INTERNATIONAL STANDARD

ISO 7960

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Airborne noise emitted by machine tools — Operating conditions for woodworking machines

Bruit aérien émis par les machines-outils — Conditions de fonctionnement des machines à bois



ISO 7960:1995(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 7960 was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 6, *Noise of machine tools* and ISO/TC 43, *Acoustics*.

Annexes A to H, J to N and P to U form an integral part of this International Standard. Annex V is for information only.

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Airborne noise emitted by machine tools — Operating conditions for woodworking machines

1 Scope

This International Standard, together with basic noise emission International Standards, describes the mechanical and acoustical specifications necessary for a reproducible test method for the determination of airborne noise emitted by woodworking machines.

NOTE 1 Acoustic measurement procedures and noise data reporting are given in the basic acoustic standards selected from the ISO 3740 series, ISO 4871 and the ISO 11200 series (see annex V).

This International Standard specifies operating conditions and microphone positions for the measurement of noise emitted by woodworking machines.

It applies to:

- single-blade circular saw benches (annex A);
- planing machines (annex B);
- thickness planing machines (annex C);
- single-spindle moulding machines (annex D);
- double-end profiling machines (annex E);
- edge banding machines (annex F);
- double-end sizing and edge banding machines (annex G);
- two-side and multi-side planing machines and moulding machines (annex H);
- bandsawing machines (annex J);
- single-end tenoning machines (annex K);
- routing machines (annex L);
- double-end trim circular machines (nonstroke) (annex M);

- single-blade stroke circular sawing machines for cross cutting (annex N);
- vertical and horizontal panel sizing sawing machines (annex P);
- multiblade circular sawing machines (for ripping) (annex Q);
- sanding machines (annex R);
- double-edging circular sawing machines (for rough cutting) (annex S);
- double-blade stroke circular sawing machines for cross cutting (annex T);
- double-end tenoning machines (for tenoning only (annex U).

The existence of special-purpose machines, for which such standard operating conditions cannot be specified, is acknowledged. This International Standard applies to the types of woodworking machines listed above. Additional types will be covered in future editions of this International Standard (ISO 7960).

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7984:1988, Woodworking machines — Technical classification of woodworking machines and auxiliary machines for woodworking.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 7984 apply.

4 General provisions for machine installation and operation

Specified operating conditions for particular types of machines are given in the annexes. When testing multi-purpose machines, each function shall be mounted separately according to the requirements specified in the annexes.

4.1 Machine installation

The machine shall be installed according to the manufacturer's instructions. If the manufacturer does not provide such instructions, this shall be stated in the test report, together with the installation method used.

The machine shall be installed in such a way that access to all sides is possible.

4.2 Machine operation

The operation during measurement shall be representative of the noisiest normal and typical use of the machinery that is reproducible. Standard operating conditions shall be those specified in the relevant annex. Where conditions are not specified in annexes, manufacturer's instructions shall be followed. Where neither specifications nor instructions exist, the machine shall be set up to give maximum noise emission.

The machine shall be tested when carrying out a sequence of operations deemed to be representative of the use of the machine, using test materials and operating conditions specified in the relevant annex. In addition, a test shall be performed under no load. The level of the no-load noise is that produced when the machine is running, ready for load test, unless otherwise specified in the annex.

NOTE 2 Distinctive features of noise within the machinecycle may have to be measured separately or may be included in a single measurement of equivalent continuous sound pressure level sampled over the whole operating cycle.

Machines with provision for dust extraction shall be tested with the extraction working, under both idling and operating conditions. In order to determine the influence of the dust extraction system on the total noise, an additional measurement shall be carried out at a point at the operator position (see suggested figures in the annexes), with the dust extraction switched off.

The operating conditions and the sequence of operations shall be defined, recorded and reported.

New or re-sharpened tools shall be used for all tests under load and the machine shall be running at normal operating temperature.

General safety requirements shall take precedence over conditions specified in the annexes.

4.3 Specification of test materials

The test material shall be one of the materials specified in 4.3.1 to 4.3.3.

- **4.3.1 Particle board,** made from particles of wood bonded with synthetic resin and/or organic binder, density 500 kg/m³ to 750 kg/m³, three-layer construction and moisture content 6 % to 10 %.
- **4.3.2 Coated particle board,** of the type specified in 4.3.1, coated on both sides with a rigid plastic of the melamine type, of maximum 0,2 mm thickness, moisture content 6 % to 10 %.
- **4.3.3 Softwood**, pre-planed resinous (similar to spruce, Norway spruce or Scots pine), in good condition and of uniform quality, with average annual growth ring thickness of 5 mm or less. The grain should run parallel to the longest edge but a general gradient of less than 12 % on at least one side is tolerable. Moisture content shall be between 8 % and 14 %. Density shall be between 300 kg/m³ and 600 kg/m³.

4.4 Microphone positions

Microphone positions for measurement of the noise at the operator's position(s) are given in the annexes. Some forms of acoustical enclosure or hood may require redefinition of the operator microphone position in some cases; in such case the microphone shall be positioned to be representative of the noise at the position of the operator's head.

Provision of data for the noisiest position is optional.

Prescribed microphone positions for the determination of sound power level are given in the annexes.

The use of additional microphone positions is optional.

5 Test report (see annexes)

For measurements that are made according to the requirements of this International Standard, the following information shall be compiled as completely as possible and recorded:

- a) description of the machine under test (including its dimensions);
- b) mounting conditions (including auxiliary equipment, safety devices and noise control measures);

- c) operating conditions and sequence of operations;
- d) details of machine tool and cutting data (cutters saw-blades, etc.);
- e) details of test material;
- f) photo or detailed illustration of the machine tested;
- g) name and address of the firm/institution that has carried out the measurements (including date and place).

NOTE 3 The above requirements are met if the data sheets given in the annexes are used.

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Annex A

(normative)

Woodworking machines — Operating conditions for single-blade circular saw benches

A.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from circular saws. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machines.

Machine classification number (see ISO 7984)

Circular saw bench with or without travelling table

12.131.36

Circular sawing machine with travelling table

12.131.372

This annex may also be applied for measurement of noise from special-purpose machines having a similar construction and function.

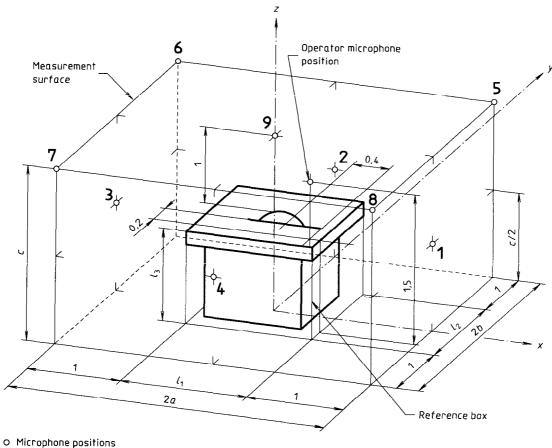
A.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. During the first part of the work cycle, when the test material is fed into the tool, a higher level of noise may be emitted which depends on the infeed rate. On manually fed machines the infeed rate is difficult to control and therefore this part of the operating cycle shall not be included in the measurement.
- c) Operator microphone position for test purpose (see figure A.1):
 - 1,5 m above floor level;
 - 0,4 m forward of the spindle centreline;
 - 0,2 m to the left side of the sawblade.

NOTE 4 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres



o The optione positions

Figure A.1 — Measurement surface and microphone array for determination of sound power level for single-blade circular saw benches (see ISO 3740 series for explanation of symbols)

ISO 7960:1995(E)

A.3 Data sheet for single-blade circular saw benches

© ISO

Machine data		
Make:		
Model:		
Year of manufacture:		Serial No.:
Overall dimensions of machine 1):		
length	mm width	mm height mm
Maximum blade diameter	mm	Clamp flange diameter mm
Nominal rotational speed:		
motor	r/min	blade r/min
Machine installation		
		Remarks/description:
Machine installed according to mathematical tions	nanufacturer's instruc-	
yes 🗌	no 🗌	
Machine installed with dust ex manufacturer's specifications	traction according to	
yes 🗍	no 🗆	
, —		
Machine mounted on vibration is	olators	
yes 🗌	no 🗌	
Machine equipped with noise-rec	lucing hood	
yes 🗌	no 🗌	
Other noise control measures		
yes 🗌	no 🗀	
Those elements which protrude from wheels, levers) may be disregarded.	the machine and which	are not likely to contribute to the noise emission (for example hand-

Data sheet for single-blade circular saw benches (continued)

Testing operation Cutting strips of particle board	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating from standard
Operating arrangement			
Parallel fence position, a	mm	50	
Saw guard position, h	mm	20	
Sawblade projection, c	mm	30	
Tool and cutting data			
Type of tool: standard sawblade with carbide-tipped teeth			
Tooth profile: double alternate helix (staggered)			
Spindle speed	r/min	4 000 ¹⁾	
Feed rate	m/min	6 ± 2	
Blade diameter ≤ 315 mm			
sawblade diameter	mm	250	
cutting speed	m/s		
number of teeth		48 to 60	
tooth width	mm	$\textbf{3,2} \pm \textbf{0,1}$	
actual blade thickness	mm	$\textbf{2,2} \pm \textbf{0,1}$	
Blade diameter > 315 mm			
sawblade diameter	mm	355 (350)	
cutting speed	m/s		
number of teeth		54 to 60	
tooth width	mm	3,2 to 3,6 (± 0,1)	
actual blade thickness	mm	2,2 to 2,6 (± 0,1)	
Spindle speed shall be as close as possible to 4 000 r/min.	1		<u></u>

ISO 7960:1995(E)

Data sheet for single-blade circular saw benches (concluded)

Testing material	
Material:	particle board, three-layer construction (see 4.3)
Moisture content:	6 % to 10 %
Board thickness:	16 mm
Board length:	600 mm to 800 mm
Board width:	600 mm to 800 mm, processed down to a final minimum width of 150 mm
Preliminary processing:	none
Photo or detailed illustration	n of the machine tested
Testing laboratory	
Firm/institution:	
	Signature:
Test carried out:	Oignature.
•	
aate:	

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Annex B

(normative)

Woodworking machines — Operating conditions for planing machines

B.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from planing machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machines.

	Machine classification number (see ISO 7984)
Planing machine	12.211.1
Combined planing and thickness planing machine used as a planing machine (separate testing shall also be performed in accordance with annex C)	{ 12.81 (used as planing machine) 12.82 12.83 (used as planing machine)

This annex may also be applied for measurement of noise from special-purpose machines having a similar construction and function.

B.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. During the first part of the work cycle, when the test material is fed into the tool, a higher level of noise may be emitted which depends on the infeed rate. On manually fed machines the infeed rate is difficult to control and therefore this part of the operating cycle shall not be included in the measurement.
- c) Operator microphone position for test purpose (see figure B.1):
 - 1,5 m above floor level;
 - 0,2 m forward of the cutter centreline;
 - 0,05 m to the right of forward left edge of the table.

NOTE 5 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

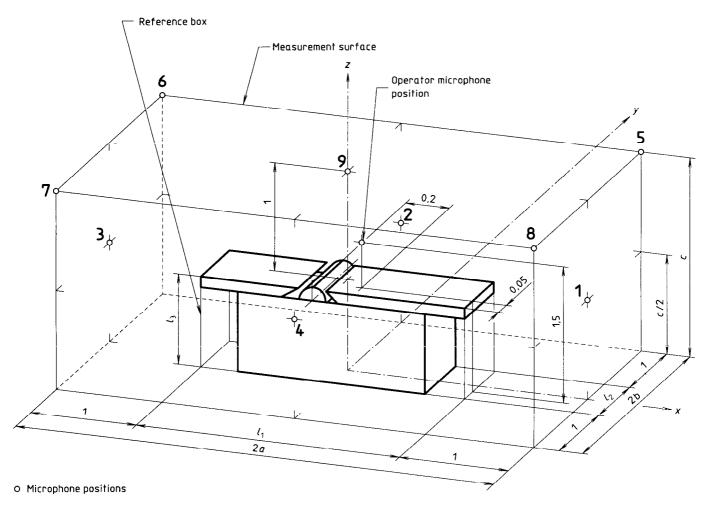


Figure B.1 — Measurement surface and microphone array for determination of sound power level for planing machines (see ISO 3740 series for explanation of symbols)

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B.3 Data sheet for planing machines

Machine data	:a			
Make:				
Model:				
Year of m	nanufacture:			Serial No.:
Overall d	limensions of machine ¹⁾ :			
length	hmm	width		mm heightmm
Cutter ler	ngth		mm	Cutting diameter mm
Number	of cutting knives:	•••••		
Nominal	rotational speed:			
motor	r		r/min	cutter r/min
Machine inst	tallation			
•				Remarks/description:
	installed according to manufact	turer's in	struc-	
tions				
yes		no		
Machine	installed with dust extraction	accordi	na to	
	turer's specifications	a000	ig	
\ <u>'</u> 00		20		
yes		no		
Machine	mounted on vibration isolators			
yes	П	no		
,		110		
Machine 6	equipped with slotted table lips			
yes	П	no		
,				
Machine e	equipped with helical cutter-bloo	ck		
yes		no		
Othar nai	se control measures			
Othernos	se control measures			
yes		no		
	ments which protrude from the mad may be disregarded.	chine and	which a	re not likely to contribute to the noise emission (for example hand-

Data sheet for planing machines (continued)

Testing operation Surface planing of softwood	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating
Operating arrangement			from standard
Parallel fence position, a	mm	150	
Tool and cutting data	•		
Type of cutter-block: Circular with straight knives			
Spindle speed	r/min	max.	
Cutting circle diameter	mm		
Cutting speed	m/s		
Projection of cutting knives	mm		1
Distance from cutting circle to table lips	mm		
Cutting width	mm	100	
Cutting depth	mm	2	
Feed rate	m/min	6 ± 2	
	:		

Data sheet for planing machines (concluded)

Testing material	
Material:	softwood, medium grade
Moisture content:	8 % to 14 %
Material length:	1 000 mm
Material width:	100 mm
Material height:	max. 80 mm, processed down to a final minimum height of 50 mm
Preliminary processing:	planing on four sides
Photo or detailed illustration	of the machine tested
Testing laboratory	
Firm/institution:	
Address:	
Telephone:	
Date:	Signature:
Test carried out:	
place:	
date:	

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Annex C

(normative)

Woodworking machines — Operating conditions for thickness planing machines

C.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from thickness planing machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machines.

		Machine classification number (see ISO 7984)
Thickness planing machine		12.212
Combined planing and thickness planing machine used as a thickness planing machine (separate testing shall also be performed in accordance with annex B)	$\Big\{$	12.81 (used as thickness planing machine) 12.83 (used as thickness planing machine)

This annex may also be applied for measurement of noise from special-purpose machines having a similar construction and function.

C.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. During the first part of the work cycle, when the test material is fed into the tool, a higher level of noise may be emitted which depends on the infeed rate. On manually fed machines the infeed rate is difficult to control and therefore this part of the operating cycle shall not be included in the measurement.
- c) Operator microphone positions for test purpose (see figure C.1)

Position A:

- 1,5 m above floor level;
- in the plane of the front face of the measurement surface;
- in line with the middle of the table.

Dimensions in metres

Position B:

- 1,5 m above floor level;
- in the plane of the rear face of the measurement surface;
- in line with the middle of the table.

NOTE 6 The use of integrating sound level meters is recommended but is not mandatory.

Operator microphone position B

Reference box
Measurement surface Departor microphone position A

S

Operator microphone position A

Figure C.1 — Measurement surface and microphone array for determination of sound power level for thickness planing machines (see ISO 3740 series for explanation of symbols)

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C.3 Data sheet for thickness planing machines

achine da	ta			
Make:				
Model:				
Year of r	manufacture:			Serial No.:
Overall o	dimensions of machine ¹⁾ :			
lengt	thmm	width .		mm heightmm
Cutter le	ngth		mm	Cutting diameterm
Number	of cutting knives:			
Nominal	l rotational speed:			
moto	or		r/min	cutterr/m
				112.11.413.22.20.20.00.00.00.00.00.00.00.00.00.00.
achine ins Machine tions	e installed according to manufa	acturer's in	struc-	Remarks/description:
yes		no		
	e installed with dust extraction cturer's specifications	on accordi	ng to	
yes	П	no	П	
, 00				
Machine	mounted on vibration isolator	s		
yes		no		
	equipped with infeed and ourrangements	utfeed noi	se-re-	
	_			
yes		no		
Machine	equipped with helical cutter-b	lock		
			_	
yes		no		
Machine	fitted with noise enclosure			
	1.1	20	1 1	
yes		no		
Other no	oise control measures			
			_	
yes		no		
-				

Data sheet for thickness planing machines (continued)

Testing operation Thickness planing of softwood	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating from standard
Operating arrangement			
Passage height at idling, h	mm	50	
Tool and cutting data Type of cutter-block: Circular with straight knives			
Spindle speed	r/min	max.	
Cutting circle diameter	mm		
Cutting speed	m/s		
Projection of cutting knives	mm		
Cutting width	mm	100	
Cutting depth	mm	2	
Feed rate	m/min	10 ± 2	

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Data sheet for thickness planing machines (concluded)

Testing material	
Material:	softwood, medium grade
Moisture content:	8 % to 14 %
Material length:	1 000 mm
Material width:	100 mm
Material height:	80 mm max., processed down to a final minimum height of 50 mm
Previous processing:	planing on four sides
Photo or detailed illustration	of the machine tested
Testing laboratory	
Firm/institution:	
	Signature:
Test carried out:	

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Annex D

(normative)

Woodworking machines — Operating conditions for single-spindle moulding machines

D.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from single-spindle moulding machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machine.

