. **Test Report issued under the responsibility of:**

TEST REPORT
IEC 62841-4-1
Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety
Part 4-1: Particular requirements for chain saws

Report Reference No. ..... :	6031445.50B
Date of issue ..... :	2019-03-12
Total number of pages ..... :	26 pages
Name of Testing Laboratory preparing the Report ..... :	DEKRA Testing and Certification (Shanghai) Ltd.
Applicant's name ..... :	LEE YEONG INDUSTRIAL CO., LTD.
Address ..... :	No.2, Kejia Rd., Douliu City, Yunlin County 64057, Taiwan
Test specification:	
Standard ..... :	IEC 62841-4-1:2017
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No ..... :	IEC62841_4_1A
Test Report Form(s) Originator .... :	VDE Prüf- und Zertifizierungsinstitut GmbH
Master TRF ..... :	2018-08-07

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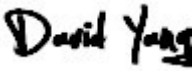
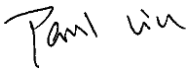
Test item description ..... :	Concrete Chain Saw
Trade Mark ..... :	AGP
Manufacturer ..... :	LEE YEONG INDUSTRIAL CO., LTD. No.2, Kejia Rd., Douliu City, Yunlin County 64057, Taiwan
Model/Type reference ..... :	CS11; E-SAW30; Chain 11; CS280; Chain 280; EZS11; EZS280
Ratings ..... :	220-240 V; 50-60 Hz; 2800 W; n_0: 10 000 min^{-1}; 382 mm; Class I 110-120 V; 50-60 Hz; 2600 W; n_0: 10 000 min^{-1}; 382 mm; Class I

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	**CB Testing Laboratory:**	DEKRA Testing and Certification (Shanghai) Ltd.	
Testing location/ address.....:		3F., #250 Jiangchangsan Road, Building 16, Headquarter Economy Park Shibei Hi-Tech Park, Zhabei District, Shanghai, 200436, China	
Tested by (name, function, signature).....:		David Yang	
Approved by (name, function, signature)...:		Paul Liu	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment): See part 1
Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
See part 1	See part 1

Summary of compliance with National Differences:

List of countries addressed

See part 1

☐ **The product fulfils the requirements of _____ (insert standard number and edition and delete the text in parenthesis, leave it blank or delete the whole sentence, if not applicable)**

Copy of marking plate:
See part 1

Test item particulars .....:	
Category of equipment .....:	Hand held
Protection Class of tool .....:	Class I
Method of supply cord attachment .....:	Type Y
Duty conditions.....:	severe
Type of operation.....:	Normal
Degree of protection .....:	IPX0
Accessories and detachable parts included .....:	Diamond saw chain and guide bar
Other options included .....:	-
Possible test case verdicts:	
- test case does not apply to the test object..... :	N/A or N (Not Applicable)
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement..... :	F (Fail)
Testing ..... :	
Date of receipt of test item ..... :	2018-11-20
Date (s) of performance of tests..... :	2018-11-20 to 2019-01-28

General remarks:

"(see Enclosure #)" refers to additional information appended to the report.
"(see table #)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☐ **Yes** ☒ **Not applicable**

When differences exist, they shall be identified in the General product information section.

Name and address of factory (ies) ..... : See part 1

General product information and other remarks:

