 0.03mm per side / 0.06mm in total)

Weight approx.	: 200 kg	Sanding belt (please test)	: Grit 80 = $\leq 6$ mm
Dimension width / height / depth	: 92 x 112 x 46 cm		: Grit 60 = $\geq 6 - 10$ mm
Colour	: light grey / graphite grey	Belt tension	: 6bar compressed air
Sanding belt length	: 2000 mm		: Side A, then side B - done
Belt travelling speed	: approx. 15 m/sec	Sanding system	: approx. 1 - 3 minutes
Power supply V/Hz/kW/A	: 400/50/1.5/2   480/60/1.5/2	Grinding time	
Number of samples each / strip	: 50 - 500 (depending on hardness)		
Number of samples per grinding	: Stack < 20 mm		

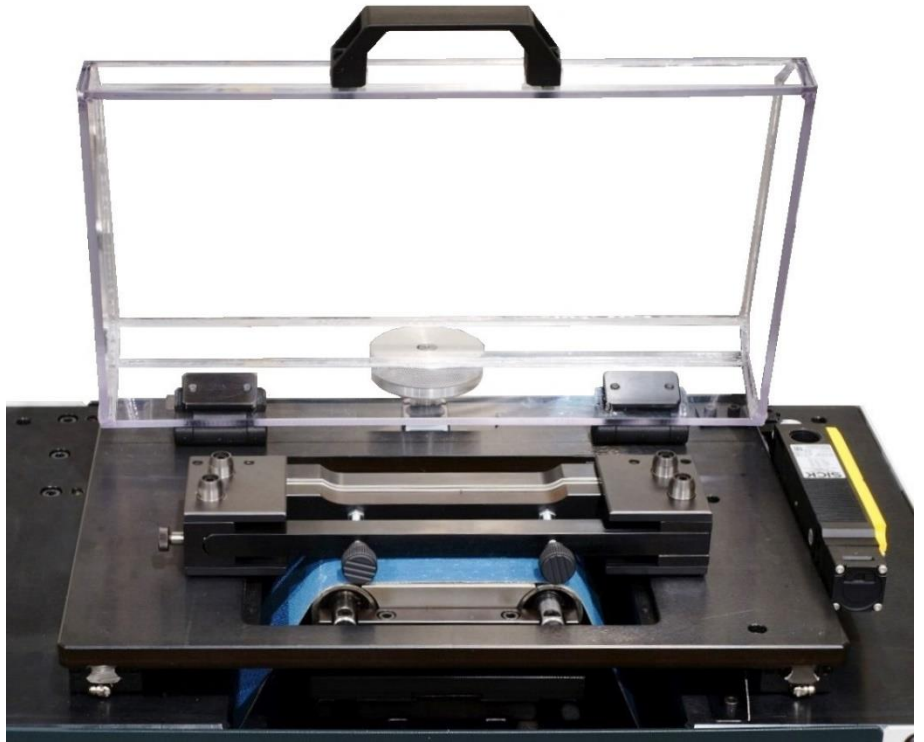


**Option:**

Protective cover in conjunction with oscillating sample table

This protective cover is NOT required to obtain CE conformity: The PSM2000 sanding machine has been assessed by the BGHM trade association: "Can be operated without this protective cover without risk".

(receives a CE declaration of conformity even without a protective cover)



**Option:**

Actively **cooled sample holder** for temperature-sensitive samples (aluminium, bake-hardening steels, vehicle bodywork, non-ferrous metals)

Hydraulic cooling with an external chiller ensures that the samples are cooled so that heating <math><50^{\circ}\text{C}</math> is excluded

Photo: Hydraulically cooled sample holder PSM2000-A2 (patent 2023)

Video: [https://youtu.be/8sNn\\_zt4AIA](https://youtu.be/8sNn_zt4AIA)

Note: If you have a large number of samples to grind, it makes sense to purchase the fully automatic PSM2000-A2 sample grinding machine: Insert samples, start and after approx. 4 minutes of unmanned operation the samples are perfectly ground (unmanned)