Machine classification number (see ISO 7984)

Single-spindle moulding machine

12.311

This annex may also be applied for measurement of noise from special-purpose machines having a similar construction and function.

D.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. During the first part of the work cycle, when the test material is fed into the tool, a higher level of noise may be emitted which depends on the infeed rate. On manually fed machines the infeed rate is difficult to control and therefore this part of the operating cycle shall not be included in the measurement.
- c) Operator microphone position for test purpose (see figure D.1):
 - 1,5 m above floor level;
 - 0,2 m forward of spindle centreline;
 - 0,4 m to the right of spindle centreline.

NOTE 7 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

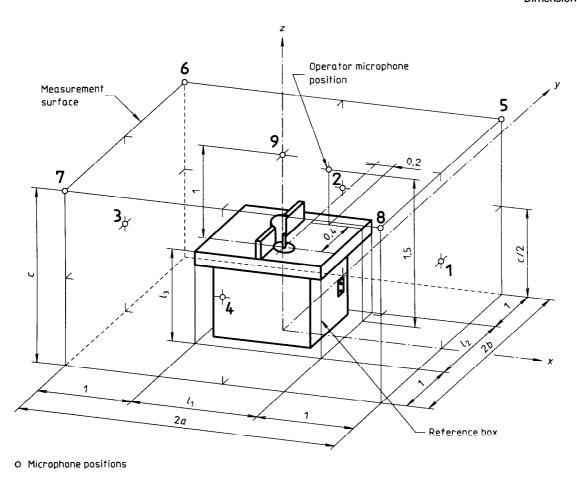


Figure D.1 — Measurement surface and microphone array for determination of sound power level for single-spindle moulding machines (see ISO 3740 series for explanation of symbols)

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D.3 Data sheet for single-spindle moulding machines

Machine data		
Make:		
Model:		
Year of manufacture:		Serial No.:
Overall dimensions of machine 1):		
lengthmm	width	mm heightmm
Drive of spindle:		
Nominal rotational speed:		
motor	r/min	spindler/min
Machine installation		
		Remarks/description:
Machine installed according to manufacture	er's instructions	
_	_	
yes 📋	no 📙	
Machine installed with dust extraction accordacturer's specifications	ording to manu-	
nactive of specimentaria		
yes 🗌	no 🗌	
Machine mounted on vibration isolators		
_		
yes 🗌	no 🗌	
Machine equipped with cutter guard design reducing hood	ned as a noise-	
reducing nood		
yes 🗆	no 🗆	
,		
Other noise control measures		
yes 🗀	no 🗌	
Those elements which protrude from the many wheels, levers) may be disregarded.	achine and which	are not likely to contribute to the noise emission (for example hand-

Data sheet for single-spindle moulding machines (continued)

Testing operation	Units	Standard condition(s)	Condition chosen within permitted range
Moulding in particle board edges			or conditions deviating from standard
Operating arrangement			
Cutter head Particle board			
Distance, a	mm	1 ± 0,1	
Projection of cutting knives, b	mm	1,1 max.	
Upper tool edge above table, h	mm	45	
Tool and cutting data			
Type of tool: Circular cutter with straight knives			
Spindle speed	r/min	6 000 ¹⁾	
Cutting circle diameter	mm	125	
Cutting speed	m/s	40	
Number of knives		2	
Tool width	mm	50	
Cutting width	mm	16	
Cutting depth	mm	10	
Feed rate	m/min	6 ± 2	
Cutting principle: cutter rotation opposing feed			
1) Spindle speed shall be as close as possible to 6 000 r/min.			

Data sheet for single-spindle moulding machines (concluded)

Testing material	
Material:	particle board, three-layer construction (see 4.3)
Moisture content:	6 % to 10 %
Board thickness:	16 mm
Board length:	600 mm to 800 mm
Board width:	600 mm to 800 mm, processed down to a final minimum width of 150 mm
Previous processing:	none
Photo or detailed illustration	on of the machine tested
Testing laboratory	
Firm/institution:	
Telephone:	
	Signature:
Test carried out:	_
place:	
date:	

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Annex E

(normative)

Woodworking machines — Operating conditions for double-end profiling machines

E.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from double-end profiling machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machine.

Machine classification number (see ISO 7984)

Double-end profiling machine

82.4

This annex may also be applied for measurement of noise from special purpose machines having a similar construction and function.

E.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. A continuous supply of test pieces should be fed with a minimum distance between successive test pieces so that measurements are made during simultaneous operation of all working units.
- c) Operator microphone positions for test purpose (see figure E.1)

Position A:

- 1,5 m above floor level;
- in the plane of the front face of the measurement surface;
- in line with the middle of the infeed referred to a constant material width of 600 mm.

ISO 7960:1995(E)

Position B:

- 1,5 m above floor level;
- in the plane of the rear face of the measurement surface;
- in line with the middle of the outfeed referred to a constant material width of 600 mm.
- d) The reference box shall enclose all elements of the machine which are significant radiators of sound energy. The reference box shown in figure E.1 refers to a machine set-up for a 600 mm board width.

NOTE 8 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

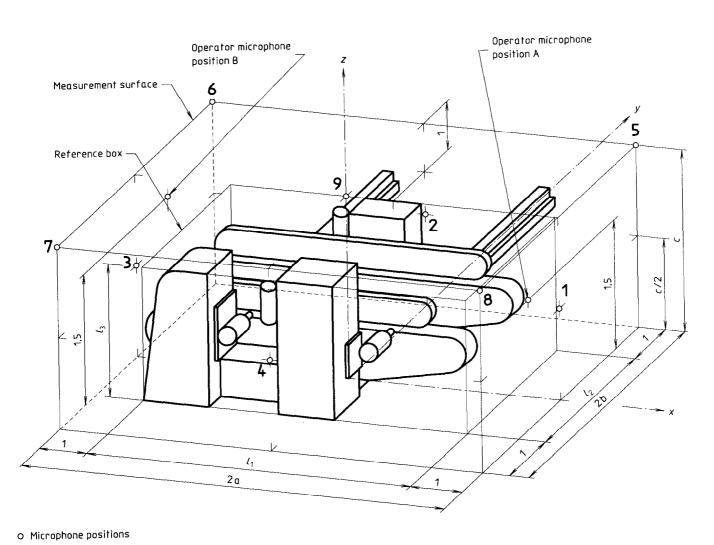


Figure E.1 — Measurement surface and microphone array for determination of sound power level for double-end profiling machines (see ISO 3740 series for explanation of symbols)

E.3 Data sheet for double-end profiling machines

Model:							
	nanufacture:			Serial No.:			
Overall d	limensions of machin	e ¹⁾ :					
lengt	h	mm width		r	mm heigh	t	mr
	Spindle No. ¹⁾	Spindle function		Maximum tool diameter	sp Motor		
	1			mm	r/min	r/min	
	1						
	3						
	4						
	5						
	 						
	7						
	8		+				
		o the fixed side of the	machir	20		1	
		·	macini	···			
	Attached freq	uency converter		S	eparate frequi	ency converter	
	tallation installed according t	o manufacturer's in	ıstruc-		Remarks/	description:	
tions yes	installed according t	no			Remarks	/description:	
tions yes Machine manufact	installed according t	no			Remarks	/description:	
tions yes Machine	installed according t	no			Remarks,	/description:	
tions yes Machine manufact yes	installed according t installed with dust turer's specifications	no extraction accordi			Remarks	/description:	
tions yes Machine manufact yes	installed according t installed with dust turer's specifications	no extraction accordi			Remarks	/description:	
tions yes Machine manufact yes Machine	installed according t installed with dust turer's specifications mounted on vibration	no extraction accordi no n isolators			Remarks	/description:	
tions yes Machine manufact yes Machine yes	installed according t installed with dust turer's specifications mounted on vibration	no extraction according no			Remarks	/description:	
tions yes Machine manufact yes Machine yes	installed according t installed with dust turer's specifications mounted on vibration	no extraction according no			Remarks	/description:	
tions yes Machine manufact yes Machine yes	installed according t installed with dust turer's specifications mounted on vibration	no extraction accordi no n isolators no se enclosure			Remarks	/description:	
tions yes Machine manufact yes Machine yes	installed according t installed with dust turer's specifications mounted on vibration	no extraction according no no nisolators no se enclosure no			Remarks	/description:	
tions yes Machine manufact yes Machine yes	installed according t installed with dust turer's specifications mounted on vibration fitted in separate nois	no extraction according no no nisolators no se enclosure no			Remarks	/description:	
tions yes Machine manufact yes Machine yes Machine yes Machine yes	installed according t installed with dust turer's specifications mounted on vibration fitted in separate nois equipped with integr	no extraction according no no nisolators no se enclosure no al noise enclosure no	ng to		Remarks	/description:	
tions yes Machine manufact yes Machine yes Machine yes Machine yes Machine	installed according t installed with dust turer's specifications mounted on vibration fitted in separate nois	no extraction according no no nisolators no se enclosure no al noise enclosure no	ng to		Remarks	/description:	
tions yes Machine manufact yes Machine yes Machine yes Machine yes	installed according t installed with dust turer's specifications mounted on vibration fitted in separate nois equipped with integr	no extraction according no no nisolators no se enclosure no al noise enclosure no	ng to		Remarks	/description:	
tions yes Machine manufact yes Machine yes Machine yes Machine yes Machine yes	installed according t installed with dust turer's specifications mounted on vibration fitted in separate nois equipped with integrate equipped with noise-	no extraction according no no no isolators no se enclosure no all noise enclosure no orreducing hoods	ng to		Remarks	/description:	
tions yes Machine manufact yes Machine yes Machine yes Machine yes Cother noi	installed according t installed with dust turer's specifications mounted on vibration fitted in separate nois equipped with integr	no extraction according no no no isolators no se enclosure no all noise enclosure no orreducing hoods	ng to		Remarks	/description:	
tions yes Machine manufact yes Machine yes Machine yes Machine yes Machine yes	installed according t installed with dust turer's specifications mounted on vibration fitted in separate nois equipped with integrate equipped with noise-	no extraction according no no no isolators no se enclosure no all noise enclosure no orreducing hoods	ng to		Remarks	/description:	

Data sheet for double-end profiling machines (continued)

Testing operations

Sizing and grooving in particle board edges.

One of the following procedures is used:

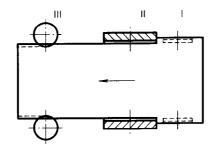
Procedure S using:

Scoring sawblade (I) Hogging cutter (II) Grooving saw (III)

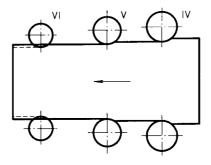
Procedure M using:

Edge moulding, relieving cutter (IV)
Edge moulding, finish planing cutter (V)
Grooving saw (VI)

8 mm shall be cut off at each side of the machine. Processing operations shall be symmetrical.





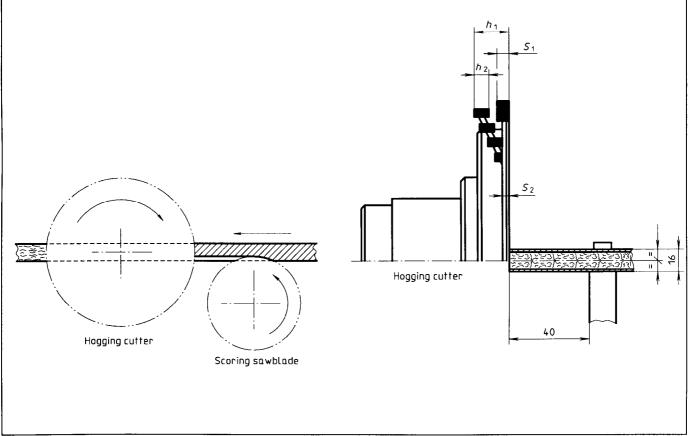


Procedure M

Operating arrangement

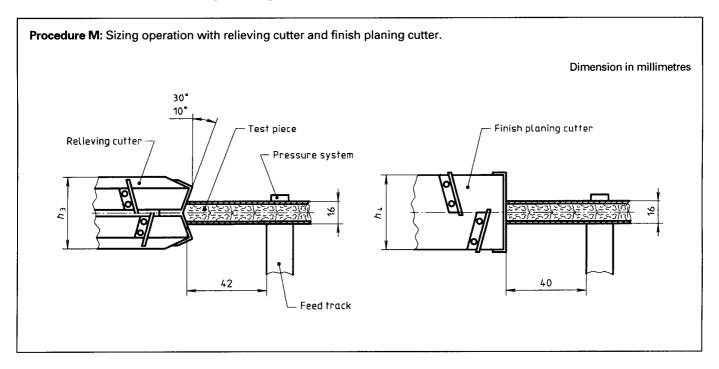
Procedure S: Sizing operation with scoring sawblade and hogging cutter. Hogging cutter axis situated at centreline of test piece.

Dimension in millimetres



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Data sheet for double-end profiling machines (continued)



Data sheet for double-end profiling machines (continued)

То	ol and cutting data	Units	Standard o	ondition(s)	Condition chosen within permitted range or conditions deviating from standard
	Procedure S				nom standard
	Scoring, sawing and hogging				
a)	Spindle I (horizontal) Scoring sawblade (spindle rotation in direction of feed) Type of saw: Standard sawblade with carbide- tipped teeth				
	spindle speed	r/min	3 000 ¹⁾ o		
	blade diameter	mm	180 to 200		
	cutting speed	m/s	204-40		
	number of teeth	,	36 to 48		
	tooth profile		221	. 0. 1	
	tooth width	mm	3,2 ± 0,1		
	actual blade thickness	mm	2,2 ±		
	scoring depth	mm	2		
b)	Spindle II (horizontal) Sawing and hogging cutter (cutting in opposition to				
	scoring sawblade)				
	Type of saw: Standard sawblade with carbide				
	tipped teeth				
	spindle speed	r/min	3 000	6 000 ¹⁾	
	blade diameter	mm	280 to 300	200	
	cutting speed	m/s			
	number of teeth		72 to 84	48 to 60	
	tooth profile		:		
	tooth width, S_1	mm	3,2 ± 0,1	4 ± 0,1	
	actual blade thickness, S_2	mm	2,2 ± 0,1	2.8 ± 0.1	
	Type of saw: Hogging cutter (helical) with carbide- tipped teeth				
	diameter	mm	280 to 300	200	
	number of teeth per row		6 to 12	4 to 6	
	total cutting width, h_1	mm	20 to 24	20 to 24	
	cutting width per tooth, h_2	mm	4 min.	4 min.	
c)	Spindle III (vertical)				
	Grooving saw (spindle rotation opposing feed) Type of saw: Grooving saw with carbide-tipped				
	teeth spindle speed	r/min	3 000	6 000 ¹⁾	
	cutting circle diameter	mm	180	180	
	cutting speed	m/s		100	
	number of teeth	11.1/0	12	18	
	tooth width	mm	4	4	
	grooving depth	mm	5	5	
d)	Feed rate	m/min	15 ²⁾		
e)	Distance, feed track-tool mm 40				

¹⁾ If available, 6 000 r/min shall be used.

²⁾ If this feed is unobtainable, the nearest available shall be used.

Data sheet for double-end profiling machines (continued)

2) If this feed rate is unobtainable, the nearest available shall be used.