See part 1

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Clause	Requirement + Test	Result - Remark	Verdict
5	**GENERAL CONDITIONS FOR THE TESTS**		
5.14	Addition:		—
	For tests carried out at any percentage of rated input or rated current, except for no-load, the saw chain and the guide bar may be removed and the chain saw loaded by means of a brake.		P
5.17	Addition:		—
	The mass of the machine includes the heaviest guide bar and saw chain combination in accordance with 8.14.2 c) 101) as well as the lubrication tank, if any, filled to the maximum specified level, but excludes the guide bar cover.		P
5.101	For tests that are performed at maximum speed and no-load, the manufacturer may need to provide special hardware and/or software.		N/A
8	**MARKINGS AND INSTRUCTIONS**		
8.2	Addition:		—
	Chain saws shall be marked with safety information which shall be written in one of the official languages of the country in which the machine is to be sold or marked with the appropriate symbol:		—
	– “Wear eye protection” or a relevant safety sign of ISO 7010 or the safety sign specified in Annex AA;		P
	– “Wear ear protection”, a relevant safety sign of ISO 7010 or the safety sign specified in Annex AA. This marking may be omitted if the measured sound pressure level at the operator’s ear in accordance with Annex I does not exceed 85 dB(A).		N/A
	A combination of ISO safety signs, such as eye, ear, dust and head protection, is allowed. In addition, a combination of safety signs as specified in Annex AA is allowed.		P
	– “Do not expose to rain” or the safety sign specified in Annex AA, unless the chain saw has a degree of protection of at least IPX4.		P
	– "Beware of chain saw kickback and avoid contact with bar tip”, or A.1.3 of ISO 17080:2005.	Diamond saw chain, not for cutting wood	N/A
	– “Always use chain saw two-handed” or A.3.1 of ISO 17080:2005.	It’s not possible to use the tool with one hand.	N/A
	For mains supplied machines:		P
	“Remove plug from the mains immediately if the cable is damaged or cut” or the safety sign specified in Annex AA.		P
8.3	Addition:		—
	Chain saws marked with the following:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	– specified nominal guide bar size or size range;		P
	– identification of the direction of rotation of the saw chain by a legible and durable mark on the body of the machine. This may be located under the drive sprocket cover.	No direction for the diamond saw chain	N/A
8.14.1	Addition:		—
	The additional safety instructions as specified in 8.14.1.101 are given. This part may be printed separately from the “General Machine Safety Warnings”.		P
8.14.1.101	Safety instructions for chain saws		—
	1) General chain saw safety warnings:		
	a) Keep all parts of the body away from the saw chain when the chain saw is operating. Before you start the chain saw, make sure the saw chain is not contacting anything. A moment of inattention while operating chain saws may cause entanglement of your clothing or body with the saw chain.		P
	b) Always hold the chain saw with your right hand on the rear handle and your left hand on the front handle. Holding the chain saw with a reversed hand configuration increases the risk of personal injury and should never be done.		P
	c) Hold the chain saw by insulated gripping surfaces only, because the saw chain may contact hidden wiring or its own cord. Saw chains contacting a "live" wire may make exposed metal parts of the chain saw "live" and could give the operator an electric shock.		P
	d) Wear eye protection. Further protective equipment for hearing, head, hands, legs and feet is recommended. Adequate protective equipment will reduce personal injury from flying debris or accidental contact with the saw chain.		P
	e) Do not operate a chain saw in a tree, on a ladder, from a rooftop, or any unstable support. Operation of a chain saw in this manner could result in serious personal injury.	The tool is not use for tree or any wood	N/A
	f) Always keep proper footing and operate the chain saw only when standing on fixed, secure and level surface. Slippery or unstable surfaces may cause a loss of balance or control of the chain saw.		P
	g) When cutting a limb that is under tension, be alert for spring back. When the tension in the wood fibres is released, the spring loaded limb may strike the operator and/or throw the chain saw out of control.	The tool is not use for tree or any wood	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	h) Use extreme caution when cutting brush and saplings. The slender material may catch the saw chain and be whipped toward you or pull you off balance.	The tool is not use for tree or any wood	N/A
	i) Carry the chain saw by the front handle with the chain saw switched off and away from your body. When transporting or storing the chain saw, always fit the guide bar cover. Proper handling of the chain saw will reduce the likelihood of accidental contact with the moving saw chain.		P
	j) Follow instructions for lubricating, chain tensioning and changing the bar and chain. Improperly tensioned or lubricated chain may either break or increase the chance for kickback.	No lubrication	N/A
	k) Cut wood only. Do not use chain saw for purposes not intended. For example: do not use chain saw for cutting metal, plastic, masonry or non-wood building materials. Use of the chain saw for operations different than intended could result in a hazardous situation.	The tool is not use for tree or any wood	N/A
	l) Do not attempt to fell a tree until you have an understanding of the risks and how to avoid them. Serious injury could occur to the operator or bystanders while felling a tree.	The tool is not use for tree or any wood	N/A
	m) This chain saw is not intended for tree felling. Use of the chain saw for operations different than intended could result in serious injury to the operator or bystanders.	The tool is not use for tree or any wood	N/A
	2) Causes and operator prevention of kickback:		P
	Kickback may occur when the nose or tip of the guide bar touches an object, or when the wood closes in and pinches the saw chain in the cut.		P
	Tip contact in some cases may cause a sudden reverse reaction, kicking the guide bar up and back towards the operator.		P
	Pinching the saw chain along the top of the guide bar may push the guide bar rapidly back towards the operator.		P
	Either of these reactions may cause you to lose control of the saw which could result in serious personal injury. Do not rely exclusively upon the safety devices built into your saw. As a chain saw user, you should take several steps to keep your cutting jobs free from accident or injury.		P
	Kickback is the result of chain saw misuse and/or incorrect operating procedures or conditions and can be avoided by taking proper precautions as given below:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) Maintain a firm grip, with thumbs and fingers encircling the chain saw handles, with both hands on the saw and position your body and arm to allow you to resist kickback forces. Kickback forces can be controlled by the operator, if proper precautions are taken. Do not let go of the chain saw.		P
	b) Do not overreach and do not cut above shoulder height. This helps prevent unintended tip contact and enables better control of the chain saw in unexpected situations.		P
	c) Only use replacement guide bars and saw chains specified by the manufacturer. Incorrect replacement guide bars and saw chains may cause chain breakage and/or kickback.		P
	d) Follow the manufacturer's sharpening and maintenance instructions for the saw chain. Decreasing the depth gauge height can lead to increased kickback.		P
8.14.2 a)	Addition:		—
	101) Explanation of chain saw safety devices;		P
	102) Instructions for properly installing and adjusting the guide bar and saw chain;		P
	103) Instruction for selection and use of protective equipment for eyes, ears, head, hands, legs and feet, as applicable.		P
8.14.2 b)	Addition:		—
