

INTERNATIONAL STANDARD



**Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 2-10: Particular requirements for hand-held mixers**



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IEC 62841-2-10

Edition 1.1 2024-12
CONSOLIDATED VERSION

INTERNATIONAL STANDARD



**Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 2-10: Particular requirements for hand-held mixers**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 25.140.20

ISBN 978-2-8327-0118-8

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS,
TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY –
SAFETY –****Part 2-10: Particular requirements for hand-held mixers**

FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62841-2-10 edition 1.1 contains the first edition (2017-02) [documents 116/303/FDIS and 116/313/RVD] and its amendment 1 (2024-12) [documents 116/723/CDV and 116/780A/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 62841-2-10 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 2-10 is to be used in conjunction with the first edition of IEC 62841-1 (2014).

This Part 2-10 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC standard: Particular requirements for hand-held mixers.

Where a particular subclause of Part 1 is not mentioned in this Part 2-10, that subclause applies as far as relevant. Where this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

The terms defined in Clause 3 are printed in **bold typeface**.

Subclauses, notes and figures which are additional to those in Part 1 are numbered starting from 101.

A list of all parts of the IEC 62841 series, under the general title: *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*, can be found on the IEC website.

The committee has decided that the contents of this document and its amendment will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The ‘colour inside’ logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 36 months from the date of publication.

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 2-10: Particular requirements for hand-held mixers

1 Scope

This clause of Part 1 is applicable, except as follows:

Addition:

This part of IEC 62841 applies to **mixers**. **Mixers** are not considered to be tools with a **liquid system**.

This standard does not apply to drills and impact drills, even if they can be used as a **mixer**.

NOTE 101 Drills and impact drills are covered by IEC 62841-2-1.

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

Addition:

3.101

mixer

tool equipped with either one or more output spindles to mount **mixer baskets** specifically designed to stir liquids or to mix building materials such as concrete, plaster, etc., see Figure 101

Note 1 to entry: The output spindle(s) is/are either threaded, or has/have other coupling means such as a chuck or a hexagonal connector.

Note 2 to entry: **Mixers** are also commonly known as stirrers.

3.102

mixer basket

accessory intended to be used with a **mixer** employing a structure of wings, spirals or helixes for moving the material in the container

Note 1 to entry: **Mixer baskets** are also commonly known as stirrer rods, stirrer baskets, paddles or **mixer rods**.

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable, except as follows:

5.17 Addition:

The mass of the tool includes the chuck and the auxiliary handle, if any.

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

This clause of Part 1 is applicable, except as follows:

8.3 Addition:

Mixers with a threaded output spindle shall be marked with the spindle thread size.

Mixers with a hexagonal coupling shall be marked with the width across flats.

For **mixers** with a chuck, the chuck shall be marked with the maximum capacity in mm.

8.14.1 Addition:

The additional safety instructions as specified in 8.14.1.101 shall be given. This part may be printed separately from the "General Power Tool Safety Warnings".

8.14.1.101 Mixer safety instructions

NOTE In the below instructions, on discretion of the manufacturer, the term "**mixer**/mixed/mixing" is replaced by "stirrer/stirred/stirring" and the term "basket" is replaced by another appropriate term such as "rod".

- a) **Hold the tool with both hands at the intended handles.** *Loss of control can cause personal injury.*
- b) **Ensure sufficient ventilation when mixing flammable materials to avoid a hazardous atmosphere.** *Developing vapour may be inhaled or be ignited by the sparks the power tool produces.*
- c) **Do not mix food.** *Power tools and their accessories are not designed for processing food.*
- d) **Keep the cord away from the working area.** *The cord may be entangled by the mixer basket.*
- e) **Ensure that the mixing container is placed in a firm and secure position.** *A container that is not properly secured may move unexpectedly.*
- f) **Ensure that no liquid splashes against the housing of the power tool.** *Liquid that has penetrated the power tool can cause damage and lead to electric shock.*
- g) **Follow the instructions and warnings for the material to be mixed.** *Material to be mixed may be harmful.*

- h) **If the power tool falls into the material to be mixed, unplug the tool immediately and have the power tool checked by a qualified repair person.** *Reaching into the bucket with the tool still plugged in can lead to electric shock.*
- i) **Do not reach into the mixing container with your hands or insert any other objects into it while mixing.** *Contact with the mixer basket may lead to serious personal injury.*
- j) **Start up and run down the tool in the mixing container only.** *The mixer basket may bend or spin in an uncontrolled manner.*

8.14.2 a) Addition:

- 101) Information about which **mixer baskets** can be used with the tool, including their maximum diameter or width, and which extensions can be used.

9 Protection against access to live parts

This clause of Part 1 is applicable.

10 Starting

This clause of Part 1 is applicable.

11 Input and current

This clause of Part 1 is applicable.

12 Heating

This clause of Part 1 is applicable, except as follows:

12.2.1 Addition:

The tool is operated continuously for a period of 30 min. The temperature rises are measured at the end of the 30 min.

13 Resistance to heat and fire

This clause of Part 1 is applicable.

14 Moisture resistance

This clause of Part 1 is applicable.

15 Resistance to rusting

This clause of Part 1 is applicable.

16 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

17 Endurance

This clause of Part 1 is applicable.

18 Abnormal operation

This clause of Part 1 is applicable, except as follows:

18.8 Replacement of Table 4:

Table 4 – Required performance levels

Type and purpose of SCF	Minimum performance level (PL)
Power switch – prevent unwanted switch-on	b
Power switch – provide desired switch-off	a
Any electronic control to pass the test of 18.3	a
Any speed limiting device	Not an SCF
Provide desired direction of rotation	Not an SCF
Prevent exceeding thermal limits as in Clause 18 18.4 and 18.5.3	a
Prevent self-resetting as required in 23.3	b
Prevent unwanted lock-on of the power switch function	a
NOTE In Europe (EN 62841-2-10), the following additional requirement applies: Restart prevention as required by 21.18.1.1	b

19 Mechanical hazards

This clause of Part 1 is applicable, except as follows:

19.1 Replacement of the first paragraph:

Moving and other dangerous parts of the tool other than the output spindle and the **mixer basket** shall be so positioned or enclosed to provide adequate protection against personal injury.

19.4 Replacement:

Mixers shall be provided with at least two handles.

Compliance is checked by inspection.

19.4.101 The design of the handle(s) shall be such that the operator can control the torque during the operation of the tool.

