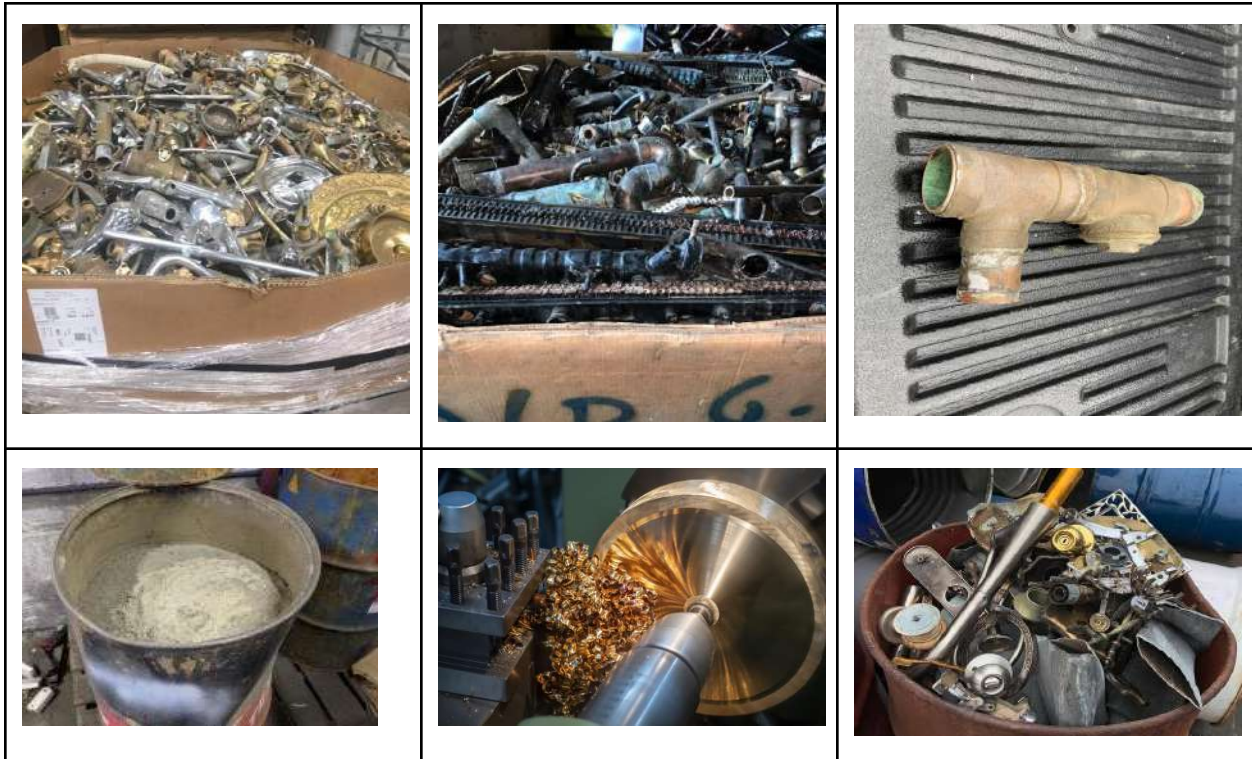


## Non-Ferrous: Red Metal

### Brass

- **Description**

- Brass is a copper alloy and a common item purchased at any scrapyard. The most common forms of brass are plumbing related. While there are various surface colors, it is important to grind the surface to confirm the brass type.



## Brass - Level 1

- Yellow Brass [Honey]
  - **Description**
    - Yellow brass is the most common type of brass found in plumbing, hardware, ornaments, keys, plaques, and even musical instruments. This commodity is often used because of its non-corrosive quality. Yellow brass is low in copper but high in zinc, giving it a distinctive yellow color. Typical chemical composition: 60% Cu, 30% Zn, 3% Pb, 1% Sn. In many cases, incoming yellow brass boxes need to be dumped and sorted to prevent brass shells (live rounds) from being shipped.
  - **Upgrade potential**
    - Brass often has iron or plastic attachments that can easily be cut off with an alligator shear. There is also potential to find higher grades of brass mixed in with yellow brass, but it can often be tedious due to the pieces' small size.
  - **ISRI definition**
    - **Honey Yellow Brass Scrap**
      - Shall consist of mixed yellow brass solids, including brass castings, rolled brass, rod brass, tubing and miscellaneous yellow brasses, including plated brass. Must be free of manganese-bronze, aluminum-bronze, unsweated radiators or radiator parts, iron, and excessively dirty and corroded materials. Must also be free of any type of munitions including, but not limited to, bullet casings.