10	oi and cutting data (continued)	Units	Standard condition(s)	Condition chosen within permitted rang or conditions deviating from standard
	Procedure M			
	Edge planing			
a)	Spindle IV (vertical)			
	Relieving (spindle rotation opposing feed)			
	Relieving cutter with carbide knives	1	0.000 1) 0.000 1)	
	spindle speed	r/min	3 000 ¹⁾ or 6 000 ¹⁾	
	cutting circle diameter	mm	200	
	cutting speed	m/s	2 × 4	
	number of cutting knives	mm	2 ^ 4 56	
	cutter width, h ₃	mm	6	
	cutting depth	mm	6	
b)	Spindle V (vertical)			
	Planing (spindle rotation opposing feed)			
	Finish planing cutter with carbide knives		4) 4)	
	spindle speed	r/min	3 000 ¹⁾ or 6 000 ¹⁾	
	cutting circle diameter	mm	180	
	cutting speed	m/s		
	number of cutting knives		2 × 3	
	cutter width, h_4	mm	56	
	cutting depth	mm	2	
c)	Spindle VI (vertical)			
	Grooving (spindle rotation opposing feed)			
	Grooving saw with carbide-tipped teeth			
	spindle speed	r/min	3 000 ¹⁾ or 6 000 ¹⁾	
	cutting circle diameter	mm	180	
	cutting speed	m/s		
	number of teeth		12 18	
	tooth width	mm	4	
	cutting depth	mm	5	
d)	Feed rate	m/min	15 ²⁾	
	Distance, feed track-tool	mm	40	

Data sheet for double-end profiling machines (concluded)

Testing materia	I	
Material:	uncoated particle board, three-layer construction (see 4.3)	
Moisture co	ntent: 6 % to 10 %	
Board thickn	ess: 16 mm	
Board length	a: 2 000 mm	
Board width	600 mm, processed down to a final minimum width of 400 mm	
Previous pro	cessing: none	
Photo or detaile	d illustration of the machine tested	
Testing laborate	pry	_
Firm/instituti	on:	
	······································	
	Signature:	
Test carried		
uate		

Annex F

(normative)

Woodworking machines — Operating conditions for edge-banding machines

F.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from edge-banding machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machine.

Machine classification number (see ISO 7984)

Edge-banding machine, single and double-sided

83.15

This annex may also be applied for measurement of noise from special-purpose machines having a similar construction and function.

F.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. A continuous supply of test pieces should be fed with a minimum distance between successive test pieces so that measurements are made during simultaneous operation of all working units.
- c) Operator microphone positions for test purpose (see figure F.1)

Position A:

- 1,5 m above floor level;
- in the plane of the front face of the measurement surface;
- 0,3 m to the right of the left fence (viewed from infeed direction).

Position B:

- 1,5 m above floor level;
- in the plane of the rear face of the measurement surface;
- 0,3 m to the right of the left fence (viewed from infeed direction).
- d) The reference box shall enclose all elements of the machine which are significant radiators of sound energy. The reference box shown in figure F.1 refers to a machine set-up for a 600 mm board width.

NOTE 9 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

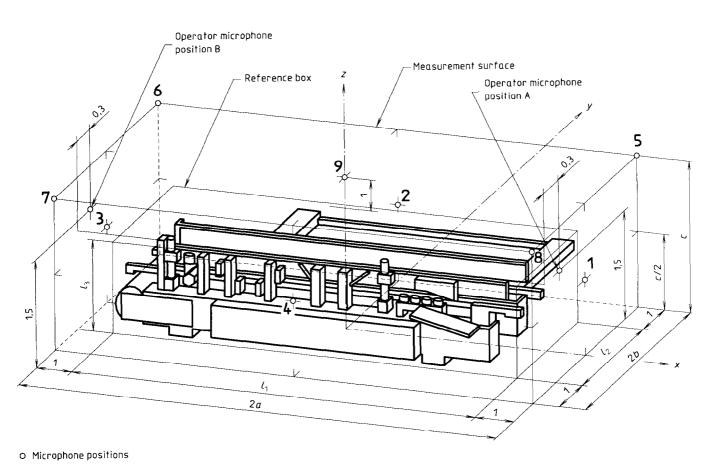


Figure F.1 — Measurement surface and microphone array for determination of sound power level for edgebanding machines (see ISO 3740 series for explanation of symbols)

ISO 7960:1995(E)

F.3 Data sheet for edge-banding machines

achine data Make:						
Model:					•••••	
Year of ma	nufacture:		Serial No.:			
Overall din	nensions of machin	e ¹⁾ :				
length		mm width		mm heigh	t	r
	Spindle No. ¹⁾	Spindle function	Maximum tool diameter	sp	rotational eed	
			mm	Motor r/min	Spindle r/min	
	1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	By reference to	o the fixed side of the m	achine.			
	☐ Attached freque	uency converter	□ S	Separate freque	ency converter	•
achine insta Machine ir tions		o manufacturer's inst	ruc-	Remarks	/description:	
yes		no				
	nstalled with dust	extraction according	, to			
yes		no				
Machina m	nounted on vibration	n isolators				
yes						
y 0.3		110				
Machine fi	tted in separate nois	ea ancloeura				
yes		no		•••••		
yes		110				***************************************
NA - alaine -		al maia a amala a		•••••		
	quipped with integr					
yes		no				
Machine e	quipped with noise-	reducina hoods				
	 П	no	Π		••••	
, = -						
	e control measures					
Other nois	~ ~~ v					
		no				
Other nois		no			••••	

Data sheet for edge-banding machines (continued)

Testing operations

Edge-banding of particle board and final processing.

a) Edge-banding, using one of the following procedures:

Procedure P: Plastic edge is banded by machines constructed for banding of plastic edges as well as wooden edges

Procedure H: Hardwood edge is banded by machines constructed for that purpose only.

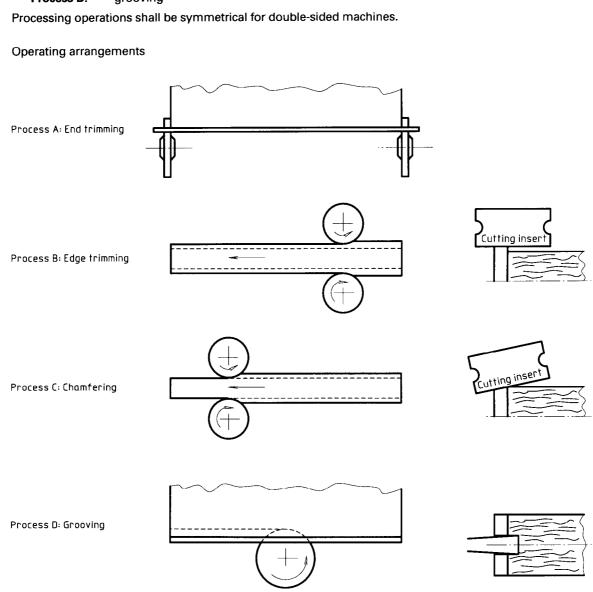
b) Final processing of the banded edge, by means of the following operations:

Process A: end trimming

Process B: edge trimming

Process C: chamfering

Process D: grooving



ISO 7960:1995(E)

Data sheet for edge-banding machines (continued)

То	ol and cutting data	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating from standard
	Procedure P			
a)	End trimming saw			
	Type of saw: Specify according to make of machine			
	spindle drive	r/min		
	sawblade diameter	mm		
	cutting speed	m/s		
	number of teeth			
	tooth profile	mm		
	tooth width	mm		
	actual blade thickness	mm		
b)	Edge trimming cutter			
	Type of tool:			
	spindle speed	r/min		
	cutting circle diameter	mm	70	
	cutting speed	m/s		
	number of teeth/knives		4	
	cutter width	mm	12 min.	
	cutting depth	mm		
	cutting principle: spindle rotation opposing feed			
c)	Chamfering cutter			
	Type of tool:			
	spindle speed	r/min		
	cutting circle diameter	mm	70	
	cutting speed	m/s		
	number of teeth/knives		4	
	cutting width	mm	12 min.	
	cutting depth	mm		
	cutting principle: spindle rotation opposing feed			
d)	Grooving saw			
	Type of tool:			
	spindle speed	r/min	,,,	
	cutting circle diameter	mm		
	cutting speed	m/s	50 min.	
	number of teeth			
	tooth width	mm	4	
	cutting depth	mm	5	
	cutting principle: spindle rotation in direction of feed			
e)	Feed rate	m/min	15 min.	

Data sheet for edge-banding machines (concluded)

Testing material		
	Procedure P	Procedure H
Board material:	plastic-coated decorative particle board (see 4.3)	uncoated particle board, three-layer construction (see 4.3)
Moisture content:	6 % to	10 %
Board thickness:	16 ו	mm
Board length:	2 000) mm
Board width:	600 mm, processed down to a f	inal minimum width of 400 mm
Previous processing:	no	one
Edge material:	plastic edge	hardwood edge
Edge width:	0,3 mm to 1,5 mm	15 mm
Edge height:	20 mm	19 mm
Photo or detailed illustration		
Testing laboratory		
Firm/institution:		
Address:		
Telephone:		
Date:	Signature:	
Test carried out:		
place:		
date:		

Annex G

(normative)

Woodworking machines — Operating conditions for double-end sizing and edge-banding machines

G.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from double-end sizing and edge-banding machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machine.

Machine classification number (see ISO 7984)

Combined double-end sizing and edge-banding machine

83.21

This annex may also be applied for measurement of noise from special-purpose machines having a similar construction and function.

G.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. A continuous supply of test pieces should be fed with a minimum distance between successive test pieces so that measurements are made during simultaneous operation of all working units.
- c) Operator microphone positions for test purpose (see figure G.1)

Position A:

- 1.5 m above floor level;
- in the plane of the front face of the measurement surface;
- 0,3 m to the right of the left fence (viewed from infeed direction).

Position B:

- 1,5 m above floor level;
- in the plane of the rear face of the measurement surface;
- 0,3 m to the right of the left fence (viewed from infeed direction).

d) The reference box shall enclose all elements of the machine which are significant radiators of sound energy. The reference box shown in figure G.1 refers to a machine set-up for a 600 mm board width.

NOTE 10 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

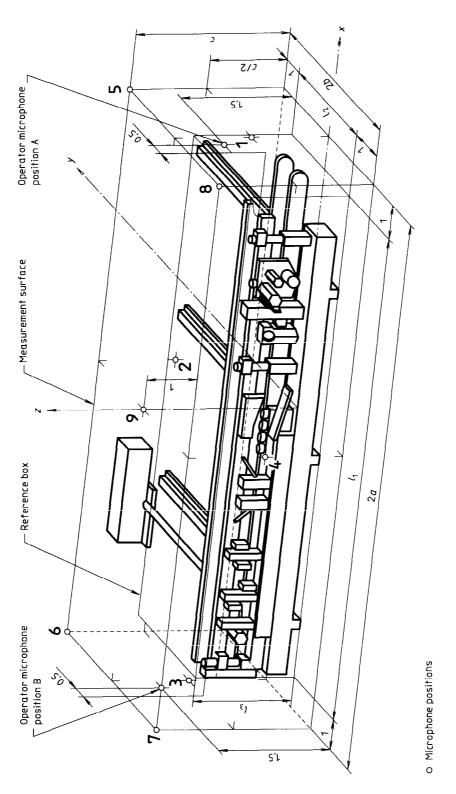


Figure G.1 — Measurement surface and microphone array for determination of sound power level for doubleend sizing and edge-banding machines (see ISO 3/40 series for explanation of symbols)

ISO 7960:1995(E)

G.3 Data sheet for double-end sizing and edge-banding machines

chine data Make:							
Model:							
Year of ma	anufacture:	•••••		Serial No.:			
Overall dir	mensions of machine	e ¹⁾ :					
length		mm width .		r	nm heigh	t	m
	Spindle No. ¹⁾	Spindle function		Maximum tool diameter		rotational eed	
				mm	Motor r/min	Spindle r/min	
	1					1,,,,,,	
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9					·	
	10						
	11						
	12						
	By reference to	the fixed side of the r	nachine				
	Attached frequency	uency converter		□ Se	eparate frequ	ency converter	
chine insta Machine ir tions	nstalled according to	o manufacturer's ins	struc-		Remarks	description:	
yes		no					
	nstalled with dust	extraction according	ng to				
yes		no					
NA I- !							
	nounted on vibratior □			•••••			
yes		no		,	*************************	••••••••••	
Machine fi	tted in separate nois	e enclosure					
yes		no					
	quipped with integra				•••••	•••••	
yes		no		***************************************	•••••		
Machine e	quipped with noise-	reducing hoods					
yes		no					
,							
, 55							
	e control measures						
	e control measures	no					••••••

Testing operations

Sizing and edge-banding of particle board and final processing.

a) Sizing, using one of the following procedures:

Procedure S: Scoring sawblade (I)

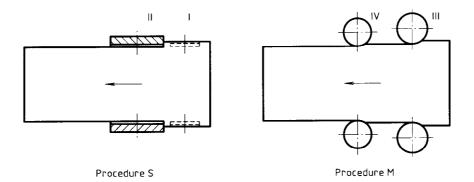
Hogging cutter (II)

Procedure M: Edge-moulding, relieving cutter (III)

Edge-moulding, finish planing cutter (IV)

8 mm shall be cut off at each side of the machine.

Processing operations shall be symmetrical.



- b) Edge-banding, using one of the following procedures:
 - **Procedure P:** Plastic edge is banded by machines constructed for banding of plastic edges as well as wooden edges.
 - **Procedure H:** Hardwood edge is banded by machines constructed for that purpose only.
- c) Final processing of banded edges, carried out by means of the following operations:

Process A: end trimming

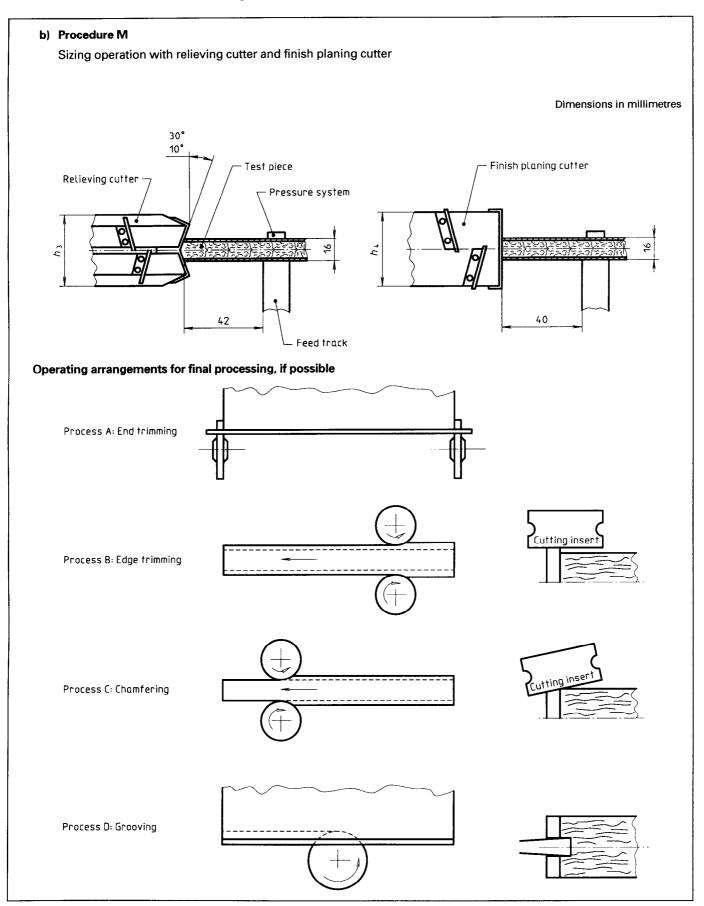
Process B: edge trimming

Process C: chamfering

Process D: grooving

Processing operations shall be symmetrical.

Operating arrangements a) Procedure S Sizing operation with scoring sawblade and hogging cutter Hogging cutter Scoring sawblade Dimensions in millimetres Hogging cutter 40 Hogging cutter, axis situated at centreline of test piece



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То	ol and cutting data	Units	Standard c	ondition(s)	Condition chosen within permitted range or conditions deviating from standard
	Procedure S				iroiri standard
	Scoring, sawing and hogging				
a)	Spindle I (horizontal)				
	Scoring (spindle rotation in direction of feed)				
	Type of saw: Standard sawblade with carbide- tipped teeth				
	spindle speed	r/min	3 000 ¹⁾ o	r 6 000 ¹⁾	
	blade diameter	mm	180 to	o 200	
	cutting speed	m/s			
	number of teeth		36 to	o 48	
	tooth profile				
	tooth width	mm	3,2 =	± 0,1	
	actual blade thickness	mm	2,2 ±	± 0,1	
	scoring depth	mm	2	2	
b)	Spindle II (horizontal)				
	Sawing and hogging cutter (cutting in opposition to scoring cutter)				
	Type of saw: Standard sawblade with carbide- tipped teeth				
	spindle speed	r/min	3 000	6 000 ¹⁾	
	blade diameter	mm	280 to 300	200	
	cutting speed	m/s			
	number of teeth		72 to 84	48 to 60	
	tooth profile				
	tooth width, S ₁	mm	3,2 ± 0,1	4 ± 0,1	
	actual blade thickness, S_2	mm	2,2 ± 0,1	2,8 ± 0,1	
	Type of saw: Hogging cutter (helical) with carbide- tipped teeth				
	diameter	mm	280 to 300	200	
	number of teeth per row		6 to 12	4 to 6	
	total cutting width, h_1	mm	20 to 24	20 to 24	
	cutting width per tooth, h ₂	mm	4 min.	4 min.	
c)	Feed rate	m/min	15	2)	
d)	Distance, feed track-tool	mm	4	0	

¹⁾ If available, 6 000 r/min shall be used.

