

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Live working – Terminology for tools, equipment and devices**

**Travaux sous tension – Terminologie pour l'outillage, le matériel et les dispositifs**

IEC 60743:2001

<https://standards.iteh.ai/en/standards/iec/851b522f-5466-4942-bcc5-fce872ae5d19/iec-60743-2001>

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Email: [inmail@iec.ch](mailto:inmail@iec.ch)  
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## LIVE WORKING – TERMINOLOGY FOR TOOLS, EQUIPMENT AND DEVICES

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International Standard IEC 60743 has been prepared by IEC technical committee 78: Live working.

This consolidated version of IEC 60743 consists of the second edition (2001) [documents 78/393/FDIS and 78/403/RVD] and its amendment 1 (2008) [documents 78/695/CDV and 78/723/RVC].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 2.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

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## INTRODUCTION (to amendment 1)

This amendment modifies a list of terms and definitions, as a contribution to the harmonization of terms and definitions used in product standards of technical committee 78, improving at the same time some illustrations of tools as well as the internal coherence of the existing edition of IEC 60743.

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# LIVE WORKING – TERMINOLOGY FOR TOOLS, EQUIPMENT AND DEVICES

## 1 General

### 1.1 Scope

This International Standard applies to the terminology used to describe tools, equipment, devices and methods used in live working.

IEC 60050(651) gives the definitions of all terms used in live working. The present standard permits identification of the tools, equipment and devices and standardizes their names.

### 1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050(195):1998, *International Electrotechnical Vocabulary – Chapter 195: Earthing and protection against electric shock*

IEC 60050(651):1999, *International Electrotechnical Vocabulary – Chapter 651: Live working*

Guide ISO-IEC 51 :1990, *Guidelines for the inclusion of safety aspects in standards*

ISO 472:1999, *Plastics - Vocabulary*

## 2 General terms

### 2.1 Live working and methods

#### 2.1.1

##### **live working (live work)**

activity in which a worker makes contact with energized or charged live parts or penetrates inside a live working zone with either parts of his or her body or with tools, equipment or devices being handled

NOTE 1 Examples of live working include maintenance, connection and disconnection operations.

NOTE 2 Live working is performed using specific methods: hot stick working, insulating glove working and bare hand working.

[IEV 651-01-01 modified]

### 2.1.2

#### **live part**

conductor or conductive part intended to be energized in normal operation, including a neutral conductor, but by convention not a PEN conductor [IEV 195-02-12] or PEM conductor [IEV 195-02-13] or PEL conductor [IEV 195-02-14]

NOTE This concept does not necessarily imply a risk of shock.

[IEV 651-01-03 modified]

### 2.1.3

#### **live working zone**

space around live parts where prevention of electrical hazard is assured by suitable means such as limiting access to skilled persons, maintaining the appropriate air distances and using tools for live working

NOTE 1 The limits of a live working zone are equal to or greater than the minimum working distance.

NOTE 2 The live working zone and the specific precautions that apply are generally defined by national or company regulations.

NOTE 3 In some countries the terms "danger zone" or "guard zone" are used instead of live working zone.

[IEV 651-01-06 modified]

### 2.1.4

#### **hot stick working**

live working according to a method whereby the worker remains at a specified distance from the live parts and carries out the work by means of insulating sticks

[IEV 651-01-09]

### 2.1.5

#### **insulating glove working**

live working according to a method whereby the worker is electrically protected by insulating gloves and other insulating equipment and carries out the work in direct mechanical contact with live parts

[IEV 651-01-10]

### 2.1.6

#### **bare hand working**

live working according to a method whereby the worker carries out the work in electrical contact with live parts, having the potential of the worker's body raised to the voltage of the live parts by electrical connection, and suitably isolated from the surroundings at a different potential

[IEV 651-01-11]

## 2.2

#### **tools for live working**

tools, devices and equipment specifically designed or adapted, tested and maintained as apparatus for live working

[IEV 651-01-24 modified]

## 2.3 Difference between insulated and insulating tools

### 2.3.1

#### **insulated tool**

tool made of conductive material(s), fully or partially covered by insulating material(s)

[IEV 651-01-25 modified]

### 2.3.2

#### **insulating tool**

tool made essentially or totally from insulating material(s)

[IEV 651-01-26 modified]

## 2.4 Components of insulating tools

### 2.4.1

#### **end fitting**

part permanently fitted to the end of the insulating tube or rod

[IEV 651-02-02 modified]

### 2.4.2

#### **foam (in live working)**

insulating material composed of closed cells, generally made of polyurethane, used to prevent the ingress and migration of moisture

NOTE Foam is generally used to fill tubes and similar insulating structures.

[IEV 651-02-03]

### 2.4.3

#### **elastomer**

generic term that includes rubber, latex and elastomeric compounds that may be natural or synthetic or a mixture or a combination of both

### 2.4.4

#### **plastic**

material which contains as an essential ingredient a high polymer and which at some stage in its processing into finished products can be shaped by flow

NOTE 1 Elastomeric materials, which also are shaped by flow, are not considered as plastics.

NOTE 2 In some countries, particularly in the United Kingdom, it is a permitted option to use the term « plastics » as the singular form as well as the plural form.

