



SECTION 3: Contaminants:

What They Are And Why They're An Issue

While there are numerous contaminants, those of primary concern include plastics and rubber; heavy metal objects; dirt and rocks; glass; non-UBC aluminum; other metals (e.g. copper, brass, bronze, lead); iron; and moisture. Each of these contaminants impacts the recycling process in various ways.

Plastics and Rubber Act as Uncontrollable Secondary Fuel Sources

While plastic bags, six-pack rings, PET bottles, cups, bottle caps, faucet washers and other plastic and rubber materials may look rather harmless, they represent a highly flammable fuel source looking for heat. In fact, polyethylene, the material from which plastic grocery bags are made, and rubber have a higher BTU value than coal and wood.

Plastics and rubber, because they're composed of petroleum and natural gas by-products, act as a secondary fuel source in the delacquering kiln. In small amounts, these combustibles have the potential to cause hot spots which over-oxidize the metal. When present in large amounts, they represent the potential for serious fires.

In addition to clogging scrubber systems, plastics and rubber can create emissions which must be controlled.

Heavy Metal Objects Create Deadly Missiles

Aluminum can shredders were not designed to process 12-pound shot puts, lawn mower motors, kitchen sinks or auto parts. Yet these and countless other heavy metal objects, have found their way into can bales and, in many cases, into can reclamation shredders.

Recently, a 25-pound steel object was launched from a shredder and embedded harmlessly into the ceiling of a processing plant. The potential for injury from these foreign objects present a concern for the safety and welfare of all recycling employees.

Dirt and Rocks Create Inefficient Operations

Excessive amounts of dirt, rocks and plaster can affect the chemistry of the melt and decrease operational efficiency. These contaminants contain calcium, sodium and silicon. When in the melt, they are difficult to remove and high rates of prime metal may have to be added to bring the metal within specifications. This process is not only time-consuming, it is also expensive and wastes valuable natural resources.

Every pound of dirt creates two pounds of dross or skim -- the collection of impurities which float to the top of the molten metal and must be removed. Half of the skim being removed is aluminum, representing another loss of valuable material.

Dirt and rocks also increase maintenance costs. The dust they produce clogs UBC reclamation plant air pollution control equipment. Rocks can also break expensive molten metal pumps.

As more and more communities develop curbside recycling programs, problems related to glass shards are on the rise. Glass is an issue in the recycling process because it contains silica which upsets the chemistry of the melt. Just four pounds of silica can bring 40,000 pounds of metal "off-target." A typical glass beer bottle is 70 to 75 percent silica.

Contrary to popular opinion, all aluminum is not the same. There are different alloys used to produce a variety of properties. Some alloys are designed for strength. Others provide greater formability or corrosion resistance. *The alloy used to produce aluminum can sheet, for example, is a precise mixture which includes primarily manganese and magnesium.*

Other aluminum products such as extrusions or castings all contain their own special alloy mixtures. Some may contain high levels of iron or silicon which in turn can affect the chemistry of the UBC melt. Some aluminum materials such as foil clog the grates in crushers and significantly reduces their efficiency.

So despite the fact that a product may be aluminum and recyclable, it cannot be recycled with UBCs.

Copper, brass, bronze, lead and other non-ferrous metals, even in extremely small amounts, represent significant sources of contamination. Customers should be encouraged to remove all copper, bronze and brass for two reasons. First, certain copper alloys such as brass and bronze may contain lead. Second, these metals can offer a higher value when sold separately.

The lead content in packaging is carefully monitored by all aluminum producers to ensure compliance with strict controls issued by federal and state governments. Every effort must be made to ensure that lead is removed. Please refer to Addendum B for additional information.

Iron

Stray iron and steel objects are the easiest contaminants to remove. *The use of magnetic systems and proper monitoring can effectively eliminate most iron and steel objects.* Eliminating iron is critical to manufacturing new cans.

Moisture

A drop here, a drop there. Moisture adds up quickly and can have a negative impact on processing operations because it acts as a magnet for dirt. It also takes more fuel to process wet cans than dry ones, thus increasing the cost of the raw material. *And contrary to popular belief, moisture is not "squeezed out," but trapped, when cans are crushed or densified.*

Summary

Each of the contaminants listed above affects the recycling process in its own particular way. Some can potentially affect health and safety, others affect metal quality and still others increase costs. Regardless of the nature of their impact, these contaminants must be eliminated before they reach the can reclamation mill.



19

Scrap Aluminum Quality Rating Guidelines

Form Metal

Pass/Fail Criteria

The following categories are not represented in the overall quality grade. These categories will be graded on a Pass/Fail method. Listed below are descriptions for each category that would result in immediate rejection.