	101) Recommendation for the use of a residual current device with a tripping current of 30 mA or less;		P
	102) Statement to position the cord so that it will not be caught on branches and the like, during cutting;		P
	103) Recommendation that the first-time user should, as a minimum, practise cutting logs on a saw-horse or cradle;	The tool is not use for tree or any wood	N/A
	104) Information that the chain saw is not suitable for tree felling, if applicable;	The tool is not use for tree or any wood	N/A
	105) Instructions to explain the proper techniques for basic felling, limbing, and crosscutting. Examples for the required instructions are given in Clause BB.1 to BB.5. If the chain saw is not suitable for tree felling as specified by the manufacturer, then instructions for felling techniques may be omitted;	The tool is not use for tree or any wood	N/A
	106) If applicable, instruction on the use of a manual lubrication control;		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	107) If applicable, instruction not to operate the chain saw without lubrication and to replenish it in due time before the container is empty;		N/A
	108) Instruction to use only recommended lubricants;		N/A
	109) Information on the maximum speed of the saw chain, or if the maximum speed of the saw chain is less than 20 m/s, this may be stated.	20,65 m/s	P
8.14.2 c)	Addition:		—
	101) Information on recommended guide bar and saw chain combination(s) that can be used and that maintains compliance with this standard;		P
	102) Instructions on sharpening and maintenance of the saw chain and/or a recommendation to have sharpening and maintenance of the saw chain performed by authorised service centres.	Diamond saw chain	N/A
8.14.3	Replacement:		—
	If information about the mass or weight of the machine is provided, it is the mass of the machine without the saw chain, guide bar, guide bar cover, oil and optional accessories.	8,94 kg	P
12	**HEATING**		
12.2.1	Replacement:		—
	The load conditions for the heating test of 12.2 are as follows:		P
	The machine is operated with a torque load applied such that rated input or rated current is drawn.		P
	The machine is operated for 30 min. During this period, the torque load is adjusted as necessary to maintain rated input or rated current.		P
14	**MOISTURE RESISTANCE**		
14.2.1	Replacement:		—
	The machine is not connected to the supply.		N/A
	The machine is placed in its normal rest position on a perforated turntable.		N/A
	The turntable is then turned continuously at approximately 1 rev/min during the test.		N/A
	Electrical components, covers and other detachable parts are removed and subjected, if necessary, to the relevant treatment with the main part.		N/A
	Movable covers that are non-detachable parts and are not self-restoring are placed in the most unfavourable position.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
14.3	This subclause of Part 1 is not applicable for saw chain lubrication tanks and lubrication systems intended for use with oil as specified in 8.14.2.		—
17	**ENDURANCE**		
17.2	Modification:		—
	This subclause is applicable as for hand-held tools. The saw chain is removed for the endurance test.		P
18	**ABNORMAL OPERATION**		
18.3	Replacement:		—
	Machines incorporating a series motor are operated without the saw chain at a voltage equal to 1,3 times rated voltage for 1 min at no-load.		P
	During the test, parts not be ejected from the machine. After this test, the machine need not be capable of further use.		P
	An additional device incorporated in the machine to limit the speed may operate during the test.		P
18.5	Modification:		P
	The requirements for tools other than lawn and garden machinery are applicable.		P
18.8.1	Replacement of Table 4 by the following:		—
	Required performance levels.....:	See Table 18.8.1	P
19	**MECHANICAL HAZARDS**		
19.1	Modification:		
	The requirements of this subclause do not apply to those moving parts and guards which are separately covered by 19.102, 19.103 and 19.104.		—
19.6	This subclause of Part 1 is not applicable.		N/A
19.7	This subclause of Part 1 is not applicable.		N/A
19.8	This subclause of Part 1 is not applicable.		N/A
19.9	Replacement:		—
	If, in accordance with 8.14.2, the user is instructed to remove a drive sprocket cover, such as for maintenance, to change the saw chain or guide bar, then the fastenings remain attached to the drive sprocket cover or to the machinery, unless the drive sprocket cover fastenings are the only means for retaining the guide bar. If a fastening is not removed for removing the drive sprocket cover, it is considered as still attached.		P
19.101	**Handles**		—
	Chain saws is fitted with at least two handles to provide safe control.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The length of the grip area of the front handle is 100 mm.		P
	The handle surfaces is designed and shaped that firm grip may be applied.		P
	Minimum clearances and sizes of the handles is in accordance with ISO 7914 for forest work chain saws, except for the determination of dimension D.		P
	Front:		—
	Finger clearance in the grip area - minimum size 35 mm (mm) .....:	>35	P
	Handle grip area fulfils the requirement with the gauge A (ISO 6533:2012)		P
	Clearance between the front of the chain-saw body and the handle at the top measured 60 mm to the left of the guide bar plane - minimum size 38 mm (mm) .....:	65 mm	P
	Clearance between the front of the chain-saw body and the handle measured at the centreline of the guide bar - minimum size 25 mm (mm) .....:	65 mm	P
	Front and rear:		—
	Perimeter of the cross-section of the handle - minimum size 65 mm (mm) .....:	140 mm	P
	Distance from the rear side of the throttle trigger to the centre of the front handle at the top - minimum size 225 mm (mm) .....:	354 mm	P
	Rear:		—
	Finger clearance at the released throttle trigger - minimum size 30 mm (mm) .....:	38 mm	P
	Clearance below the released throttle trigger		P
	- minimum size 35 mm (mm) .....:	36 mm	P
	Clearance behind the released throttle trigger		P
	- minimum size 4x25 mm (mm) .....:	> 4 x 25 mm	P
	Dimension D is the straight line distance from the rear side of the power switch to a point on the axis of the front handle, 50 mm to the left of X0, where X0 is determined in accordance with ISO 6533.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	For chain saws with a maximum speed of the saw chain not exceeding 8 m/s and a maximum cutting length not exceeding 300 mm, however, the dimension D in Table 1 of ISO 7914:2002 may be reduced to a minimum of 125 mm.		N/A
19.102	**Front hand guard**		—
	A guard is fitted in the vicinity of the front handle to protect the operator's fingers from injury by contact with the saw chain.		P
	The dimensions and clearances of this front hand guard and the prevention of access from the front handle to the saw chain comply with ISO 6533.		P
	Front hand-guard width, *W*1 minimum of 100 mm (mm) .....:	135 mm	P
	Front hand-guard height over front handle, H_1 at least 20 mm (mm) .....:	35 mm	P
	H_{1A} minimum height is 0 mm (mm) .....:	35 mm (No brake lever)	P
	Height of front hand-guard openings, *H*3 Type C gauge cannot pass through the openings		P
	Clearance between hand-guard and saw body, *H*2 type C gauge, held parallel to the front hand-guard, cannot pass through		P
	Clearances between hand-guard and front handle, *type A gauge* **and** *type B gauge*		P
	Type A gauge a type A gauge can pass the clearance without coming into contact with the hand-guard		P
	Type B gauge a type B gauge cannot pass the clearance and any part of the gauge centreline will come lower than any part of the centreline of the front handle		P
19.103	**Rear hand guard**		—
	A rear hand guard provided along the length of the right side of the bottom of the rear handle to protect the operator's hand from contact in case the saw chain breaks or derails.		P
	The rear hand guard extend from the right edge of the rear handle for at least 30 mm on the guide bar side (see Figure 104) and		P
	Measurement at the guide bar side (mm) .....:	>50 mm	P