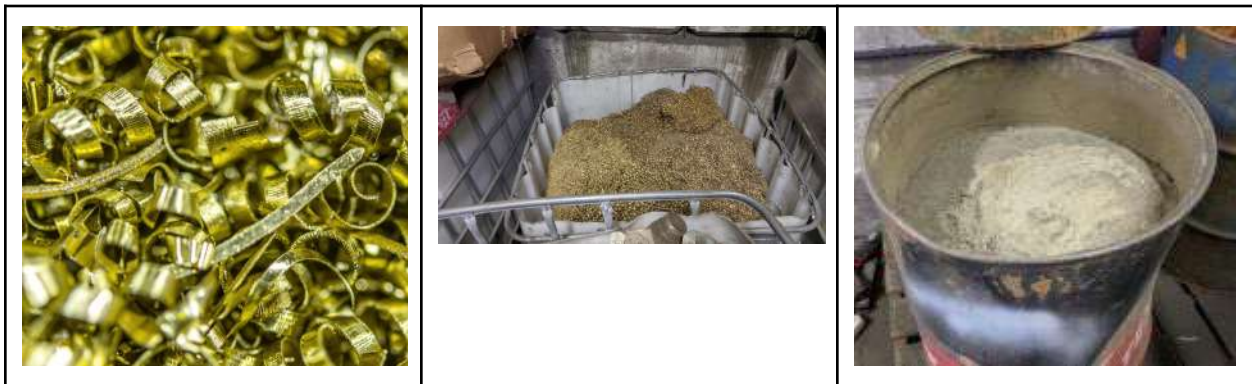


- Red Brass [Ebony]
  - **Description**
    - Red brass is the second most common type of brass at a scrapyard, typically found as valves, machinery bearings, and parts. The typical chemical composition is 85% Cu, 5% Zn, 5% Pb, 5% Sn. Red brass gets its color from its higher copper content. There has been a flood of red brass-coated yellow brass in recent years, so it is very important to cut or grind questionable red brass. It might be safer to buy yellow and red brass at the same price to avoid potential losses.
  - **Upgrade potential**
    - Hard/Gear brass can often be found within a red brass box; however, it will require manual sorting that may negate the upgrade.
  - **ISRI definition**
    - **Ebony** Composition or Red Brass
      - Shall consist of red brass scrap, valves, machinery bearings and other machinery parts, including miscellaneous castings made of copper, tin, zinc, and/or lead. Shall be free of semi-red brass castings (78% to 81% copper); railroad car boxes and other similar high-lead alloys; cocks and faucets; closed water meters; gates; pot pieces; ingots and burned brass; aluminum, silicon, and manganese bronzes; iron and non-metallics. No piece to measure more than 12" over any one part or weigh over 100 lbs. Heavier pieces acceptable upon mutual agreement between buyer and seller.



