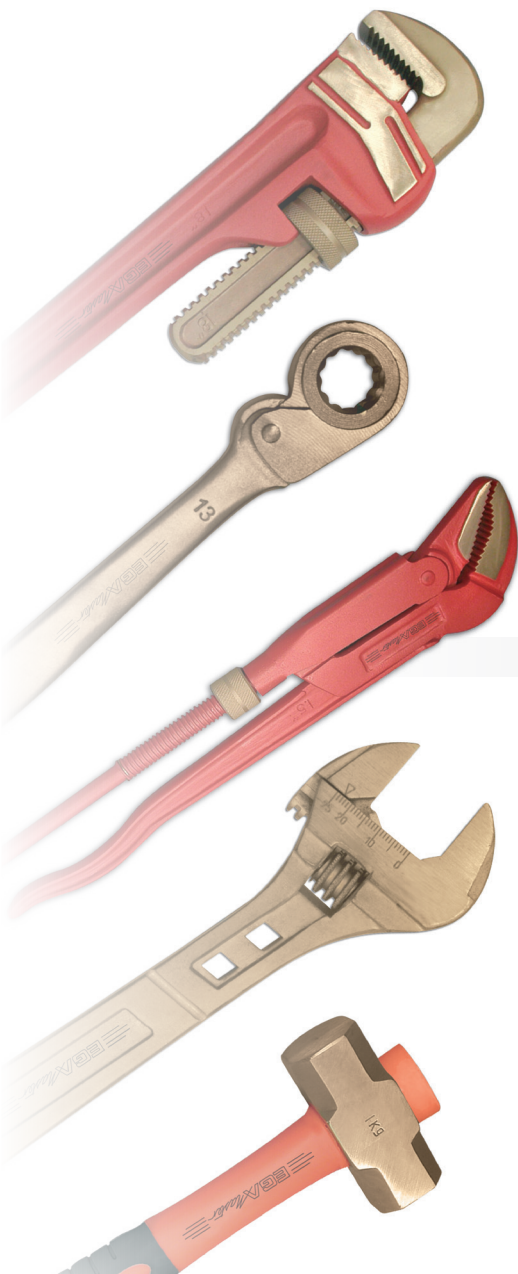


# NON-SPARKING TOOLS

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

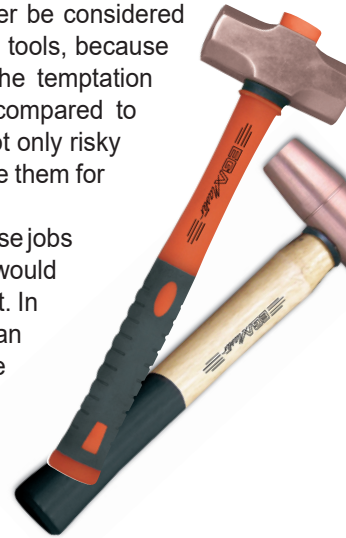
Petrochemicals  
 Refineries  
 Oil Companies  
 Gas & oil pipe lines  
 Power Stations  
 Paint Manufacturing  
 Plastic manufacturing  
 Pharmaceutical Industry  
 Fireworks Industry  
 Chemical Industry  
 Paper making Industries  
 Flour silos and mills  
 Breweries  
 Alcohol processing industries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



Cu-Be		AF	L mm	Kg.
RS Components	EGA Master			
1230081	70299	22mm	165	0,2
1230082	70300	24mm		
1230097	72631	25mm		
1230083	70301	27mm	175	0,3
1230098	72633	28mm		
1230099	72634	29mm	185	0,4
1230084	70302	30mm		
1230100	72635	31mm		
1230085	70303	32mm		
1230086	70304	36mm	200	0,6
1230102	72636	39mm	220	0,7
1230118	73327	40mm		
1230087	70305	41mm		
1230103	72638	43mm	230	0,8
1230104	72640	45mm		
1230089	70306	46mm	240	0,9
1230105	72642	49mm		
1230090	70307	50mm	250	1,0
1230106	72643	51mm		
1230091	70308	52mm	260	1,3
1230107	72644	53mm		
1230092	70309	55mm		
1230108	72647	57mm	270	1,4
1230109	72648	59mm		
1230093	70310	60mm	300	1,5
1230110	72650	61mm		
1230111	72651	62mm		
1230112	72652	63mm	300	1,5
1230113	72653	64mm		
1230095	70311	65mm	300	1,8
1230114	72655	66mm		
1230115	72656	68mm	320	2,2
1230116	72657	69mm		
1230096	70312	70mm		

Al-Bron		AF	L mm	Kg.
RS Components	EGA Master			
1230119	71082	22mm	165	0,2
1230120	71083	24mm		
1230133	72677	25mm		
1230121	71084	27mm	175	0,3
1230134	72679	28mm		
1230135	72680	29mm	185	0,4
1230122	71085	30mm		
1230136	72681	31mm		
1230124	71086	32mm		
1230154	73331	34mm	200	0,5
1230125	71087	36mm		0,6
1230137	72682	39mm	220	0,7
1230155	73332	40mm		
1230126	71088	41mm		
1230156	73333	42mm	230	0,8
1230138	72684	43mm		
1230157	73334	44mm	240	0,8
1230140	72686	45mm		
1230127	71089	46mm	250	0,9
1230158	73335	48mm		
1230141	72688	49mm		
1230128	71090	50mm	260	1,0
1230142	72689	51mm		
1230129	71091	52mm	270	1,1
1230143	72690	53mm		
1230130	71092	55mm		
1230144	72693	57mm	260	1,3
1230146	72694	59mm		
1230131	71093	60mm	270	1,4
1230147	72696	61mm		
1230148	72697	62mm		
1230149	72698	63mm	300	1,5
1230150	72699	64mm		
1230132	71094	65mm	300	1,8
1230159	73340	66mm		
1230152	72702	68mm		
1230153	72703	69mm	320	2,2