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Orodje za obdelavo lesa – Varnostne zahteve – 1. del: Frezalno orodje, listi krožnih žag

Tools for woodworking - Safety requirements - Part 1: Milling tools, circular saw blades

Maschinen-Werkzeuge für Holzbearbeitung - Sicherheitstechnische Anforderungen - Teil 1: Fräs- und Hobelwerkzeuge, Kreissägeblätter

Outils pour le travail du bois - Exigences de sécurité - Partie 1 : Outils de fraisage, lames de scies circulaires

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25.100.40	Žagni listi	Saws
79.120.20	Lesnoobdelovalno orodje	Woodworking tools

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Contents

Foreword

This document (EN 847-1:2005) has been prepared by Technical Committee CEN/TC 142 “Wood working machines - safety”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2005, and conflicting national standards shall be withdrawn at the latest by October 2005.

This document supersedes EN 847-1:1997.

Organisations contributing to the preparation of this document include the EUMABOIS Tool Group.

All figures in this standard are examples or explanations.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom

Introduction

The extent to which hazards are covered is indicated in the scope of this document.

The requirements of this document concern designers, manufacturers, suppliers and importers of tools for wood-working.

This document also includes information which the manufacturer shall provide to the user.

1 Scope

This document specifies all hazards arising from the design of tools for woodworking machines, and describes the methods for the elimination or reduction of these hazards by tool design and by the provision of information. This document deals with milling tools (bore mounted, shank mounted, integrated spindle) and circular saw blades, but does not cover any hazard related to the strength of shank of shank mounted milling tools. The hazards are listed in Clause 5. This document does not apply to boring bits, eccentric single router cutters, cutters with cutting circle less than 16 mm and to tools used in rotary knife lathes and copying lathes where the hazard of ejection and contact with the tool is always prevented by a system of fixed guards and/or movable guards interlocked with guard-locking and/or self-closing guards.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 847-2, *Tools for woodworking — Safety requirements — Part 2: Requirements for the shank of shank mounted milling tools*

EN 23878, *Hardmetals - Vickers hardness test (ISO 3878:1983)*

ISO 286-2, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*

ISO 1940-1, *Mechanical vibration — Balance quality requirements for rotors in a constant (rigid) state — Part 1: Specification and verification of balance tolerances*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
milling tool
rotating cutting tool, (e.g. milling cutter, planing cutter, thicknessing cutter) normally having its main feed direction perpendicular to the rotation axis, for working various surfaces on wood and similar materials through chip removal.

The cutting edge of the cutting part may be

— parallel to the axis of rotation,

— square to the axis of rotation, or

— a profile which is a combination of the two.

The tool may be

— a one piece tool,

— a composite tool,

— a complex tool, or

— in the form of a tool set

3.2
circular saw blade
rotating cutting tool for cross-cutting or ripping wood and similar materials through chip removal.

The tools cut on the periphery and on both flanks simultaneously, and may be

— a one piece tool,

— a composite tool, or

— a complex tool

3.3
one piece tool (solid tool)
tools without bonded or detachable parts: the body and the cutting parts are one piece

3.4
composite tool (tipped tool)
tools where the cutting parts (tips) are firmly connected by bonding to the body, e.g. welding, brazing, adhesive fixing, etc.

3.5
complex tool
tools where one or more cutting parts (inserts, blades) are exchangeably mounted in a body through detachable fixing elements. The cutting parts may be one piece or composite

3.6
tool set
number of individual tools clamped together on a tool carrier designed to function as one tool

3.7
integrated tools
tools where the body is part of the machine and only the cutting parts are exchangeable