²⁾ If this feed is unobtainable, the nearest available shall be used.

Tool and cutting data (continued)	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating from standard
Procedure M Edge planing			
Spindle III (vertical) Relieving (spindle rotation opposing feed)			
Relieving cutter with carbide knives spindle speed cutting circle diameter cutting speed number of cutting knives cutting width, h_3 cutting depth	r/min mm m/s mm mm	3 000 or 6 000 ¹⁾ 200 2 × 4 56 6	
b) Spindle IV (vertical) Planing (spindle rotation opposing feed)			
Finish planing cutter with carbide knives spindle speed cutting circle diameter cutting speed number of cutting knives	r/min mm m/s	3 000 or 6 000 ¹⁾ 180 2 × 3	
cutter width, h_{4} cutting depth	mm mm	56 2	
c) Feed rate	m/min	15 ²⁾	
d) Distance, feed track-tool	mm	40	
If available, 6 000 r/min shall be used.			

¹⁾ If available, 6 000 r/min shall be used.

²⁾ If this feed is unobtainable, the nearest available shall be used.

ISO 7960:1995(E)

To	ol and cutting data (continued)	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating
	Procedure P Procedure H			from standard
	_			
a)	End trimming saw Type of saw: Specify according to make of machine			
	spindle drive sawblade diameter	r/min mm		
	cutting speed	m/s		
	number of teeth	,,5		
	tooth profile			
	tooth width	mm		
	actual blade thickness	mm		
b)	Edge trimming cutter			
	Type of tool:			
	spindle speed	r/min		
	cutting circle diameter	mm	70	
	cutting speed	m/s		
	number of teeth/knives		4	
	cutter width	mm	12 min.	
	cutting depth	mm		
	cutting principle: spindle rotation opposing feed			
c)	Chamfering cutter			
	Type of tool:			
	spindle speed	r/min	,	
	cutting circle diameter	mm	70	
	cutting speed	m/s		
	number of teeth/knives		4	
	cutting width	mm	12 min.	
	cutting depth	mm		
	cutting principle: spindle rotation opposing feed			
d)	Grooving saw			
	Type of tool:			
	spindle speed	r/min		
	cutting circle diameter	mm		
	cutting speed	m/s	50 min.	
	number of teeth			
	tooth width	mm	4	
	cutting depth	mm	5	
	cutting principle: spindle rotation in direction of feed			
e)	Feed rate	m/min	15 min.	

Testing material		
	Procedure P	Procedure H
Board material:	plastic-coated decorative particle board (see 4.3)	uncoated particle board, three-layer construction (see 4.3)
Moisture content:	6 % to	o 10 %
Board thickness:	16 r	mm
Board length:	2 000	0 mm
Board width:	600 mm, processed down to a f	final minimum width of 400 mm
Previous processing:	no	one
Edge material:	plastic edge	hardwood edge
Edge width:	0,3 mm to 1,5 mm	15 mm
Edge height:	20 mm	19 mm
Testing laboratory		
Telephone:		
	Signature:	
Test carried out:		
place:		
date:		

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Annex H

(normative)

Woodworking machines — Operating conditions for two-side and multi-side planing machines and moulding machines

H.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from two-side and multi-side planing machines and moulding machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machines.

Machine classification number (see ISO 7984)

	12.22	12.32
Two-side and multi-side planing and moulding machines	12.23	12.33
	12.24	12.34

For the purpose of this annex the following distinction applies:

- planing machines refers to machines with fixed cutters;
- moulding machines refers to machines with all cutters interchangable.

Moulding machines are subdivided into:

- those having a feed rate ≤ 60 m/min, which are classed normal duty; and
- those having a feed rate > 60 m/min, which are classed heavy duty.

This annex may also be applied for measurement of noise from special-purpose machines having a similar construction and function.

H.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. A continuous supply of test pieces should be fed with a minimum distance between successive test pieces so that measurements are made during simultaneous operation of all working units.
- c) Operator microphone positions for test purpose (see figure H.1)

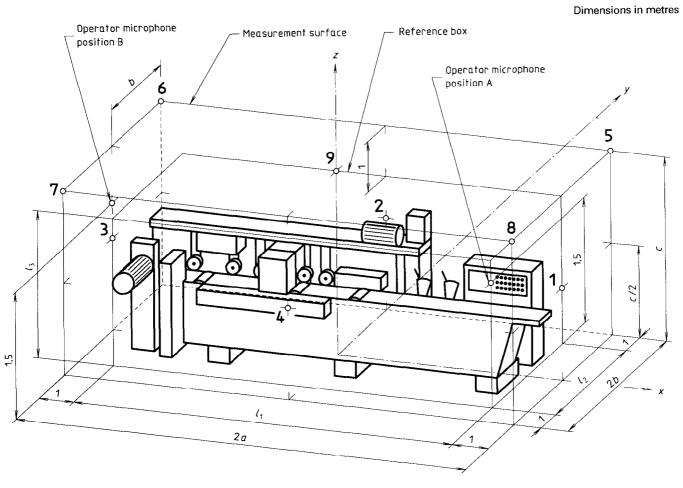
Position A:

- 1,5 m above floor level;
- in the left corner of the front face of the reference box.

Position B:

- 1,5 m above floor level;
- in the plane of and in the middle of the rear face of the measurement surface.

NOTE 11 The use of integrating sound level meters is recommended but is not mandatory.



O Microphone positions

Figure H.1 — Measurement surface and microphone array for determination of sound power level for two-side and multi-side planing machines and moulding machines (see ISO 3740 series for explanation of symbols)

ISO 7960:1995(E)

H.3 Data sheet for two-side and multi-side planing machines and moulding machines

Machine data								
	nufacture:				Serial No.:			
Overall din	nensions of machine	e ¹⁾ :						
length		mm wi	dth			mm heigh	t	mm
	Spindle No. ¹⁾	Spindle fund	ction	ı	Vlaximum tool diameter	sp	rotational eed	
					mm	Motor r/min	Spindle r/min	
	1				111111	1/111111	1/111111	
	2				,			
	3							
	4				<u> </u>			
	5			-				
	6							
	By reference to	the fixed side of	f the n	nachine.				
	Maximum feed rat	e:					m/min	· i
	Attached frequ	ency converte	r		S	eparate freque	ency converter	
Machine instal	llation							
		٠.				Remarks/	description:	
Machine in tions	stalled according to	manutacturer	's ins	struc-				
_			no				•••••	
,00 [,,,,	ليا				
	nstalled with dust rer's specifications	extraction acc	ordin	ig to				
yes [_ ·		no					
Machine m yes [ounted on vibratior	ı isolators	no					
84								
_	ted in separate nois	se enclosure	20					
yes [no	Ш				
Machine ed	quipped with integra	al noise enclosi	ure					
yes [no					
Machine ed	quipped with noise-	reducing hood:	s	_				
yes			no					
Machina ac	quipped with slotted	l table line						
-		rtable lips	no					
, [_							
Machine ed	quipped with helical	cutter block						
yes [no					
_	quipped with segme	ent cutter block		$\overline{}$		• • • • • • • • • • • • • • • • • • • •		•••••
yes			no	L	***************************************			
Other noise	e control measures							
yes [no					***************************************
	ents which protrude fi	rom the machine	e and	which a	re not likely to cont	tribute to the no	oise emission (f	or example hand-

Data sheet for two-side and multi-side planing machines and moulding machines (continued)

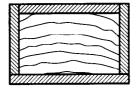
Testing operations

Planing of softwood on maximum number of sides.

Operating arrangements

a) Moulding machines, class normal duty, and planing machines, all sizes.

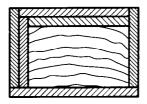
Moulding machines with a feed rate of \leq 60 m/min, and planing machines (all sizes).



Planing on max. four sides with front bottom to top heads and front right side and left side heads.

b) Moulding machines, class heavy duty.

Moulding machines with a feed rate > 60 m/min.



Planing on max. four sides with front bottom to top head and front right side and left side heads. Additional planing on one horizontal and one vertical surface, if possible.

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Data sheet for two-side and multi-side planing machines and moulding machines (continued)

r/min mm mm mm	6 000 ¹⁾ 120 min. 100 min.	from standard
mm mm mm	120 min.	
mm mm		1
mm	100 min.	
l	1,5 max.	
mm	3	
mm	4	
	1	
m/min	15 ¹⁾	
	4 max.	
mm	125 ²⁾	
m/s	39	
	4	
	1	
m/min	15 ¹⁾	
	4 max.	
mm	125 ²⁾	
m/s	39	
	4	
m/min	60 ¹⁾	
m/min	6 max.	
mm	160	
m/s	50	
	6	
1	i	1
1	mm m/s m/min m/min mm	mm 125 ²⁾ m/s 39 4 m/min 60 ¹⁾ m/min 6 max. mm 160 m/s 50

¹⁾ Spindle speed and feed rate shall be as close as possible to indicated values.

²⁾ If the spindle diameter is over 40 mm, then a cutting circle diameter greater than 125 mm may be chosen.

Data sheet for two-side and multi-side planing machines and moulding machines (concluded)

Material: softwood, medium grade Moisture content: 8 % to 14 % Material length: planing machines: 1 000 mm moulding machines, normal duty: 1 000 mm moulding machines, heavy duty: 2 000 mm min. Material width: 100 mm Material height: 80 mm max., processed down to a final minimum height of 50 mm Previous processing: planed on four sides Photo or detailed illustration of the machine tested Testing laboratory Firm/institution: Address: Telephone: Date: Signature:	Testing material	
Material length: planing machines: 1 000 mm moulding machines, normal duty: 2 000 mm min. Material width: 100 mm Material height: 80 mm max., processed down to a final minimum height of 50 mm Previous processing: planed on four sides Photo or detailed illustration of the machine tested Testing laboratory Firm/institution: Address: Telephone:	Material:	softwood, medium grade
moulding machines, normal duty: 1 000 mm moulding machines, heavy duty: 2 000 mm min. Material width: 100 mm Material height: 80 mm max., processed down to a final minimum height of 50 mm Previous processing: planed on four sides Photo or detailed illustration of the machine tested Testing laboratory Firm/institution: Address: Telephone:	Moisture content:	8 % to 14 %
Material height: 80 mm max., processed down to a final minimum height of 50 mm Previous processing: planed on four sides Photo or detailed illustration of the machine tested Testing laboratory Firm/institution: Addrese: Telephone:	Material length:	moulding machines, normal duty: 1 000 mm
Photo or detailed illustration of the machine tested Testing laboratory Firm/institution: Address: Telephone:	Material width:	100 mm
Photo or detailed illustration of the machine tested Testing laboratory Firm/institution: Address: Telephone:	Material height:	80 mm max., processed down to a final minimum height of 50 mm
Testing laboratory Firm/institution: Address: Telephone:	Previous processing:	planed on four sides
Firm/institution: Address: Telephone:	Photo or detailed illustration	of the machine tested
Firm/institution: Address: Telephone:		
Address: Telephone:	Testing laboratory	
Address: Telephone:	Firm/institution:	
Telephone:		
0.5.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0		
Test carried out:		
place:		
date:	·	

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Annex J

(normative)

Woodworking machines — Operating conditions for band sawing machines

J.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from band sawing machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

The present annex shall be used in connection with measurement of noise from the following machines.

Machine classification number (see ISO 7984)

Band resawing machine, vertical Table band sawing machine

12.121.42 12.121.5

This annex may also be applied for measurement of noise from special kinds of machines having a similar construction and function.

J.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. During the first part of the work cycle, when the test material is fed into the tool, a higher level of noise may be emitted which depends on the infeed rate. On manually fed machines the infeed rate is difficult to control and therefore this part of the operating cycle shall not be included in the measurement.
- c) Operator microphone position for test for band sawing machines (see figure J.1):
 - 1,5 m above floor level;
 - in a plane perpendicular to the table and including the infeed edge of table;
 - in vertical plane of sawblade.

d) Operator microphone positions for test for band resawing machines (see figure J.2)

Position A:

- 1,5 m above the surface on which the operator stands:
- 1 m forward of the machine table;
- 0,5 m to the left of sawblade (viewed from infeed direction).

Position B:

- 1,5 m above the surface on which the operator stands;
- 1 m rearwards from machine table;
- 0,5 m to the left of the sawblade (viewed from infeed direction).

NOTE 12 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

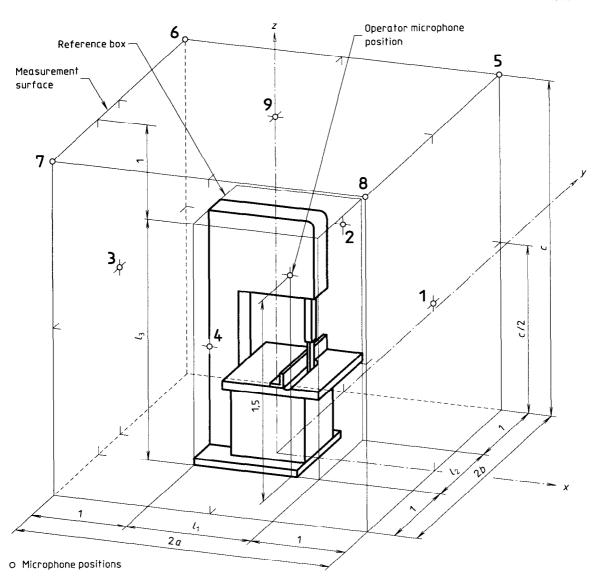


Figure J.1 — Measurement surface and microphone array for determination of sound power level for band sawing machines (see ISO 3740 series for explanation of symbols)

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Dimensions in metres

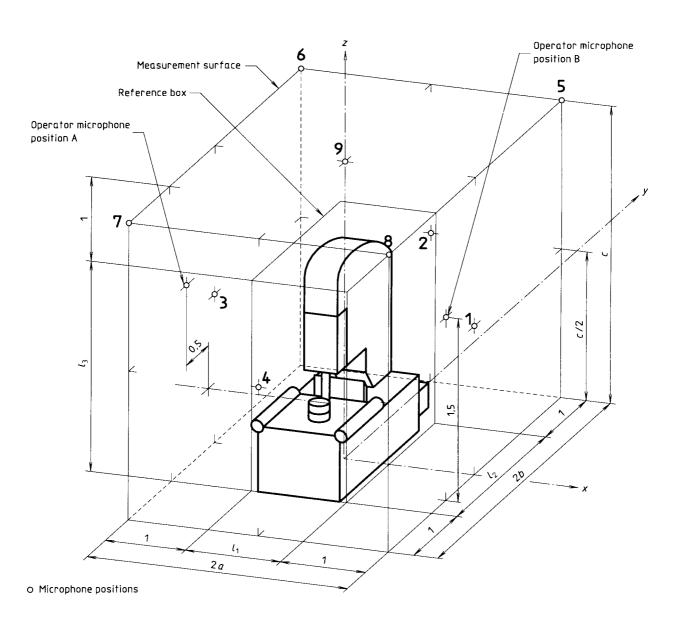


Figure J.2 — Measurement surface and microphone array for determination of sound power level for band resawing machines (see ISO 3740 series for explanation of symbols)

J.3 Data sheet for band sawing machines

Machine data			
Make:			
Model:			
Year of manufacture:			Serial No.:
Overall dimensions of machine 1):			
lengthmm	width		mm heightmm
Pulley diameter:	m	ım	Max. sawblade width: mm
Nominal rotational speed:			
motor	r/m	nin	
pulley			
max.:	•		
min.:	r/m	nin	
Machine installation			Remarks/description:
NA calcino di casa lle di casa calcino del casa casa di			
Machine installed according to manufactions	turer's mstru	IC-	
yes 🗌	no 🗆		
Machine installed with dust extraction	according	to	
manufacturer's specifications	· ·		
yes 🗌	no [
Machine mounted on vibration isolators			
yes 🗌	no [
Machine fitted in separate noise enclosur	e		
yes 🗌	no [
Machine equipped with integral noise en	closure		
yes 🗌	no 🗀		
Machine equipped with noise-reducing h	oods		
yes 🗌	no 🗆		
Other noise control measures			
yes □	no [
 Those elements which protrude from the ma- wheels, levers) may be disregarded. 	chine and whi	ich aı	re not likely to contribute to the noise emission (for example hand-