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Clause	Requirement + Test	Result - Remark	Verdict
	– at least 100 mm lengthwise from the inner rear part of the chain saw body (see Figure 104); or		P
	Measurement lengthwise (mm) .....:	>150 mm	P
	– at least three times the diameter of 25 mm behind the power switch, as defined by three cylinders pressed against the rear handle and the power switch;		P
	This requirement may also be fulfilled by parts of the machine.		P
19.104	**Drive sprocket cover**		—
	The drive sprocket and saw chain is covered within the area of the body of the chain saw.		P
	This cover is not be removable without the aid of a tool unless the drive sprocket cover fastenings are the only means for retaining the guide bar.		N/A
	There may be openings at the front, the front upper section and the bottom section to allow the ejection of wood chips and to allow passage of the guide bar and saw chain.		P
19.105	**Chain catcher**		—
	The chain saw is fitted with a chain catcher device placed under the saw chain as far to the front as practicable. The chain catcher extend sideways at least 5 mm from the centre-plane of the guide bar.		P
	Extension of the chain catcher (mm) .....:	>8 mm	P
	Temperature (°C).....:	-	N/A
19.106	**Void**		—
19.107	**Protection against injury by kickback**		—
	Chain saws is designed to minimize the risk of injury due to the effect of kickback.	Diamond saw chain and this product is not used for cutting wood	N/A
19.107.1	Chain saws is equipped with a manually activated chain brake, operated by the front hand guard in a direction away from the operator, that stops movement of the saw chain.	Diamond saw chain and this product is not used for cutting wood	N/A
	A manually activated chain brake is not required if the chain saw is fitted with a non-manually activated chain brake that meets the requirements of 19.107.2 or provided the following requirements are fulfilled:		—
	– the maximum speed of the saw chain does not exceed 5 m/s; and		N/A
	– the cutting length without bar tip guard does not exceed 300 mm.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Compliance is checked by inspection and by measurement with the chain saw fitted with a saw chain and guide bar as specified in 8.14.2.		—
19.107.1.1	The manually activated chain brake is designed so that the static activation force required is not more than 60 N and not less than 20 N.		N/A
	Static release force (N) .....:		N/A
	With the power switch in the "on" position and the chain saw disconnected from the power source, the force on the front hand guard needed to activate the brake measured at the centre of the top (horizontal) part of the front hand guard and in the direction of 45° forward and downward in relation to the guide bar centreline.		—
19.107.1.2	The average braking time not exceed 0,12 s and the maximum braking time not exceed 0,15 s.		N/A
	average braking time (s) .....:		N/A
	maximum braking time (s) .....:		N/A
	Compliance is checked by the following test:		—
	The chain saw shall be run in before starting the test by performing 10 on"/"off" cycles with the power switch.		N/A
	One cycle consists of 30 s running and 30 s rests.		N/A
	With the saw chain lubricated as in normal use, and operated at rated voltage and maximum speed, the front hand guard is set in motion by the impact of a pendulum. This pendulum shall have a mass of 0,70 kg, a hammer with a flat strike face of 50 mm diameter and an arm of 700 mm length. The pendulum drop height shall be 200 mm. Any special hardware and/or software used to achieve maximum speed in accordance with 5.101 shall not influence the braking performance provided by the chain brake. The time for the saw chain to stop shall be measured from the moment of impact with the front hand guard.		—
	The chain brake shall be operated a total of 25 times. The maximum stopping time and the average stopping time of the saw chain shall be determined at the first five and the last five braking operations.		—
	The saw chain is considered to be stopped when the time taken for two successive drive links (see dimension a in Figure 108) to pass a fixed point exceeds 5 Ms.		—
	The tests shall be done in 2 min intervals, comprising a no-load running period of 1 min prior to each impact of the pendulum. Immediately after the operation of the chain brake and the saw chain has stopped, the chain saw shall be switched off for the remainder of the interval. The chain brake actuation mechanism shall be reset during this off period.		—
19.107.2	Chain saws with a maximum speed of the saw chain above 15 m/s be equipped with a non-manually activated chain brake that is sufficiently sensitive to operate when kickback occurs.		N/A
	Compliance is checked by inspection and by the test of ISO 13772, with the power switch in the "on" position and the chain saw disconnected from the power source. For cutting lengths less than 500 mm, the threshold level of chain saws for forest service with ≤ 40 cm3 engine displacement shall apply. For cutting lengths of 500 mm or greater, the threshold level of chain saws for forest service with > 40 cm3 engine displacement shall apply.		—

