



# SLOVENSKI STANDARD

## SIST HD 400.2E S2:1995

01-marec-1995

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### Hand held motor operated tools - Part 2: Particular specifications - Section E: Circular saws and circular knives

Hand-held motor operated tools -- Part II: Particular specifications -- Section E: Circular saws and circular knives

Handgeführte Elektrowerkzeuge -- Teil II: Besondere Bestimmungen -- Hauptabschnitt E: Kreissägen und Kreismesser

Outils portatifs à main à moteur -- Partie II: Règles particulières -- Section E: Scies circulaires et couteaux circulaires

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**Ta slovenski standard je istoveten z: HD 400.2E S2:1988/A1:1991**

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#### **ICS:**

25.140.20	Električna orodja	Electric tools
79.120.20	Lesnoobdelovalno orodje	Woodworking tools

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KEY WORDS: Hand-held motor operated tools; circular saws; circular knives; safety rules; protection against electric shock; heating; leakage current; endurance; abnormal operation; mechanical hazards; construction

**HAND-HELD MOTOR OPERATED TOOLS  
PART II: PARTICULAR SPECIFICATIONS  
SECTION E: CIRCULAR SAWS AND CIRCULAR KNIVES**

Outils portatifs à main à moteur  
Partie II: Règles particulières  
Section E: Scies circulaires et  
couteaux circulaires

Handgeführte Elektrowerkzeuge  
Teil II: Besondere Bestimmungen  
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und Kreismesser

**BODY OF THE HD**

The Harmonization Document consists of:

- CEE 20 Part II Section E ed 2, (1977); CEE 313, not appended
- with CENELEC common modifications prepared by CLC/TC 61F

This Harmonization Document was approved by CENELEC on 1988-12-06.

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The English and French versions of this Harmonization Document are provided by the text of the IEC publication and the German version is the official translation of the IEC text.

All texts prepared by CENELEC exist in three official versions (English, French, and German).

According to the CENELEC Internal Regulations the CENELEC member National Committees are bound:

to announce the existence of this Harmonization Document at national level by or before 1989-06-01

to publish their new harmonized national standard by or before 1989-12-01

to withdraw all conflicting national standards by or before 1989-12-01.

Harmonized national standards are listed on the HD information sheet, which is available from the CENELEC National Committees or from the CENELEC Central Secretariat.

The CENELEC National Committees are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**HD 400.2 Section E S2****FOREWORD**

This revised edition of the Harmonization Document has been prepared by the Secretariat of CENELEC Technical Committee 61F following the decision taken by the committee and the result of voting on the draft document CLC/TC 61F(SEC)22.

The editorial comments have been dealt with by a special Working Group.

This Harmonization Document, Section E of HD 400.2 has to be used together with HD 400.1 (Hand-held motor operated tools - Part I: General Specifications).

The clauses of this section supplement or modify the corresponding clauses in Part I. Where there is no corresponding clause or sub-clause in this section, the clause or sub-clause of Part I applies without modification as far as is reasonable. Where the text of these sections states "addition", "modification" or "replacement", the relevant requirement, test specification or explanation of Part I should be adapted accordingly.

Note 1: Temporary national deviations from this Harmonization Document are mentioned in an informative annex which does not form part of this Harmonization Document. It is published separately.

HD 400.2

## SECTION E

## CIRCULAR SAWS AND CIRCULAR KNIVES

## 1. SCOPE

## 1.1 Modification:

This section applies to all types of circular saws and circular knives used for cutting any kind of material.

## Addition:

These requirements do not cover the use of circular saws when in conjunction with a support.

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## 2. DEFINITIONS

## 2.2

Modification: <https://standards.iteh.ai/catalog/standards/sist/df8c8384-6226-465e-b8a7-2b3ef7d21650/sist-hd-400-2e-s2-1995>

18. Normal load denotes, circular saws intended to cut materials other than metal, the load obtained when the circular saw is operated continuously with the saw blades in the vertical position, the load being such that the input, in watts, is equal to:

$0.25 s \sqrt{n_0}$  For saws with A.C. asynchronous induction motors,

$0.2 s \sqrt{n_0}$  For other saws designed for cutting depths exceeding 55 mm,

$0.13 s \sqrt{n_0}$  For other saws designed for cutting depths not exceeding 55 mm, and for multi-purpose tools which can be fitted with circular-saw accessories,

where  $s$  is the maximum cutting depth, in millimetres, and  $n_0$  the no-load speed of the saw blade, in revolutions per minute, after the tool has been operating for a period of 15 min at no-load, at rated voltage or at the upper limit of the rated voltage range.

## Addition:

Definitions for normal load for other types of saw, for circular knives and for tools intended to cut metal are under consideration.