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Data sheet for band sawing machines (continued)

Testing operation	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating from standard
Cutting of softwood			
Operating arrangement			;
Operating arrangement			
Fence position, a: Table band saw Band resawing machine	mm mm	10 25	
Height to saw guide, h:		min. possible	

Data sheet for band sawing machines (continued)

Tool and cutting data	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating from standard
a) Table band sawing machines			
☐ Pulley diameter, <i>D</i> ≤ 500	mm		
pulley diameter	mm		
spindle speed	r/min	max. possible	
cutting speed	m/s		
sawblade width	mm	16	
tooth pitch	mm	6 to 8	
sawblade thickness	mm	0,5	
feed rate	m/min	4 ± 2	
☐ Pulley diameter, 500 < D ≤ 900	mm		
pulley diameter	mm		
spindle speed	r/min	max. possible	
cutting speed	m/s		
sawblade width	mm	25	
tooth pitch	mm	8 to 10	
sawblade thickness	mm	≤ 0,001 <i>D</i>	
feed rate	m/min	6 ± 2	
☐ Pulley diameter, <i>D</i> > 900	mm		
pulley diameter	mm		
spindle speed	r/min	max. possible	
cutting speed	m/s		
sawblade width	mm	40	
tooth pitch	mm	10 to 12	
sawblade thickness	mm	≤ 0,001 <i>D</i>	
feed rate	m/min	6 ± 2	
b) Band resawing machines			
☐ Pulley diameter, <i>D</i> , unspecified	mm		
pulley diameter	mm		
spindle speed	r/min	max. possible	
cutting speed	m/s		
sawblade width	mm	max. recomm.	
tooth pitch	mm	30 to 50	
sawblade thickness	mm	≤ 0,001 <i>D</i>	
feed rate			
manual feed	m/min	6 ± 2	
mechanical feed	m/min	15	

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Data sheet for band sawing machines (concluded)

Testing material						
Material:	softwood, medium grade					
Moisture content:	8 % to 14 %					
	Table band saw	Band resawing machine				
Material length:	1 000 mm	2 000 mm				
Material width:	80 mm processed down to a final minimum width of 40 mm	150 mm processed down to a final minimum width of 50 mm				
Material height:	40 mm	150 mm				
Previous processing:	no	one				
Photo or detailed illustration						
Testing laboratory						
Firm/institution:						
Address:						
Telephone:						
Date:	Signature:					
Test carried out:						
place:						
date:						

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Annex K

(normative)

Woodworking machines — Operating conditions for single-end tenoning machines

K.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from single-end tenoning machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machine.

Machine classification number (see ISO 7984)

Single-end tenoning machine with two spindles

82.1 (two spindles only)

This annex may also be applied for measurement of noise from special kinds of machines having a similar construction and function.

K.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. For each operation the equivalent continuous sound pressure level is measured over a full working cycle from when the tool/workpiece starts moving until the tool/workpiece has returned to the start position. The time period for each working cycle shall be reported.
- c) Operator microphone position for test purpose (see figure K.1):
 - 1,5 m above floor level;
 - 0,6 m sideways from the sawblade;
 - in the plane of the front face of the reference box.
- d) The reference box shall enclose the moving table but shall exclude the protruding fence.

NOTE 13 In practice, such a measurement can only be carried out by using integrating sound level meters.

Dimensions in metres

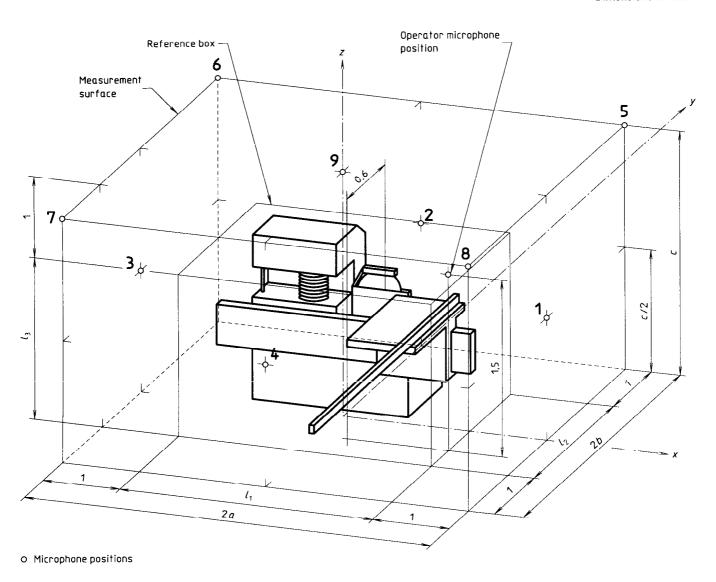


Figure K.1 — Measurement surface and microphone array for determination of sound power level for single-end tenoning machines (see ISO 3740 series for explanation of symbols)

ISO 7960:1995(E)

K.3 Data sheet for single-end tenoning machines

	a						
Model:							
	nanufacture:			Serial No.:			
Overall di	imensions of machin	e ¹⁾ :					
length	٠	mm width			mm heigh	t	mn
				Maximum tool	Nominal	rotational	
	Spindle No. ¹⁾	lle No. ¹⁾ Spindle function		diameter	speed		
				mm	Motor r/min	Spindle r/min	
	1						
	2						
	3						
	4	•					
	5						
	6						
	By reference to	o the fixed side of the	machine) .			
	☐ Manual move	ment			☐ Automa	atic movement	
Machine instantions	installed according to	o manufacturer's in	struc-		Remarks	description:	
yes		no					
ycs		110		***************************************		•••••	
	installed with dust urer's specifications	extraction according	ng to				
Machine r	mounted on vibration	n isolators					
	mounted on vibration	n isolators no	П				
Machine r							
yes		no					
yes Machine f		no se enclosure					
yes		no					
yes Machine f yes	fitted in separate nois	no se enclosure no					
yes Machine f yes Machine e		no se enclosure no al noise enclosure					
yes Machine f yes	fitted in separate nois	no se enclosure no					
yes Machine f yes Machine e yes	fitted in separate nois cup control of the control of the cup	no se enclosure no al noise enclosure no					
yes Machine f yes Machine e yes	fitted in separate nois	no se enclosure no al noise enclosure no					
yes Machine f yes Machine e yes	fitted in separate nois cup control of the control of the cup	no se enclosure no al noise enclosure no					
yes Machine f yes Machine e yes	fitted in separate nois cup control of the control of the cup	no se enclosure no al noise enclosure no reducing hoods					
Machine f yes Machine e yes Machine e yes	fitted in separate nois cup control of the control of the cup	no se enclosure no al noise enclosure no reducing hoods					
Machine f yes Machine e yes Machine e yes	fitted in separate nois equipped with integra equipped with noise-	no se enclosure no al noise enclosure no reducing hoods					
Machine of yes Machine of yes Machine of yes Other noise	fitted in separate nois equipped with integra equipped with noise-	no se enclosure no al noise enclosure no reducing hoods no					
Machine of yes Machine of yes Machine of yes Other nois yes	fitted in separate nois equipped with integra equipped with noise- se control measures	no se enclosure no al noise enclosure no reducing hoods no					
Machine of yes Machine of yes Machine of yes Other noisyes Antisplitting	fitted in separate nois equipped with integra equipped with noise- se control measures	no se enclosure no al noise enclosure no reducing hoods no					
Machine of yes Machine of yes Machine of yes Other nois yes	fitted in separate nois equipped with integra equipped with noise- control measures	no se enclosure no al noise enclosure no reducing hoods no					

Data sheet for single-end tenoning machines (continued)

Testing operation	Units	Standard condition(s)	Condition chosen within permitted range
Tenoning and slotting of softwood			or conditions deviating from standard
Operating arrangement			
Cross-cutting Slotting any be accepted any any accepted			
Tenoning thickness, a Slot width, b Tenon depth, c Distance to support, d Surplus for cross-cutting, e	mm mm mm mm	8 8 60 to 65 min. possible 2 to 20	
a) Spindle I			
Cross-cutting sawblade (standard sawblade with carbide-tipped teeth)			
spindle speed sawblade diameter cutting speed number of teeth tooth profile: alternate top-level tooth width actual blade thickness	r/min mm m/s mm	3 000 ¹⁾ 355 (350) 48 to 64 3,2 to 3,6 2,2 to 2,6	
b) Spindle II			
Slotting cutters (cutter rotation opposing feed) spindle speed cutting circle diameter cutting speed number of cutting knives blade projection	r/min mm m/s	3 000 ¹⁾ 300 2 to 3	
c) Feed rate during tenoning	m/min	6 ± 2	
1) Spindle speed shall be as close as possible to 3 000 r/min.			

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Data sheet for single-end tenoning machines (concluded)

Testing material	
Material:	softwood, medium grade
Moisture content:	8 % to 14 %
Material length:	1 000 mm to 2 000 mm
Material width:	58 mm to 65 mm
Material height:	58 mm to 65 mm
Previous processing:	planed on four sides
Photo or detailed illustration	on of the machine tested
Testing laboratory	
Firm/institution:	
	Signature:
Test carried out:	-
place:	
date:	

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Annex L

(normative)

Woodworking machines — Operating conditions for routing machines

L.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from routing machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This present annex shall be used in connection with measurement of noise from the following machines.

Machine classification number (see ISO 7984)

Routing machines

12.315.12 12.315.22

This annex may also be applied for measurement of noise from special kinds of machines, for example NC-controlled machines, having a similar construction and function.

L.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. During the first part of the work cycle, when the test material is fed into the tool, a higher level of noise may be emitted which depends on the infeed rate. On manually fed machines the infeed rate is difficult to control and therefore this part of the operating cycle shall not be included in the measurement.
- c) Operator microphone position for test purpose (see figure L.1):
 - 1,5 m above floor level;
 - in middle of table in vertical plane of front edge of table.

NOTE 14 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

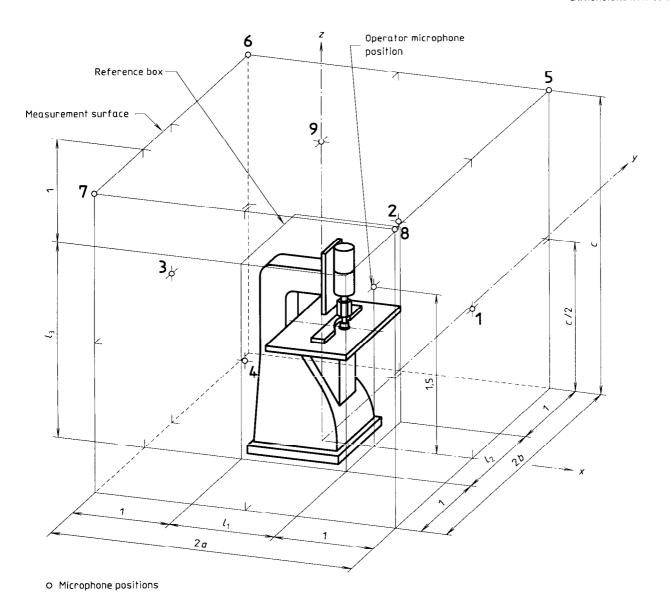


Figure L.1 — Measurement surface and microphone array for determination of sound power level for routing machines (see ISO 3740 series for explanation of symbols)

ISO 7960:1995(E)

L.3 Data sheet for routing machines

achine da	ta				
Make:					
Model:					
Year of r	manufacture:			Serial No.:	
Overall c	dimensions of machine ¹⁾ :				
lengt	hmm	width		mm height	n
Nominal	rotational speed:				
moto	or max.:		r/min	spindle:	r/n
	min.:		r/min		
☐ Atta	ched frequency converter		☐ Se	parate frequency converter	☐ Belt dr
					-
achine ins	tallation			Remarks/descrip	tion:
Machine tions	installed according to manufactu	rer's ir	struc-		
yes		no			
	e installed with dust extraction a cturer's specifications	no	ing to		
Machine yes	mounted on vibration isolators	no			
Machine yes	fitted in separate noise enclosure	no			
Machine yes	equipped with integral noise encl	osure no			
Machine yes	equipped with noise-reducing hoo	ods no			
Other no	sise control measures				
yes		no			

Data sheet for routing machines (continued)

Testing operation Routing particle board edges	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating from standard
Operating arrangement			
Router bit Particle board			
Type of tool: Router bit with shaft spindle speed cutting circle diameter cutting speed number of knives cutting knife length cutting depth, a feed rate Cutting principle: cutter rotation opposing feed	r/min mm m/s mm mm m/min	18 000 ¹⁾ 25 2 40 to 50 5 6 ± 2	
Spindle speed shall be as close as possible to 18 000 r/min.			

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Data sheet for routing machines (concluded)

Testing material	
Material:	particle board, three-layer construction
Moisture content:	6 % to 10 %
Board thickness:	16 mm
Board length:	600 mm to 800 mm
Board width:	600 mm to 800 mm, processed down to a final minimum width of 150 mm
Previous processing:	none
Photo or detailed illustration	on of the machine tested
Testing laboratory	
Firm/institution:	
Address:	
Telephone:	
Date:	Signature:
Test carried out:	
place:	
date:	

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Annex M

(normative)

Woodworking machines — Operating conditions for double-end trim circular sawing machines (nonstroke)

M.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from double-end trim circular sawing machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This present annex shall be used in connection with measurement of noise from the following machines.

Machine classification number (see ISO 7984)

Nonstroke double and multiple trim circular sawing machines

12.132.31

This annex covers only double-end trimming machines with sawblade spindles below the table.

This annex may also be applied for measurement of noise from special kinds of machines having a similar construction and function.

M.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. During the first part of the work cycle, when the test material is fed into the tool, a higher level of noise may be emitted which depends on the infeed rate. On manually fed machines the infeed rate is difficult to control and therefore this part of the operating cycle shall not be included in the measurement.

If the machine includes a table circular saw, that part of the machine should be tested according to the operating conditions specified in annex A.

- c) Operator microphone position for test purpose (see figure M.1):
 - 1,5 m above floor level;
 - 0,4 m forward of spindle centreline;
 - 0,58 m to the right of the left-hand sawblade.

Tests taken at the operator's position shall be chosen as shown for idling conditions.

d) The reference box encloses the tables and excludes the sliding frame. The reference box shown in figure M.1 refers to a machine set-up for a 1 200 mm board width.