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Clause	Requirement + Test	Result - Remark	Verdict
19.107.2.1	If the actuation of the non–manually activated chain brake is independent of the front hand guard, the stopping time requirements apply as specified in 19.107.1.2.		N/A
	Compliance is checked by the test described by 19.107.1.2. The pendulum, however, is replaced by any arrangement suitable to measure the time from the moment the simulated kickback is detected by the non-manually activated chain brake until the saw chain has stopped.		—
19.107.2.2	If the non-manually activated chain brake functions through the activation of the front hand guard, then the stopping time requirements in 19.107.1.2 apply.		N/A
19.107.3	After activation of a chain brake, if any, the motion of the saw chain stop and operation of the chain saw not resume without deliberate operator action of either:		—
	– deactivation and reactivation of the power switch; or		N/A
	– resetting of the front hand guard, if the operational state of the chain brake is recognizable by position or other means.		N/A
19.107.4	The computed kickback angle or the chain stop angle, whichever is lower, is determined for the most unfavourable guide bar and saw chain combination specified in 8.14.2. The angle not exceed 45°.		N/A
	Bar tip guard prevents contact of any part of the saw chain with the workpiece within the angle α between 45° and 135°		N/A
	If the chain saw is provided with a guide bar incorporating a bar tip guard, whether removable or permanently attached, this removed prior to testing.		N/A
	Bar guard with a not removable tip guard (riveted, spot welded, etc.) or		N/A
	Computed kickback angle, or		N/A
	Chain stop angle		N/A
	The medium-density fibreboard (MDF) samples be as specified in ISO 9518.		N/A
19.108	**Guide bar cover**		—
	A protective cover is provided with the chain saw to cover the guide bar in order to prevent injuries during transportation.	Now sharp edges for this diamond saw chain	N/A
	The guide bar cover is not be displaced by more than 50 mm when the guide bar is in a vertical downward position.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	When the guide bar is adjusted to its maximum length and the guide bar cover is fully engaged on the guide bar, no more than 50 mm of the saw chain on the top or bottom of the guide bar is remain exposed.		N/A
19.109	**Saw chain tension**		—
	Chain saws provided with means of tensioning the saw chain.		P
19.110	**Saw chain lubrication**		—
	Chain saws with a maximum speed of the saw chain of 5 m/s and above equipped with a provision for lubricating the saw chain.		N/A
	If the chain saw is fitted with a manual lubrication control, it is so located that it can be operated while holding the chain saw with both hands in a normal operating position.		N/A
19.111	**Balance**		—
	Chain saws is in longitudinal balance.		P
	Compliance is checked by the following test:		—
	The angle α between the centreline of the guide bar and the horizontal plane as shown in Figure 109 shall not exceed ± 30°.	12°	P
19.112	**Run down time**		—
	Compliance is checked by the following test:		—
	The chain saw and saw chain tension shall be adjusted as for normal use, as specified in 8.14.2.		—
	The chain saw shall be run in before starting the test by performing 10 “on”/”off” cycles with the power switch.	The concrete chain saw is not used for cutting wood	N/A
	The test is made under no-load. The test sequence shall consist of a total of 2 500 cycles.		N/A
	The run down time of chain saws is limited.		N/A
	for the first 6 cycles of operation run down time of the chain does not exceed 2 s……..(s):		N/A
	for the final 6 cycles of the test sequence run down time of the chain does not exceed 3 s (s):		N/A
	The stop time is measured from the moment of release of the power switch actuator until the saw chain is stopped. The saw chain is considered to be stopped when the time taken for two successive drive links (see dimension a in Figure 108) to pass a fixed point exceeds 5 Ms.		—
20	**MECHANICAL STRENGTH**		
20.1	Addition:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Damage to the guide bar, saw chain and chain catcher are ignored.		P
20.3.1	Replacement:		—
	The chain saw, fully assembled in accordance with 8.14.2 and with the lubrication tank empty, is dropped three times in total on a concrete surface from a height of 1 m.		P
	For these three drops, the sample is tested in the three most unfavourable positions with the lowest point of the machine being 1 m above the concrete surface. Secondary impacts is avoided.		P
	If attachments are provided as specified and mounted in accordance with 8.14.2, the test is repeated with each attachment or combination of attachments mounted to a separate machine sample.		P
	After the test, the lubrication tank is filled to the maximum level in accordance with 8.14.2.		P
20.101	**Handles**		—
	The handles of durable construction and capable of withstanding stress sustained under normal working conditions.		P
	Forwards and backwards X1 and X2 700 N		P
	Up and down Y1 and Y2 700 N		P
	Right and left Z1 and Z2 350 N		P
20.102	**Front and rear hand guard**		—
	The front hand guard and rear hand guard of durable construction and capable of withstanding impacts sustained in normal working conditions.		P
20.103	The chain catcher have sufficient mechanical strength.		P
21	**CONSTRUCTION**		
21.18	Replacement:		—
	Additional requirements for power switches for chain saws are given in 21.18.101 and 21.18.102.		—
21.18.101	The power switch required by 21.17 is a momentary power switch without a lock-on device, which can be switched on and off by the user without the need to release any of the handle(s) or grasping surface(s) required by 19.101.		P
	When the lock-off function as specified in 21.18.102 is in the unlocked state, the chain saw operate within 1 s after actuation of the power switch.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The chain saw only operate when the chain brake, if any, is deactivated.		N/A
21.18.102	The machine is provided with a power switch having a lock-off device such that at least two separate and dissimilar actions are required before drive to the saw chain is possible. It is not be possible to achieve these actions with a single grasping motion or a straight line motion within any grasping surface identified in accordance with 8.14.2 b) 6).		P
	The lock-off device and the operator presence sensor (if any) is actuated before the power switch can enable drive to the saw chain.		P
	It is not be necessary to sustain the actuation of the lock-off device until the power switch is activated, provided:		—
	– the power switch or an operator presence sensor (if any) is activated within 5 s of the release of the lock-off device; and		P
	– there is a visual or audible indication as soon as the lock-off actuator is released and continues at least until the power switch is activated, or		P
	– an operator presence sensor (if any) is activated prior to the release of the actuator of the lock-off device.		N/A
	The machine return to the original locked state within 1 s when the power switch is released (i.e. at least two separate and dissimilar actions are required before drive to the saw chain is possible), unless:		—
	– an operator presence sensor is provided; and		N/A
	– the hand is not released from the operator presence sensor.		N/A
	The lock-off device shall not be actuated by a 25 mm diameter x 75 mm long rod with a force not exceeding 20 N on the lock-off device in any direction.		P
	The rod shall be applied such that its cylindrical surface bridges the surface of the lock-off device and any surface adjacent to the lock-off device.		P
21.101	**Determination of cutting length**		—
	The cutting length L is measured with the guide bar adjusted to its midway point. The measurement is made along the centreline of the guide bar in accordance with a) – d) below.		P
	a) For chain saws without a bar tip guard and where no spiked bumper is provided or the spiked bumper is removable, the cutting length L is determined as L = L1 + L3 as shown in Figure 102 a), where		P

