

Mixed Metal - Level 1

- Electric Motors [Elmo]
 - **Description**
 - Electric motors are a standard item found in a scrapyards as they are used in various industrial applications and need to be replaced frequently. The most common type is alternating current (AC) with a cast-iron shell with roughly 8-10% copper recovery.
 - **Upgrade potential**
 - It is important to sort through electric motors as there are upgrades in direct current (DC) motors with a higher copper recovery. There might be other higher value items such as alternators, starters, and transformers. Removing the cast iron shell with a shear is another method to upgrade motors to a stator and rotor.
 - **ISRI definition**
 - **Elmo Mixed Electric Motors**
 - Shall consist of whole electric motors and/or dismantled electric motor parts that are primarily copper-wound. May contain some aluminum-wound material, subject to agreement between buyer and seller. No excessive steel attachments such as gear reducers, iron bases, and pumps, or loose free iron allowed. Specification not to include sealed units or cast iron compressors.



- Starters & Alternators
 - **Description**
 - Starters and alternators are common copper bearing items from vehicles. Starters come in two styles, aluminum nose and steel nose, so it is important to sort these as the aluminum nose has a higher value. Alternators are similar to aluminum nose starters in that they have an aluminum shell to them; however, they are of higher value due to their copper recovery.
 - **Upgrade potential**
 - Sorting between aluminum & steel nose starters is the main upgrade within this category.

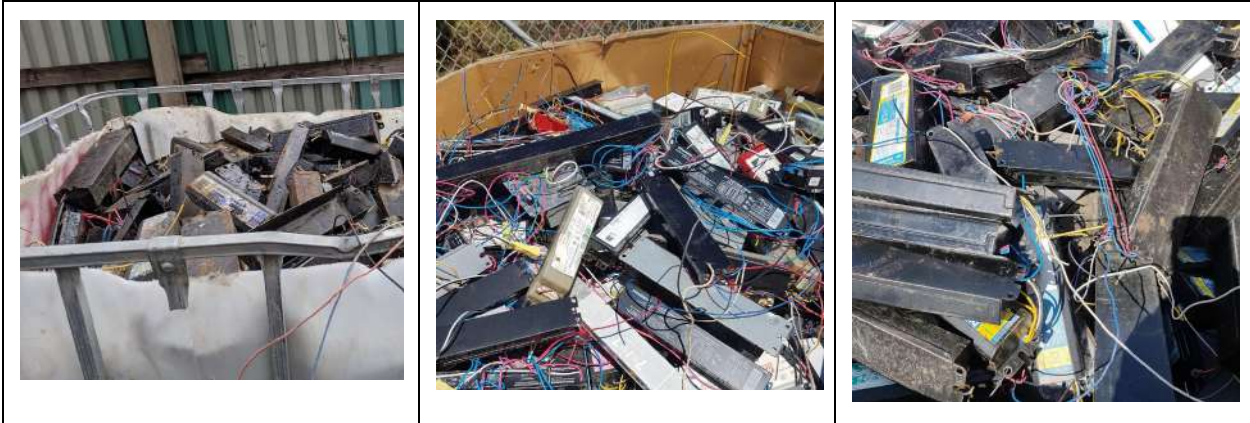


Mixed Metal - Level 2

- Transformers
 - **Description**
 - Transformers are a common scrap commodity as they often fail due to age or damage. There are three types of coils (copper, copper/aluminum, and aluminum) that differ significantly in price, so it is crucial to inspect each coil. It might be necessary to drill into each coil to ensure the metal type inside. Silicon steel sheets make up the majority of the weight in a substation transformer and represent a significant part of the value. It is important to keep these sheets in good shape as they will be re-stamped into smaller sheets.



- Ballasts [Darth]
 - **Description**
 - Ballasts are black, rectangular boxes from the inside of fluorescent light fixtures. There are two types of ballasts, copper-bearing and electronic. It is very important to sort the two types as the electronic ballasts are significantly lower value.
 - **ISRI definition**
 - **Darth Ballasts (Fluorescent)**
 - Shall consist of whole and complete fluorescent light ballasts containing copper inside. Must not contain polychlorinated biphenyls (PCB's). Electronic ballasts subject to agreement between buyer and seller.



- Sealed Units [Vader]
 - **Description**
 - Sealed units are round, black pumps that have a copper winding inside similar to an electric motor. They come from refrigerators and need to be completely drained of freon before shipping. Some scrap yards don't accept refrigerators for this reason.
 - **Upgrade potential**
 - The value in Sealed Units is the copper winding. If the case is removed or Sealed Units [Vader] are sent through a shredder, sealed units can be upgraded into Shredded Motors [Shelmo].
 - **ISRI definition**
 - **Vader Sealed Units**
 - Shall consist of whole steel-cased compressors originating from condensers from air conditioner units, freezers, refrigerators or the like, containing a motor inside. Free of hazardous materials, including chlorofluorocarbons (CFC's) or other refrigerants and polychlorinated biphenyls (PCB's). No loose iron or extra iron attachments such as framework permitted.



Mixed Metal - Level 3

- Shredded Electric Motors [Shelmo]
 - **Description**
 - Shelmo is produced when Electric motors are sent through the shredder, resulting in a copper winding without the outside steel case. Due to the loss of steel, the copper recovery increases, resulting in a higher price than electric motors.
 - **ISRI definition**
 - **Shelmo** Shredded Electric Motors (also called “shredder pickings” or “meatballs”)
 - Shall consist of mixed copper-bearing material from ferrous shredding, comprised of motors without cases. May contain up to 5 percent aluminum-wound material and may contain insulated copper harness wire, subject to agreement between buyer and seller. Trace percentages of other contaminants and fines may be present. No free iron or sealed units.

