

Nederlandse norm

# NEN-EN 847-2

(en)

Gereedschap voor houtbewerking -  
Veiligheidseisen - Deel 2: Eisen voor de schacht  
van op een schacht gemonteerde  
frezen/cirkelzaagbladen

Tools for woodworking - Safety requirements -  
Part 2: Requirements for the shank of shank  
mounted milling tools/circular saw blades

Vervangt NEN-EN 847-2:2013;  
NEN-EN 847-2:2016 Ontw.

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EUROPEAN STANDARD

**EN 847-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

## Tools for woodworking - Safety requirements - Part 2: Requirements for the shank of shank mounted milling tools/circular saw blades

Outils pour le travail du bois - Prescriptions de sécurité  
- Partie 2 : Prescriptions pour les queues des fraises à  
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Anforderungen für den Schaft von  
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Preview  
 NEN-EN 847-2:2017

## European foreword

This document (EN 847-2:2017) has been prepared by Technical Committee CEN/TC 142 "Woodworking machines - Safety", the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by May 2018, and conflicting national standards shall be withdrawn at the latest by May 2018.

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## Introduction

The content of this European Standard is aimed at eliminating hazards which can lead to overloading of the shank of shank mounted milling tools for woodworking by excessive rotational speeds.

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## 1 Scope

This European Standard specifies the determination of the maximum speed for given eccentricity at clamping devices for the shank strength of milling tools with cylindrical and taper shank. It also specifies the marking of the tool. Bore mounted tools e.g. milling tools, circular saw blades which are mounted on an arbor should be considered as a shank mounted tool.

This European Standard complements EN 847-1:2017 and applies also for shank tools with a cutting diameter of less than 16 mm.

This European Standard is not applicable for shanks of tools according to this scope, which are manufactured before the date of its publication.

## 2 Normative references

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

EN 847-1:2017, *Tools for woodworking — Safety requirements — Part 1: Milling tools, circular saw blades*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 847-1:2017 and the following apply.

### 3.1

#### **7/24 shank**

##### **SK**

type of tool holder with a 7/24 cone ratio taper

### 3.2

#### **hollow taper shank**

##### **HSK**

type of tool holder with a short hollow taper with high positioning accuracy and high grade of rigidity that contacts the spindle on two surfaces

### 3.3

#### **arbor**

device to be mounted on the machine spindle interface and which is designed to carry bore type cutting tools

## 4 List of significant hazards

Table 1 shows the list of significant hazards.

**Table 1 — List of significant hazards**

Hazard according to EN ISO 12100:2010	Condition or causes of hazard related to the tool	Corresponding clause of EN 847-2
Mechanical hazards due to: Inadequacy of mechanical strength	Breaking of the tool	5
Vibration	Dynamic unbalance of tool	5
Variations in the rotational speed of tools	Breaking of the tool	5

## 5 Safety requirements

### 5.1 General requirements for cylindrical shank

The minimum value for the clamping length  $l_{e \min}$  shall be as given in Table 2.

**Table 2 — Minimum clamping length  $l_{e \min}$**

$d_2 \leq 10 \text{ mm}$	$10 \text{ mm} < d_2 < 25 \text{ mm}$	$d_2 \geq 25 \text{ mm}$
$l_{e \min} = 20 \text{ mm}$	$l_{e \min} = 2 \cdot d_2 \text{ (mm)}$	$l_{e \min} = 1,8 \cdot d_2 \text{ (mm)}$

The tolerance of the shank diameter  $d_2$  shall be h6 for  $d_2 \geq 12 \text{ mm}$  and h8 for  $d_2 < 12 \text{ mm}$ .



## 5.2 Stability of the shank of shank mounted tools

### 5.2.1 General

For descriptions of symbols for the stability of the shank of shank mounted tools, see Table 3.

**Table 3 — Stability of the shank of shank mounted tools — Symbols and units**

Symbol	Description	Unit
$d$	diameter a) shank diameter $d_2$ b) cone diameter $d_3$ c) with axial force: $d_4$ (calculated); without axial force: $d_{\text{arbor}}$	mm
$d_{\text{cut}}$	maximum diameter of the cutting part	mm
$d_2$	shank diameter, see Figure 2	mm
$d_3$	cone diameter, see Figure 3	mm
$d_4$	calculated hub diameter, see Figure 4	mm
$d_{\text{arbor}}$	shank diameter of the arbor, see Figure 4	mm
$E$	modulus of elasticity of the shank material	$\text{N mm}^{-2}$
$e_{\text{sp}}$	maximum permissible eccentricity at clamping device	mm
$f$	form factor	—
$f_s$	safety factor ( $f_s \geq 4$ )	—
$F_a$	axial clamping force, see Figure 4	N
$G$	balance quality grade of the tool set (individual tools, arbor, spacers, HSK); product of the permissible eccentricity and the angular velocity according to EN 847-1:2017	$\text{mm s}^{-1}$
$I$	second moment of area	$\text{mm}^4$
$l_{\text{cut}}$	height of cutting part	mm
$l_0$	free shank length	mm
$l_1, l_2, l_3, \dots$	axial distance of the gravity centre of the mass $m_1, m_2, m_3, \dots$	mm
$l_s$	axial distance of gravity centre, see Figure 1	mm
$l_e$	clamping length	mm
$l_g$	total length of shank	mm
$m_1, m_2, m_3, \dots$	mass of the parts of the tool set, see Figure 1	g
$m_{\text{cut}}$	mass of the cutting part in the area of $l_{\text{cut}}$ , see Figure 2	g
$m^*$	mass of the tool in the area ( $l_0 + l_{\text{cut}}$ )	g
$m_{\text{cut}}^*$	reduced mass of the cutting part, see Figure 2	g
$n$	operational speed	$\text{min}^{-1}$
$n_{\text{shank}}$	maximum permissible rotational speed with regard to shank strength	$\text{min}^{-1}$
$S$	centre of gravity	—

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