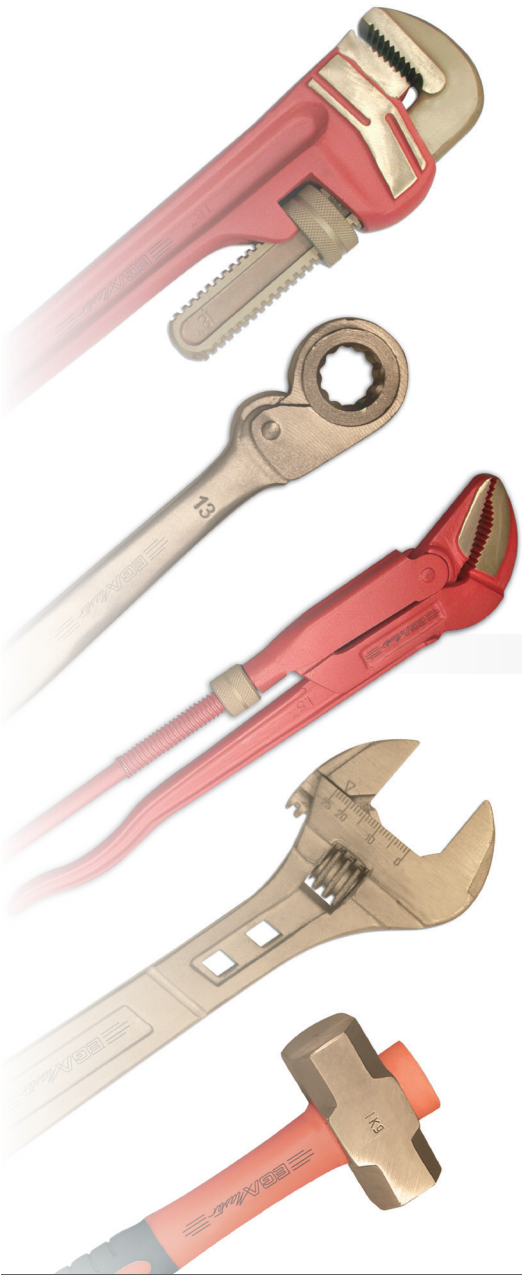
NON-SPARKING TOOLS

EGA Master Non-Sparking Tools are the best alternative for non-sparking application purposes in potentially explosive environments. We incorporate to our non-sparking tools all our knowledge of decades designing and manufacturing hand tools, making the most ergonomic and nicest design for them.

All EGA Master Tools are manufactured according to the strict control of ISO 9001-200, certified by the most prestigious institution for hand tool manufacturing, TÜV-Rheindland/Germany.



MATERIALS

COPPER-BERYLIUM ALLOY			ALUMINIUM-BRONZE ALLOY		
Composition	Be	1.8%-2%	Composition	Al	10%-12%
				Ni	4%-6%
	Ni+Co	0.2%-1.2%		Fe+Mn	<5.8%
	Rest	Cu		Rest	Cu
Hardness	283-365 Brinell		Hardness	229-291 Brinell	
Tensile Strength	1250 N/mm²		Tensile Strength	800 N/mm²	

PROPERTIES AND FEATURES

Non-sparking: Appropriate for explosive potential environments.
Non-magnetic safety: Essential for equipments that require complete non-magnetic safety.
Corrosion resistant : Specially well suited for applications in corrosive environments like encountered in marine works or fire-fighting applications.
Forged after casting: Provides higher mechanical properties and better finishing.
Ergonomic designs: The use of bi-material anti-slippery handles, dipping anti-slippery handles, totally ergonomic designs make operations easier, more comfortable and master.

TABLE OF RISKS OF EXPLOSION AND MAXIMUM TEMPERATURE

Explosion group	Class of temperature (maximum surface temperature allowed)					
Temperature of ignition	T1 (450 °C)	T2 (300°C)	T3 (200 °C)	T4 (135 °C)	T5 (100 °C)	T6 (85 °C)
	450 °C	300 - 450 °C	200 - 300 °C	135 - 300 °C	100 - 135 °C	85 - 100 °C
I	Methane					
IIA (Energy of ignition higher than 0.18 mJ)	Acetone	i-amyl acetate	Amyl alcohol	Acetaldehyde		
	Ammonia	n- butane	Gasolines			
	Benzene	n- butanol	Gas-oil			
	Ethylacetate	1-butene	Heating oil			
		Propylacetate	n-hexane			
	Methanol	i-propanol				
	Propane	Vinylchloride				
	Toluene					
IIB (Energy of ignition between 0.06 and 0.18 mJ)	Hydrogen cyanide	1.3-butadiene	Dimethyl ether	Diethyleter		
		1.4-dioxane	Ethyl glycol			
	Coal gas (lighting gas)	Ethylene	Hydrogen sulphide			
		Ethylene oxide				
IIC (Energy of ignition less than 0.06 mJ)	Hydrogen	Acetylene			Carbon disulphide	
	Water gas (CO+H2)				Ethyl nitrate	

Tools made of **Cu-Be alloy can be used in all groups (I, IIA, IIB, IIC)** in a safe way, always respecting the maximum surface temperature allowed, with the only exception of acetylene, with which copper might react and create highly explosive acetylite gases.

Tools made of **Al-Bronze alloy can be used** in a safe way, always respecting the maximum surface temperature allowed, **except for the IIC group** (Hydrogen, gas of water, acetylene, bisulphide of carbon, Ethyl nitrate).

