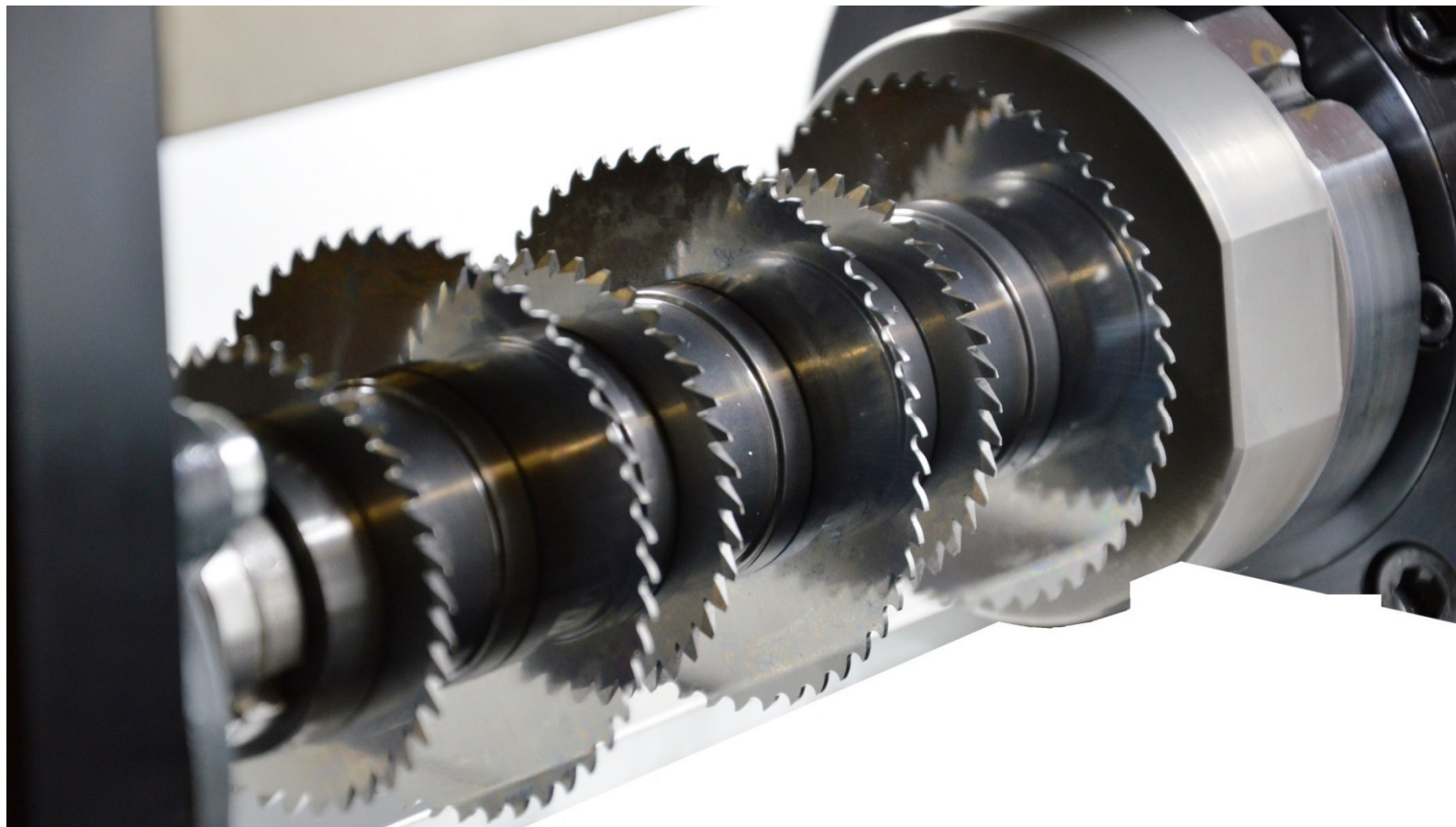


## MKF metal notch milling machine

High-performance milling machine for Charpy / Izod notched bar impact test specimens for efficient notching and simultaneous Separation or sectioning of up to 12 specimens 10 x 10 x >165 (ISO 148, ASTM E23, ASTM A370-NIST)

