Standards for machine tools, an update

ISO/TC 39, machine tools

Changes since LAMDAMAP 2015

Standards under development

Members of ISO/TC 39 machine tools

- **21 participating countries** (AT, BE, BR, CN, CZ, FI, FR, DE, IN, IR, IT, JP, KR, PL, PT, RU, ES, SE, CH, UK, US)

- **23 observing countries** (AR, BY, BG, CA, HR, CU, DK, EG, GR, HK, HU, ID, IL, KP, NL, PK, RO, RS, SK, TH, TN, TR, UA)

www.iso.org
ISO/TC 39, machine tools
152 published standards, plus 39 standards in development

SC 2
test conditions (metal cutting)
AT/NL
J. Fornather
G. Florussen
81 documents

SC 4
wood-working machines
IT
P. Visintin
I. Betti
35 documents

SC 6
noise
DE
K. Mack
H. Schmischke
6 documents

SC 8
spindles, chucks
DE
K. Mack
J.-C. Laurent
11 documents

SC 10
safety
CH
R. Widmer
W. Knapp
12 documents

TC
TC, WGs

ISO/TC 39 Machine tools

- components (tables, centres, lubrication, etc.)
- symbols
- presses, testing
- modular units
- ball screws, ball splines
- production equipment for microsystems
- environmental evaluation

ISO series 14955
ISO/TC 39 Machine tools, environmental evaluation

ISO 14955-1:2014, energy-efficient machine tools
revised version to be published in 2017 (updated energy efficiency improvements)
know the relevant users of energy

1 total energy
2 machine tool operation
3 process conditioning
4 workpiece handling
5 tool handling
6 recyclables and waste handling
7 machine tool cooling

ISO 14955-2:2017, measuring energy supplied
correct and repeatable measurement of energy supplied
sample shift regime

1 OFF
2 READY FOR PROCESSING
3 PROCESSING
4 evaluation period
defined operating states
defined machine tool activities

specific shift regimes
task based test scenarios
ISO/TC 39 Machine tools, environmental evaluation

ISO 14955-2:2017, measuring energy supplied
correct and repeatable measurement of energy supplied
results presented in kWh (Wh)
electrical energy equivalent

example for 1 m³ (ANR)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>300 bar</td>
<td>0,003 kWh</td>
<td>0,005 kWh</td>
<td>0,060 kWh</td>
<td>0,11 kWh – 0,13 kWh</td>
</tr>
<tr>
<td>600 bar</td>
<td>0,010 kWh</td>
<td>0,017 kWh</td>
<td>0,085 kWh</td>
<td></td>
</tr>
<tr>
<td>1 000 bar</td>
<td>0,034 kWh</td>
<td>0,093 kWh</td>
<td>0,105 kWh</td>
<td></td>
</tr>
<tr>
<td>1 600 bar</td>
<td>0,077 kWh</td>
<td>0,120 kWh</td>
<td>0,145 kWh</td>
<td></td>
</tr>
</tbody>
</table>

ISO/TC 39 Machine tools, environmental evaluation

ISO/WD 14955-3:2017, Testing metal-cutting machine tools with respect to energy efficiency
definition of a reference process (process, material, tools, tolerances)

ISO/DIS 14955-4:2017, Measuring metal-forming machine tools and laser processing machine tools with respect to energy efficiency
idle cycling
spacers for force simulation
test pieces for punch presses and for laser cutting machines

ISO/WD 14955-5:2017, Testing woodworking machine tools in respect to energy supplied
test pieces (including process parameters) for a wide range of woodworking machine tools
ISO/TC 39/SC 2, test conditions for metal cutting m.t.

**basic standards**
- series 230

**machine specific standards**
- machining centres, series 10791
- turning centres, series 13041
- milling machines
- grinding machines
- drilling machines
- EDM
- broaching machines

**general standards**
- short time machine tool capability, ISO 26303:2012
- vibration of spindles, series 17243
- accessory spindle heads, ISO 17543-1
- numerical compensation, ISO/TR 16907:2015

ISO/TC 39/SC 2, basic standards, series 230

  least increment step

- ISO 230-7:2015 Geometric accuracy of axes of rotation
  application for rotary axes and several sensitive directions

  repeatability of touch trigger probes and scanning probes
ISO/TC 39/SC 2, revision of machine specific stds