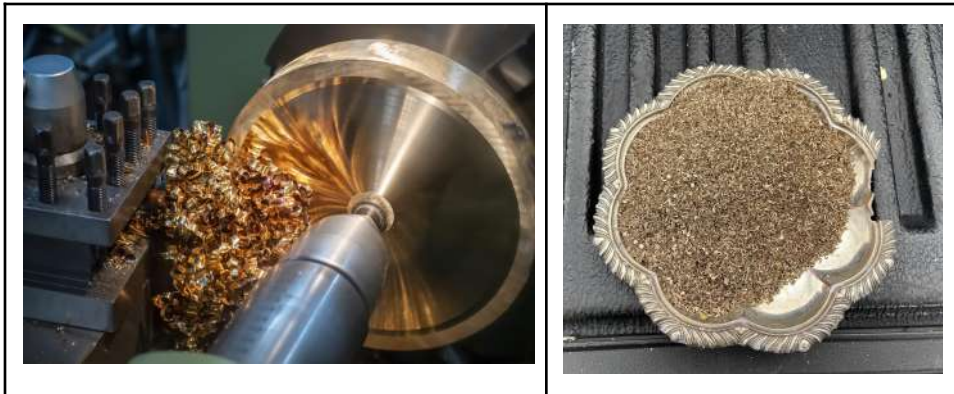
## Non-Ferrous: Red Metal

- Yellow Brass Shavings/Turnings [Nomad]
  - **Description**
    - Yellow brass shavings, turnings, or borings, are the yellow brass residuals left behind from the machining process. It is always important to visit the source of this material to understand the mix of brass types and advise maximizing value.
  - **Upgrade potential**
    - There will likely be chunks of yellow brass that can be sorted out of this material.
  - **ISRI definition**
    - **Nomad Yellow Brass Turnings**
      - Shall consist of yellow brass turnings, free of aluminum, manganese and composition turnings, not to contain over 3% of free iron, oil or other moisture; to be free of grindings and babbitts. To avoid dispute, to be sold subject to sample or analysis.



## Non-Ferrous: Red Metal

- Red Brass Shavings/Turnings [Enerv]
  - **Description**
    - Red brass shavings, turnings, or borings, are the red brass residuals left behind from the machining process. It is always important to visit the source of this material to understand the mix of brass types and advise maximizing value.
  - **Upgrade potential**
    - There will likely be chunks of red brass that can be sorted out of this material.
  - **ISRI definition**
    - **Enerv Red Brass Composition Turnings**
      - Shall consist of turnings from red brass composition material and should be sold subject to sample or analysis.



## Non-Ferrous: Red Metal

- Auto Radiators Brass/Copper Radiators [Ocean]
  - **Description**
    - As in the name, auto radiators are found in cars and trucks. These are easy to identify by running a magnet or piece of metal down the fins to see the brass color. When the ends are removed, and the inside of the radiator is exposed, both copper and brass are visible.
  - **Upgrade potential**
    - Removing the steel frame/ends will increase the value of this material moving it from a dirty radiator into a clean radiator.
  - **ISRI definition**
    - **Ocean Mixed Unsweated Auto Radiators**
      - Shall consist of mixed automobile radiators, to be free of aluminum radiators, and iron-finned radiators. All radiators to be subject to deduction of actual iron. The tonnage specification should cover the gross weight of the radiators, unless otherwise specified.



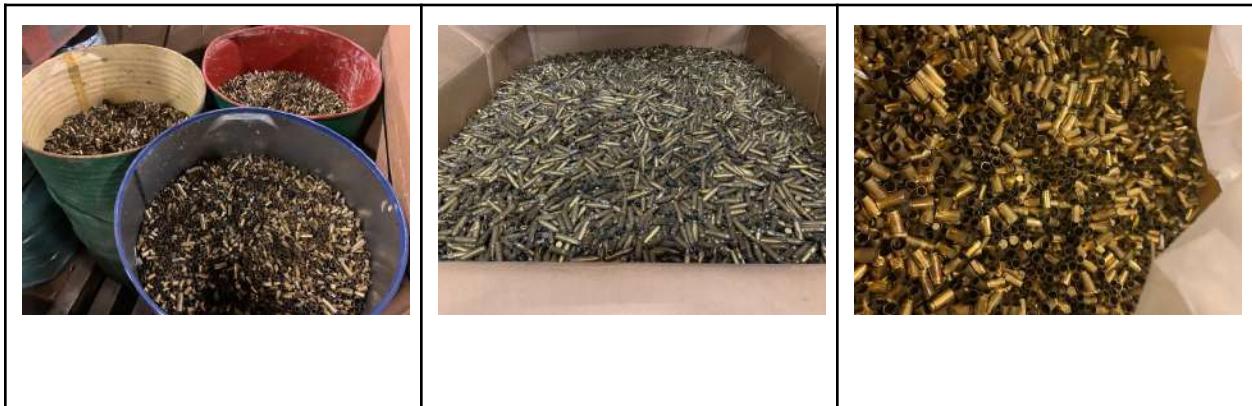
## Brass - Level 2

- **Description**

- Brass at this level might not be brought into the scrapyard daily; however, they will be seen on occasion, and correctly identifying the material is a must for profit maximization.