## Addition:

29. Circular saw with outer pendulum guard denotes a tool the lower guard of which, for operation, swings around the upper fixed guard (see figure 1).
30. Circular saw with inner pendulum guard denotes a tool the lower guard of which, for operation, swings inside the upper fixed guard. (see figure 2)
31. Circular saw with tow-guard denotes a tool the lower guard of which, for operation, slides along the upper fixed guard. (see figure 3)
32. Plunge type circular saw denotes a tool having only a fixed upper guard into which the saw blade retracts when not in use. (see figure 4)
33. Guide plate: part constituting the plane of reference on the material to be cut.
34. Fixed guard: Cover linked to the motor unit which prevents access to the part of the blade situated above the guide plate.
35. Movable guard: Cover which, in the rest position, prevents access to the part of the blade which is not covered by the fixed guard and which in most cases is situated below the guide plate. Plunge type circular saws have only one guard into which the saw blade retracts at the end of the sawing operation.
36. Riving knife: Metal part placed in the plane of the saw blade which prevents the wood from tightening onto the rear part of the saw blade and thus prevents the backward movement of the machine or jamming of the saw blade.

## 7. MARKING

## 7.1 Addition:

Circular saws and circular knives shall be marked with the indication of direction of rotation, this shall be clearly indicated by an arrow, raised or sunk on the fixed guard or by any other means no less visible and indelible.

7.6 Addition:

Rated no-load speed "no "

7.13 Addition:

All types of circular saws and circular knives shall be accompanied by an instruction sheet containing at least the substance of the following warnings where appropriate:

- Do not use blades which are deformed or cracked.
- Do not use blades made of high speed steel.
- Do not use blades which do not comply with the characteristics specified in these instructions.
- Do not stop the blades by lateral pressure on the disc.
- Ensure that movable guards operate freely without jamming.
- Do not lock the moving guard in the open position.
- Ensure that any retraction mechanism of the guard system operates correctly.
- Remove plug from the mains supply before replacement of the blade, making adjustments, or other maintenance work.

Moreover, circular saws designed for cutting wood shall, in the instruction sheet, contain the following supplementary warnings:

- Do not use saw blades the disc of which is thicker or the set of which is smaller than the thickness of the riving knife.
- Ensure that the riving knife is adjusted so that:
  - the distance between the riving knife and the toothed rim of the saw blade is not more than 5 mm.
  - the toothed rim does not extend more than 5 mm beyond the lower edge of the riving knife.
- The riving knife should always be used except when plunging in the middle of the work piece.

The instruction sheet shall also contain the following information:

- The maximum and minimum diameter, the thickness range of the saw blades, and other characteristics of the blades which can be fitted to the tool.
- The rated no-load speed of the working spindle.

## 11. H E A T I N G

### 11.1 Modification:

During the test the torque applied is equal to that corresponding to normal load or to that corresponding with the load necessary to attain rated input, whichever is the higher, the tool being operated at rated voltage or at the upper limit of the rated voltage range.

## 18. M E C H A N I C A L H A Z A R D S

### 18.1 Replacement:

Circular saws and circular knives shall be equipped with an adequate guarding system which cannot be removed without the aid of a tool.

The guarding system for circular saws designed for cutting wood and the like shall comply with the requirements of clauses 18.2, 18.3, 18.4, 18.5.

Compliance is checked by inspection.

This requirement does not apply to tools with peripheral speed of the blade of less than 5 m/s.

For these tools the relevant requirements are under consideration.

Other means of achieving the necessary degree of mechanical safety are allowed provided these are equally effective and reliable as those specified.

### 18.2 Guarding above the guide plate

- 18.2.1 In order to prevent inadvertent contact of the operator's hand or fingers with the toothed rim of the saw blade or with rotating parts on the handle side of the saw above the guide plate these parts shall be screened by means of a guard or guards.



- 18.2.1.1 For saws of the types shown in figure 1, 2 and 3 a fixed guard shall screen the saw blade rim radially at least down to the root of the saw teeth.

For the purpose of this requirement the diameter of the root of the saw teeth is considered to be not less than 0.9 times the diameter of the smallest saw blade specified in the instruction sheet.

- 18.2.1.2 Plunge type saws as shown in figure 4 shall be equipped with a guard into which the saw blade and the riving knife automatically retract when not in use. The guard shall cover the whole of the root of the teeth for all possible depths of cut.

For the purpose of this requirement the diameter of the root of the saw teeth is considered to be not less than 0.9 times the diameter of the smallest saw blade specified in the instruction sheet.

This requirement does not apply between the guide plate and the lower side of the motor, but the opening must not be wider than necessary.

The guard shall automatically lock in the closed position when the saw is not in use, whilst gripped by its handles and held in any position liable to occur in normal use, with the guide plate not in contact with the work piece.