DIFFERENCES AND HOW TO MAKE THE CORRECT CHOICE

CONCEPT	Cu-Be	Al-Bron
Hardness	283-365Brinell	229-291Brinell
Magnetism	Non ferrous substance in the composition makes it safer when non-magnetic applications are required	Minimum ferrous component makes them not 100% non-magnetic, although its low magnetism make it appropiate for non critical non-magnetic applications
Durability	Much higher due to the higher hardness and tensile strength. Higher efforts can be made	Not as much as Cu-Be
Price	Higher price due to the special raw material used	Around 30% lower price
Risk of explosion	Can be used in all groups (I, IIA, IIB, IIC)	Can be used in all groups except for the IIC group



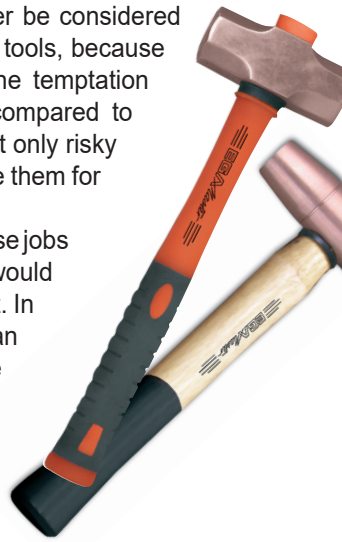

COPPER OR BRASS TOOLS

MAIN APPLICATION FIELDS

- Petrochemicals
- Refineries
- Oil Companies
- Gas & oil pipe lines
- Power Stations
- Paint Manufacturing
- Plastic manufacturing
- Pharmaceutical Industry
- Fireworks Industry
- Chemical Industry
- Paper making Industries
- Flour silos and mills
- Breweries
- Alcohol processing industries
- Distilleries
- Fire-fighters
- Mines
- Defence
- Air Forces
- Navy
- Weapon & ammunition fabrication
- Aerospace industry
- Automobile Industry

Copper or brass tools are safe in explosive environments.

EGA Master has available a complete range of copper and brass hammers and mallets made in both materials.
It is convenient to know that copper or brass tools can never be considered as alternatives to aluminum-bronze or copper-beryllium alloy tools, because their hardness is too low for most applications. There is the temptation to choose copper or brass tools due to their lower cost compared to aluminum-bronze or copper-beryllium ones. This choice is not only risky in itself, but in the short/mid term it will be necessary to replace them for new ones because they wear out fast.
For this reason, copper or brass tools should only be used in those jobs that have to be made in risky environments, if the same job would be made with copper or brass tools in a non-risky environment. In case you would use a steel tool in a non-risky environment, than you should choose for your safety and profitability tools made in aluminum-bronze or copper-beryllium to make the same job in a risky environment, never a copper or brass tool.



ACETILEX ALLOY

Items with copper composition higher than 65% should not be used in acetylene environments. Both aluminum bronze and copper-beryllium alloys do have copper compositions higher than 65%. The reason is not that copper beryllium can create a spark with enough energy to create the ignition of acetylene, but that copper reacts with acetylene creating highly explosive acetylides. For this reason, copper-beryllium or aluminum-bronze alloys should not be used in acetylene environments.

EGA Master, always commited to find new innovative solutions that will increase safety, has developed the ACETILEX alloy, 100% safe to be used in acethylene environments. Once again, pioneers in safety.

INSTRUCTIONS FOR USE & WARRANTY

Non-Sparking Tools cannot reach the hardness of conventional tools. For this reason the use of Non-Sparking Tools has to be carried out with special care, avoiding overstraining, heating, etc
The use of Non-Sparking Tools must not be the only preventive measure in areas which the items are designed for. Other items, clothes or present material must also be adequate for non-sparking purposes.
EGAMASTER, S.A Non-Sparking Tools are provided with lifetime warranty .In case an EGAMASTER, S.A.´s tool breaks or fails to perform under normal and correct use, it will be repaired or replaced free of cost.Any misuse, abuse or normal service wear is considered as an exception to the warranty.

CAUTION: These tools are not classified as anti-static because they do conduct electricity. Do not use high copper content tools (>65%) in direct contact with acetylene due to the possible formation of explosive acetylide, specially in the presence of moisture.

EXTENSION 1/2”

Cu-Be RS Components	Cu-Be EGA Master		L mm	gr.
1230724	70385	1/2”	10”	500

Al-Bron RS Components	Al-Bron EGA Master		L mm	gr.
1230725	71281	1/2”	10”	500

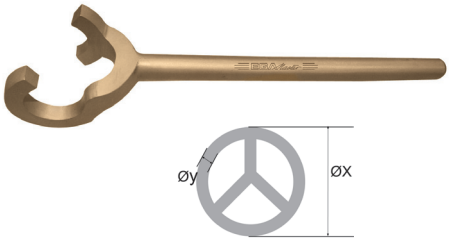
SETS 1/2”

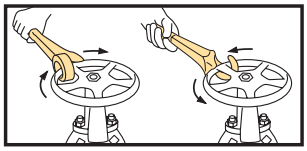
Cu-Be RS Components	Cu-Be EGA Master	PCS.			Kg.
1230726	74265	12	1/2”	8-10-11-12-14-17-19-22-24-27mm	2,3

Al-Bron RS Components	Al-Bron EGA Master	PCS.			Kg.
1230727	74266	12	1/2”	8-10-11-12-14-17-19-22-24-27mm	2,3

Technical specification	
Ratchet	250mm
Hinged handle	230mm

LONG VALVE SPANNER





Cu-Be RS Components	Cu-Be EGA Master	Øx	Øy	L mm	gr.
1230728	71433	8-15”	< 48mm	400	900

Al-Bron RS Components	Al-Bron EGA Master	Øx	Øy	L mm	gr.
1230729	71436	8-15”	< 48mm	400	900

Cu-Be cobre berilio Al-Bron aluminio bronce