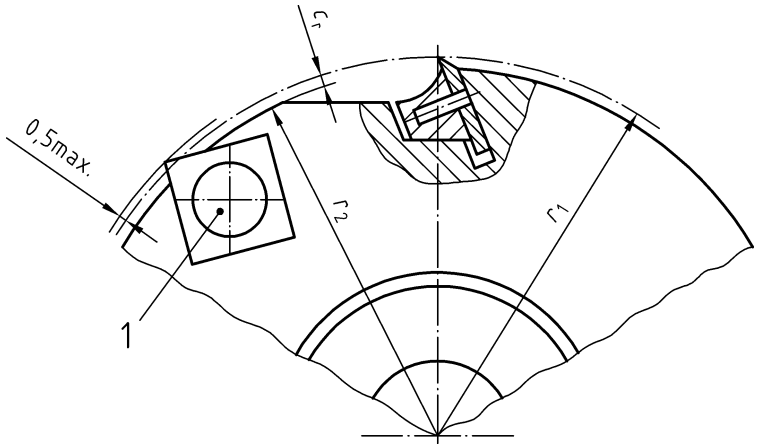
3.8
body
the part of the tool which holds the cutting blades or inserts, or on which the cutting parts are formed [ISO 3002-1:1982]

3.9
cutting part
the functional part or parts of the tool each comprised of chip producing elements. The cutting edges, face and flank are therefore elements of the cutting part. In the case of a multi-toothed cutter, each tooth has a cutting part [ISO 3002-1:1982]

3.10
auxiliary cutting parts
auxiliary cutting parts are additional cutting parts with a cutting width and a radial cutting edge projection to the body of less than 12 mm (e.g. grooving inserts, bevelling inserts, chamfering inserts)

3.11
spur
cutting part which operates both on its periphery and on its flank. The spur projects from the major cutting edge in radial, and if applicable, in axial direction. A spur is either a separate cutting part (see Figure 1) or a part of the major cutting edge

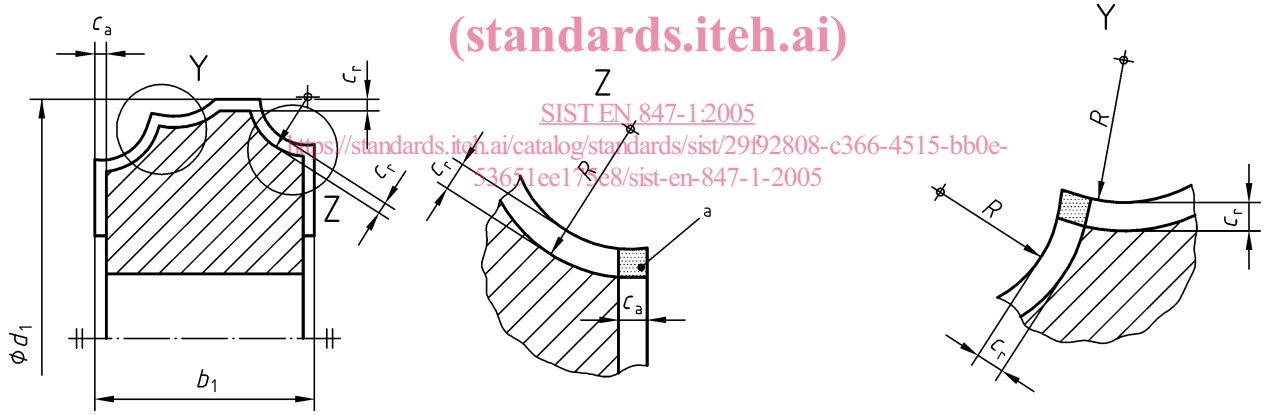
Dimensions in millimetres



Key
1 Screw at the choice of the manufacturer

Figure 1 — Milling tool with a spur

3.12
cutting diameter
d_1 (cutting radius r_1)
for tools where various blades can be mounted, the cutting diameter d_1 (cutting radius r_1) is the maximum possible value (see Figure 2)



a Shaded area (see 6.2.1.2)

Figure 2 — Cutting diameter and cutting width

3.13
cutting width
b_1
for tools where various blades can be mounted, the cutting width b_1 is the maximum possible value (see Figure 2)

3.14
deflector
projecting part exchangeably mounted or firmly connected by bonding to the body or part of the body which performs chip thickness limitation (see Figures 3 b), c), d), e) and g))

NOTE The deflector can also be called a "counter-knife".