NOTE 15 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

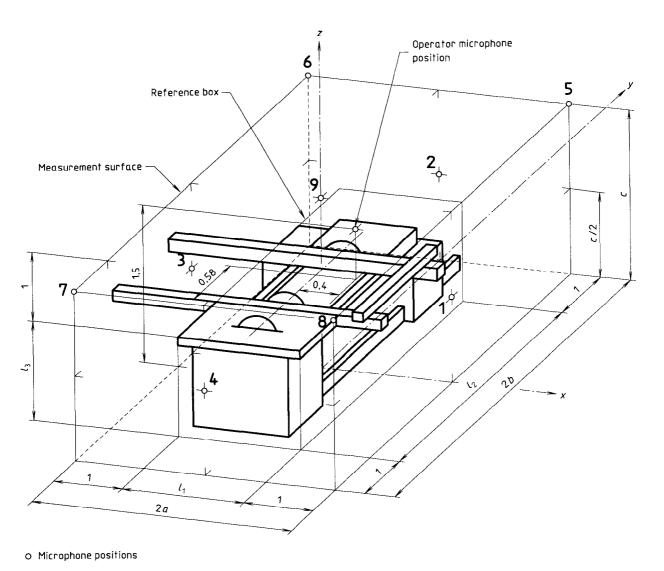


Figure M.1 — Measurement surface and microphone array for determination of sound power level for doubleend trim circular sawing machines (see ISO 3740 series for explanation of symbols)

ISO 7960:1995(E)

M.3 Data sheet for double-end trim circular sawing machines (nonstroke)

chine da	ta				
Make:	•••••	•••••			
Model:					
Year of r	manufacture:			Serial No.:	
Overall c	dimensions of machine	e ¹⁾ :			
lengt	h	mm width		mm height	m
Max. bla	de diameter			Clamp flange diameter	m
☐ With	n scoring sawblade			☐ Without scoring sawblade	
Nominal	rotational speed:				
moto	or:		r/min		
sawb	olade max		r/min		
	min		r/min		
scori	ng sawblade:		r/min		
chine ins	tallation			Remarks/description:	
Machine tions	installed according to	manufacturer's in	struc-		
tions	installed according to		struc-		
	installed according to	o manufacturer's in no	struc-		•••••
tions yes Machine	installed according to installed with dust turer's specifications	no			
yes yes Machine nanufact	installed with dust	no extraction accordi			
tions yes Machine	installed with dust	no			
yes Wachine manufact yes	installed with dust turer's specifications	no extraction accordi no			
yes Wachine manufact yes	installed with dust	no extraction accordi no			
yes Wachine manufact yes	installed with dust turer's specifications	no extraction accordi no			
yes Machine manufact yes Machine	installed with dust turer's specifications	no extraction accordi no isolators			
yes Machine manufact yes Machine yes	installed with dust turer's specifications	no extraction accordi no isolators			
yes Machine manufact yes Machine yes	installed with dust turer's specifications mounted on vibration	no extraction accordi no isolators			
yes Machine manufact yes Machine yes	installed with dust turer's specifications mounted on vibration	no extraction accordi no isolators			
yes Machine manufact yes Machine yes	installed with dust turer's specifications mounted on vibration	no extraction accordi no isolators no reducing hoods			
yes Machine manufact yes Machine yes Machine yes	installed with dust turer's specifications mounted on vibration	no extraction accordi no isolators no reducing hoods			
yes Machine manufact yes Machine yes Machine yes	installed with dust turer's specifications mounted on vibration equipped with noise-r	no extraction accordi no isolators no reducing hoods			
yes Machine manufact yes Machine yes Machine yes	installed with dust turer's specifications mounted on vibration equipped with noise-r	no extraction accordi no isolators no reducing hoods			

Data sheet for double-end trim circular sawing machine (nonstroke) (continued)

Testing operation Trimming of particle board	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating
Operating arrangement			from standard
Width of cutoff, <i>a</i> Saw guard position, <i>b</i> Sawblade projection, <i>c</i> Scoring sawblade projection Machine set-up when performing measurement under no load, <i>d</i>	mm mm mm mm	20 20 max. 30 2 1 160	
Fool and cutting data			
Type of tool: Standard sawblade with carbide-tipped teeth Tooth profile: Alternate top-level teeth			
Main sawblade	, ,	0.000 1)	
spindle speed sawblade diameter cutting speed number of teeth tooth width actual blade thickness	r/min mm m/s mm	3 000 ¹⁾ 355 (350) 54 to 60 3,2 to 3,6 (± 0,1) 2,2 to 2,6 (± 0,1)	
actual blade thickness	111111	2,2 (0 2,0 (± 0, 1)	
Scoring sawblade			
spindle speed	r/min	2)	
sawblade diameter	mm	2) 2)	
cutting speed	m/s	2)	
number of teeth		± 0,1 ²⁾	
tooth width	mm	± 0,1 2)	
actual blade thickness	mm		
Feed rate	m/min	6 ± 2	

Data sheet for double-end trim circular sawing machines (nonstroke) (concluded)

Testing material	
Material:	particle board, three-layer construction
Moisture content:	6 % to 10 %
Board thickness:	16 mm
Board length:	1 200 mm, processed down to a final minimum length of 600 mm
Board width:	600 mm to 800 mm
Previous processing:	none
Photo or detailed illustration	n of the machine tested
Testing laboratory	
Firm/institution:	
Address:	
Telephone:	
	Signature:
Test carried out:	
place:	

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Annex N

(normative)

Woodworking machines — Operating conditions for single blade stroke circular sawing machines for cross-cutting

N.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from single blade stroke circular sawing machines for cross-cutting. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This present annex shall be used in connection with measurement of noise from the following machine.

Machine classification number (see ISO 7984)

Single blade stroke circular sawing machine for cross-cutting

12.131.1

This annex may also be applied for measurement of noise from special kinds of machines having a similar construction and function.

N.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. For each operation the equivalent continuous sound pressure level is measured over a full working cycle from when the tool/workpiece starts moving until the tool/workpiece has returned to the start position. The time period for each working cycle shall be reported.
- c) Operator microphone position for test purpose:
 - 1,5 m above floor level;
 - in the plane of the front face of the reference box;
 - 0,2 m to the left of sawblade.

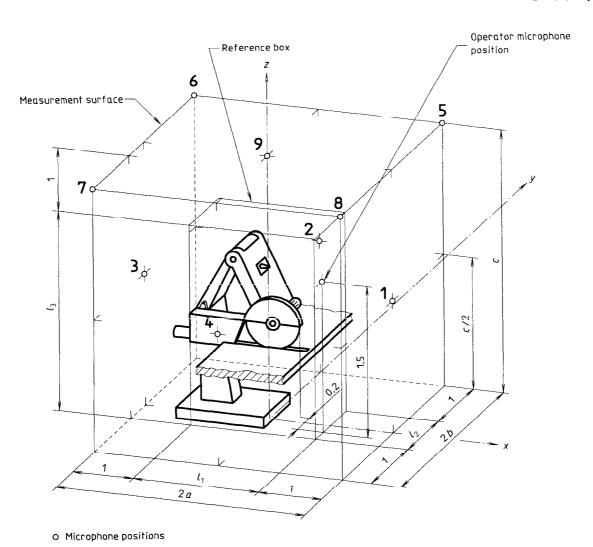
d) The reference box

1) encloses the machine in all outward and upward positions but excludes the table and protruding parts of foundation [see figure N.1 a)];

- 2) encloses the table. The height of the reference box equals the height of the table above floor level [see figure N.1 b)];
- 3) encloses the table and the hood (in upper position) [see figure N.1 c)].

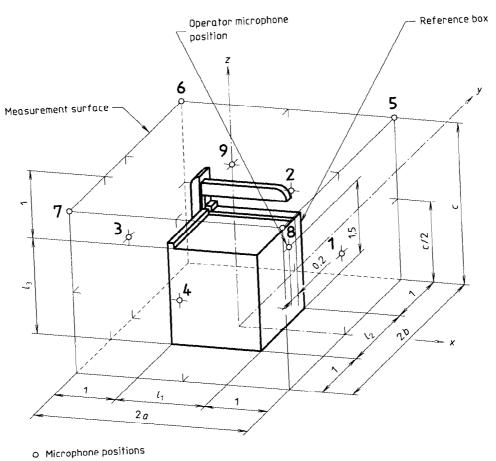
NOTE 16 In practice, such a measurement can only be carried out by using integrating sound level meters.

Dimensions in metres



a)

Dimensions in metres



b)

© ISO ISO 7960:1995(E)

Dimensions in metres

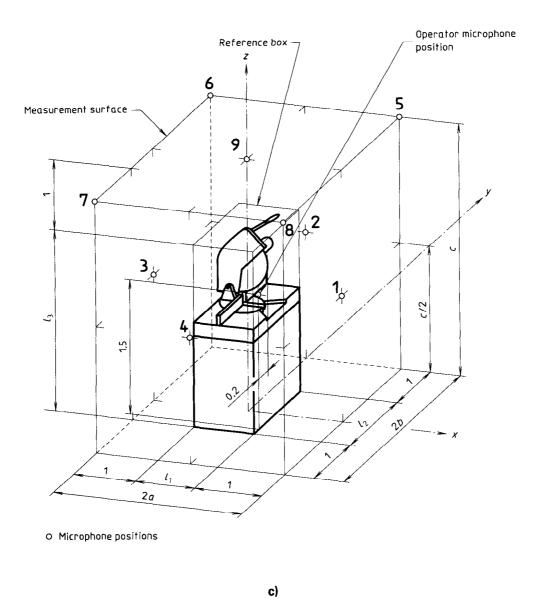


Figure N.1 — Measurement surface and microphone array for determination of sound power level for single blade stroke circular sawing machines for cross-cutting (see ISO 3740 series for explanation of symbols)

88

ISO 7960:1995(E)

N.3 Data sheet for single blade stroke circular sawing machines for cross-cutting

Machine dat				
Make:				
Model:				
Year of r	manufacture:			Serial No.:
Machine	function:			
Overall c	dimensions of machine ¹⁾ :			
lengt	thmm	width .		mm heightmm
Max. bla	ade diameter		mm	Clamp flange diameter mm
	l rotational speed:			
	or:			
aws	olade max			
	min		[/f1Hi11	
Machine ins	stallation			
				Remarks/description:
Machine tions	e installed according to manufac	turer's in	struc-	
yes		no		
	e installed with dust extraction cturer's specifications	accordir	ng to	
	·			
yes		no		
Machine	mounted on vibration isolators			

yes		no		
	_			
Machine	fitted in separate noise-enclosur	ro		
11140	nttod in doporate no.55 che.552.	·		
yes	П	no	П	
,			\Box	
Maahina	i	-1		
Machine	equipped with integral noise en	Closure		
yes	П	no		
y 0.5		110	Ш	
8.4 L.S	1 - 1 - 10 - 10 - 10 - 10 - 10 - 10 - 1			
Macnine	equipped with noise-reducing h	000		
201	П	no		
yes		no	Ш	
Other noi	ise control measure			
			_	
yes		no		
1) Those ele	ments which protrude from the ma	chine and	which a	re not likely to contribute to the noise emission (for example hand-
	s) may be disregarded.	Alline und	Willeria	Te not likely to continuate to the hoise emission from example hand-

Data sheet for single blade stroke circular sawing machines for cross-cutting (continued)

Sawblade Num	op, a uta andard sav		arbide-tipped	mm	20	or conditions deviating from standard
Position of fixed stop Tool and cutting data Type of tool: Stateeth Sawblade data (large Sawblade Num diameter te	op, a n ta andard sav		arbide-tipped	mm	20	
Tool and cutting data Type of tool: Starteeth Sawblade data (large Sawblade Num diameter te	nta andard sav		arbide-tipped	mm	20	
Tool and cutting data Type of tool: Starteeth Sawblade data (large Sawblade Num diameter te	nta andard sav	vblade with ca	arbide-tipped	mm	20	
Type of tool: Starteeth Sawblade data (largest Sawblade Num diameter te	andard sav	vblade with ca	arbide-tipped			
Sawblade Num diameter te		nmended saw e chosen):	blade diameter			
mm	nber of eeth	Tooth width	Blade thick- ness			
		mm	mm			
250 56 315 (300) 56 315 (350) 54 3 400 36 36 450 401 500 48 3 630 (600) 48 3	to 64 to 84 to 84 to 60 to 64 to 72 to 72 ording to r	2,5 to 3,2 2,5 to 3,2 3,0 to 3,2 3,2 to 3,6 3,2 to 3,6 3,6 to 4,0 4,0 to 4,5 5,6	1,6 to 2,2 1,6 to 2,2 2,0 to 2,2 2,2 to 2,6 2,2 to 2,6 2,5 to 2,8 2,8 to 3,2 3,6			
Spindle speed				r/min ¹⁾		
Sawblade diame	eter			mm		
Cutting speed				m/s		
Number of teeth	า					
Tooth width				mm	± 0,1	
Actual blade thic	ckness			mm	± 0,1	
Feed rate				m/min	6 ± 2	

Data sheet for single blade stroke circular sawing machines for cross-cutting (concluded)

Testing material			
Material:	softwood, medium grade		
Moisture content:	8 % to 14 %		
Material length:	1 000 mm, processed down to	o a final minimum length of 500 mm	
	≤ 315 mm	Sawblade diameter 355 mm to 450 mm	> 450 mm
Material height:	50 mm	75 mm	100 mm
Material width:	50 mm	150 mm	250 mm
Previous processing:	none		
Photo or detailed illustration	on of the machine tested		
Testing laboratory			
Firm/institution:			
Test carried out:		•	
date:			

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Annex P

(normative)

Woodworking machines — Operating conditions for vertical and horizontal panel sizing sawing machines

P.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from vertical and horizontal panel sizing machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This present annex shall be used in connection with measurement of noise from the following machine.

Machine classification number (see ISO 7984)

Vertical and horizontal panel sizing sawing machine

12.131.261

This annex may also be applied for measurement of noise from special kinds of machines having a similar construction and function.

P.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is the average of a series of at least three operations. During the first part of the work cycle, when the test material is fed into the tool, a higher level of noise may be emitted which depends on the infeed rate. On manually fed machines the infeed rate is difficult to control and therefore this part of the operating cycle shall not be included in the measurement.
- c) Operator microphone position for test purpose for horizontal panel sizing sawing (see figure P.1):
 - 1,5 m above floor level;
 - 0,5 m forward of the front face of the reference box;
 - 0,8 m to the right of the sawblade outlet.

NOTE 17 The reference box excludes protruding parts in front of the machine.

d) Operator microphone position for test purpose for vertical panel sizing sawing machines (see figure P.2):

- 1,5 m above floor level;
- 0,5 m forward of the saw unit in idle position;
- in the vertical plane of the sawblade.

NOTE 18 Figure P.2 shows a machine placed against a wall. If the machine is detached, the microphone positions should be extended to include positions 3, 6 and 7 shown in figure P.1. Likewise, microphone positions 5', 8' and 9' should be used instead of 5, 8 and 9, if space so allows.

NOTE 19 The use of integrating sound level meters is recommended but is not mandatory.

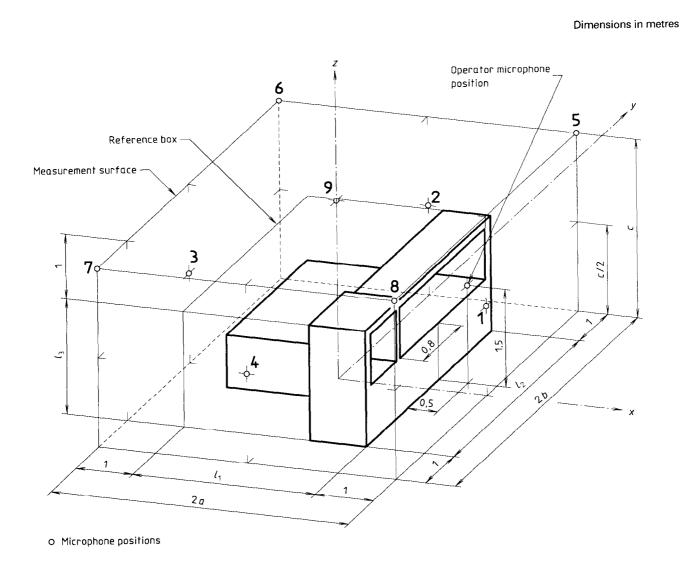


Figure P.1 — Measurement surface and microphone array for determination of sound power level for horizontal panel sizing sawing machines (see ISO 3740 series for explanation of symbols)

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Dimensions in metres

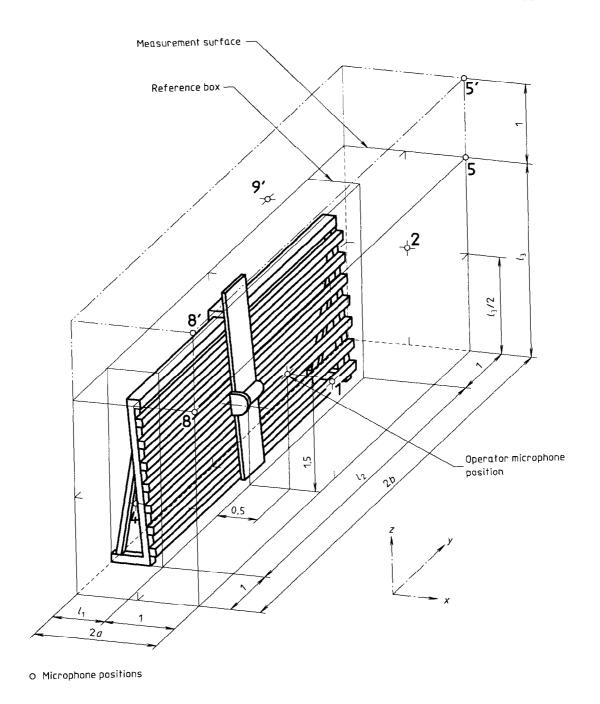


Figure P.2 — Measurement surface and microphone array for determination of sound power level for vertical panel sizing sawing machines (see ISO 3740 series for explanation of symbols)