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Clause	Requirement + Test	Result - Remark	Verdict
	– L1 is the distance from the chain saw body (A), to the tip end of the guide bar (not including the bar tip sprocket, if any); and		P
	– L3 is 6 mm, which is an approximation for the height of the saw chain cutter.		P
	b) For chain saws without a bar tip guard and where the spiked bumper is permanently attached to the chain saw, the cutting length L is determined as L = L2 + L3 as shown in Figure 102 a), where		N/A
	– L2 is the distance from root of the spike nearest the centreline of the guide bar on the spiked bumper (B); and		N/A
	– L3 is 6 mm, which is an approximation for the height of the saw chain cutter.		N/A
	c) For chain saws with a bar tip guard and where no spiked bumper is provided or the spiked bumper is removable, the cutting length L is determined as L = L1 as shown in Figure 102 b), where L1 is the distance from the chain saw body (A) and the inside part of the bar tip guard.		N/A
	d) For chain saws with a bar tip guard and where the spiked bumper is permanently attached to the chain saw, the cutting length L is determined as L = L2 as shown in Figure 102 b), where L2 is the distance from the root of the spike nearest the centreline of the guide bar on the spiked bumper (B) and the inside part of the bar tip guard.		N/A
21.102	**Operator presence sensor**		—
	The operator presence sensor, if any, is incorporated in the handle or grasping surface associated with the power switch.		N/A
	It is not required that the operator presence sensor is capable of distinguishing between an operator's hand and other objects.		N/A
	The function of the operator presence sensor may be achieved by one or any combination of mechanical, electrical or electronic means.		N/A
21.103	**Spiked bumper**		—
	Chain saws:		
	– be equipped with a spiked bumper (see Figure 101); or		P
	– have provision for mounting one.		N/A
21.104	**Bar tip guard**		—
	Chain saws may be equipped with a bar tip guard (see Figure 102 b)).		N/A

