



WHITE PAPER

Insulated handtools

1000V 
IEC 60900

Building a safer world

EGA *Master*

ART IN INNOVATION

BE SAFE...BE EFFICIENT

Insulated handtools 1000V



Workplace accidents that lead to loss of life remain one of the main challenges that some industries have. In a survey carried out during the Ferroforma International show in 2015, 51% of those surveyed thought that there is a direct relationship between work-place accidents and the tools used. This result is in line with EGA Master's experience across the over 150 countries we distribute to.

The reality is that today, most companies and employees do not know how to work safely, and what tools need to be used in hazardous environments.

1- REGULATION AND STANDARDS

The International Standard IEC 60900 outlines the requirements for insulated and insulating hand tools used for working in live or close to live parts at nominal voltages up to 1000V A.C. and 1500V D.C.

The norm requires insulated tools to be tested at 10,000V. In addition, the insulated tools need to pass 4 additional tests (see **Figure I**) :

Adherence test: Tests the adherence of the insulating material to the metal elements of the tool.

Impact test: Tests the resilience of the insulating part to external impacts and falls.

Heat Resistance propagation test: Tests whether the insulating material does not propagate flames.

Dielectric Penetration Tests: Measures any leakages through the insulated material.

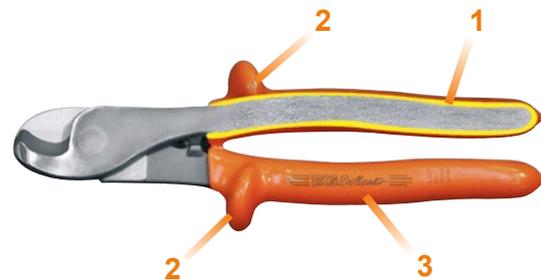
Figure I



2- EGA MASTER INSULATED TOOLS

EGA Master insulated tools go through the test outlined above and hence comply with IEC 60900 international standard. The EGA Master insulated tools offer:

1. Double hard-soft PVC insulation provides maximum adherence and safety.
2. Anti-shock guards and ends.
3. Un-erasable marking.



Insulated tools can be identified thanks to the marking on the insulating material. The sign should include a double triangle followed by a 1000V sign and a reference to the standard. In addition, EGA Master tools always include the product reference code and the year of manufacture for a better traceability.

3- FIELDS OF APPLICATION

Insulated tools are safe to be used for working live or close to live parts. The regulation requires voltage to be turned off before any work is undertaken, however, considering there is always a risk of “residual voltage” or “returning voltage”, insulated tools keep the workers protected.

The regulation requires voltage to be turned off before any work is undertaken, however, considering there is always a risk of “residual voltage” or “returning voltage”, insulated tools keep the workers protected.

Some important elements to keep in mind when using insulated tools:

1. Never use tools under voltage if they present pores, fissures, encrusted elements or if the yellow insulation layer is visible.
2. Insulating floors and safety shoes are recommended to work under voltage.
3. Avoid contact with water while working under voltage.
4. Do not ever touch directly any item that may be under voltage. Use a voltage tester to check first.

The following table outlines the main fields of application for insulated hand tools:

MAIN APPLICATION FIELDS		
Electrical installation	High Voltage networks	Electric maintenance
Power Plants	Low Voltage networks	Fire-fighters
Electric Stations and substations	Telecommunications	Lighting installation and repair



4- NON-SPARK INSULATED HAND TOOLS

Certain working areas may present 2 different health and safety risks: voltage tension and at the same time an explosive environment (environment with the presence of an explosive agent such as gases or dust). Such areas may appear, for example, in:

- Manufacturing of batteries
- Battery repair and maintenance
- Electrical maintenance in ATEX areas.



The EGA Master Non-sparking 1000V insulated tool range provides insulated tools, certified according to international IEC 60900 standard, with non-sparking properties for ATEX classified areas. Tools are exactly the same shape and design as the high-quality EGA Master non-sparking tools, but with the necessary and adequate insulation for jobs under voltage. Manufactured in Al-Bron or Cu-Be, both alloys are certified by the German Federal BAM Institution, accredited by the European Union for the approval of products to be used in explosion hazard environments.

Non-spark insulated tools are designed for working in explosive areas with voltage tension.

Insulated handtools 1000V

5. QUESTIONS AND ANSWERS

1- When should insulated tools be used?

Insulated tools should be used when working in or near live objects. The regulation requires voltage to be shut down before any work is undertaken, however, considering the possibility of “residual voltage” or “returning voltage”, insulated tools are required to keep workers safe.

2- What standards define the requirements for insulated tools?

The IEC 60 900 outlines the requirements for insulated tools used for working in or near live objects.

3- What tests are applied to insulated tools?

The standard requires the insulated tools to be tested to up to 10,000V and to pass 4 additional tests: Adherence test, Impact test, heat resistance propagation test and dielectric penetration test.

Adherence test: Tests the adherence of the insulating material to the metal elements of the tool

Impact test: Tests the resilience of the insulating part to external impacts and falls.

Heat Resistance propagation test: Tests whether the insulating material does not propagate flames.