Compliance is checked by measurement and by calculations as follows:

*The moment arm of each handle (a) is determined as illustrated in Figure 102. The sum of the moment arms of the two handles shall be greater than or equal to the diameter or width of the largest recommended **mixer basket** in accordance with 8.14.2 a) 101). If there are more than*

*two handles, then the worst case configuration in accordance with 8.14.2 b) 6) shall be used, with one of the handles incorporating the **power switch**.*

19.6 This subclause is not applicable.

19.101 For **mixers** with more than one spindle, the spindles shall be adequately spaced in order to reduce the risk of entanglement. The minimal clearance *c* between rotating parts in the area of the spindle outputs and along further 100 mm down to the **mixer basket** shall be at least 40 mm, see Figure 103.

Compliance is checked by measurement.

19.102 Chuck keys shall be so designed that they drop easily out of position when released. This requirement does not exclude the provision of clips for holding the key in place when not in use; metal clips fixed to the flexible cable or cord are not allowed.

Compliance is checked by inspection and by manual test.

The key is inserted in the chuck and, without tightening, the tool is turned such that the key is facing down. The key shall fall out.

20 Mechanical strength

This clause of Part 1 is applicable, except as follows:

20.3.1 Replacement:

Mixers are subjected to three impacts that result from the tool being tipped over to strike a concrete surface. The tool is tipped with the longest **mixer basket**, including extensions, if applicable, recommended by the manufacturer in accordance with 8.14.2 a) 101). If no length of the recommended **mixer basket** is specified, the tip test is performed with a **mixer basket** of 1 m length. The tool is positioned in an upright position with the tip of the **mixer basket** resting on the concrete surface. The tool is then tipped in three different directions on to the concrete surface.

NOTE Typical **mixer baskets** have a length of 600 mm. Available extensions have a length up to 400 mm.

*If **attachments** are provided as specified in accordance with 8.14.2, the test is repeated with each **attachment** or combination of **attachments** mounted to a separate tool sample.*

20.5 This subclause is not applicable.

21 Construction

This clause of Part 1 is applicable, except as follows:

21.18.1.1 Addition:

A **power switch** lock-on device, if any, shall be located such that it can be activated without releasing any hand from the grasping area of the handles required in 19.4. In addition, it shall be so designed that it is not likely to be unintentionally locked on by the user's hand.

*Compliance is checked by inspection or, for a **power switch** with a lock-on device within the grasping area, by the following test.*

*With the **power switch** in the “on” position, the lock-on device shall not be actuated by a straight edge 25 mm long when the straight edge is pushed down on the lock-on device. The straight edge shall be oriented in any direction and be applied to bridge the surface of the lock-on device and any surface adjacent to the lock-on device.*

NOTE In Europe (EN 62841-2-10), the following additional requirement applies:

For **mixers**, either

- the **power switch** shall be a **momentary power switch** without having a locking arrangement in the “on” position
- or
- the tool shall not restart after an interruption of the mains supply without releasing and re-actuating the **power switch**.

21.18.1.2 Addition:

Mixers are regarded as tools having a risk associated with inadvertent starting.

21.30 This subclause is not applicable.

21.35 This subclause is not applicable.

22 Internal wiring

This clause of Part 1 is applicable.

23 Components

This clause of Part 1 is applicable, ~~except~~ as follows:

23.3 Replacement of the first paragraph:

Protection devices or circuits shall be of the non-self-resetting type unless the tool is equipped with a **momentary power switch** with no provision for being locked in the “on” position.

24 Supply connection and external flexible cords

This clause of Part 1 is applicable.

25 Terminals for external conductors

This clause of Part 1 is applicable.

26 Provision for earthing

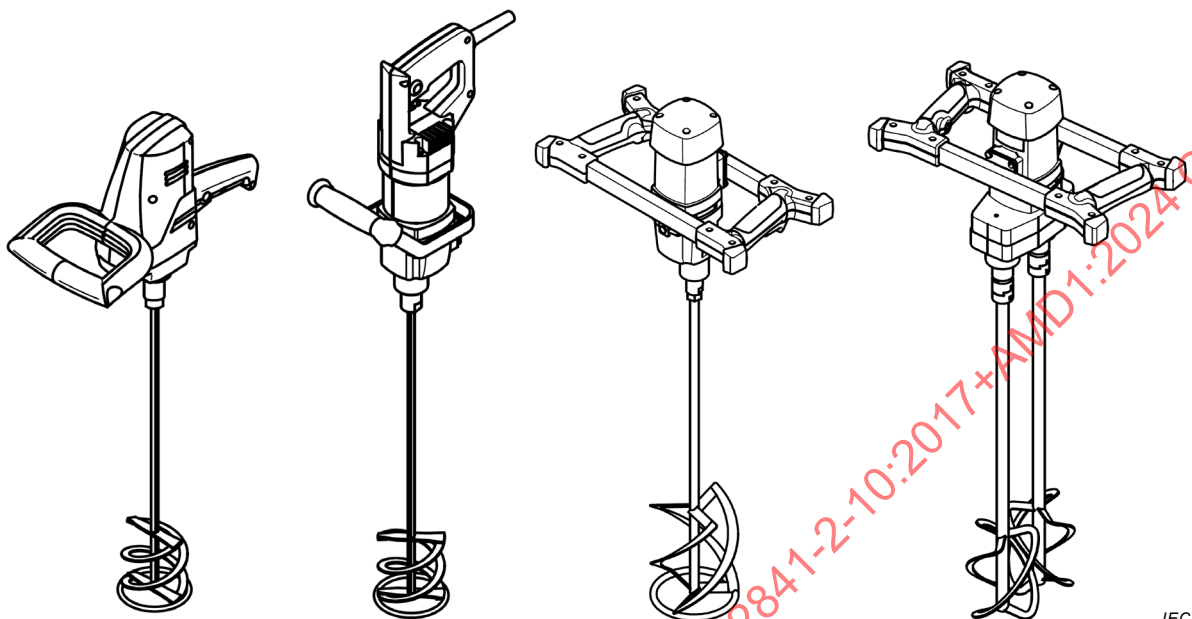
This clause of Part 1 is applicable.

27 Screws and connections

This clause of Part 1 is applicable.