3.15
cutting blade projection
t
difference between the radius r_1 of the cutting circle and the radius r_5 of the back supporting circle where $t = r_1 - r_5$ (see Figure 3)

3.16
radial cutting edge projection
c_r
difference between the deflector (not round form tools) or the body (round form tools) and the cutting edge measured in the direction of the normal to the profile (see Figures 2 and 3)

3.17
axial cutting edge projection
c_a
distance measured axially between the axial cutting edge and the body (see Figure 3 a)) or the deflector (see Figure 3 d))

3.18
round form tool
tool where the body has a circular shape in any cross section perpendicular to the rotational axis of the tool and which performs chip thickness limitation (see Figures 3 a) and 5)). Auxiliary cutting parts with a deflector or spurs (see 3.10 and 3.11) are not considered

3.19
not round form tool
tool where chip thickness limitation is performed by a deflector (see Figures 3 b), c), d), e) and g)) or where a cross section of the body is not circular (see Figure 3 f))

3.20
round form tool set
functional unit consisting of a number of individual not round form and/or round form tools clamped together and forming a round form tool shape with radial gaps of less than 5 mm and axial gaps less than 15 mm and the top and the bottom side is a full round

3.21
tool combination
unit consisting of a number of loose tools connectable in a variable sequence or extendable in a variable position

3.22
adhesive fixing
bonding of the tool components to the body which prevents their change of position relative to each other

3.23
separable fixing

3.23.1
friction lock fixing (see Figure 4)
fixing where the relative change of position in a radial direction during rotation is prevented only by the friction forces

3.23.2
form lock fixing (see Figure 5)
fixing where the relative change of position in the radial direction during rotation is prevented by the form and arrangement of the components

3.24
radial and axial approach flats (see Figure 6)
flat on the radial and/or axial surface of the deflector or of the body, in front of the deflector edge

3.25
radial approach angle
τ_r (see Figure 6)
angle between the approach flat and the tangent to the deflector circle at the deflector edge or to the body circle at the point where the radial approach flat begins

3.26
axial approach angle
τ_a (see Figure 6)
angle between a plane perpendicular to the axis of the tool and the axial approach flat

3.27
basic number of teeth
the number of teeth cutting in each part of the profile

3.28
woodworking machine
machine or a combination of machines intended for cutting of wood and similar materials (see 3.29) by chip removal, or chipless cutting, sanding and forming, laminating (including gluing and edging) or joining.

It includes equipment for the noise and dust control which is integral with the machine.

A “machine” includes also associated auxiliary equipment, e.g. power feed units, reversing units, magazines and hoppers, clamping devices and conveying and lifting equipment

3.29
similar materials
materials with physical and technological characteristics similar to those of wood, such as cork, bone, wood based materials as chipboard, fibreboard, plywood etc. and for which the process for machining and chip or particle removal is similar

3.30
tools
all individual tools and tool sets for the mechanical removal of chips e.g. circular saw blades, bandsaw blades, milling cutters, chain cutters. Tools also include devices for forming and shaping or chipless cutting

3.31
hand feed
manual holding and/or guiding of the workpiece or of a machine element incorporating a tool. Hand feed includes the use of hand-operated carriage on which the workpiece is placed manually or clamped and the use of demountable power feed unit (see 3.36)

3.32
integrated feed
feed mechanism for the workpiece or tool which is integrated with the machine and where the workpiece or machine element with incorporated tool is held and controlled mechanically during the machining operation

3.33
maximum rotational speed
maximum rotational speed for the operation for which the tool is designed

3.34
speed range
minimum and maximum rotational speeds within which the tool spindle or tool is designed to operate

3.35
loading the machine
manual or automatic placing of the workpiece onto a carriage, magazine, lift, hopper, movable bed, conveyor or the presentation of the workpiece to an integrated feed device