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- 18.2.1.3 All apertures including chip outlets, shall be so designed and arranged as to comply with the foregoing requirements

Compliance with the above requirements is checked by the following tests: <https://standards.itech.ai/catalog/standards/sist/df8c8384-6226-465e-b8a7-2b3ef7d21650/sist-hd-400-2e-s2-1995>

All apertures in the guard shall be tested with the rigid test probe "a" of figure 5. At no angle of the test probe shall it be possible to touch the toothed rim of the saw blade at any depth of cut, not with the saw set at maximum depth of cut the rotating parts on the handle side of the saw.

For checking the accessibility of the toothed rim of the saw blade at the front of the saw the rigid test probe "b" of figure 6 is brought into such a position that its longitudinal axis is parallel to the axis of the saw spindle and is centrally in alignment with the saw blade plane. When the saw is set for a right angled cut, for any depth of cut, it shall not be possible to touch the toothed rim of the saw blade with the test probe when moved laterally. (see figure 6)

- 18.2.1.4 For circular saws having an inclinable guide plate the test with the rigid test probe "a" (figure 5) is not made to check the accessibility between the front part of the guard and the guide plate.

In such a case, the distance in the area of the toothed rim of the saw blade between the lateral side of the guard and the guide plate (or the top of any bent up edge) must be less than 3 mm for the maximum cutting angle at maximum depth of cut, measured at right angles at to the guide plate (see figure 7).

### 18.3 Guarding below the guide plate

Saws of the types shown in figure 1, 2 and 3 shall, on the working side below the guide plate, have a movable guard which when the saw is not in use, shall screen both sides of the saw blade radially down to the root of the teeth.

For the purpose of this requirement the diameter of the root of the saw teeth is considered not to be less than 0.9 times the diameter of the smallest saw blade specified in the instruction sheet.

This guard shall return automatically to its closed position when the saw is not in use, and it shall not be lockable in the open position.

For saws of the types shown in figure 1 and 2 there may be an opening angle of not more than 10° at the front of the guard (see figure 6) when the tool is set for maximum depth of cut and positioned at right angles to the guide-plate.

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- 18.3.1 For saws as shown in figures 2 and 3 the movable guard of which needs to allow for the passage of the saw blade and/or the riving knife including its holder the aperture shall be kept as small as possible. In the closed position the distance "a" between the outer circumference of the guard and the periphery of the toothed rim of the largest saw blade specified in the instruction sheet as well as the width "b" of this aperture shall comply with the values specified in table 1 (see figure 8).
- 18.3.2 For saws with a tow-guard as shown in figure 3 the movable guard shall automatically lock in the closed position when the saw is not in use whilst gripped by its handles and held in any position liable to occur in normal use with the guide plate not in contact with the work piece.
- 18.3.3 For all types of saw the closing time of the movable guarding system from the maximum opening position or from the maximum cutting depth shall not exceed 0,2 sec. for saws having a blade with a diameter not exceeding 200 mm. For blades having a diameter exceeding 200 mm, the closing time in seconds, shall not be more than the diameter expressed in metres. During the measurement the saw is set for a right angled cut, and for maximum cutting depth with the guide plate in the horizontal position and not inverted.

Compliance with the requirements of sub-clause 18.3, 18.3.1, 18.3.2 and 18.3.3 is checked by inspection, by measurement and, for sub-clause 18.3.1, by the following test:

When the movable guard is completely closed it shall not be possible to touch the teeth of the saw blade through the aperture with the test probe "a" specified. (see figure 5).

#### 18.4 Riving knife

Hand-held circular saws shall be equipped with a riving knife.

18.4.1 The riving knife must, within the cutting depth, be in alignment with the plane of the saw blades and positioned so as to pass freely through the cutting groove and shall not tilt towards the blade.

18.4.2 The riving knife and its holder shall be designed as to allow the adjustment of the riving knife, for all saw blade diameters resulting in cutting depths between 100% and 90% of the rated cutting depth, to comply with the following conditions: (see figure 9)

- a) Below the guide plate the radial distance between the riving knife and the toothed rim of the saw blade shall not at any point exceed 5 mm at the depth of cut set.
- b) The tip of the riving knife shall be within the tooth peak and 5 mm from the tooth peak.
- c) During the operation of the circular saw, the position of the riving knife shall not change.

Compliance with the requirements of sub-clause 18.4.2 is checked by inspection and by measurement.

18.4.3 For saws with a rated cutting depth exceeding 55 mm the riving knife and its holder shall be so designed that when the cutting depth is adjusted the riving knife automatically continues to comply with the requirement of sub-clause 18.4.2 (a), (b) and (c).

Compliance with this requirement is checked by inspection.

18.4.4 The riving knife shall not be thicker than the width of the cutting groove nor thinner than the saw blade body.