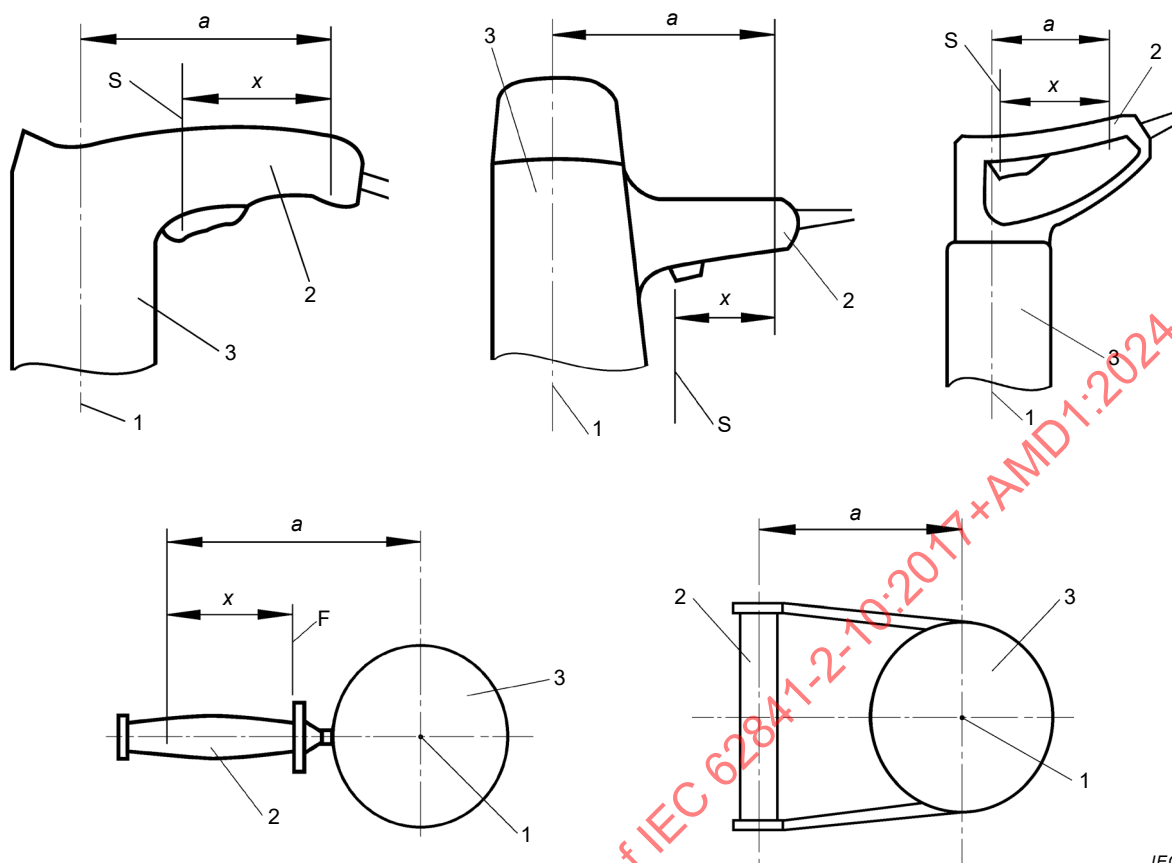
28 Creepage distances, clearances and distances through insulation

This clause of Part 1 is applicable.



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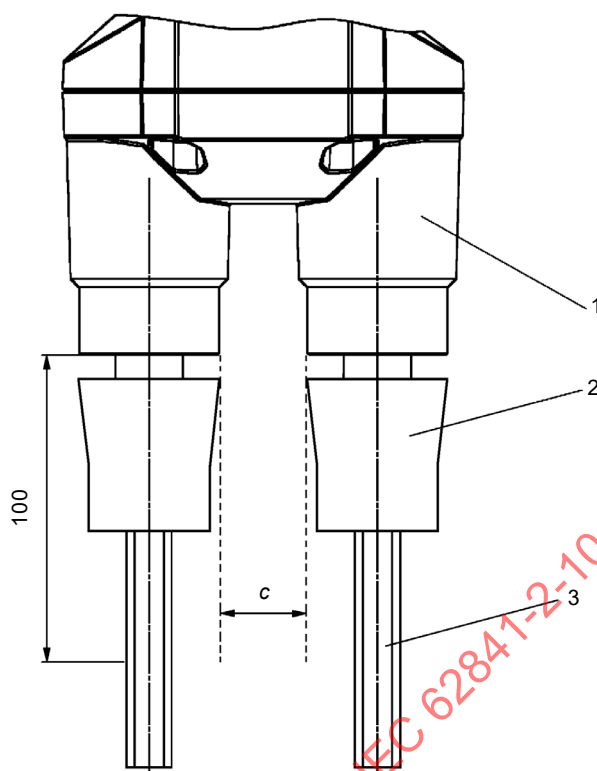
Figure 101 – Mixers with various handle and spindle configurations



Key

- 1 axis of the output spindle
- 2 handle
- 3 motor housing
- S location of the hand on the **power switch** where the operator naturally grasps
- x measurement point that is 80 mm or the remaining length of the handle, whichever is less, from S in the direction of where the hand grasps the tool
- a moment arm
- F location of the hand on the flange where the operator naturally grasps

Figure 102 – Moment arm for various handle designs

Dimensions in millimetres

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Key

- c clearance
- 1 **mixer** housing/gear box
- 2 coupling means
- 3 mounting end of **mixer basket**

NOTE The shape of the coupling devices as illustrated is only an example and not a mandatory design.

Figure 103 – Clearance between spindles

Annexes

The annexes of Part 1 are applicable except as follows.

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Annex I (informative)

Measurement of noise and vibration emissions

NOTE In Europe (EN 62841-2-10), Annex I is normative.

I.2 Noise test code (grade 2)

This clause of Part 1 is applicable except as follows:

I.2.4 Installation and mounting conditions of the power tools during noise tests

Addition:

Mixers are suspended vertically with no **mixer basket** installed.

I.2.5 Operating conditions

Addition:

Mixers are tested at no-load, all speed setting devices adjusted to the highest value.

The temperature requirements of 5.6 are not applicable.

I.3 Vibration

This clause of Part 1 is applicable except as follows:

I.3.3.2 Location of measurement

Addition:

Figure I.101 shows the position for different types of tools.

I.3.5.1 General

Addition:

For **battery** operated tools, the tests are conducted with the lightest **battery** in accordance with K.8.14.2 e) 2) of Part 1 that has sufficient capacity to operate the tool with the simulated **mixer basket** in accordance with Figure I.102 and Figure I.103 at no-load for at least 25 min.

I.3.5.3 Operating conditions

Addition:

Mixers are tested at no-load, all speed setting devices adjusted to the highest value. During the test, the tool is held vertically.

