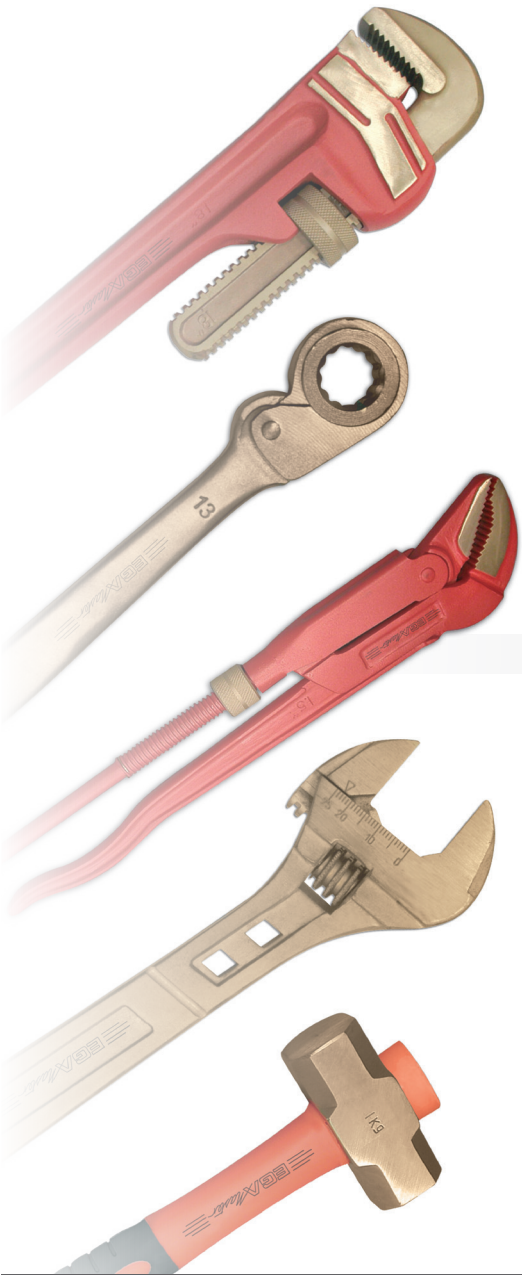
NON-SPARKING TOOLS

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



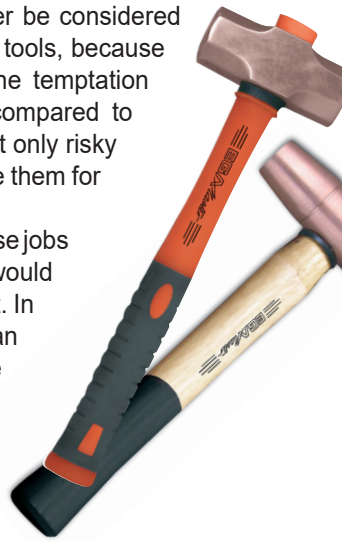

COPPER OR BRASS TOOLS

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.

HEXAGONAL WRENCHES

Cu-Be		AF	L mm	H mm	gr.
RS Components	EGA Master				
1230160	74357	5,5mm	79	32	20
1230162	70395	6mm	85		
1230163	70396	7mm	88	43	30
1230164	70397	8mm	92	44	45
1230165	70398	9mm	97		55
1230166	70399	10mm	110	45	70
1230178	72241	11mm	119	48	90
1230168	70400	12mm	130	52	130
1230180	72243	13mm	140	54	160
1230169	70401	14mm	150	58	190
1230176	74629	15mm	156	60	240
1230170	70402	17mm	168	65	350
1230182	72245	18mm	173	69	420
1230171	70403	19mm	177	72	450
1230172	70404	22mm	186	77	650
1230174	70405	24mm	192	82	800
1230175	70406	27mm	213	93	1200

Al-Bron		AF	L mm	H mm	gr.
RS Components	EGA Master				
1230161	74358	5,5mm	79	32	20
1230183	71291	6mm	85		
1230184	71292	7mm	88	43	30
1230185	71293	8mm	92	44	45
1230186	71294	9mm	97		55
1230187	71295	10mm	110	45	70
1230177	72240	11mm	119	48	90
1230188	71296	12mm	130	52	130
1230179	72242	13mm	140	54	160
1230189	71297	14mm	150	58	190
1230256	74634	15mm	156	60	240
1230190	71298	17mm	168	65	350
1230181	72244	18mm	173	69	420
1230191	71299	19mm	177	72	450
1230257	74631	20mm	184	74	600
1230255	74633	21mm			
1230251	71300	22mm	186	77	650
1230253	71301	24mm	192	82	800
1230254	71302	27mm	213	93	1200

Cu-Be cobre berilio

Al-Bron aluminio bronce