Safety	The following violations would result in immediate disqualification: Live ammunition, Explosives, Gasoline, Propane bottles, Hypodermic Needles/syringes, Radioactive material, Medical waste, Batteries, Fertilizers, Intact Aerosol cans, Butane Lighters, Free lead, Unidentifiable materials.
---------------	---

Moisture	Ice or snow covering or embedded in the load. Excessive water flowing out of rear doors when opened.
-----------------	--

Glass	Heavy concentrations of glass in the load.
--------------	--

Non-UBC Aluminum	Concentrations of castings, auto trim, siding sheet, tubing, foil, pie pans in the load.
-------------------------	--

Unloading	Any load that might pose a threat to the safety of Alcoa personnel, or damage the trailer or unloading equipment should unloading be attempted. Load that does not meet the proper clearances or load pattern.
------------------	--

Bale Integrity	Extremely low density, excessive flaking, dimensions that do not meet ALCOA's UBC specifications or broken bands throughout the load. Cardboard, wood, or siding used as bale sides or plastic overwrap on bales.
-----------------------	---

Scrap Aluminum Quality Rating Guidelines

Form Metal

Dirt

Dirt description: There are many different types of dirt. This category includes sand, soil, rocks, dust, and mud.

Excessive amounts of dirt, rocks and plaster can affect the chemistry of the melt and decrease operational efficiency. These contaminants contain calcium, sodium and silicon. When in the melt, they are difficult to remove and high rates of prime metal may have to be added to bring the metal within specifications. This process is not only time-consuming, it is also expensive and wastes valuable natural resources.

Every pound of dirt creates two pounds of dross or skim -- the collection of impurities which float to the top of the molten metal and must be removed. Half of the skim being removed is aluminum, representing another loss of valuable material.

Dirt and rocks also increase maintenance costs. The dust they produce clogs UBC reclamation plant air pollution control equipment. Rocks can also break expensive molten metal pumps.

Grading of dirt is to be done on an entire load basis because one bale is not representative of the load due to the variations that can exist within a load.

4	Relatively clean cans, no suspended dirt, no surface dirt, some dust visible throughout the load.
3	Traces of surface dirt on cans throughout the load.
2	Light concentration of embedded dirt, <i>or</i> light to medium surface dirt throughout the load.
1	Isolated concentrations of embedded dirt <i>or</i> heavy surface dirt throughout the load.
0 - Rejection	Heavy concentrations of embedded dirt throughout the load.

Scrap Aluminum Quality Guidelines

Form Metal

Combustibles

Combustibles description: Paper, plastic, cardboard, wood, rubber, oil, grease, etc.

Combustibles in a load become an unwanted fuel source during the UBC delacquering process. The combustible material catches fire and creates an overheated condition in the oven. In extreme cases the heat becomes so intense that it causes the magnesium in the can ends to catch on fire. The magnesium fire will actually melt through the stainless steel pans of the delacquering oven, causing significant downtime and repair costs.

Grading of combustibles is to be done on a bale- by- bale basis because of the potential problems in the delaq process. It is important to recognize the difference between heavy gauge plastic (i.e.: PET containers, milk jugs, bottles, food containers or lids, or bottle caps) v. Light gauge plastic (i.e.: plastic bags) v. Wood pulp products (i.e.: paper, cardboard, and wood).

4	Trace amounts of paper, cardboard, or plastic bags <i>or</i> a few bales/bundles containing one PET container with the balance free of PET.
----------	---

3	Light concentrations of paper, cardboard, or plastic bags <i>with no more than one</i> PET container visible per bale/bundle .
----------	---

2	Light concentrations of paper, cardboard, or plastic bags <i>with no more than three</i> PET container visible per bale/bundle .
----------	---

1	Medium concentrations of paper, cardboard, or plastic bags <i>or no more than six</i> PET containers visible per bale/bundle .
----------	---

0 - Rejection	Heavy concentrations of paper, cardboard, or plastic bags <i>or more than six</i> PET containers visible in any one bale/bundle .
----------------------	--

Scrap Aluminum Quality Rating Guidelines

Form Metal

Other Metallics

Other Metallics description: All metals other than aluminum such as steel, lead, copper, brass, etc.

Note: Excessive levels of steel indicate the supplier's screening process is not functioning properly due to poor magnetic separation or total absence of magnetic separation. Any shipment that indicates a total lack of magnetic separation (e.g. over .50% mag fallout) will result in immediate disqualification. Brass can contain up to five to seven percent lead and should be rated as a more severe contaminant.

Grading of other metallics is to be done on an entire load basis because one bale is not representative of the load due to the variations that can exist within a load.

4	Total absence of any other metals throughout the load.
3	Trace amount of steel cans, copper tubing or small tramp steel throughout the load.
2	Light amount of steel cans, copper tubing or small tramp steel throughout the load.
1	Medium amount of steel cans, copper tubing, small tramp steel, or any amount of brass or steel castings throughout the load.
0 - Rejection	Heavy amount of steel cans, copper tubing, small tramp steel, brass or steel castings throughout the load or any free lead or batteries.