

Source: EN ISO 23125; Example of a group 4 single- or multi-spindle automatic turning machines.

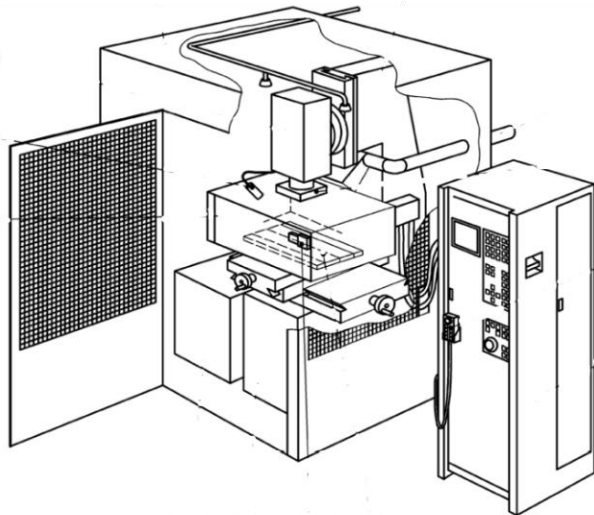
EN ISO 28881 Machine tools – Safety – Electrical discharge machines

This international standard specifies safety requirements and/or protective measures applicable to the following *EDM equipment and EDM systems:

- Manually controlled EDM die sinking or EDM drilling machines
- Numerically controlled EDM die sinking or EDM drilling machines and
- Numerically controlled EDM wire cutting machines

These safety requirements and/or protective measures must be observed by the persons involved in the design, construction, installation and/or supply of such equipment. This international standard also includes information to be made available to the user by the manufacturer.

* The abbreviation EDM stands for electrical discharge machining.



Source: EN ISO 28881; Example of a EDM die sinking machine

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Machine tools – Important type-C standards

Overview of frequently used type-C standards with additional information



This **publication** is intended for **manufacturers of machine tools** intended for machining metals and materials with similar physical properties.

Anyone who places a **machine tool** on the market must be able to demonstrate compliance with the Machinery Directive 2006/42/EC and, where applicable, other provisions.

Detailed safety requirements and protective measures for machine tools can be found in the standards. The purpose of this publication is to provide an overview of the most important Type C standards for machine tools.

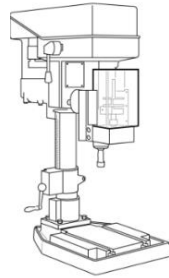
EN 12717 Safety of machine tools – Drilling machines

This European standard defines the technical safety requirements and protective measures to be observed during the design, construction and supply (including installation, dismantling, transport and maintenance) of stationary drilling machines. This standard covers both manual and automatic drilling machines.

Scope:

- Table or stand-drilling machines;
- Radial drilling machines;
- Coordinate drilling machines with fixed table height;
- Horizontal drilling machines;
- Multi-spindle drilling machines;
- Turret drilling machines with manual turret circuit

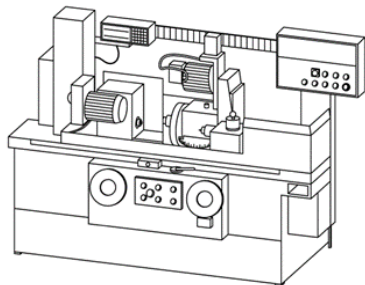
Source: EN 12717; Example of a table- or column drilling machine



EN ISO 16089 Machine tools – Safety – Stationary grinding machines

This International Standard specifies the requirements and/or measures to eliminate the hazards or reduce the risks in the following groups of stationary grinding machines which are designed primarily to shape metal by grinding.

- Group 1:** Manually controlled grinding machine without power operated axes and without numerical control
- Group 2:** Manually controlled grinding machine with power operated axes and, if applicable, with limited numerically controlled capability
- Group 3:** Numerically controlled grinding machine



Source: EN ISO 16089; Example of a group 2 grinding machine

*EN ISO 16090-1 Machine tools – Safety – Machining centres, milling machines, transfer machines – Part 1: Safety requirements

This International Standard specifies the technical safety requirements and protective measures for the design, construction and supply (including installation and dismantling, with arrangements for transport and maintenance) of milling machines, including machines capable of performing boring operations, machining centres and transfer machines designed for continuous production use, which are intended to cut cold metal, and other non combustible cold materials except for wood or materials with physical characteristics similar to those of wood.