IEC 62841-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
23	**COMPONENTS**		
23.1.10.1	Modification of the sixth paragraph:		—
	Switches further be classified as follows with respect to endurance:		—
	power switches for chain saws – for 50 000 cycles.		P
	Addition:		—
	Auxiliary switches, if any, associated with the chain brake are considered to be switches other than power switches and is classified as follows with respect to endurance – for 10 000 cycles.		N/A
23.1.10.2	Modification of the third paragraph:		—
	Power switches for chain saws are tested for 50 000 cycles.		N/A
23.3	Addition:		—
	Protection devices (e.g. overload or over-temperature protection devices) or circuits that switch off the chain saw is of the non-self-resetting type.		P
24	**SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS**		
24.1	Replacement:		—
	Machines is provided with one of the following means of connection to the supply:		—
	– an appliance inlet having at least the same degree of protection against moisture as marked in accordance with 8.1 for the machine; or		N/A
	– a supply cord with a length between 0,2 m and 0,5 m and fitted with a plug or other connector having at least the same degree of protection against moisture as marked in accordance with 8.1 for the machine.	Not for outdoor use or cutting wood, refer to part 1	N/A
	Plugs, connectors and inlets is suitable for the ratings of the machine.		N/A
	The plug shall be withdrawn not more than the distance necessary to permit the test probe to be inserted between the plug body and the extension cord receptacle.		—
	The test probe shall be inserted with a force of 18 N (4,1 lb) or less, until the probe contacts one blade of the plug.		N/A
24.4	Modification:		—
	Supply cords not be lighter than heavy polychloroprene sheathed flexible cable (code designation 60245 IEC 66) or equivalent.	H07RN-F	P
ANNEX K	**BATTERY TOOLS AND BATTERY PACKS**		
K.1	**Scope**		—
	Addition:		—

IEC 62841-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	This standard applies to chain saws for cutting wood and designed for use by one person. This standard does not cover chain saws designed for use in conjunction with a guide-plate and riving knife or in any other way such as with a support or as a stationary or transportable machine.		N/A
	This standard does not apply to		
	– chain saws for tree service as defined in ISO 11681-2; or		N/A
	– pole-mounted pruners.		N/A
	The chain saws covered by this standard are designed only to be operated with the right hand on the rear handle and the left hand on the front handle.		N/A
K.8.14.1.101	**Safety instructions for chain saws**		—
	Replacement of item 1) c):		—
	c) Hold the chain saw by insulated gripping surfaces only, because the saw chain may contact hidden wiring. Saw chains contacting a "live" wire may make exposed metal parts of the chain saw "live"' and could give the operator an electric shock.		N/A
K.8.14.1.301	**General chain saw safety warnings**		—
	a) Follow all instructions when clearing jammed material, storing or servicing the chain saw. Make sure the switch is off and the battery pack is removed.		N/A
	b) Follow all instructions when clearing jammed material, storing or servicing the chain saw. Make sure the switch is off and the lock-off is in the locked position.		N/A
K.8.14.2 b)	Items 101) and 102) in Part 4-1 are not applicable.		N/A
	Addition:		N/A
301)	Instructions for the use and adjustment of any means of support for separable battery packs in accordance with K.21.301 and instructions for release or removal.		N/A
K.8.14.2 c)	Addition:		
301)	For machines with integral batteries, instructions on how to disable the machine during maintenance or servicing.		N/A
K.8.14.3	If information about the mass or weight of the machine is provided, it is the mass of the machine without the saw chain, guide bar, guide bar cover, oil, battery (except for integral batteries) and optional accessories.		N/A

IEC 62841-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	If information about the mass or weight of the battery(ies) is provided, it cover the range of specified batteries.		N/A
K.12.2.1	This subclause of Part 4-1 is not applicable.		N/A
K.14	**Moisture resistance**		—
	This clause of Part 4-1 is not applicable, except as follows:		—
K.14.301	**Battery-powered chain saw moisture resistance**		—
K.14.301.1	The enclosure of the machine provide the degree of protection against moisture in accordance with the classification of the machine. This does not apply to saw chain lubrication tanks and lubrication systems intended for use with oil as specified in 8.14.2.		N/A
K.14.301.2	The machine is tested with detachable battery pack(s) or separable battery pack(s) fitted. The machine is switched off during the test.		N/A
	The machine is placed in its normal rest position on a perforated turntable. The turntable is then turned continuously at approximately 1 rev/min during the test.		N/A
	Electrical components, covers and other detachable parts are removed and subjected, if necessary, to the relevant treatment with the main part.		N/A
	Movable covers that are non-detachable parts and are not self-restoring are placed in the most unfavourable position.		N/A
	Batteries with a classification greater than IPX0 are tested separately according to their rating.		N/A
K.14.301.3	Machines other than IPX0 are subjected to tests of IEC 60529 as follows:		—
	– IPX1 machines are subjected to the test described in 14.2.1;		N/A
	– IPX2 machines are subjected to the test described in 14.2.2;		N/A
	– IPX3 machines are subjected to the test described in 14.2.3;		N/A
	– IPX4 machines are subjected to the test described in 14.2.4;		N/A
	– IPX5 machines are subjected to the test described in 14.2.5;		N/A
	– IPX6 machines are subjected to the test described in 14.2.6;		N/A