- Brass Shell Casing [Lace/Lake]
  - **Description**
    - Brass Shell Casings are 70/30 brass. This material is typically collected from shooting ranges where they must be discharged and no longer contain explosives. Due to several accidents resulting from live rounds, this material must be mutilated before shipping to ensure future accidents are prevented.
  - **Upgrade potential**
    - The collection of this material should only contain shells, therefore eliminating any upgrade potential.
  - **ISRI definition**
    - **Lace** Brass Shell Cases Without Primer
      - Shall consist of clean fired 70/30 brass shell cases free of primers and any other foreign material. For material to be exported from the United States, all shells must be sufficiently mutilated to prevent reuse and reloading.
    - **Lake** Brass Small Arms and Rifle Shells, Clean Fired
      - Shall consist of clean fired 70/30 brass shells free of bullets, iron and any other foreign material. For material to be exported from the United States, all shells must be sufficiently mutilated to prevent reuse and reloading.





- Manganese Bronze [Parch]
  - **Description**
    - Manganese Bronze is similar to yellow brass, with the big difference being that the manganese bronze will have a slight magnetic draw to it. The manganese in this material also provides a slight chocolate brown color. This material is often found as marine propellers, engine pumps, engine frames, valves, and gears because of its corrosion resistance, strength, and flexibility.
  - **Upgrade potential**
    - Yellow Brass [Honey] will often be mixed within a box of Manganese Bronze. If there are pieces that don't have a magnetic draw, further testing should be conducted with a metal analyzer.
  - **ISRI definition**
    - **Parch** Manganese Bronze Solids
      - Shall have a copper content of not less than 55%, a lead content of not more than 1%, and shall be free of aluminum bronze and silicon bronze.



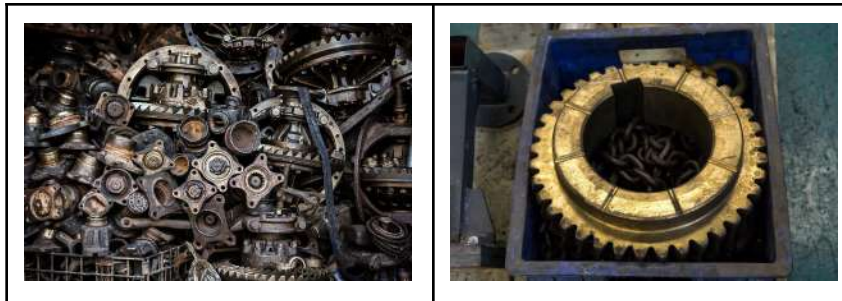
## Non-Ferrous: Red Metal

- Machinery Hard Brass [Engel]
  - **Description**
    - Machinery Hard Brass is usually identifiable as it will typically come in the form of industrial machinery or a thick cylindrical shape with a much harder surface than Red Brass [Ebony].
  - **Upgrade potential**
    - This is the top grade of brass, so there aren't any upgrades available.
  - **ISRI definition**
    - **Engel Machinery or Hard Brass Solids**
      - Shall have a copper content of not less than 75%, a tin content of not less than 6%, and a lead content of not less than 6% nor more than 11%, and total impurities, exclusive of zinc, antimony, and nickel of not more than 0.75%; the antimony content not to exceed 0.50%. Shall be free of lined and unlined standard red car boxes.