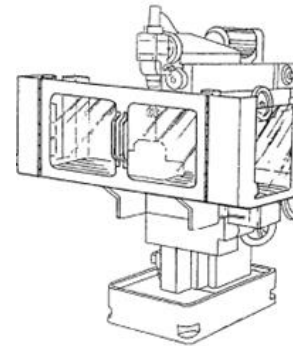
- Group 1:** Manually controlled boring and milling machine without numerical control
- Group 2:** Manually controlled boring and milling machine with limited numerical controlled capability
- Group 3:** Numerical controlled milling machine, milling and machining centre
- Group 4:** Numerical controlled transfer and special purpose machine

* **The Standard EN ISO 16090-1** is not listed in the European Official Journal under the Machinery Directive 2006/42/EC and does not lead to a **presumption of conformity**. The Standard EN ISO 16090-1 will be revised in the near future, and replace the following standards still listed in the European Official Journal under the Machinery Directive 2006/42/EC with presumption of conformity:

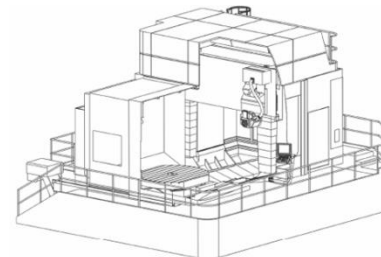
EN 12417 Machine tools – Safety – Machining centres

EN 13128 Safety of machine tools – Milling machines (including drilling and milling machines)

EN 14070 Safety of machine tools – Transfer and single purpose or special purpose machines



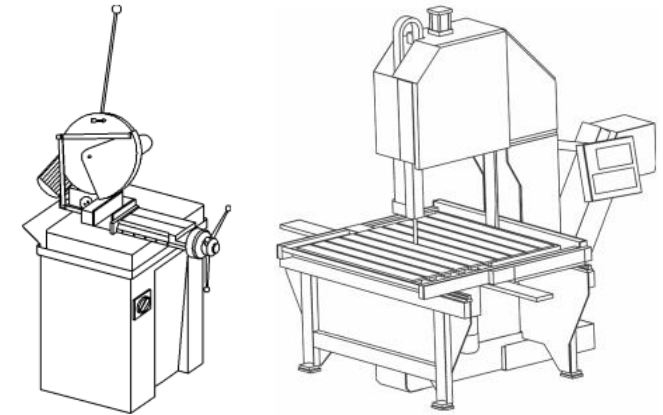
Source: EN ISO 16090-1; Example of a group 1 manually controlled boring and milling machine without numerical control



Source: EN ISO 16090-1; Example of a group 3 Numerical controlled milling machine, milling and machining centre

EN ISO 16093 Machine tools – Safety – Sawing machines for cold metal

This international standard covers all significant hazards, hazards and incidents associated with sawing machines and defines the technical safety requirements and protective measures. The main purpose of these machines is to saw cold metal (ferrous and non-ferrous metals) or material consisting partly of cold metal.

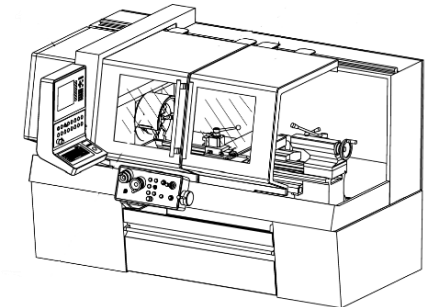


Source: EN ISO 16093; Example of a circular and band sawing machine

EN ISO 23125 Machine tools – Safety – Turning machines

This International Standard specifies the requirements and/or measures to eliminate the hazards or reduce the risks in the following groups of turning machines and turning centres, which are designed primarily to shape metal by cutting.

- Group 1:** Manually controlled turning machines without numerical control.
- Group 2:** Manually controlled turning machines with limited numerically controlled capability.
- Group 3:** Numerically controlled turning machines and turning centres.
- Group 4:** Single- or multi-spindle automatic turning machines.



Source: EN ISO 23125; Example of a group 2 manually controlled turning machines with limited numerically controlled capability.