P.3 Data sheet for vertical and horizontal panel sizing sawing machines

chine dat	ta		
Make:			
Model: .			
	nanufacture:		Serial No.:
	limensions of machine ¹⁾ :		Little
_	h		mm heightmi
Max. bla	de diameter	mm	Clamp flange diameter mi
☐ With	scoring sawblade		
∇ertical machine			☐ Horizontal machine
☐ Man	ual saw unit movement		Automated saw unit movement
Nominal	rotational speed:		
moto	r:	r/min	
sawb	lade max	r/min	
	min	r/min	
scorir	ng sawblade:	r/min	
chine ins	tallation		B. I. W. State
			Remarks/description:
Machine tions	installed according to m	anufacturer's instruc-	
lions			
yes		no 🗌	
Machine	installed with dust ext	raction according to	
	turer's specifications	raction according to	
yes		no 🗌	
Machine	mounted on vibration is	olators	
Machine	mounted on vibration is	olators	
Machine yes	mounted on vibration is	olators	
	mounted on vibration is		
yes		no 🗌	
yes	mounted on vibration is	no 🗌	
yes		no 🗌	
yes Machine		no 🗌	
yes Machine yes	equipped with noise-red	no 🗌	
yes Machine yes		no 🗌	
yes Machine yes	equipped with noise-red	no 🗌	
yes Machine yes Other no	equipped with noise-red	no ucing hood	

Data sheet for vertical and horizontal panel sizing sawing machines (continued)

Testing operation Cutting particle board	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating
Operating arrangement			from standard
Vertical machine			
Vertical machine			
The board shall be placed centrally on the machine			
Saw unit position at idle running, $\it c$	mm	1 200	
Horizontal machine			
Distance between panel and sawblade outlet, d	mm	200	
Width of cutoff, a Cutting length, b	mm mm	50 1 200	
Tool and cutting data Type of tool: Standard sawblade with carbide-tipped teeth Tooth profile: Alternate top level teeth Feed rate a) vertical machines b) horizontal machines Main sawblade spindle speed	m/min m/min r/min	8 ± 2 ¹⁾ 15 ± 2 ¹⁾	
spindie speed sawblade diameter	mm	2)	
cutting speed number of teeth	m/s	2)	
tooth width actual blade thickness	mm mm	± 0,1 2) ± 0,1 2)	
Scoring sawblade spindle speed sawblade diameter cutting speed number of teeth tooth width actual blade thickness	r/min mm m/s mm	2) 2) 2) 2) 2) 2) 40,12) 40,12)	
 Speed shall be as close as possible to the standard condition. In accordance with manufacturer's recommendations. 	- '		

Data sheet for vertical and horizontal panel sizing sawing machines (concluded)

Testing material	
Material:	particle board, three-layer construction
Moisture content:	6 % to 10 %
Board thickness:	16 mm
Board length:	1 200 mm
Board width:	1 000 mm, processed down to a final minimum width of 300 mm
Previous processing:	none
Photo or detailed illustration	n of the machine tested
Testing laboratory	
Firm/institution:	
Address:	
Telephone:	
Date:	Signature:
Test carried out:	
place:	
date:	

Annex Q

(normative)

Woodworking machines — Operating conditions for multiblade circular sawing machines for ripping

Q.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from multiblade circular sawing machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This present annex shall be used in connection with measurement of noise from the following machine.

Machine classification number (see ISO 7984)

Multiblade circular sawing machine

12.132.34

This annex may also be applied for measurement of noise from special kinds of machine having a similar construction and function.

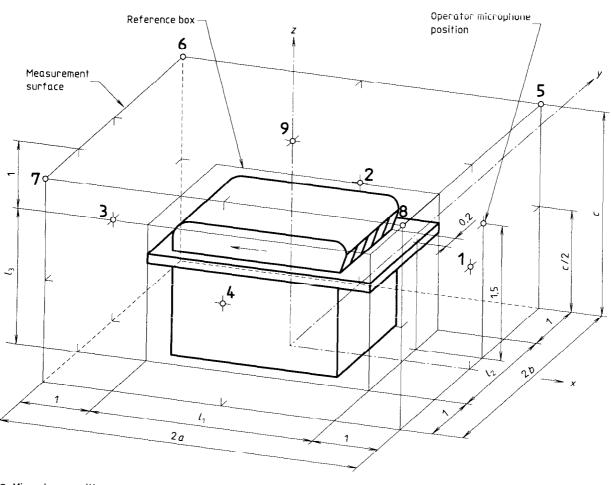
Q.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. A continuous supply of test pieces should be fed with minimal distance between successive test pieces so that measurements are made during simultaneous operation of all working units.
- c) Operator microphone position for test purpose (see figure Q.1):
 - 1,5 m above floor level;
 - in the plane of the front face of the measurement surface;
 - 0,2 m to the left of fence position (viewed from infeed direction).

NOTE 20 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres



Microphone positions

Figure Q.1 — Measurement surface and microphone array for determination of sound power level for multiblade circular sawing machines (for ripping) (see ISO 3740 series for explanation of symbols)

ISO 7960:1995(E)

Q.3 Data sheet for multiblade circular sawing machines for ripping

© ISO

Machine data		
Make:		
Model:		
Year of manufacture:		Serial No.:
Overall dimensions of machine 1):		
	dth	mm heightmm
Max. blade diameter		Clamp flange diameter mm
Nominal rotational speed:		
motor:	r/min	sawblade: r/min
A. I.		
Machine installation		Remarks/description:
Machine installed according to manufacture	r'e inetrue-	· ·
tions	S IIISHUC	
yes 🗌	no 🗌	
Machine installed with dust extraction acc	cording to	
manufacturer's specifications	-	
yes 🗌	no 🗌	
Machine mounted on vibration isolators		
yes 🗌	no 🗌	
Machine fitted in separate noise enclosure		
yes 📙	no 📋	
Machine equipped with integral noise enclose	_	
yes []	no 📋	
Machine equipped with infeed and outfe reducing arrangements	ea noise-	
yes □	no 🗌	
Other noise control measures		
yes	no 🗌	
Those elements which protrude from the machine wheels levers) may be disregarded.	and which a	are not likely to contribute to the noise emission (for example hand-

Data sheet for multiblade circular sawing machines for ripping (continued)

Testing operation Ripping of softwood			Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating from standard	
Operating arrangement						
a a a						
Number o Width of s	of sawblades strips, a			mm	4 26 to 28	
Tool and cutt						
Type of to teeth	ol: Standard sa	wblade with ca	irbide-tipped			
Sawblade da		mmended saw e chosen):	blade diameter			
Sawblade diameter	Number of teeth	Tooth width	Blade thick- ness			
mm 250	18 to 24	mm 2,5 to 3,2	mm 1,6 to 2,2			
315 (300)	20 to 28	3,0 to 3,2	2,0 to 2,2			
355 (350) 400	24 to 32 28 to 36	3,2 to 3,6 3,2 to 3,6	2,2 to 2,6 2,2 to 2,6			
		•				
Spindle speed ¹⁾			r/min			
Sawblade				mm		
Cutting sp				m/s		
Number						
Tooth width			mm	± 0,1		
Actual bla	de thickness			mm	± 0,1	
Feed rate				m/min	15 ± 2	
1) Spindle sp	eed shall be the m	naximum possib	le for the operation	า.		

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Data sheet for multiblade circular sawing machines for ripping (concluded)

Testing material		
Material:	softwood, medium grade	
Moisture content:	8 % to 14 %	
Material length:	2 000 mm	
Material height:	40 mm	
Material width:	150 mm	
Previous processing:	none	
Photo or detailed illustration	n of the machine tested	
		:
		,
Testing laboratory		
Firm/institution:		
Address:		
Telephone:		
		re:
Test carried out:	-	
·		

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Annex R

(normative)

Woodworking machines — Operating conditions for sanding machines

R.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from sanding machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machines.

Machine classification number (see ISO 7984)

Narrow belt sanding machines with fixed table	12.721.1
Narrow belt sanding machines with sliding table or frame	12.721.2
Automatic narrow belt sanding machines	12.721.3
Wide belt sanding machines	12.722
Sanding machines with cylindrical tool	12.74
Sanding machines with different tools	12.75

This annex may also be applied for measurement of noise from special kinds of machines having a similar construction and function.

R.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. Measurements are made during simultaneous operation of all working units. For machines with conveyor belt drive a continuous supply of test pieces should be fed with minimum distance between successive test pieces. For machines with sliding table or frame only one test piece is necessary.
- c) Operator microphone positions for test purpose (sanding machine without travelling pad) (see figure R.1)

 Position A:
 - 1,5 m above floor level;
 - 0,5 m forward of vertical plane of front edge of table;
 - in middle of table.

Position B:

- 1,5 m above floor level;
- 0,5 m rearward of vertical plane of rear edge of table;
- in middle of table.
- d) Operator microphone position for test purpose (sanding machine with travelling pad) (see figure R.2)
 - 1,5 m above floor level;
 - 1,0 m forward of travelling pad.

Position for travelling pad:

- 0,6 m from the fence.

NOTE 21 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

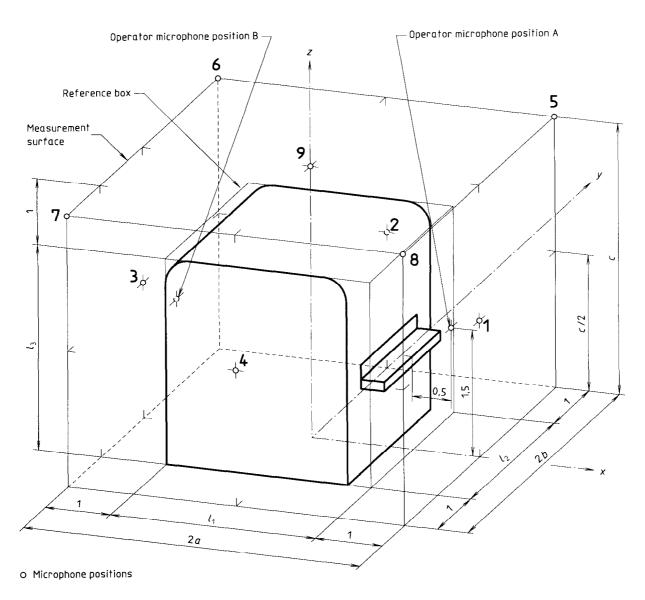


Figure R.1 — Measurement surface and microphone array for determination of sound power level for sanding machines without travelling pad (see ISO 3740 series for explanation of symbols)

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Dimensions in metres

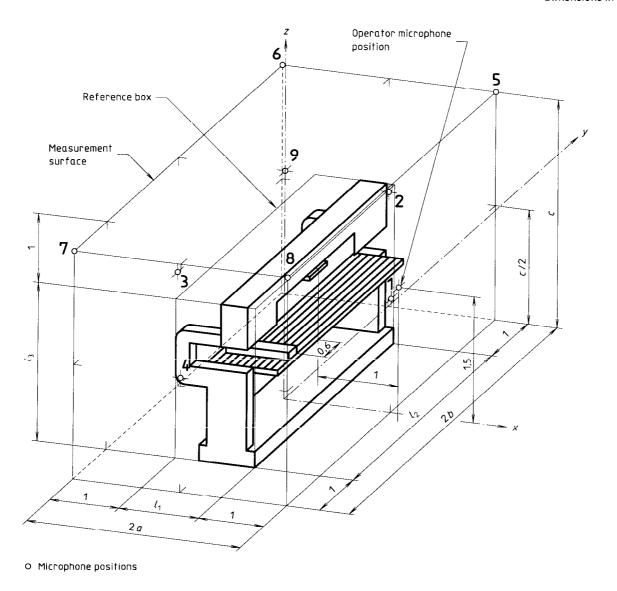


Figure R.2 — Measurement surface and microphone array for determination of sound power level for sanding machines with travelling pad (see ISO 3740 series for explanation of symbols)

R.3 Data sheet for sanding machines

chine da	ta						
Make:							
Model:							
Year of r	manufacture:			Serial	No.:		
	dimensions of machine ¹⁾ :						
lengt	th mm	width .			mm heigh	nt	n
Width of	f sanding belt:		. mm	Maxir	num speed of sanding	belt:	r
	Description of function:		No.	of	Max. speed of	Motor	
	•		uni	ts	sanding belt	power	
	Wide belt with cylinder Wide belt with pad Cross belt				m/s	kW	
	Brushing device	d air					
	Cleaning device, compressed Vacuum device on conveyor						
	vacuum device on conveyor	Deit					
chine ins	stallation						
Machine	installed according to manufactu	rar'e in	etruc-		Remarks	s/description:	
tions	e installed according to manufactu	161 3 111	Struc				
yes		no					
•	_						
	e installed with dust extraction a cturer's specifications	accordii	ng to				
yes		no					
Machine	e with built-in dust extraction						
yes		no				***************************************	
·							
	e mounted on vibration isolators	no					
yes		no		*********			
Machine	e fitted in separate noise enclosure						
Machine yes	e fitted in separate noise enclosure	no					
	e fitted in separate noise enclosure						
yes		no					
yes Machine	e fitted in separate noise enclosure certain contract the second	no osure					
yes		no					
yes Machine yes	□ e equipped with integral noise encl □	no osure					
yes Machine yes		no osure					
yes Machine yes	□ e equipped with integral noise encl □	no osure					

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Data sheet for sanding machines (continued)

Testing operation	Units	Standard condition(s)	Condition chosen within permitted range
Sanding of particle board			or conditions deviating from standard
Operating arrangement			
First and second wide belt units operating. Other belt units: idle running with belt.			
Built-in dust extraction, and all auxiliary units (e.g. cleaning and vacuum devices) necessary for the operation, shall be working.			
Machine with conveyor belt drive			
Passage height at idling, h	mm	16	
Machine with sliding table			
Passage height at idling, h Distance from fence to travelling pad, a	mm mm	16 600	
Tool and cutting data			
New sanding belts or sanding paper shall be used.			
☐ Machine with conveyor belt drive			
speed of sanding belt feed rate grit size for first wide belt unit grit size for second wide belt unit	m/s m/min	max. recommended 10 ± 2 80 to 120 120 to 160	
grit size for other belt units		In accordance with	
total sanding depth	mm	normal belt functions 0,1 to 0,3	
pressure oscillation		In accordance with manufacturer's recommendation	
☐ Machine with sliding table or frame			
speed of sanding belt feed rate (movement of table) grit size	m/s m/min	max. recommended 4 ± 1 80 to 120	
sanding depth	mm	0,1 to 0,3	
pressure		Corresponding to the sanding depth	

Data sheet for sanding machines (concluded)

Testing material	
Material:	particle board, three-layer construction
Moisture content:	6 % to 10 %
Board thickness:	16 mm
Board length:	1 200 mm
Board width:	600 mm
Previous processing:	none
Photo or detailed illustratio	n of the machine tested
Testing laboratory	
Firm/institution:	
Address:	
Telephone:	
	Signature:
Test carried out:	· ·
place:	

Annex S

(normative)

Woodworking machines — Operating conditions for double edging circular sawing machines for rough cutting

S.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from double edging circular sawing machines (for rough cutting). Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This present annex shall be used in connection with measurement of noise from the following machine.

Machine classification number (see ISO 7984)

Double edging circular sawing machine for rough cutting

12.132.33

This annex may also be applied for measurement of noise from special kinds of machines having a similar construction and function.

S.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. A continuous supply of test pieces should be fed with minimum distance between successive test places so that measurements are made during simultaneous operation of all working units.
- c) Operator microphone position for test purpose (see figure S.1):
 - 1,5 m above the surface on which the operator stands;
 - in the plane of the front face of the measurement surface;
 - 0,5 m to the left of centreline of infeed aperture (viewed from infeed direction).

NOTE 22 The use of integrating sound level meters is recommended but is not mandatory.