Dielectric Penetration Tests: Measures any leakages through the insulated material.

4- Are insulated tools always safe to be used in or near live objects?

Insulated tools that meet the requirements of the IEC 60 900 are safe to be used in or near live objects. However, the following are some important elements to remember:

1. Never use tools under voltage if they present pores, fissures, encrusted elements or if the yellow insulation layer is visible.

The standard requires the insulated tools to be tested to up to 10,000V and to pass 4 additional tests: Adherence test, Impact test, flame propagation test and dielectric penetration test.

Insulated tools that meet the requirements of the IEC 60 900 are safe to be used in or near live objects.

2. Insulating floors and safety shoes are recommended to work under voltage.

3. Avoid contact with water while working under voltage.

4. Do not ever touch directly any item that may be under voltage. Use a voltage tester to check first.

5- If there any tool that is 100% insulated?

Insulation of 100% of a tool's surface is difficult and not always feasible since the surface making contact with potentially live objects often need to be made out of steel or a metal.

6- Can any tool be turned into an insulated tool?

In order to meet with the requirements of the IEC 60 900 standard, tools need to pass all relevant tests. This is done by the manufacturer using the right test equipment. Turning a normal tool into an insulated tool is therefore not advisable unless the final product can be tested for compliance with the standard.

Most tools can be designed to include an insulated part (most often the handle) in order for the tool to be used in or near live objects. EGA Master offers a wide range of insulated tools, including wrenches, spanners, allen keys, pliers, screwdrivers, torque wrenches to name a few.

7- What should you ask when procuring an insulated tool?

Compliance against the IEC 60 900 standard is the most important criteria when purchasing an insulated tool. This can only be verified through the symbol (double triangle symbol and immediately adjacent 1000V and the reference to the IEC 60900) placed on the insulating material. Note that the colour of the tool or of the handle

does not relate to the compliance with the standard. There may be tools that look like an insulated tool but do not comply with the required standards. Always look or ask for information related to the compliance with the required standards.

In addition, EGA Master tools always include the product reference code and the year of manufacture for a better traceability of its hand tools.

8-What tool should I use if there is both voltage and an explosive atmosphere?

If work has to be carried out in a place with both voltage tension and an explosive atmosphere (environment with the presence of an explosive agent such as gases or dust), insulated tools are not sufficient to ensure the safety of the worker.

In such occasions, a non-spark insulated tool should be used. Non-spark insulated tools have all the properties of a non spark tool (i.e. they are made of alloys that are safe to use in the presence of an explosive atmosphere) and an insulated tool. Like standard non-spark tools, EGA Master offers Non-Spark insulated tools in two different alloys. Aluminium – Bronze (Al-Bron) and Copper Beryllium (Cu-Be).

9- What is EGA Master's Insulated Tool offering?

EGA Master offers a wide range of insulated tools to ensure workers have access to the right tool without compromising their safety. EGA Master's insulated tools are available in stock for immediate delivery.

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Insulated handtools 1000V

6. CERTIFICATES

Considering the potential catastrophic consequences associated with choosing the wrong tool, it is critical that workers are 100% sure that the tools they are using are certified against the applicable standard. This is best achieved through the certification of the tools by independent third parties.

ABOUT VDE

VDE is a German institute that certifies tools against the European IEC 60900 standard. Under this standard, the statement of conformity issued by a manufacturer stating compliance with the norm is sufficient, and hence it is not mandatory to certify the tools by an independent body.

The VDE certification therefore offers those who require a higher degree of confidence, a third party verification of the compliance. However, VDE is not the only third party certification available in the market, and there isn't such a thing as a VDE norm or certificate for tools. What VDE certifies, like any other third party independent body does, is that the tools comply with the IEC 60900 norm and that the manufacturer has the required capabilities and means to manufacture and test de tools against the requirements of the standard.

As a result, it is common that manufacturers only certify a few references (i.e. few sizes in each product category) and not all the references. Once the independent body certifies a specific size, all other sizes within that product category can also be considered as safe as the ones VDE certified, considering that that they would be manufactured following the same process, tested with the same test equipment and backed by the Statement of Conformity of the manufacturer.

ZEICHENGENEHMIGUNG MARKS APPROVAL

EGA Master S.A.
Zorrolleta St. 11
Jundiz Industrial Estate
01015 VITORIA
SPAIN

ist berechtigt, für ihr Produkt /
is authorized to use for their product

Zusammensetzbares Werkzeug
Assembly tool

die hier abgebildeten markenrechtlich geschützten Zeichen
für die ab Blatt 2 aufgeführten Typen zu benutzen /
the legally protected Marks as shown below for the types referred to on page 2 ff.



Geprüft und zertifiziert nach /
Tested and certified according to

DIN EN 60900 (VDE 0682-201):2013-04; EN 60900:2012

Das Produkt entspricht den Anforderungen des deutschen Produktsicherheitsgesetzes (ProdSG) hinsichtlich der Gewährleistung von Sicherheit und Gesundheit.

The product covers the requirements of the German Act "Produktsicherheitsgesetz (ProdSG)" regarding the ensurance of safety and health.