## Non-Ferrous: Red Metal

- Gear Brass
  - **Description**
    - Like Machinery Hard Brass [Engel], Gear Brass is usually identifiable since it will be in a gear shape. While this material should be sold separately, it is common to mix in with Red Brass.
  - **Upgrade potential**
    - Keeping Gear Brass on its own will maximize the grade's value; however, since it is not a common material, it will most likely be mixed with Red Brass [Ebony].



## Non-Ferrous: Red Metal

- Semi-Red Brass
  - **General video**
    -
  - **Description**
    - Semi-Red Brass is typically cast into a shape. An example of this material would be a water meter. When cut with a shear, the inside of these pieces has almost a pink color.
  - **Upgrade potential**
    - Depending on the supply of this material, it might come mixed with other brass types such as Red Brass [Ebony] or Hard Brass, so it is always important to check for upgrades in every received box.



### Brass - Level 3

- Dirty [Irony] Brass
  - **Description**
    - Dirty Brass or irony brass is brass that still has ferrous or other contaminants attached to it. Dirty Brass is bought & sold on a recovery basis so it is important to have an experienced person grade this material.
  - **Upgrade potential**
    - There are several upgrades within Dirty Brass when sorted & processed thoroughly. Making use of a shear and other hand tools to remove steel attachments can instantly upgrade this material to yellow, red, or higher brass grades.



## Non-Ferrous: Red Metal

- Door Knobs
  - **Description**
    - Door knobs fall into the category of dirty brass but should be kept separate as their recovery is significantly lower.
  - **Upgrade potential**
    - This material can be upgraded with hand tools; however, the labor cost usually outweighs the benefit, so this material is usually bought and sold as-is.



### Copper

- **Description**

- Copper is most commonly used in plumbing and electrical applications as pipe and wire, respectively. Due to its conductive nature, copper is ideal for electrical use; however, its cost is significantly greater than aluminum. It is relatively malleable and easily identifiable by its orange color.



### Copper - Level 1

- #1 Bright and Shiny [Barley]
  - **Description**
    - #1 bright and shiny copper is clean copper wire with individual strands of 16 gauge or thicker. This material is usually upgraded when insulation is removed from ICW by way of a wire stripper. Something to be aware of is copper-coated steel wire as it looks just like Barely. Testing this material with a magnet can potentially save thousands of dollars.
  - **Upgrade potential**
    - This material is at the top of the copper price range, so there are no upgrades to be recognized.
  - **ISRI definition**
    - **Barley No. 1 Copper Wire**
      - Shall consist of No. 1 bare, uncoated, unalloyed copper wire, commonly known as Bare Bright copper wire. Wire gauge subject to agreement between buyer and seller. Green copper wire and hydraulically compacted material to be subject to agreement between buyer and seller.





- #1 Copper [Berry/Candy]
  - **Description**
    - This is a combination of #1 copper pipe & wire. Paint, stickers, solder, and attachments must be removed. The individual wire strands must be 16 gauge or thicker, and the pipe must have all fittings and elbows removed. Wire might come from ICW that has been stripped or burnt to expose only copper.
  - **Upgrade potential**
    - Barley can be found within this grade so it is important to dump and sort this material to recognize this upgrade.
  - **ISRI definition**
    - **Berry/Candy**
      - A combination of copper wire and heavy copper as defined in Berry and Candy. See above.
    - **Berry No. 1 Copper Wire**
      - Shall consist of clean, untinned, uncoated, unalloyed copper wire and cable, free of brittle burnt wire. Wire gauge subject to agreement between buyer and seller. Free of copper tubing. Hydraulically briquetted copper subject to agreement.
    - **Candy No. 1 Heavy Copper Solids and Tubing**
      - Shall consist of clean, unalloyed, uncoated copper clippings, punchings, bus bars, commutator segments, and clean copper tubing. Hydraulically briquetted copper subject to agreement.