For the test, one simulated test **mixer basket** with a specified unbalance as shown in Figure I.102 is mounted to the output spindle or, for tools with more than one output spindle, to one of the output spindles. The test **mixer basket** consists of a steel rod and an aluminium wheel with an unbalance, see Figure I.103, mounted appropriately to the steel rod. The upper end of the steel rod may be modified in order to fit to the output spindle.

NOTE Experimental investigations have shown that the vibration emission values of **mixers** when mixing material are similar or even lower than at no-load, because the main source of vibration is the unbalance of the **mixer basket(s)**. Hence, the above test results in a worst case value.

I.3.6.2 Declaration of the vibration total value

Addition:

The vibration total value a_h of the handle with the highest emission and the uncertainty K shall be declared.

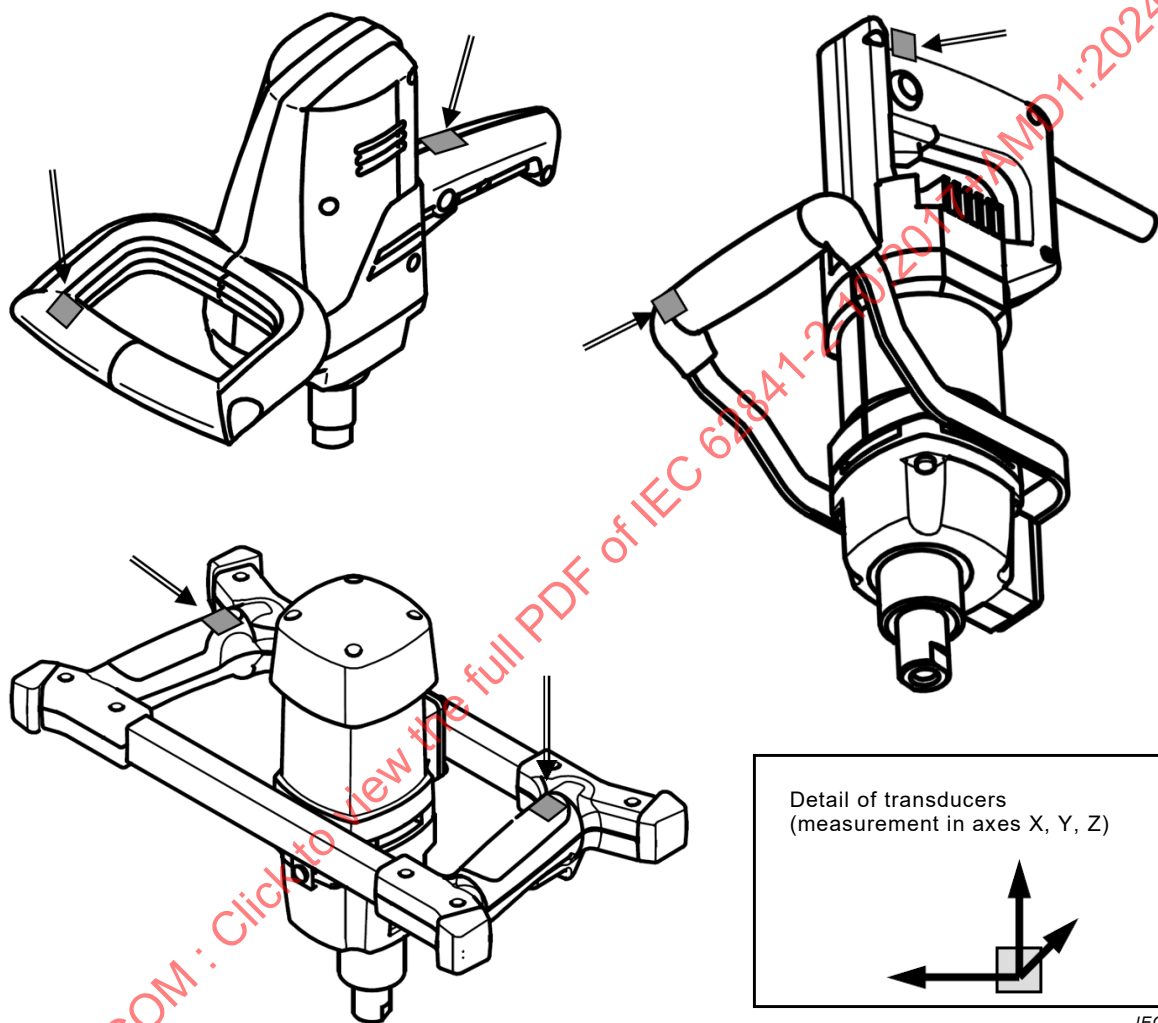
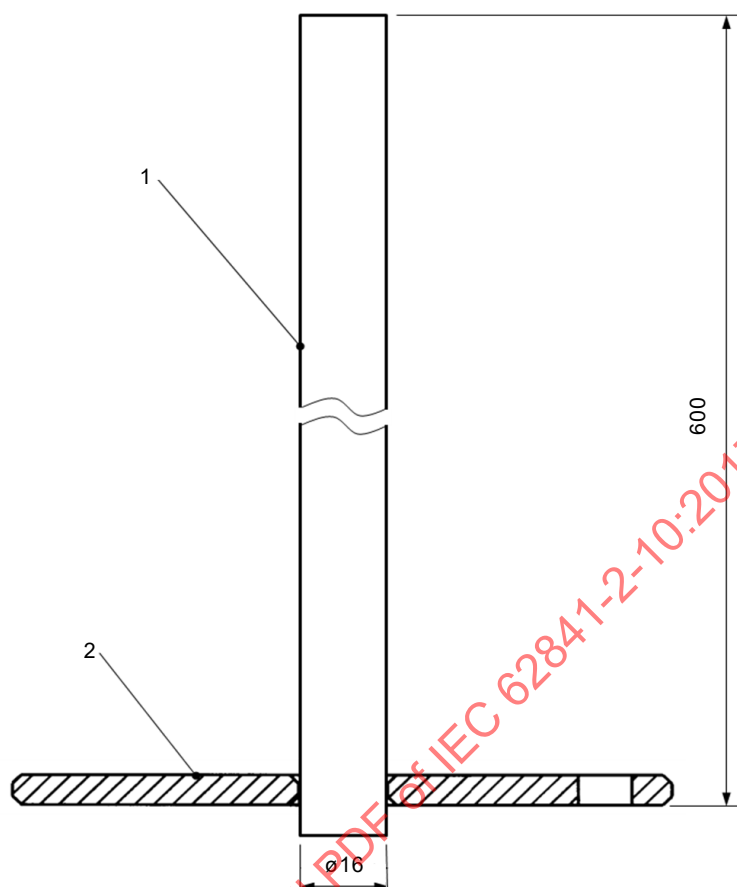