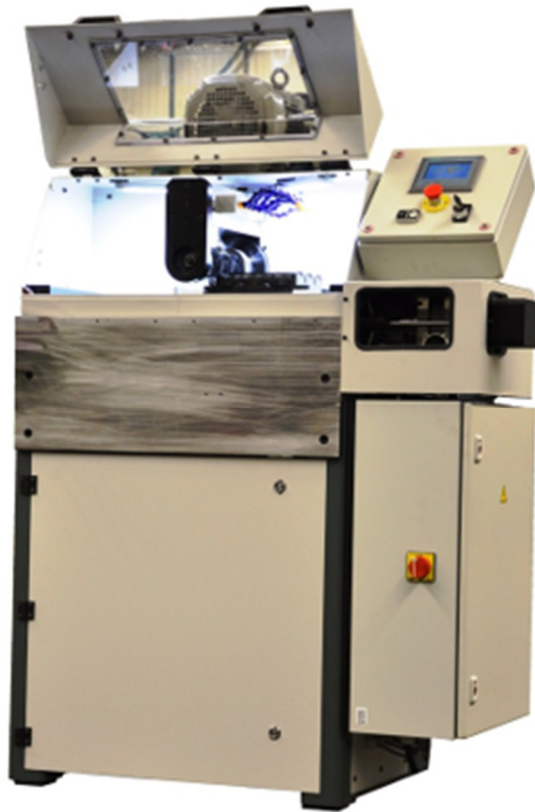
The conventional production of specimens for notched bar impact tests involves considerable effort: The milled and ground test bars (5 µm RA without end faces) must be precisely aligned, clamped and, depending on the specimen thickness (notch depth or residual thickness), milled for precise milling of the notch, which is very time-consuming. Aligning the sample package for milling in a conventional CNC milling machine alone often takes >10 minutes. If the process is to be fully automated from A to Z, an extremely expensive 5-axis milling center with tool changer is required.



The MKF enables a different procedure: The milled and ground test bars 10 x 10 x approx. 165 mm are fixed to the travelling table using magnetic clamps and clamping screws. The user closes the protective cover and starts the cycle (approx. 30 - 180 seconds). At the end of the notch, the travelling carriage is located on the left-hand side of the milling shaft. The finished impact samples are removed and the clamping table is cleaned. After repositioning in rapid traverse, a new load can be applied. Within the cycle, up to 12 test bars are milled and divided (3 samples) or sectioned (one bar remains for breaking off) simultaneously in one process. The machine mills V or U notches on 12 test bars >165 mm with 3 specimens each within **30 - 180** seconds plus loading. The machine body is mounted in an extremely solid frame.

The high dead weight of 1,100 kg ensures smooth running. The extremely rigid structure of the milling spindle, its support frame and the machine bed ensure high-precision milling of the V or U notches while simultaneously separating/sectioning the test bar into 55 mm sections.

The speed of the milling spindle can be infinitely adjusted from 190 - 465 rpm. The feed rate is infinitely adjustable from 260 - 645 mm/min. The desired notch depth can be set on the machine (once during commissioning). During processing, the samples are cooled by a circulating cooling system using a water jet.