Befristet zum / valid until: 2020-02-29

VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute
Zertifizierungsstelle / Certification

M. Tasotti

Aktenzeichen: 2176300-3940-0019 / 203800

File ref.:

Ausweis-Nr. 40041849

Certificate No.

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Offenbach, 2015-03-10

(letzte Änderung / updated 2015-03-27)

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VDE Prüf- und Zertifizierungsinstitut

ZEICHENGENEHMIGUNG MARKS APPROVAL

EGA Master S.A.
Zorrolleta St. 11
Jundiz Industrial Estate
01015 VITORIA
SPAIN

ist berechtigt, für ihr Produkt /
is authorized to use for their product

Zange, isoliert
Pliers, insulated

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EGA Master S.A.
Zorrolleta St. 11
Jundiz Industrial Estate
01015 VITORIA
SPANIEN

ist berechtigt, für ihr Produkt /
is authorized to use for their product

Schere, isoliert
Scissors, insulated

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EGA Master S.A.
Zorrolleta St. 11
Jundiz Industrial Estate
01015 VITORIA
SPAIN

ist berechtigt, für ihr Produkt /
is authorized to use for their product

Schraubendreher, isoliert
Screw driver, insulated

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M. Tasotti

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EGA Master S.A.
Zorrolleta St. 11
Jundiz Industrial Estate
01015 VITORIA
SPANIEN

ist berechtigt, für ihr Produkt /
is authorized to use for their product

Isolierter Schraubenschlüssel
Insulated wrench

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The product covers the requirements of the German Act "Produktsicherheitsgesetz (ProdSG)"
regarding the ensurance of safety and health.

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J. Güntermann

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Insulated handtools 1000V

7. PRESENTATION

EGA Master is a Spanish manufacturer committed to keeping field workers safe and efficient.

Born as specialists in Piping Tools, EGA Master has steadily diversified into other fields. At present the company has become a world leader in the safety category and manufactures tools and equipment for the most demanding industries such as automotive, aerospace, shipbuilding, construction, oil, gas or mining.

The EGA Master proposition is sustained on 3 key pillars:

- **One Stop Solution:** EGA Master is currently the only manufacturer that offers a one-stop solution for the industrial end-user with these 10 product ranges: Hand tools, Pipe tools, 1000V Insulated tools, ESD Electro Dissipative tools, Non-sparking and Titanium tools, Anti-drop tools, Tool control system, Hydraulic and Pneumatic Underwater tools and ATEX-certified Intrinsically Safe/Explosion-Proof Instruments.
- **High Quality:** EGA Master manufactures for more than 100 different brands, including some of the leading manufacturers in the industry.
- **Quick Service:** As a result of EGA Master manufacturing model and investment in stock, the company is able to provide an availability level above 98% across the 150 countries the company distribute to.

Some end users of EGA Master tools include companies and institutions such as Exxon Mobil, Shell, Airbus, United Nations, NATO, Coca Cola, Audi, Volkswagen, Nissan-Renault, Siemens or Philips (<http://www.egamaster.com/en/what-our-customers-say>).

Nowadays, EGA Master:

- **Exports around 90% of its production to more than 150 countries** across five continents.
- Has **over 200 patented products developed entirely by its R + D + I department**, in which invests more than 6% of its resources.
- Provides unlimited life time guarantee for all its hand-tools.
- Holds, among others, the **ISO 9001, ISO 14001 and OSHAS 18001 certificates** and has been a pioneer in its industry in the implementation of the European EFQM model of Total Quality Management.
- It is the most awarded tool manufacturer, as evidenced by the long list of awards that the company has received since its foundation.



SOME END USERS

Amy Yang
Procurement
KBR (USA)

"KBR was very pleased with EGA Master's responsiveness during the bidding phase and performance throughout the execution phase of the order. EGA Master exemplified excellent customer service, attention to detail and quality work which allowed the order to be inspected and delivered successfully and on-time."

Pedro Henriques
Purchasing Manager
TAP Engineering and Maintenance (Lisbon and Brazil)

"EGA Master has been in this last 4 years a great support for TAP Engineering and Maintenance in Lisbon and Brazil. Key factors as top quality, delivery time, versatility, whether in manufacturing special tools out of catalogue or in customized tools according to our directions, and constant innovation turned EGA Master into strategic partner with whom we can always trust in any situation. For all this, we can only recommend to our business partners in the aviation branch to bet without fear in a complete cooperation with EGA Master."

Glauber Lima Fraga
Projects Department Head
Eletropaulo (Brasil)

"The persistence shown by EGA Master to find a solution that would meet the customer's needs is a clear evidence of EGA Master's commitment to fulfil the needs and requirements of its customers."

Eng. Edmundo Homero Cacho
Volkswagen, Puebla (Mexico)

"EGA Master's service is fast and effective. We believe that in EGA Master we have a supplier we can trust to find solutions to our needs."

Chantramohan Suparmaniam
Production Manager
Mercedes-Benz (Malaysia)

"EGA Master is a trusted supplier that offers us the best service in the industry. We see EGA Master as a key partner for us going forward."

TESTIMONIALS



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