Revision of machine specific standard on machine tool accuracy
- ISO 1985:2015 Surface grinding machines
- ISO 2407:1997/Amd 1:2016 Internal cylindrical grinding machines
- ISO 3070-2:2016 Boring and milling machines
- ISO 13041-5:2015 Turning centres, Accuracy of speeds and interpolation
- ISO 14137:2015 Wire EDM

ISO/TC 39/SC 2, future work

Basic standards
- ISO 230-10, Measuring performance of probing systems including laser light barrier systems, bore gauges
- ISO/DTR 230-11 Measuring instruments for geometry tests publication 2017
### ISO/TC 39/SC 2, future work

**Basic standards**
- ISO 230-10, Measuring performance of probing systems including laser light barrier systems, bore gauges
- ISO/DTR 230-11 Measuring instruments for geometry tests publication 2017

**Machine specific standards**
- ISO 10791-7:2014/DAmd 1, MC, S-shaped test piece
- ISO/NP 10791-10, MC, thermal distortion, machining tests
- ISO/DIS 6480, broaching machines, horizontal, internal, rev.
- ISO/DIS 6481, broaching machines, vertical, surface, rev.
- ISO/DIS 6779, broaching machines, vertical internal, revision
- ISO/NP 19744-1, broaching machines, NC, vertical surface

**General standards**
- ISO/DTR 17243-2 Spindle vibrations, direct and belt driven
- ISO 17543-1 Accessory spindle heads, under publication

### ISO/TC 39/SC 4, woodworking machines

**Active since about 3 years**

**Safety of woodworking machines**
- ISO 18217:2015, edge-banding machines
- ISO 19085-1, common requirements, under publication
- ISO 19085-2, horizontal beam panel circular sawing, u. publ.
- ISO 19085-3, NC boring and routing machines, under publ.
- ISO/FDIS 19085-4, vertical panel circular sawing machines
- ISO 19085-5, dimension saws, under publication
- ISO/DIS 19085-6, single spindle vertical moulding machines
- ISO/FDIS 19085-7, planing machines
- ISO/DIS 19085-8, wide-belt calibrating and sanding machines
- ISO/DIS 19085-9, circular saw benches
- ISO/DIS 19085-10, building site saws
- ISO/CD 19085-12, tenoning and/or profiling machines
- ISO/CD 19085-13, multiblade rip sawing machines
ISO/TC 39/SC 6, noise of machine tools

- ISO 230-5, determination of noise emission, revision
- ISO/NP 7960, airborne noise, operating conditions for woodworking machines
- ISO 8525, airborne noise, operating conditions for metal-cutting machines, revision

ISO/TC 39/SC 10, safety of machine tools

Revision of EN safety standards for metal working machine tools

Safety of presses
- ISO/DIS 16092-1 Safety of presses, general requirements
- ISO/CD 16092-2 Safety of mechanical presses
- ISO/DIS 16092-3 Safety of hydraulic presses
- ISO/CD 16092-4 Safety of pneumatic presses

Safety of grinding machines
- ISO 16089:2015 Safety of stationary grinding machines

Safety of turning machines
- ISO 23125:2015 Safety of turning machines

Safety of milling machines
- ISO/FDIS 16090-1 Safety of MC, milling, transfer machines

Safety of EDM
- ISO 28881:2013 Safety of EDM + Cor 1:2013
- ISO/TR 17529:2014 Guidance, example of risk assessment

Safety of sawing machines
- ISO 16093 Safety of sawing machines for cold metal, u. publ.
Standards for machine tools, summary

Environmental evaluation of machine tools, ISO series 14955
relevant users of energy / measuring energy supplied / reference process / simulated force / test pieces

Probes on machine tools, ISO 230-10
touch trigger probes / scanning probes / laser beam systems / boring gauges

Instruments for machine tool testing, ISO/TR 230-11
typical ranges / applications / uncertainties

broaching machines
NC broaching machines

Standards for machine tools, participation

Join via national standards organisation (BSI, DIN, JISC, …)

Influencing standards
projects, comments, planning

Information
project proposals, drafts, standards
comments, ISO browsing platform, www.iso.org/obp/ui/

education
worked off know-how, actual problems, up-to-date solutions
different points of view, discussion

presentation
manufacturer/supplier and user show commitment
manufacturer/supplier and user show performance
Knapp, W., Standards for machine tools, an update


Key:
1. Laser head
2. Interferometer
3. Tracking device
4. Reflective
5. Measuring basis
6. Reflection

Standards for machine tools, an update