IEC 62841-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	– IPX7 machines are subjected to the test described in 14.2.7. For this test, the machine is immersed in water containing approximately 1,0 % Nalco.		N/A
	Immediately after the appropriate treatment, the machine shall show that there is no trace of water on insulation which could result in a reduction of creepage distances and clearances which impairs compliance with K.28.1.		N/A
K.17.2	This subclause of Part 4-1 is not applicable.		N/A
K.18.3	This subclause of Part 4-1 is not applicable.		N/A
K.18.5	This subclause of Part 4-1 is not applicable.		N/A
K.19.107.4	Addition:		—
	The weight of different optional batteries is taken into consideration when conducting the test in order to identify the worst case.		N/A
K.19.111	Replacement:		—
	Chainsaws is in longitudinal balance.		N/A
	Compliance is checked by the following test.		—
	The angle α between the centreline of the guide bar and the horizontal plane as shown in Figure 109 shall not exceed ± 30°.		N/A
K.20.1	This subclause of Part 1 is applicable, except as follows:		—
	Addition:		—
	Damage to the guide bar, saw chain and chain catcher are ignored.		N/A
	There is no leakage of lubrication through cracks in lubrication tanks and tank caps while the chain saw is being held in each of the six orthogonal directions for 30 s. Seepage through ventilation systems is not considered a failure.		N/A
K.20.3.1	The chain saw, fully assembled in accordance with 8.14.2 and with the lubrication tank empty, with any detachable battery pack attached is dropped three times in total on a concrete surface from a height of 1 m.		N/A
	For these three drops, the sample is tested in the three most unfavourable positions the lowest point of the tool being 1 m above the concrete surface. Secondary impacts is avoided.		N/A
	For the test, separable accessories are not mounted.		N/A
	For battery machines with detachable battery packs, the test is repeated three more times without the battery pack attached to the machine.		N/A

IEC 62841-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	New samples may be used for each series of three drops. For the test, separable accessories are not mounted.		N/A
	In addition for detachable battery packs or separable battery packs, the test is repeated three more times on the battery packs separately.		N/A
	If attachments are provided as specified and mounted in accordance with 8.14.2, the test is repeated with each attachment or combination of attachments mounted to a separate machine sample with a detachable battery pack or separable battery pack installed.		N/A
K.21.301	Separable battery packs that are intended to be supported on the body of an operator in accordance with K.8.14.2 b) 301) is provided with a means of support or attachment.		N/A
	This requirement may be fulfilled by providing a shoulder harness, belt harness or other means of support or attachment.		N/A
	Any shoulder or belt harness is adjustable to the size of the operator and its operation is in accordance with K.8.14.2 b) 301).		N/A
	Shoulder or belt harnesses is:		N/A
	– designed in a way for easy removal; or		N/A
	– equipped with a quick release mechanism		N/A
	that ensures that the separable battery pack(s) can be removed or released quickly from the operator.		N/A
	The quick release mechanism is positioned either at the connection between the separable battery pack(s) and harness or between the harness and operator. The quick release mechanism only allow separation by deliberate action of the operator. The quick release mechanism is designed to open while under the weight of the separable battery pack(s). It require the use of only one hand and have no more than two release points.		N/A
	A double shoulder harness is considered to be designed in a way for easy removal, if the left and right shoulder straps are not connected to each other in front of the operator’s body. If straps to connect between the left and right shoulder straps are provided, it is also considered to be designed in a way for easy removal when the straps connecting between the left and right shoulder straps can be released under the load of the separable battery pack(s) by using one hand and have no more than two release points.		N/A
	The release mechanism only allow separation by deliberate action of the operator.		N/A

IEC 62841-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
K.23.1.10.1	This subclause of Part 4-1 is not applicable.		N/A
K.23.1.10.2	This subclause of Part 4-1 is not applicable.		N/A
K.23.301	Auxiliary switches, if any, associated with the chain brake are considered to be switches other than power switches. They, however, meet the requirements of K.23.1.10 and K.23.1. 201.		N/A
K.24	**Supply connection and external flexible cords**		—
	This clause of Part 4-1 is not applicable, except as follows:		—
K.24.301	For battery machines with separable battery packs, the external flexible cable or cord have anchorages such that the conductors are relieved from strain, including twisting, where they are connected within the machine, and protected from abrasion.		N/A
K.24.302	If a machine is supplied with a separable battery pack, it is possible for the operator to disconnect the separable battery pack from the machine without the use of a tool during normal use.		N/A
ANNEX L	**BATTERY TOOLS AND BATTERY PACKS PROVIDED WITH MAINS CONNECTION OR NON-ISOLATED SOURCES**		N/A

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