- #2 Copper [Birch/Cliff]
  - This is a combination of #2 copper pipe & wire. Gauge is not as important in the individual strands of wire, although it will typically run 16 gauge or smaller, and oxidation, stickers, elbows, and solder are acceptable for the pipe.
  - **Upgrade potential**
    - There are a variety of upgrades within #2 copper. The most common upgrade is to use a stationary shear to remove contaminants (attachments, fittings, elbows) from the pipe to upgrade it to #1 copper (Candy). #1 wire can also be found within this material, reiterating the importance of dumping boxes of copper to recognize this upgrade.
  - **ISRI definition**
    - **Birch No. 2 Copper Wire**
      - Shall consist of miscellaneous, unalloyed copper wire having a nominal 96% copper content (minimum 94%) as determined by electrolytic assay. Should be free of the following: Excessively leaded, tinned, soldered copper wire; brass and bronze wire; excessive oil content, iron, and non-metallics; copper wire from burning; insulation; hair wire; brittle burnt wire; and should be reasonably free of ash. Hydraulically briquetted copper subject to agreement.
    - **Cliff No. 2 Copper Solids and Tubing**
      - Shall consist of miscellaneous, unalloyed copper scrap having a nominal 96% copper content (minimum 94%) as determined by electrolytic assay. Should be free of the following: Excessively leaded, tinned, soldered copper scrap; brasses and bronzes; excessive oil content, iron and non-metallics; copper tubing with other than copper connections or with sediment; copper wire from burning; insulation; hair wire; brittle burnt wire; and should be reasonably free of ash. Hydraulically briquetted copper subject to agreement.



## **Non-Ferrous: Red Metal**

## Copper - Level 2

- #3 Copper / Light Copper [Dream]
  - **Description**
    - #3 copper is copper solids or wire with excess attachments in the form of steel, tar, or in the case of transformer windings, shellac. The copper recovery is typically lower than #2 Copper [Birch/Cliff], so it is important to thoroughly sort this material.
  - **Upgrade potential**
    - There are upgrades within this grade by making use of a shear or hand tools to remove attachments. This will result in either #1 or #2 copper and a significant increase in value.
  - **ISRI definition**
    - **Dream Light Copper**
      - Shall consist of miscellaneous, unalloyed copper scrap having a nominal 92% copper content (minimum 88%) as determined by electrolytic assay and shall consist of sheet copper, gutters, downspouts, kettles, boilers, and similar scrap. Should be free of the following: Burnt hair wire; copper clad; plating racks; grindings; copper wire from burning, containing insulation; radiators and fire extinguishers; refrigerator units; electrotpe shells; screening; excessively leaded, tinned, soldered scrap; brasses and bronzes; excessive oil, iron and non-metallics; and should be reasonably free of ash. Hydraulically briquetted copper subject to agreement. Any items excluded in this grade are also excluded in the higher grades above.



- #1 Copper Chops [Clove]
  - **Description**
    - #1 Copper Chops are produced by chopping or granulating #1 ICW. It is important to ensure the gauge of ICW being chopped is thicker than 16 gauge as density dictates the value.
  - **Upgrade potential**
    - Since this is the highest copper grade, there really isn't much to upgrade other than the material's gauge.
  - **ISRI definition**
    - **Clove #1 Copper Wire Nodules**
      - Shall consist of #1 bare, uncoated, unalloyed copper wire scrap nodules, chopped or shredded, free of tin, lead, zinc, aluminum, iron, other metallic impurities, insulation, and other foreign contamination. Minimum copper 99%. Gauge smaller than No. 16 B & S wire and hydraulically compacted material subject to agreement between buyer and seller.



## Non-Ferrous: Red Metal

- #2 Copper Chops [Cobra]
  - **Description**
    - #2 Copper Chops are produced by chopping or granulating #2 ICW. The gauge is not as important as #1 Chops, and tin coating is acceptable.
  - **Upgrade potential**
    - This is the highest grade of #2 Copper so there really isn't much to upgrade other than sorting the ICW prior to chopping.
  - **ISRI definition**
    - **Cobra #2 Copper Wire Nodules**
      - Shall consist of No. 2 unalloyed copper wire scrap nodules, chopped or shredded, minimum 97% Copper. Maximum metal impurities not to exceed 0.50% aluminum and 1% each of other metals or insulation. Hydraulically compacted material subject to agreement between buyer and seller.

