



***ALUMINUM
BRAZING & SOLDERING
FUNDAMENTALS***

WWW.BTiBRAZE.COM

What is the difference between **brazing** and **soldering** ?

- The soldering process takes place at temperatures **under** 840F.
- The brazing process takes place at temperatures **over** 840F.

Melting Characteristics

Melting Points

The metal or alloy begins to melt at the solidus point and is completely melted at the liquidus point.

Melting Range

The melting range of a metal or alloy is the difference between the solidus and liquidus points.

Working Range

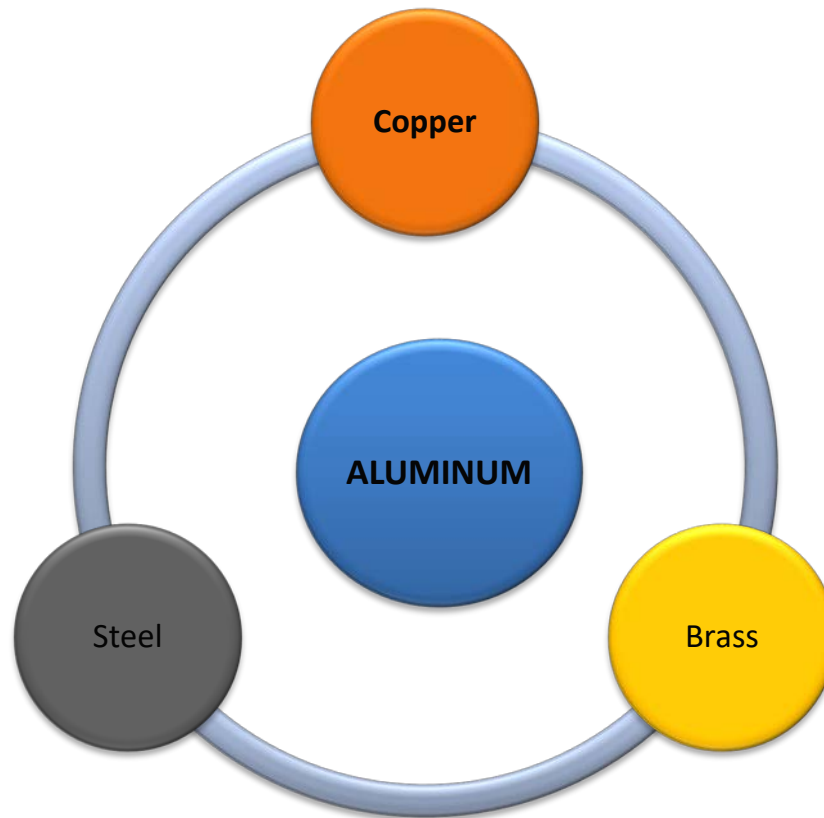
This is a temperature range somewhere above the solidus point and just above the liquidus point.

*Eutectic alloys have only one melting point

Which Alloys can be Brazed or Soldered ?

Wrought Aluminum Alloys		
Main Alloy	Alloy Properties	Solder or Braze Recommendations
None (99% alu) 1XXX	Unalloyed aluminum is highly corrosion resistant, low strength, workable, conductive. Non-heat-treatable.	Recommended
Copper 2XXX	Gives strength, hardness, machinability. Heat-treatable.	Not Recommended
Manganese 3XXX	Adds moderate strength, good workability. Non-heat-treatable.	Recommended
Silicon 4XXX	Typically offered as brazing alloys	Not Recommended
Magnesium 5XXX	Moderate to high strength. Corrosion resistant. Non-heat-treatable.	Not Recommended
Magnesium & Silicon 6XXX	Increases strength, formability, corrosion resistance. Heat-treatable.	Recommended
Zinc 7XXX	For greatest strength. Heat treatable. Other alloying elements such as copper, magnesium, chromium and zirconium may be specified.	Not Recommended
Tin, Lithium & Other elements. 8XXX	Effects vary.	Not Recommended
N/A 9XXX	(This series is unused presently.)	Not Recommended

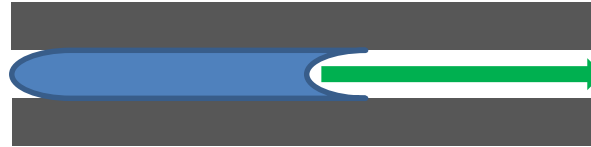
Recommended Dissimilar Base Material Applications



Capillary Flow and Gap Clearance



A strong and durable brazed or soldered joint requires a consistent and narrow gap. The recommended clearance .05mm (.002") and 0.2mm (.008")

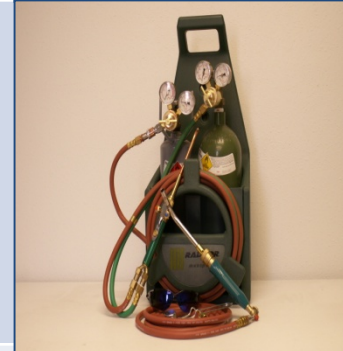


Flame Brazing & Soldering Equipment & Gases

Air & Acetylene
B-Tank



Oxygen & Acetylene
R Tank & B or M Tank



Propane/Propylene & Air
Disposable 1 lb. Tanks



Aluminum Brazing & Soldering Fluxes

Flux Types	Working Temperature	Description
ALUMATEC™ Non-Corrosive Brazing Flux Aluminum-Copper-Brass-Steel	560°C - 600°C 1040F - 1112F	White paste applied to the surfaces to be joined. Flux residue removal is not required.
ALUMATEC™ Corrosive Brazing Flux Aluminum only	450°C - 572°C 600F-1100F	Off white paste applied to the surfaces to be joined. Flux residue removal is suggested using warm water and wire brush.
SOLDERTEC™ Non-Corrosive Soldering Flux Aluminum-Copper-Brass-Steel	410°C - 460°C 770F-842F	White paste applied to the surfaces to be joined. Flux residues do not need to be removed.

Aluminum Brazing & Soldering Steps

STEP 1	Pre-clean using a stainless wire brush. Remove all surface contaminants
STEP 2	Apply flux to the surfaces being brazed or soldered.
STEP 3	Heat area “keeping torch in motion” Watch for the flux to turn clear as an indicator that the parts are at temperature
STEP 4	Pull the flame back slightly. Apply material into the capillary until the joint is filled
STEP 5	Remove heat and turn off gas flow.
STEP 6	Allow the joint to air cool.

PROTECT YOURSELF

ALWAYS WEAR THE REQUIRED SAFETY EQUIPMENT

Refer to Manufacturer’s Material Safety Data Sheet

ALUMINUM BRAZING & SOLDERING FUNDAMENTALS

Product	Working Range	General Application	Service Kit Contents
ALUMATEC™ 1200FC	577° - 582°C 1070°F-1080°F	Join or Repair Aluminum	2.0mm x 20" and MSDS 10 Sticks per Tube

Product	Working Range	General Application	Service Kit Contents
SOLDERTEC™	375°C - 388°C 707°F – 730°F	Join or Repair Aluminum – copper - brass Flux Integrated into the Rod	2.0mm x 20" and MSDS 10 Sticks per Tube

Product	Working Range	General Application	Service Kit Contents
SOLDERTEC™ PLUS	797°F - 898°F 425°C - 481°C	Join or Repair Aluminum-Copper-Brass Flux Integrated into the Rod	2.0mm x 20" and MSDS 10 Sticks per Tube