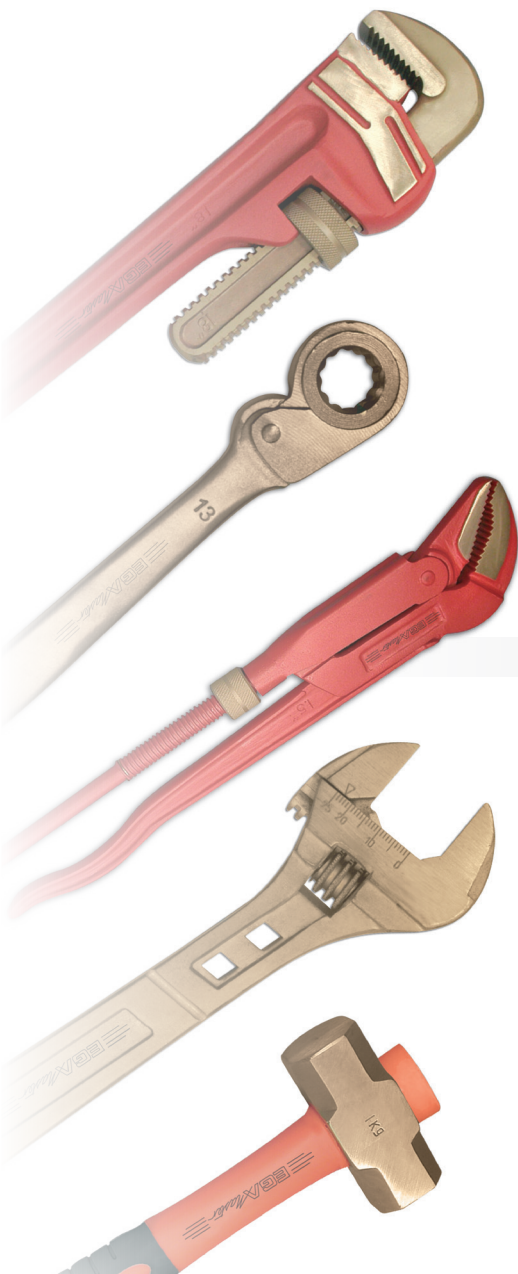


# NON-SPARKING TOOLS

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

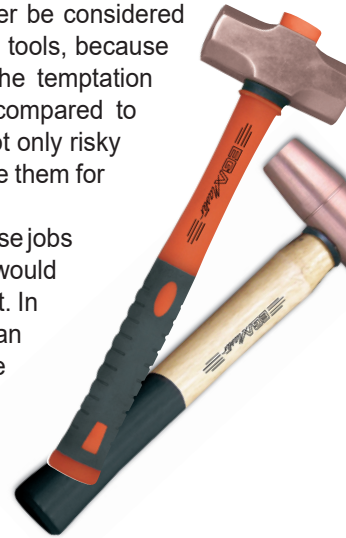
Petrochemicals  
 Refineries  
 Oil Companies  
 Gas & oil pipe lines  
 Power Stations  
 Paint Manufacturing  
 Plastic manufacturing  
 Pharmaceutical Industry  
 Fireworks Industry  
 Chemical Industry  
 Paper making Industries  
 Flour silos and mills  
 Breweries  
 Alcohol processing industries  
 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.



**SOCKET WRENCHES 1/2"**



Cu-Be		AF	L mm	gr.
RS Components	EGA Master			
1230390	74449	7mm	70	70
1230391	74450	8mm		
1230392	74451	9mm		
1230393	74452	10mm		
1230394	74453	11mm		
1230395	74454	12mm		
1230396	74455	13mm		
1230397	74456	14mm		
1230398	74457	15mm		
1230399	74458	16mm		
1230400	74459	17mm	80	80
1230401	74460	18mm		
1230402	74461	19mm	42	100
1230403	74462	20mm		
1230404	74463	21mm	43	120
1230405	74464	22mm		
1230683	74465	23mm		
1230684	74466	24mm		
1230685	74467	25mm		
1230686	74468	26mm	46	200
1230687	74469	27mm		
1230688	74470	28mm		
1230689	74471	29mm	50	350
1230690	74472	30mm		
1230691	74473	32mm		
1230720	75300	34mm	450	450
1230692	74474	36mm		

Al-Bron		AF	L mm	gr.
RS Components	EGA Master			
1230693	74475	6mm	40	60
1230694	74476	7mm		
1230695	74477	8mm		
1230696	74478	9mm		
1230697	74479	10mm		
1230698	74480	11mm		
1230699	74481	12mm		
1230700	74482	13mm		
1230701	74483	14mm		
1230702	74484	15mm		
1230703	74485	16mm	90	90
1230704	74486	17mm		
1230705	74487	18mm	42	100
1230706	74488	19mm		
1230707	74489	20mm		
1230708	74490	21mm	43	120
1230709	74491	22mm		
1230710	74492	23mm		
1230711	74493	24mm		
1230712	74494	25mm		
1230713	74495	26mm	46	200
1230714	74496	27mm		
1230715	74497	28mm		
1230716	74498	29mm	50	350
1230717	74499	30mm		
1230718	74500	32mm		
1230721	75301	34mm	450	450
1230719	74501	36mm		

**REVERSIBLE RATCHET HANDLE 1/2"**



Cu-Be		1/2"	L mm	gr.
RS Components	EGA Master			
1230722	70375	1/2"	250	600

Al-Bron		1/2"	L mm	gr.
RS Components	EGA Master			
1230723	71272	1/2"	250	600