[ISO 472]

### 2.4.5

#### **insulating rod (in live working)**

long-shaped piece, normally of circular cross section, which is constructed or formed from synthetic insulating and rigid material and which may be reinforced

[IEV 651-02-04 modified]

### 2.4.6

#### **insulating tube (in live working)**

long-shaped hollow piece, normally of circular cross section, which is constructed or formed from synthetic insulating and rigid material and is normally reinforced, the interior of which can be foam-filled

[IEV 651-02-05 modified]

## 2.5 Insulating sticks, assemblies and tools

### 2.5.1

#### **insulating stick**

insulating tool essentially made of insulating tube and/or rod with end fittings

[IEV 651-02-01]

### 2.5.2

#### **hand stick**

insulating stick manipulated by hand, used to operate on live parts at a distance

[IEV 651-02-07]

### 2.5.3

#### **attachable universal tool (in live working)**

tool designed to be affixed at the end of a universal hand stick

NOTE This tool permits a variety of tasks to be carried out such as:

- to hold various parts: e.g. adjustable insulator fork, screw clamp, pin holder;
- to install or to pull out parts: e.g. split-pin installer, split-pin remover;
- to manipulate binding ties: e.g. rotary blades, rotary prongs.

[IEV 651-03-01]

### 2.5.4

#### **support stick**

insulating stick used to hold or move conductors and other equipment

[IEV 651-12-12]

### 2.5.5

#### **insulating assemblies**

various arrangements of support sticks and accessories for lifting, moving and/or supporting loads such as conductors, insulators, etc.

### 2.5.6

#### **attachable device (fitting)**

device to be affixed at the end of a universal hand stick or at the end of a support stick

### 2.5.7

#### **splined end device**

attachable device to be affixed at the end of a universal hand stick

### 2.5.8

#### **clevis and tongue stick device**

attachable device to be affixed at the end of a support stick

### 2.5.9

#### **hand tool**

insulated or insulating tool manipulated by hand to work at low voltage

NOTE Hand tools are generally tools such as screwdrivers, pliers, wrenches and knives.

### 2.6

#### **protective cover**

rigid or flexible cover made of insulating material used to cover energized and/or dead parts and/or adjacent earthed parts in order to prevent inadvertent contact between these parts and a worker

[IEV 651-04-01 modified]

## 2.7

### **working distance**

air distance in the work location, determined to sustain the required insulation level for live working, and being ensured either by physical means or by skilled person following instructions and procedures

[IEV 651-01-19 modified]

### 2.7.1

#### **minimum working distance**

#### **minimum approach distance**

minimum distance in air to be maintained between any part of the body of a worker, including any object (except appropriate tools for live working) being directly handled, and any parts at different potentials

NOTE 1 The minimum working distance is the sum of the electrical distance, corresponding to the maximum nominal voltage calculated in accordance with IEC 61472, and the selected ergonomic distance appropriate to the work being undertaken.

NOTE 2 “Appropriate tools” are tools for live working suitable for the maximum nominal voltage of the live parts.

[IEV 651-01-20 modified]

### 2.7.2

#### **electrical distance**

distance in air required to prevent a disruptive discharge between energized parts or between energized parts and earthed parts during live working

NOTE When safety precautions are taken, the probability of a disruptive discharge is negligible. Safety is defined as freedom from unacceptable risk of harm (see Guide ISO-IEC 51:1990).

[IEV 651-01-21 modified]

### 2.7.3

#### **ergonomic distance**

distance in air to take into account inadvertent movement and errors in judgement of distances while performing work

[IEV 651-01-22]

### 2.7.4

#### **handling zone (in live working)**

area marked on the insulated or insulating tool in which it is permissible to handle the tool

NOTE This zone gives the assurance that requirements equivalent to the minimum working distance are fulfilled when the tool is used according to its instructions.

[IEV 651-02-06]

### 2.7.5

#### **vicinity zone**

limited space outside the live working zone where an electrical hazard can exist

[IEV 651-01-07]

### 2.7.6

#### **working in the vicinity of live parts**

activity in which a worker with part of his or her body, with a tool or with any other object enters into the vicinity zone without encroaching into the live working zone

[IEV 651-01-02]

### 2.7.7

#### **disruptive discharge**

passage of an arc following dielectric breakdown

NOTE 1 The term “sparkover” (in French “amorçage”) is used when a disruptive discharge occurs in a gaseous or liquid dielectric.

NOTE 2 The term “flashover” (in French “contournement”) is used when a disruptive discharge occurs over the surface of a solid dielectric surrounded by a gaseous or liquid medium.

NOTE 3 The term “puncture” (in French “perforation”) is used when a disruptive discharge occurs through a solid dielectric.

[IEV 651-01-18]

### 2.7.8

#### **skilled person (electrically)**

person with relevant education and experience to enable him or her to analyse risks and to avoid hazards which electricity can create

[IEV 651-01-33 modified]

### 2.8

#### **washing zone**

zone within the range of sprayed water

[IEV 651-15-03]

### 2.8.1

#### **full jet**

jet of water which is closed on issuing from a nozzle and which disperses into individual drops at a certain distance from the nozzle

NOTE A jet can be regarded as closed when it is as transparent as a glass rod when it issues from the nozzle.

[IEV 651-15-04]

### 2.8.2

#### **spray jet**

jet of water which, on issuing from a nozzle is formed from a close sequence of individual drops of water making no contact with one another

[IEV 651-15-05]