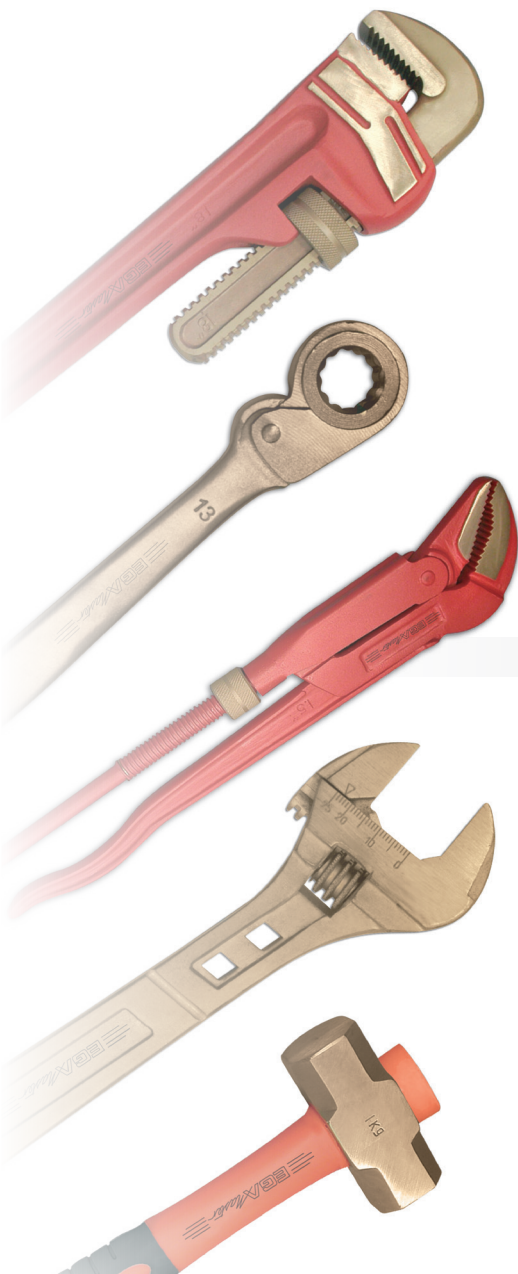


# NON-SPARKING TOOLS

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-Rheinland/Germany.



## MATERIALS

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

## 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)					
	T1 (450 °C)	T2 (300°C)	T3 (200 °C)	T4 (135 °C)	T5 (100 °C)	T6 (85 °C)
<b>Temperature of ignition</b>	450 °C	300 - 450 °C	200 - 300 °C	135 - 300 °C	100 - 135 °C	85 - 100 °C
<b>I</b>	Methane					
<b>IIA (Energy of ignition higher than 0.18 mJ)</b>	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					
<b>IIB (Energy of ignition between 0.06 and 0.18 mJ)</b>	Hydrogen cyanide	1.3-buta-diene	Dimethyl ether	Diethyleter		
		1.4-dioxane	Ethyl glycol			
	Coal gas (lighting gas)	Ethylene	Hydrogen sulphide			
		Ethylene oxide				
<b>IIC (Energy of ignition less than 0.06 mJ)</b>	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 acetylide 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
<b>Hardness</b>	283-365Brinell	229-291Brinell
<b>Magnetism</b>	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 appropriate for non critical non-magnetic applications
<b>Durability</b>	Much higher due to the higher hardness and tensile strength. Higher efforts can be made	Not as much as Cu-Be
<b>Price</b>	Higher price due to the special raw material used	Around 30% lower price
<b>Risk of explosion</b>	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

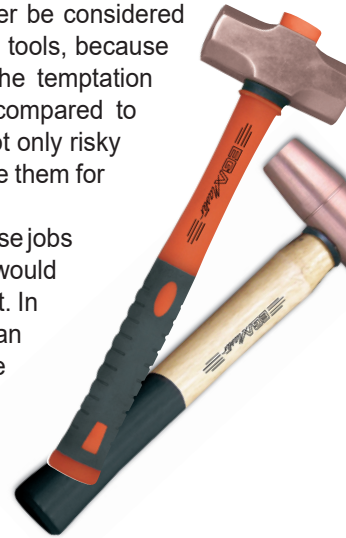
Petrochemicals  
 Refineries  
 Oil Companies  
 Gas & oil pipe lines  
 Power Stations  
 Paint Manufacturing  
 Plastic manufacturing  
 Pharmaceutical Industry  
 Fireworks Industry  
 Chemical Industry  
 Paper making Industries  
 Flour silos and mills  
 Breweries  
 Alcohol processing industries  
 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 committed to find new innovative solutions that will increase safety, has developed the ACETILEX alloy, 100% safe to be used in acetylene 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 acetylides, specially in the presence of moisture.

**SLOGGING OPEN WRENCHES**



Cu-Be		AF	L mm	Kg.
RS Components	EGA Master			
1230041	70281	17mm	125	0,1
1230042	70282	19mm		
1230043	70283	22mm	135	0,2
1230045	70284	24mm		
1230053	74875	25mm	150	0,3
1230046	70285	27mm		
1230055	74877	28mm	165	0,3
1230057	77278	29mm		
1230047	70286	30mm	180	0,4
1230048	70287	32mm		
1230059	77280	33mm	190	0,5
1230061	77282	35mm		
1230049	70288	36mm	210	0,7
1230063	77284	37mm		
1230051	70289	41mm	230	0,9
1230065	77286	42mm		
1230052	70290	46mm	240	1,1
1230068	77288	47mm		
1230070	77290	52mm	270	1,4
1230073	77292	54mm		
1230075	77294	56mm	290	1,8
1230077	77296	58mm		
1230079	77298	63mm	310	2,4

Al-Bron		AF	L mm	Kg.
RS Components	EGA Master			
1230054	74876	25mm	150	0,3
1230056	74878	28mm	165	
1230058	77279	29mm	180	0,4
1230060	77281	33mm	190	0,5
1230062	77283	35mm	210	0,7
1230064	77285	37mm		0,7
1230067	77287	42mm	230	0,9
1230069	77289	47mm	250	1,2
1230071	77291	52mm	270	1,4
1230074	77293	54mm		1,5
1230076	77295	56mm	290	1,8
1230078	77297	58mm		2,0
1230080	77299	63mm	310	2,4