

Metal Basics

- Scrap Metal
 - **Description**
 - Scrap metal refers to end of life goods (consumer and/or industrial). Anything made of metal or containing metal is recyclable and should be taken to the nearest scrapyards. Many metals can be recycled over and over again. Once the material is delivered to the scrapyards, it is sorted, processed, and shipped to be remelted. While it can be challenging to differentiate materials from one another, learning how to identify where an item belongs correctly is imperative to maximize profitability.

- Ferrous
 - **Description**
 - Steel and/or tin products are ferrous metals that contain iron. Iron is one of only three naturally occurring magnetic elements. The number one identifier for all ferrous commodities is that it is magnetic. Ferrous includes items such as household appliances right through to industrial structures and equipment. This metal category is bought & sold by the ton and is typically much lower value compared to Non-Ferrous metals.
 - Common categories:
 - Light Iron (Tin)
 - Heavy Melt Steel (HMS)
 - Cast Iron
 - **ISRI categories**
 - Electric Furnace Casting and Foundry Grades
 - Specially Processed Grades
 - Cast Iron Grades
 - Special Boring Grades
 - Steel From Scrap Tires
 - Railroad Ferrous Scrap

- Non-Ferrous
 - **Description**
 - The term non-ferrous refers to alloys without significant amounts of iron. Unlike ferrous material, most non-ferrous material does not stick to a magnet. Non-ferrous metals typically have a higher value than ferrous metals. They are chosen for their lightweight, conductive, and/or non-corrosive properties.
 - **Most common categories:**
 - Aluminum: *Silver/gray and very light*
 - Brass: *Yellow or reddish, found in various applications such as plumbing all the way to housing fixtures*
 - Copper: *Orange with a variety of applications from pipe to wires*
 - Insulated Wire (Aluminum & Copper): *Wire with insulation (rubber or plastic)*
 - Stainless Steel / Nickel / High-Temperature Alloys (High Temp): *Stainless Steel is similar in color to aluminum but denser due to its iron content*
 - Lead: *Very malleable and one of the densest metals*
 - Mixed Metals: *A combination of ferrous and non-ferrous metals*
 - **ISRI categories**
 - Red Metals [Copper & Brass]
 - Aluminum
 - Zinc
 - Magnesium
 - Lead
 - Nickel/Stainless/Hi Temp
 - Mixed Metals
 - Other

Operations

- Unit of Measure
 - **Description**
 - Ferrous material is weighed by the ton (as per below), while Non-Ferrous material is weighed by the pound (North America) or KG in other countries. Each type of ton is described below.
 - Net Ton (NT) or Short Ton is the USA measurement for 2,000 pounds (907.18 kg).
 - Metric ton (MT) is the most common measurement in countries outside the USA. It is 1,000 kg (2,204.6 pounds). Also often referred to as a tonne.
 - Gross ton (GT) or Long Ton is used most often in the US and is equal to 2,240 pounds (1,016.05 kg).

- Scale Types

- Description

- The scale is the most important tool in the scrap business. There are various scales used to capture weight, depending on the type of metal as per below. It is important to know if the scales are correctly calibrated, as several environmental factors can affect the scale's accuracy. The last calibration date is typically recorded on the scale indicator with a sticker.
 - Truck Scale - A truck scale is typically long enough to capture the vehicle's weight delivering the scrap metal, whether it be a passenger vehicle, pickup truck, or a semi-truck and trailer. This scale type is most common for ferrous material and non-ferrous material greater than 100 lbs.
 - Platform or floor scales - platform scales are smaller, free-standing scales placed near the point of purchase and/or loading areas that require individual package weights.
 - Mobile scales - Mobile scales are found on mobile equipment such as wheel loaders, cranes, and trucks. These scales are not as accurate as a stationary scale; however, they are beneficial when only a weight estimate is required.



- Scale Weights

- Description

- Three measurements govern the scrap business, Gross, Tare, and Net.
 - The Gross weight is the weight captured before the material being unloaded. It is the total weight of the metal, vehicle, and driver.
 - The Tare weight is recorded after the material has been dumped. The weight captured here is the vehicle and driver's weight only now that the material has been removed from the truck.
 - The Net weight is simply the Gross weight minus the Tare weight.

- Personal Protective Equipment

- Description

- Personal Protective Equipment (PPE) is a requirement in most scrapyards to varying degrees. The typical PPE range includes hard hats, earplugs, safety glasses, visvest, gloves, and steel-toe boots. Each yard will have its own specific PPE requirements, so it's important to understand the requirements before entering the yard



- Unloading in the Yard

- Description

- Once the gross weight has been recorded, the scale operator or yard employee will direct the customer/truck to dump the material. There is a clear division between the ferrous and non-ferrous area due to space and handling requirements for each commodity group. To avoid double handling, incoming material will typically be unloaded in the same area that similar material is stored and/or processed.