Figure I.101 – Positions of transducers for mixers

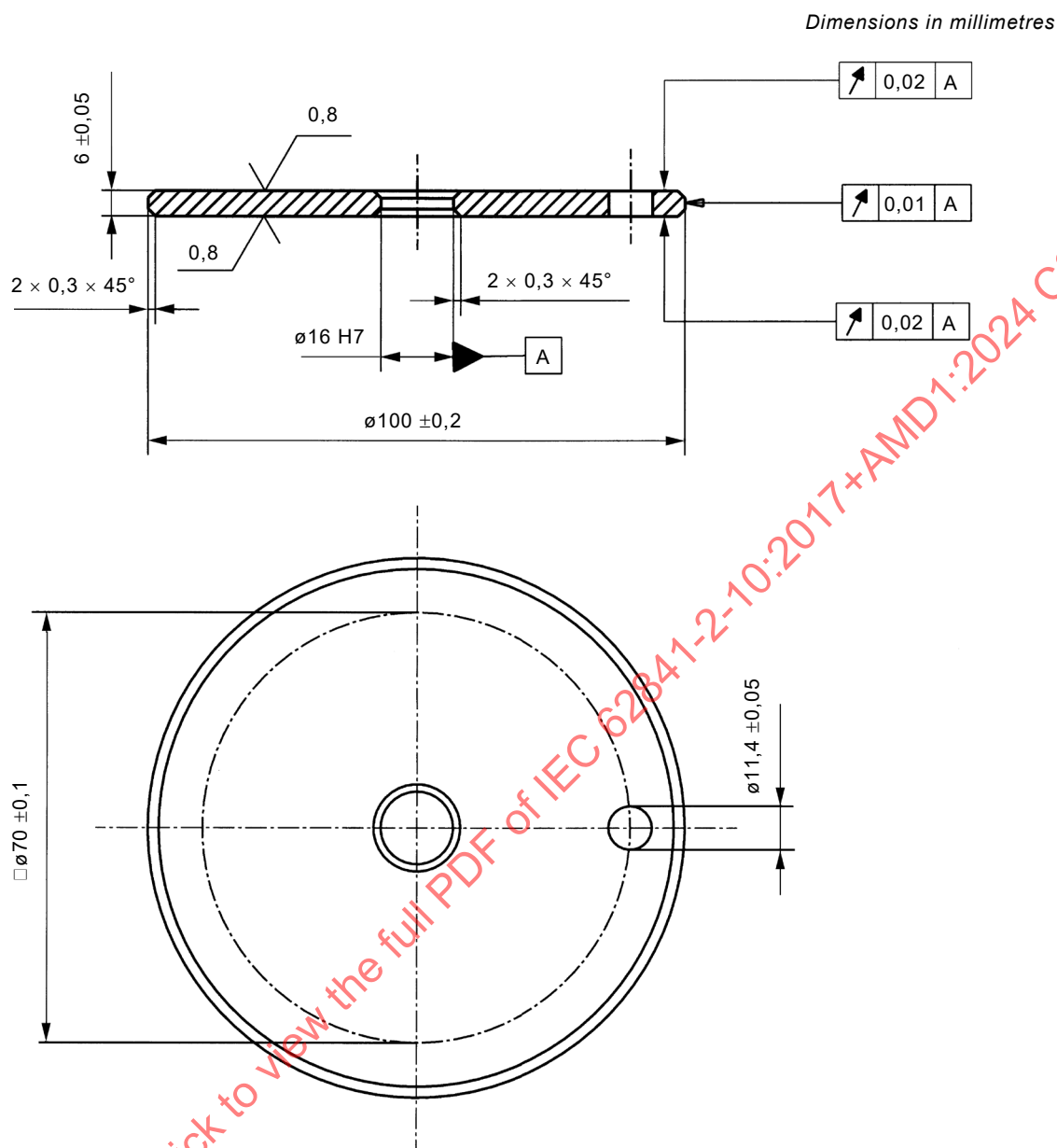
Dimensions in millimetres

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Key

- 1 steel rod
- 2 wheel with unbalance as specified in Figure I.103

Figure I.102 – Simulated test mixer basket



Material: aluminium

Figure I.103 – Wheel with unbalance

Annex K (normative)

Battery tools and battery packs

All clauses of the main body of this Part 2-10 apply unless otherwise specified in this annex. If a clause is stated in this annex, its requirements replace the requirements of the main body of this Part 2-10 unless otherwise specified.

K.8.14.1.101 Items d), f) and h) are not applicable.

K.12.2.1 This subclause is not applicable.

NOTE In Europe (EN 62841-2-10), the following additional subclause applies:

K.21.18.Z101 Isolation and disabling device

Tools with an **integral battery** shall either be equipped

- with an isolation device to prevent the risk of injury from mechanical hazards during servicing or **user maintenance**; or
- with a disabling device that prevents unintentional starting of the tool.

An isolation device shall

- provide disconnection of all poles of the **battery** from the serviceable region of the tool;
- be equipped with an unambiguous indication of the state of the disconnection device which corresponds to each position of its manual control (actuator);
- be provided with protection against accidental reconnection.

NOTE 1 Examples of methods to achieve this disconnection include removable jumpers, **integral batteries** that can be disconnected for servicing or **user maintenance**, or an electromechanical **power switch** with a direct mechanical link between the actuator and the contact.

NOTE 2 The risk of accidental reconnection for a **power switch** is addressed by the requirement of 21.18.1.2. The other examples in NOTE 1 achieve this by the necessary actions for reconnection.

A disabling device may be achieved by any of the following:

- a self-restoring or non-self-restoring lock-off device where two separate and dissimilar actions are necessary before the motor is switched on (e.g. a **power switch** which has to be pushed in before it can be moved laterally to close the contacts to start the motor). It shall not be possible to achieve these two actions with a single grasping motion or a straight line motion;
- a removable disabling device provided with the tool where it shall not be possible for the tool to be operated when either applied or removed.

Compliance is checked by inspection and by manual test.