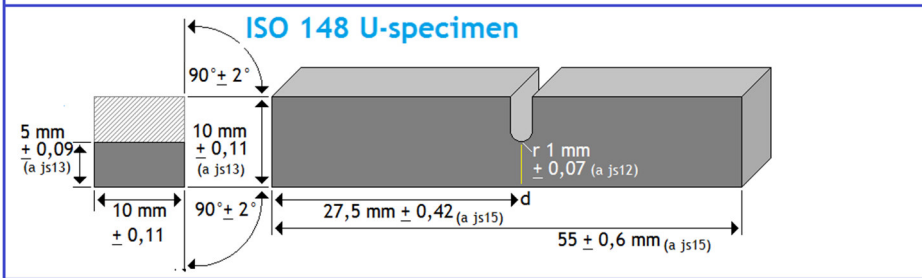
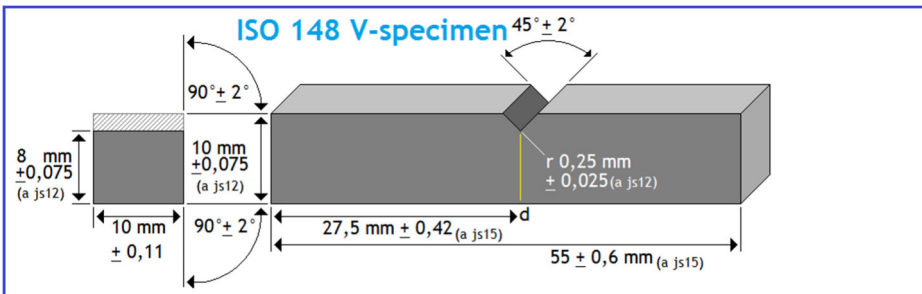
### Equipment features:

- Extremely stable frame with height adjustment via wedge slider and spindle fixation
- Powder-coated enclosure
- Lower part coated with special oil chamber paint (oil emulsion resistance)
- Very solid milling spindle with excellent bearings, extremely rigid C-shaped frame
- Oversized milling spindle drive motor: 5.5KW for speeds: 190 - 465 rpm
- Cutting speed notch milling cutter 38 - 92 m/second
- Cutting speed cut-off cut 48 - 117m/second
- Travelling section with precision linear guides with wipers and roller blind covers
- Drive power feed: 0.37KW (gearbox 1:26) for milling feed: 260 - 645 mm/min
- Total power in average milling operation approx.: 4 KW
- Cycle time approx. between 30 - 180 seconds, depending on the material
- Emulsion cooling milling cutter, integrated circulation cooling system with stainless steel tank 60 liter coarse filter, chamber filter, circulation pump
- Optional: Chip collector magnet (extends the service life of the coolant)
- Clamping device for 12 bars of 3 specimens = 36 impact test specimens per cycle
- Speed and feed programmable via display
- 60-liter tank on castors, drain valve, lid, coarse + chamber filter, circulation pump, hoses
- 1 set of cutters (saw cut for separation) made of carbide, diameter 80 x 1 mm
- 1 set of contour / notch cutters for V-notch 45 degrees, made of carbide, diameter 63 x 2 mm
- 5 liter of water-based lubricating emulsion concentrate (environmentally friendly), can be disposed of with waste water
- Dimensions / weight approx.: 1180 x 700 x 1,680 mm / approx.: 1,150 kg
- Connection 400V/50Hz 16A plug

The machine is bolted to an extremely solid base frame. A 60-liter recirculating cooling system is housed in this base. The height adjustment (unique during set-up) is guided by a very solid graphite self-lubricating linear guide. The infeed spindle is protected against splash water and milling chips by a dirt roller blind. The control unit is installed in a separate electrical box. Once the machine has been set up, operation is extremely simple:

- Open the protective cover
- Unclamp and remove samples from the previous cycle
- Clean the holder from the previous milling process (blow out chips)
- Push in new test rods to the stop and secure with clamping screws
- Close the protective cover
- If necessary, change the milling / infeed speed, press Start
- Wait 30 - 180 seconds ...





a (js) : Tolerance = ISO286-1 © Wolfram Schütz 2013

b : surface roughness:  $< 5 \mu\text{m Ra}$  (not required for end surface)

c : If different specimen height will be defined (2 / 3 mm) also limits of accuracy has to be defined

d : At impact testing machines with automatic centring devices a centricity tolerance of  $\pm 0,165 \text{ mm}$  (instead  $\pm 0,42$ ) is recommended.