- Tools

- **Description**

- There are various tools required to process scrap metal; however, the following are the most basic yet most effective.

- Sensory Faculties

- Three of the five senses (sight, sound, and touch) are perhaps the most effective free tools available to distinguish between the various grades of scrap metal. For example, when looking at a shiny aluminum piece, eyesight will verify it's not copper. The more frequent contact with metals will further enhance the sensory methods of identifying metal.

- Simple questions to distinguish between metals

- What color is it?
- Is it heavy or light in weight?
- What sound does it make when it's dropped?

- Magnet

- Without question, the magnet is the most important tool outside of sensory faculties. The magnet will instantly differentiate between ferrous and non-ferrous material by sticking to the metal being tested. Every employee should carry a magnet with them as our senses can't always tell the difference between material types. A common example is a copper-coated steel. Even to the trained eye, this material would appear as copper; however, with the use of a magnet, it will become apparent it is not.
- A magnet on a chain is the best option as sometimes non-ferrous material can contain small amounts of iron, creating a slight draw off the magnet. If the magnet swings toward the material, this should indicate further testing is required.

- Grinder

- Power grinders with an abrasive disk can help identify material due to the spark created when contact is made with the metal being tested.

- Hand-Held Analyzer

- A hand-held analyzer is really a portable spectrometer that can test and display the chemical composition of any piece of metal in seconds. The surface should be ground before testing should the metal in question be coated with a different alloy and/or contaminants.

- Forklift
 - **Description**
 - A forklift is a small, powered industrial truck used to lift and move materials over short distances. The forklift's backside is a counterweight, and the front side has two tapered steel forks that can be raised and lowered. The counterweight will determine the lift capacity or the weight it can lift. Due to packaging weight limits, 5000 lbs. lift capacity forklifts are the most common.
 - Several upgrades and attachments can make the forklift more useful, such as side-shift, rotate, tilt, and fork positioner. While these all result in an additional cost, they most often result in efficiency gains, such as rotating a bin to dump out the contents rather than trying to flip it over, causing damage to it.



Scrap Yard Orientation

- Skid Steer
 - **Description**
 - A skid steer is a compact, lightweight machine that can withstand the rugged demands in the scrapyards. These small machines are typically used to handle loose material during processing and/or loading. Standard skid steer attachments are buckets, forks, shears, and grapples. Most skid steers used in a scrapyards have a 2,500 lbs lift capacity as anything heavier will be moved with a forklift.



- Material Handler
 - **Description**
 - Material handlers (also known as cranes) are either tracked or on solid rubber tires intended for vertical lifting. They have a very long reach with the combination of a boom and a stick and come standard with a cab capable of raising to see the contents of bins they're loading or unloading. These machines are often built specifically for a scrap yard and can be customized with safety glass and/or cages to protect the operator. The standard attachments in a scrap application are grapples (with 4-5 tines and varying cubic yard sizes), electro-magnets, and shears that can cut varying metal sizes.



Commercial

- Scale Tickets
 - **Description**
 - A scale ticket is a receipt given for the commodity or commodities purchased. It records the weight (Gross, Tare, Net) of each transaction along with the commodity and value.
- Weight Deductions
 - **Description**
 - In some cases, additional weight can be found on a scale ticket known as a deduction. A weight deduction is a weight subtracted from the net weight of your material. The inspector typically estimates the deduction amount. These deductions are entered due to non-metallic (dirt, garbage, wood, water) items mixed in with the delivered material.
- Purchase Price
 - **Description**
 - The purchase price is the price a scrapyard pays for each commodity. The purchase price of a commodity tends to fluctuate depending on the market value (LME, Comex) of the type of metal. Ferrous material is typically priced monthly, while non-ferrous prices change daily. Pricing can also change depending on the amount of material being delivered as a volume incentive.
- Payment
 - **Description**
 - Once weights have been captured, the material has been graded and priced; payment will be issued. There are various payment methods, such as check, cash, wire, or ATM slip. Due to a rise in metal theft, most municipalities have introduced bylaws that require government-issued ID to issue payment to an individual.
- Software
 - **Description**
 - Most scrap yards in today's business environment will use some form of the electronic operating system. Industry-specific software such as ScrapIT has helped transform the scrap business from pencil & paper to digital records. With access to digital records, scrap yards have become much more efficient, which has led to improved customer service.