Annex L (normative)

Battery tools and battery packs provided with mains connection or non-isolated sources

All clauses of the main body of this Part 2-10 apply unless otherwise specified in this annex. If a clause is stated in this annex, its requirements replace the requirements of the main body of this Part 2-10 unless otherwise specified.

NOTE In Europe (EN 62841-2-10), the following additional subclause applies:

L.21.18.Z101 Isolation and disabling device

Tools with an **integral battery** shall either be equipped

- with an isolation device to prevent the risk of injury from mechanical hazards during servicing or **user maintenance**; or
- with a disabling device that prevents unintentional starting of the tool.

An isolation device shall

- provide disconnection of all poles of the **battery** from the serviceable region of the tool;
- be equipped with an unambiguous indication of the state of the disconnection device which corresponds to each position of its manual control (actuator);
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NOTE 1 Examples of methods to achieve this disconnection include removable jumpers, **integral batteries** that can be disconnected for servicing or **user maintenance**, or an electromechanical **power switch** with a direct mechanical link between the actuator and the contact.

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A disabling device may be achieved by any of the following:

- a self-restoring or non-self-restoring lock-off device where two separate and dissimilar actions are necessary before the motor is switched on (e.g. a **power switch** which has to be pushed in before it can be moved laterally to close the contacts to start the motor). It shall not be possible to achieve these two actions with a single grasping motion or a straight line motion;
- a removable disabling device provided with the tool where it shall not be possible for the tool to be operated when either applied or removed.

Compliance is checked by inspection and by manual test.

Bibliography

The bibliography of Part 1 is applicable, except as follows:

Addition:

IEC 62841-2-1, *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 2-1: Particular requirements for hand-held drills and impact drills*¹

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS,
TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY –
SAFETY –****Part 2-10: Particular requirements for hand-held mixers**

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62841-2-10 edition 1.1 contains the first edition (2017-02) [documents 116/303/FDIS and 116/313/RVD] and its amendment 1 (2024-12) [documents 116/723/CDV and 116/780A/RVC].

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

International Standard IEC 62841-2-10 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 2-10 is to be used in conjunction with the first edition of IEC 62841-1 (2014).

This Part 2-10 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC standard: Particular requirements for hand-held mixers.

Where a particular subclause of Part 1 is not mentioned in this Part 2-10, that subclause applies as far as relevant. Where this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

The terms defined in Clause 3 are printed in **bold typeface**.

Subclauses, notes and figures which are additional to those in Part 1 are numbered starting from 101.

A list of all parts of the IEC 62841 series, under the general title: *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*, can be found on the IEC website.

The committee has decided that the contents of this document and its amendment will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 36 months from the date of publication.

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 2-10: Particular requirements for hand-held mixers

1 Scope

This clause of Part 1 is applicable, except as follows:

Addition:

This part of IEC 62841 applies to **mixers**. **Mixers** are not considered to be tools with a **liquid system**.

This standard does not apply to drills and impact drills, even if they can be used as a **mixer**.

NOTE 101 Drills and impact drills are covered by IEC 62841-2-1.

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

Addition:

3.101

mixer

tool equipped with either one or more output spindles to mount **mixer baskets** specifically designed to stir liquids or to mix building materials such as concrete, plaster, etc., see Figure 101

Note 1 to entry: The output spindle(s) is/are either threaded, or has/have other coupling means such as a chuck or a hexagonal connector.

Note 2 to entry: **Mixers** are also commonly known as stirrers.

3.102

mixer basket

accessory intended to be used with a **mixer** employing a structure of wings, spirals or helixes for moving the material in the container

Note 1 to entry: **Mixer baskets** are also commonly known as stirrer rods, stirrer baskets, paddles or **mixer** rods.

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable, except as follows:

5.17 Addition:

The mass of the tool includes the chuck and the auxiliary handle, if any.

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

This clause of Part 1 is applicable, except as follows:

8.3 Addition:

Mixers with a threaded output spindle shall be marked with the spindle thread size.

Mixers with a hexagonal coupling shall be marked with the width across flats.

For **mixers** with a chuck, the chuck shall be marked with the maximum capacity in mm.

8.14.1 Addition:

The additional safety instructions as specified in 8.14.1.101 shall be given. This part may be printed separately from the "General Power Tool Safety Warnings".

8.14.1.101 Mixer safety instructions

NOTE In the below instructions, on discretion of the manufacturer, the term "**mixer**/mixed/mixing" is replaced by "stirrer/stirred/stirring" and the term "basket" is replaced by another appropriate term such as "rod".

- a) **Hold the tool with both hands at the intended handles.** *Loss of control can cause personal injury.*
- b) **Ensure sufficient ventilation when mixing flammable materials to avoid a hazardous atmosphere.** *Developing vapour may be inhaled or be ignited by the sparks the power tool produces.*
- c) **Do not mix food.** *Power tools and their accessories are not designed for processing food.*
- d) **Keep the cord away from the working area.** *The cord may be entangled by the mixer basket.*
- e) **Ensure that the mixing container is placed in a firm and secure position.** *A container that is not properly secured may move unexpectedly.*
- f) **Ensure that no liquid splashes against the housing of the power tool.** *Liquid that has penetrated the power tool can cause damage and lead to electric shock.*
- g) **Follow the instructions and warnings for the material to be mixed.** *Material to be mixed may be harmful.*

- h) **If the power tool falls into the material to be mixed, unplug the tool immediately and have the power tool checked by a qualified repair person.** *Reaching into the bucket with the tool still plugged in can lead to electric shock.*
- i) **Do not reach into the mixing container with your hands or insert any other objects into it while mixing.** *Contact with the mixer basket may lead to serious personal injury.*
- j) **Start up and run down the tool in the mixing container only.** *The mixer basket may bend or spin in an uncontrolled manner.*

8.14.2 a) Addition:

- 101) Information about which **mixer baskets** can be used with the tool, including their maximum diameter or width, and which extensions can be used.

9 Protection against access to live parts

This clause of Part 1 is applicable.

10 Starting

This clause of Part 1 is applicable.

11 Input and current

This clause of Part 1 is applicable.

12 Heating

This clause of Part 1 is applicable, except as follows:

12.2.1 Addition:

The tool is operated continuously for a period of 30 min. The temperature rises are measured at the end of the 30 min.

13 Resistance to heat and fire

This clause of Part 1 is applicable.

14 Moisture resistance

This clause of Part 1 is applicable.

15 Resistance to rusting

This clause of Part 1 is applicable.

16 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

17 Endurance

This clause of Part 1 is applicable.