Dimensions in metres

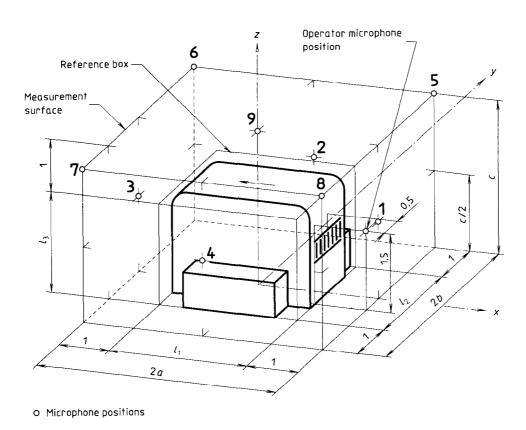


Figure S.1 — Measurement surface and microphone array for determination of sound power level for double edging circular sawing machines (see ISO 3740 series for explanation of symbols)

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S.3 Data sheet for double edging circular sawing machines for rough cutting

Machine da	ta			
Make:				
Model: .				
Year of a	manufacture:			Serial No.:
Overall o	dimensions of machine ¹⁾ :			
lengt	thmm	width		mm heightmm
Max. bla	de diameter		mm	Clamp flange diameter mm
Ni a mai mai				
	l rotational speed:		-/:-	
moto	or:		7/111111	sawblades: r/min
Machine ins	stallation			
				Remarks/description:
	installed according to manufac	turer's in	struc-	
tions				
yes	П	no		
,				
Maahima	والمعالم المعالم	:	4_	
	e installed with dust extraction cturer's specifications	accordi	ng to	
yes		no		
Machine	mounted on vibration isolators			
yes		no		
Machine	fitted in separate noise enclosu	re		
yes		no		
Machine	equipped with integral noise en	closure		
yes		no		
	equipped with infeed and o	outfeed r	noise-	
reducing	arrangements			
Voc		no		
yes		no	Ш	
0.1				
Other no	ise control measures			
yes	П	no		
,				
	ments which protrude from the ma b) may be disregarded.	chine and	which a	re not likely to contribute to the noise emission (for example hand-

Data sheet for double edging circular sawing machines for rough cutting (continued)

Testing opera	ation			Units	Standard condition(s)	Condition chosen within permitted range
Edging of	Edging of softwood					or conditions deviating from standard
Operating an	rangement					nom standard
-(-		mnz (
piece.	dle can be arran	ged above or b	pelow work-		2	
Width of		···	M-5:	mm	75	
Tool and cutt	ting data					
teeth	ool: Standard sa					
Sawbia	de data (largest diameter sho	recommended uld be chosen)				
Sawblade diameter mm	Number of teeth	Tooth width mm	Blade thick- ness mm			:
355 (350) 400 450 500 630 (600)	16 to 36 18 to 36 24 to 36 24 to 36 30 to 36	3,6 to 5,0 3,8 to 5,0 4,2 to 5,2 4,8 to 5,5 5,0 to 5,5	2,4 to 3,0 2,4 to 3,0 2,6 to 3,2 3,0 to 3,5 3,0 to 3,5			
630 to 1 000	According to	manufacturer's	s specification			
Sawblade Cutting sp	Spindle speed ¹⁾ Sawblade diameter Cutting speed			r/min mm m/s		
Number of Tooth wid				mm	± 0,1	
	ade thickness			mm	± 0,1	
Feed rate				m/min	40 ± 2	
4) 0:::"		and market and the second		1		
1) Spindle sp	eed shall be the m	aximum possib	e ioi uie operatioi	1.		

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Data sheet for double edging circular sawing machines for rough cutting (concluded)

Testing material	
Material:	softwood (green timber), medium grade
Moisture content:	> 20 %
Material length:	3 000 mm
Material width:	≈ 200 mm
Material height:	50 mm
NOTE — If the machine is d height may be 24 mm to 26	esigned for normal use with a feed rate of more than 40 m/min and tested with this feed rate, the material mm.
Previous processing:	none
Photo or detailed illustration	n of the machine tested
Testing laboratory	
Firm/institution:	
Address:	
Telephone:	
Date:	Signature:
Test carried out:	
place:	
date:	

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Annex T

(normative)

Woodworking machines — Operating conditions for double blade stroke circular sawing machines for cross-cutting

T.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from double blade stroke circular sawing machines for cross-cutting. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This present annex shall be used in connection with measurement of noise from the following machines.

Machine classification number (see ISO 7984)

Double and multi-blade stroke circular sawing machines

12.132.1 (double blade only)

This annex may also be applied for measurement of noise from special kinds of machines having a similar construction and function.

T.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The measurement result is average of a series of at least three operations. For each operation the equivalent continuous sound pressure level is measured over a full working cycle from when the tool/workpiece starts moving until the tool/workpiece has returned to the start position. The time period for each working cycle shall be reported.
- c) Operator microphone position for test purpose (see figure T.1):
 - 1,5 m above floor level;
 - in vertical plane of front edge of table;
 - 1 m to the right of the left-hand sawblade.

Tests taken at the operator's position shall be as shown for idling conditions.

The reference box shall enclose the table and the hood (in upper position).

NOTE 23 In practice, such a measurement can only be carried out by using integrating sound level meters.

Dimensions in metres

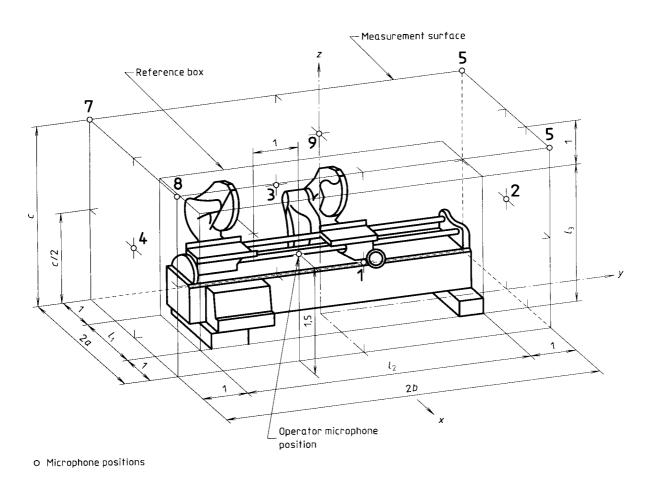


Figure T.1 — Measurement surface and microphone array for determination of sound power level for double blade stroke circular sawing machines for cross-cutting (see ISO 3740 series for explanation of symbols)

- - -

T.3 Data sheet for double blade stroke circular sawing machines for cross-cutting

chine da	ta					
Make:						
Model: .						••••••
Year of I	manufacti	ıre:			Serial No.:	
Overall o	dimensior	ns of machine ¹⁾ :				
-					mm height	
Max. bla	ade diame	ter		mm	Clamp flange diameter	m
Nomina	l rotationa	l speed:				
moto	or:			r/min		
sawb	olade ma	ax.:		r/min		
	mi	n.:		r/min		
chine ins	stallation					
					Remarks/description:	
tions	installed	according to manufac	cturer's in	struc-		
yes			no			
		with dust extraction	n accordi	ng to		
manufac	cturer's sp	ecifications				
yes	П		no			
,						
Machine	mounted	on vibration isolators				•••••
yes			no			
Machine	fitted in s	eparate noise enclosu	re			
yes			no			
,00			110	ш		
Machine	equipped	d with integral noise er	nclosure			
yes			no			
Machine	equipped	l with noise-reducing h	nood			
			n o			
yes			no	Li		
		ol measures				
Other no	ilea contro	// /// Casules				***************************************
Other no	oise contro					
Other no	oise contro		no			

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Data sheet for double blade stroke circular sawing machines for cross-cutting (continued)

	Testing operation Cross-cutting of softwood			Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating
Operating arr	angement					from standard
Operating an	angement					
a	d	a				
Position o	of fixed stops, a			mm	20	
	set-up when per	forming meas	urement			
under no		-		mm	1 960	
Tool and cutt	ting data	• • • • • • • • • • • • • • • • • • • •				
	ool: Two equal s pped teeth	tandard sawbl	ades with			
Sawbla	de data (largest diameter sho	recommended uld be chosen)				
Sawblade diameter mm	Number of teeth	Tooth width mm	Blade thick- ness mm			
200	48 to 64	2,5 to 3,2	1,6 to 2,2			
250	56 to 84	2,5 to 3,2	1,6 to 2,2			
315 (300)	56 to 84	3,0 to 3,2	2,0 to 2,2			
355 (350)	54 to 60	3,2 to 3,6	2,2 to 2,6			
400	36 to 64	3,2 to 3,6	2,2 to 2,6			
450	40 to 64	3,6 to 4,0	2,5 to 2,8			
500	48 to 72	4,0 to 4,5	2,8 to 3,2			
630 (600)	48 to 72	5,6	3,6			
630 to 1 000	According to	manufacturer's	s specification			
Spindle s				r/min		
Sawblade				mm		
Cutting sp				m/s		
Number o						
Tooth wid	lth			mm	± 0,1	
Actual bla	de thickness			mm	± 0,1	
Feed rate				m/min	6 ± 2	
1) Spindle sp	eed shall be the m	naximum possibl	e for the actual ma	achine.		.1

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Data sheet for double blade stroke circular sawing machines for cross-cutting (concluded)

Testing material			
Material:	softwood, medium grade		
Moisture content:	8 % to 14 %		
Material length:	2 000 mm, processed down to	a final minimum length of 1 500 r	nm
	≤ 315 mm	Sawblade diameter 355 mm to 450 mm	> 450 mm
Material height:	50 mm	75 mm	100 mm
Material width:	50 mm	150 mm	250 mm
Previous processing:	none		
Photo or detailed illustration	n of the machine tested		
			18
Testing laboratory			
Firm/institution:			
Test carried out:			
place:			

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Annex U

(normative)

Woodworking machines — Operating conditions for double-end tenoning machines for tenoning only

U.1 General

This annex contains a series of standard operating conditions to be applied in connection with measurement of noise from double-end tenoning machines. Microphone positions are specified to allow measurement of sound pressure level at the operator's position and for determining the sound power level of a machine of this type.

These standard conditions shall be complied with as closely as possible. If, in a specific situation, it is necessary to deviate from standard conditions, the actual condition applied for the test shall be recorded where a blank space in the column "Condition chosen within permitted range or conditions deviating from standard" allows for such a situation.

Mandatory and standard safety attachments shall be mounted and in use during the tests.

This annex may also serve as a data sheet on which information on operating conditions is recorded.

This annex shall be used in connection with measurement of noise from the following machines.

Machine classification number (see ISO 7984)

Double-end tenoning machines (for tenoning only) producing a tenon on both ends of the workpiece during an automatic cycle; different arrangements can be used

82.2

This annex may also be applied for measurement of noise from special kinds of machines having a similar construction and function.

U.2 Noise measurements

The machine shall be tested under the following conditions.

- a) Testing under no load with operating arrangement and tool and cutting data as specified in this annex.
- b) Testing under load as specified in this annex. The machine shall be fed with a continuous supply of workpieces and the measurement period is considered finished when three pieces are completed. This measurement period shall be reported.
- c) Operator microphone position for test purpose (see figure U.1):
 - 1,5 m above floor level;
 - in line with middle of infeed or outfeed referred to a constant material length of 2 000 mm;
 - in the plane of front or rear face of the reference box.

NOTE 24 If middle of infeed or outfeed cannot be defined, point 1 or 3 of the measurement surface should be used.

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d) The reference box shall enclose all elements of the machine which are significant radiators of sound energy. The reference box shown in figure U.1 refers to a machine set-up for a 2 000 mm material length.

NOTE 25 In practice, such a measurement can only be carried out by using integrating sound level meters.

Dimensions in metres

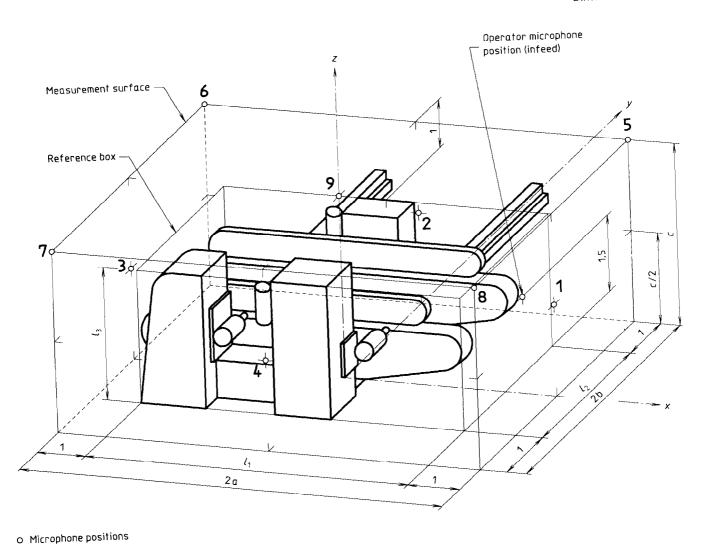


Figure U.1 — Measurement surface and microphone array for determination of sound power level for doubleend tenoning machines (for tenoning only) (see ISO 3740 series for explanation of symbols)

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U.3 Data sheet for double-end tenoning machines for tenoning only

	a						
Make:							
Model:							
Year of m	nanufacture:			Serial No.:			
Overall d	imensions of machin	e ¹⁾ :					
length	າ	mm width		r	nm height		n
				Maximum tool	Nominal	rotational	
	Spindle No. ¹⁾	Spindle function	n	diameter mm	spe Motor r/min		
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
		the fixed side of the	machine				
	Attached frequency	iency converter		□ Se	eparate freque	ncy converter	
chine inst Machine i	installed according to	o manufacturer's in	struc-		Remarks/d	description:	
tions							
yes		no					
							• • • • • • • • • • • • • • • • • • • •
	installed with dust	extraction accordi	_				
manufact	installed with dust		_				
		extraction accordi	_				
manufact yes	urer's specifications	no	_				
manufact yes Machine r	mounted on vibration	no n isolators	_				
manufact yes	urer's specifications	no	_				
manufact yes Machine r yes	rurer's specifications mounted on vibration	no n isolators no	_				
manufact yes Machine r yes Machine f	mounted on vibrations fitted in separate nois	no i isolators no e enclosure	_				
manufact yes Machine r yes	rurer's specifications mounted on vibration	no n isolators no	_				
manufact yes Machine r yes Machine f yes	rurer's specifications mounted on vibration fitted in separate nois	no n isolators no e enclosure no	_				
manufact yes Machine r yes Machine f yes	mounted on vibrations fitted in separate nois	no n isolators no e enclosure no al noise enclosure	_				
manufact yes Machine r yes Machine f yes	rurer's specifications mounted on vibration fitted in separate nois	no n isolators no e enclosure no	_				
manufact yes Machine r yes Machine f yes	eurer's specifications mounted on vibration fitted in separate nois equipped with integra	no n isolators no e enclosure no al noise enclosure no	_				
manufact yes Machine r yes Machine 6 yes	equipped with noise-requipped	no n isolators no e enclosure no al noise enclosure no reducing hoods	_				
manufact yes Machine r yes Machine f yes	eurer's specifications mounted on vibration fitted in separate nois equipped with integra	no n isolators no e enclosure no al noise enclosure no	_				
manufact yes Machine r yes Machine e yes Machine e yes	equipped with noise-i	no n isolators no e enclosure no al noise enclosure no reducing hoods	_				
manufact yes Machine f yes Machine e yes Machine e yes	equipped with noise-requipped	no n isolators no e enclosure no al noise enclosure no reducing hoods	_				
manufact yes Machine r yes Machine e yes Machine e yes	equipped with noise-i	no n isolators no e enclosure no al noise enclosure no reducing hoods	_				

Data sheet for double-end tenoning machines for tenoning only (continued)

Testing operation Tenoning and slotting of softwood at both ends of	Units	Standard condition(s)	Condition chosen within permitted range or conditions deviating from standard
test piece.			ii oili stallaafa
Operating arrangement			
Tools shall be fitted only to those spindles which are used in the test procedure			
The machine shall be equipped with a backstop device for the workpiece			
Cross-cutting Slotting			
a Other shapes may be accepted b a			
Tenoning thickness, a	mm	8	
Slot width, b	mm	8	
Tenon depth, c	mm	60 to 65	
Distance to support, d Surplus for cross-cutting, e	mm mm	min. possible 2 to 20	
Tool and cutting data			
a) Spindle I			
Cross-cutting sawblade (standard sawblade with carbide-tipped teeth)			
spindle speed	r/min	3 000 ¹⁾	
sawblade diameter	mm	355 (350)	
cutting speed number of teeth	m/s	48 to 64	
tooth profile: alternate top-level		10.004	
tooth width	mm	3,2 to 3,6	
actual blade thickness	mm	2,2 to 2,6	
b) Spindle II			
Slotting cutters (rotation opposing feed)			
number each side spindle speed	r/min	3 3 000 ¹⁾	
cutting circle diameter	mm	300	
cutting speed	m/s		
number of cutting knives		2 to 3	
blade projection	mm		
c) Feed rate during tenoning	m/min	6 ± 2	
Spindle speed shall be as close as possible to 3 000 r/min.			1

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Data sheet for double-end tenoning machines for tenong only (concluded)

Testing material	
Material:	softwood, medium grade
Moisture content:	8 % to 14 %
Material length:	1 000 mm to 2 000 mm
Material width:	58 mm to 65 mm
Material height:	58 mm to 65 mm
Previous processing:	planed on four sides
Photo or detailed illustration	n of the machine tested
Testing laboratory	
Firm/institution:	
	Signature:
Test carried out:	Signature.
·	
ual t	

Annex V

(informative)

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¹⁾ To be published. (Revision of ISO 3746:1979)

²⁾ To be published. (Revision of ISO 4871:1984)

³⁾ To be published.

ICS 17.140.20; 79.120.10

Descriptors: acoustics, machine tools, woodworking machinery, noise (sound), engine noise, airborne sound, tests, acoustic tests, determination, sound pressure, sound power, testing conditions, acoustic measurements.

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