No Lead Brass alloys are much more similar than different to the traditional cast and forging brass alloys that are commonly used to manufacture valves. To meet no lead requirements, three major types of alloys have been developed: binary brass, bismuth brass and silicon brass.

When proper solder techniques are followed, valves and fittings made from any of the three no lead brass alloys may solder as well as those made from traditional brass. Soldering a valve or fitting constructed of silicon brass alloy does require strict adherence to solder techniques (in particular joint preparation and flux application) due to the properties of the silicon. Whereas, soldering valves constructed of either binary or bismuth brass alloy material perform the same as those made from traditional brasses.

Legend uses binary brasses for the 1001, 1002 and 2000 Series Ball Valves and for most other Legend products due to several advantages the alloys offer, including the ease of soldering. Bismuth brass alloys are utilized for the valves and fittings for which their applications are optimized by the properties of the alloy.

For more information please visit www.legendnolead.com or call Legend Customer Service at 1-800-752-2082.
### Binary Brass / Bronze

Bismuth brass/bronze materials are also copper alloys that remove lead from the compound, substituting a small amount of bismuth (0.5%-4%) to aid in the processes during manufacturing. There are over 20 ASTM specified material listings for approved bismuth brass/bronze alloys. Examples include UNS C89830, UNS C89833, UNS C89836 and UNS C89844.

**Advantages:**
- Provides good manufacturing capabilities for casting, forging, and machining. Bismuth alloys also solder just like standard brasses and bronzes. Recycling is easier than with materials containing silicon, but separation from standard brasses is recommended.

**Disadvantages:**
- Performance at high temperatures can be an issue with bismuth materials. Legend avoids this issue in our products by specifying very low amounts of bismuth in our alloys and utilizing alternative materials for finished goods that are likely to encounter heat during use.

### Silicon Brass / Bronze

Silicon brass/bronze materials are copper alloys that remove lead from the material and add a small amount of silicon (2%-4%) to improve the performance of the alloy during the manufacturing processes. Examples include UNS C87600, UNS C87850 and UNS C69300.

**Advantages:**
- Provides good manufacturing capabilities for casting, forging, and machining. Copper silicon alloys are naturally corrosion resistant. High temperature performance is very good.

**Disadvantages:**
- There can be issues in soldering silicon brass materials; special care needs to be used to produce good soldered joints. Although performing very well in most other desired attributes, silicon brasses are more expensive than other no lead alternatives. There are also some recycling issues as silicon brasses cannot be mixed with their non-silicon counterparts, thus increasing production costs.