18 Abnormal operation

This clause of Part 1 is applicable, except as follows:

18.8 Replacement of Table 4:

Table 4 – Required performance levels

Type and purpose of SCF	Minimum performance level (PL)
Power switch – prevent unwanted switch-on	b
Power switch – provide desired switch-off	a
Any electronic control to pass the test of 18.3	a
Any speed limiting device	Not an SCF
Provide desired direction of rotation	Not an SCF
Prevent exceeding thermal limits as in 18.4 and 18.5.3	a
Prevent self-resetting as required in 23.3	b
Prevent unwanted lock-on of the power switch function	a
NOTE In Europe (EN 62841-2-10), the following additional requirement applies: Restart prevention as required by 21.18.1.1	b

19 Mechanical hazards

This clause of Part 1 is applicable, except as follows:

19.1 Replacement of the first paragraph:

Moving and other dangerous parts of the tool other than the output spindle and the **mixer basket** shall be so positioned or enclosed to provide adequate protection against personal injury.

19.4 Replacement:

Mixers shall be provided with at least two handles.

Compliance is checked by inspection.

19.4.101 The design of the handle(s) shall be such that the operator can control the torque during the operation of the tool.

Compliance is checked by measurement and by calculations as follows:

*The moment arm of each handle (a) is determined as illustrated in Figure 102. The sum of the moment arms of the two handles shall be greater than or equal to the diameter or width of the largest recommended **mixer basket** in accordance with 8.14.2 a) 101). If there are more than two handles, then the worst case configuration in accordance with 8.14.2 b) 6) shall be used, with one of the handles incorporating the **power switch**.*

19.6 This subclause is not applicable.

19.101 For **mixers** with more than one spindle, the spindles shall be adequately spaced in order to reduce the risk of entanglement. The minimal clearance *c* between rotating parts in the area of the spindle outputs and along further 100 mm down to the **mixer basket** shall be at least 40 mm, see Figure 103.

Compliance is checked by measurement.

19.102 Chuck keys shall be so designed that they drop easily out of position when released. This requirement does not exclude the provision of clips for holding the key in place when not in use; metal clips fixed to the flexible cable or cord are not allowed.

Compliance is checked by inspection and by manual test.

The key is inserted in the chuck and, without tightening, the tool is turned such that the key is facing down. The key shall fall out.

20 Mechanical strength

This clause of Part 1 is applicable, except as follows:

20.3.1 Replacement:

Mixers are subjected to three impacts that result from the tool being tipped over to strike a concrete surface. The tool is tipped with the longest **mixer basket**, including extensions, if applicable, recommended by the manufacturer in accordance with 8.14.2 a) 101). If no length of the recommended **mixer basket** is specified, the tip test is performed with a **mixer basket** of 1 m length. The tool is positioned in an upright position with the tip of the **mixer basket** resting on the concrete surface. The tool is then tipped in three different directions on to the concrete surface.

NOTE Typical **mixer baskets** have a length of 600 mm. Available extensions have a length up to 400 mm.

If attachments are provided as specified in accordance with 8.14.2, the test is repeated with each attachment or combination of attachments mounted to a separate tool sample.

20.5 This subclause is not applicable.

21 Construction

This clause of Part 1 is applicable, except as follows:

21.18.1.1 Addition:

A **power switch** lock-on device, if any, shall be located such that it can be activated without releasing any hand from the grasping area of the handles required in 19.4. In addition, it shall be so designed that it is not likely to be unintentionally locked on by the user's hand.

Compliance is checked by inspection or, for a power switch with a lock-on device within the grasping area, by the following test.

With the power switch in the "on" position, the lock-on device shall not be actuated by a straight edge 25 mm long when the straight edge is pushed down on the lock-on device. The straight edge shall be oriented in any direction and be applied to bridge the surface of the lock-on device and any surface adjacent to the lock-on device.

NOTE In Europe (EN 62841-2-10), the following additional requirement applies:

For **mixers**, either

- the **power switch** shall be a **momentary power switch** without having a locking arrangement in the "on" position

or

- the tool shall not restart after an interruption of the mains supply without releasing and re-actuating the **power switch**.

21.18.1.2 Addition:

Mixers are regarded as tools having a risk associated with inadvertent starting.

21.30 This subclause is not applicable.

21.35 This subclause is not applicable.

22 Internal wiring

This clause of Part 1 is applicable.

23 Components

This clause of Part 1 is applicable, except as follows:

23.3 Replacement of the first paragraph:

Protection devices or circuits shall be of the non-self-resetting type unless the tool is equipped with a **momentary power switch** with no provision for being locked in the "on" position.

24 Supply connection and external flexible cords

This clause of Part 1 is applicable.

25 Terminals for external conductors

This clause of Part 1 is applicable.

26 Provision for earthing

This clause of Part 1 is applicable.

27 Screws and connections

This clause of Part 1 is applicable.

28 Creepage distances, clearances and distances through insulation

This clause of Part 1 is applicable.

