TECHNICAL FILE

NON-SPARKING TOOLS

EGA Master Non Sparking Tools are the best alternative for non sparking application purposes in explosive potential environments. All its tools are forged after casting to achieve the best quality tools in the market, both in mechanical properties and attractive finishing. We incorporate to our non sparking tools all our knowledge of decades designing and manufacturing hand tools, making the most ergonomic, easy to be used and nicest design for them.

All EGA Master Tools are manufactured according to the strict control of ISO 9001-2000, certified by the most prestigious institution for hand tool manufacturing, TUV-Rheinland.

MATERIALS

Copper-Beryllium 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

Property	Application or benefit
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 faster

TABLE OF RISKS OF EXPLOSION AND MAXIMUM TEMPERATURE

Explosion group						
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			
	Etilacetato	1-butene	Heating oil			
	Methane	Ethyl acetate	n-hexane			
	Methanol	i-propanol				
	Propane	Vinyl chloride				
	Toluene					
IIB (Energy of ignition between 0.06 and 0.18 mJ)	Hydrogen cyanide	1.3-butadiene	Dimethyl ether	Dietileter		
		1.4-dioxane	Ethyl glycol			
	Coal gas (lighting gas)	Etylene	Hydrogen sulphide			
		Ethylene oxide				
IIC (Energy of ignition minor of 0.06 mJ)	Hydrogen	Acetylene			bisulphide of carbon	
	Gas of water (CO + H2)				Ethyl nitrate	

The tools made of Cu Be alloy can be used in all groups (I, IIA, IIB, IIC) in a safety way, always respecting the maximum surface temperature allowed, except with acetylene that can create explosive acetylite gases.

The tools made of Al Bronze alloy can be used in a safety 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	283-365 Brinell	229-291 Brinell
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 proper for non critical non-magnetic applications
Durability	Much higher due to the higher hardness and tensile strength. Higher efforts can be afforded	Not as much as Co-Be
Price	Higher price due to the special raw material used	Around 30% more economic
Risk of ignition	Alloy can be used in all groups (I, IIA, IIB, IIC)	Alloy can be used in all groups except IIC

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

COPPER OR BRASS TOOLS

Copper or brass tools are safe in explosive environments of risk groups I and IIA. It is safe to work with them in these 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 for the wearing out suffered due to their low hardness.

For this reason, copper or brass tools should only be used in those jobs that have to be made in risky environments (I and IIA), 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 alloys to make the same jobe in a risky environment. Never a copper or brass tool.

ACETILEX ALLOY

Items with copper compositions higher than 65% should not be used in acetylene environments. Both aluminum bronze and copper-beryllium alloys do have higher copper compositions 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 can react with acetylene creating highly explosive acetylates.

For this reason, copper-beryllium or aluminum-bronze alloys should not be used in acetylene environments.

In Ega Master S.A., always commited to find new innovative solutions that will increase safety, we have 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.

EGA Master Non-Sparking Tools are provided with lifetime warranty. In case an EGA Master 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 no use them in acetylene environments as they can create explosive acetylite gases