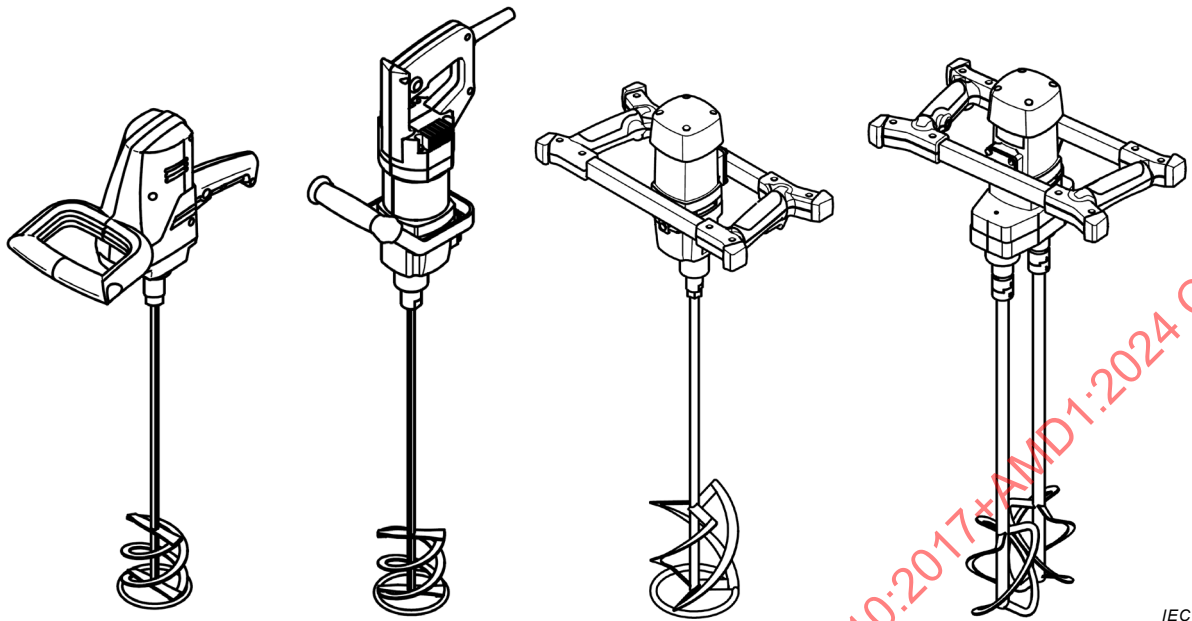
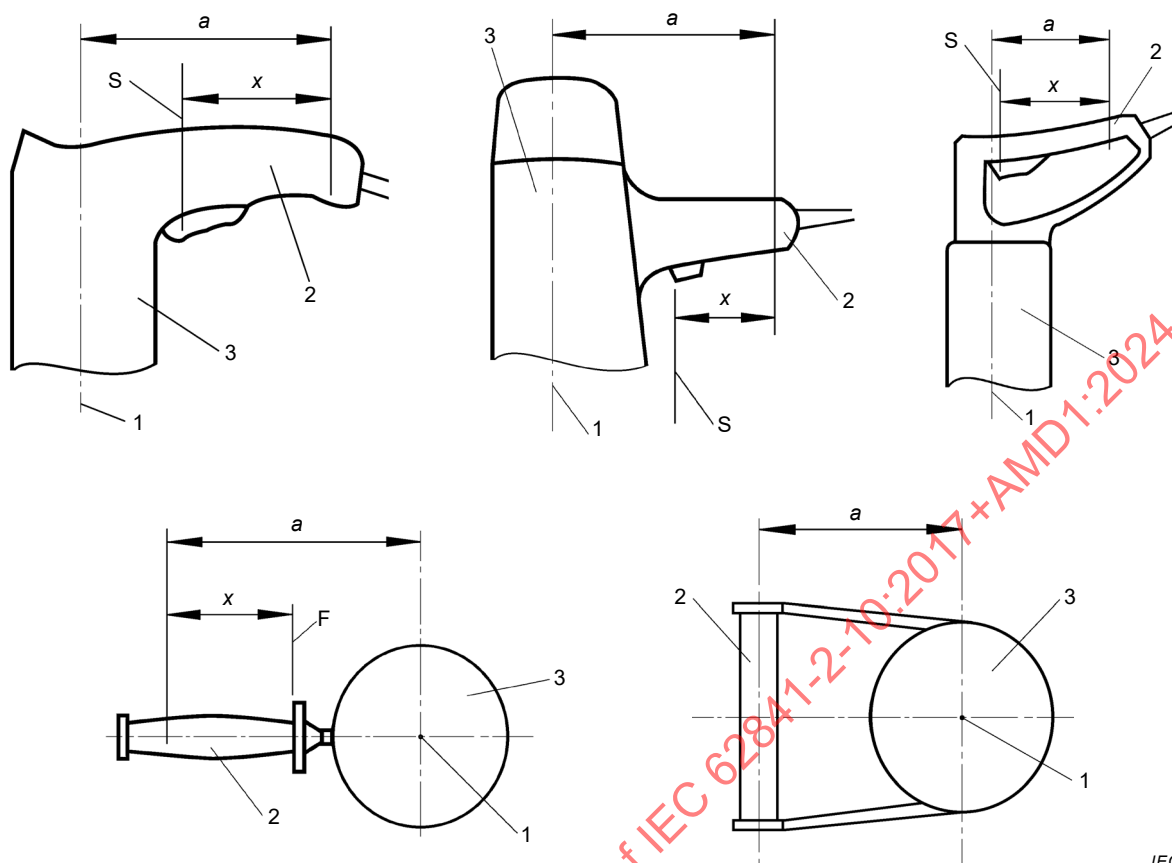


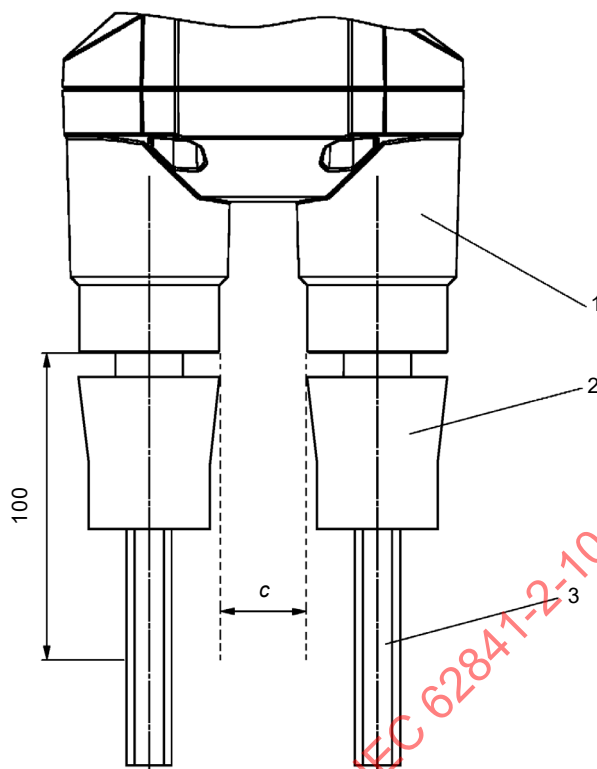
Figure 101 – Mixers with various handle and spindle configurations



Key

- 1 axis of the output spindle
- 2 handle
- 3 motor housing
- S location of the hand on the **power switch** where the operator naturally grasps
- x measurement point that is 80 mm or the remaining length of the handle, whichever is less, from S in the direction of where the hand grasps the tool
- a moment arm
- F location of the hand on the flange where the operator naturally grasps

Figure 102 – Moment arm for various handle designs

Dimensions in millimetres

IEC

Key

- c clearance
- 1 **mixer** housing/gear box
- 2 coupling means
- 3 mounting end of **mixer basket**

NOTE The shape of the coupling devices as illustrated is only an example and not a mandatory design.

Figure 103 – Clearance between spindles