GUIDE TO ASSAY Get the most from your converters with a process you can trust.







How Successful Recyclers Can Get More for their Converters

In converter recycling, the best recyclers know their numbers and partner with companies that educate. Knowing key metrics about your converter loads safeguards you against misleading key metrics, like your average price per unit, and increases your bottom line.

Every recycler looks at his or her average converter price. It's an easy metric to track but an even easier number to get wrong if you didn't get an accurate whole-body count before you shipped. You would be surprised how many recyclers consider the average sales price as gospel, but do not take the time to count their load before selling it. Relying on your processor to count for you could be costing you.

The average unit price is just one of many key metrics when it comes to converter recycling. There are many more. Each key metric affects your profits and how you view and choose your processing company. Unfortunately, it is very easy to be misled in converter recycling.

To avoid common pitfalls in converter recycling, we suggest the following actions.

Know your count before you sell. Train a key person to count and inspect the converters before you package them up. Teach him or her the difference between the ceramic and metallic (foil/wire) converters. And if you are selling on assay recovery, send in the empties if they have just a little catalyst in them. A good processor will cut those and add that material. Also, if it's genuinely empty, you and the processor will both agree that it is. Become an educated seller. Work with a company that believes in educating you about your loads. A good company will not hesitate to explain your invoice and how the numbers are derived. With selling on assay recovery, your results can be verified. That's the beauty of the program. However, as with all science and commodity sales, we are taking something complex and simplifying it for ease. This lack of uniformity across companies that process and refine, makes you an easy target for skimming weight, actual value, and YOUR profits.

Audit your program. Become a data junkie. Learn all the key metrics to avoid misleading data, like your average converter price, and track true sales. You will be amazed as you gain data points, how easy it is to get misled.

At United Catalyst Corporation, we educate recyclers every day. Stephen R. Covey once said, "If the ladder is not leaning against the right wall, every step we take just gets us to the wrong place faster." We believe data doesn't lie IF you know how it was derived and how to interpret it.



Understanding the Importance of Weights

In converter recycling, the best recyclers know their numbers and partner with companies that educate. We encourage our customers to sell converters on assay, the verified analysis of the precious metal contained in the converters less the customary recycling costs. You want to use a scientific method because it is reliable and can be validated. By selling on the assay method and understanding key metrics, it is less likely that you will leave money on the table.

In the first article of this series, *Getting the Most from Your Converters with A Process You Can Trust*, we emphasized **Know Your Numbers**. We strongly advise our customers to know their count before they sell. Train a key person to count and inspect the converters before they are packaged up. Teach him or her the difference between the ceramic and metallic (foil/wire) converters. Without an accurate ceramic, metallic, empty, and DPF count it is impossible to know key bottom-line metrics like a true price per unit, price per pound, and average weight per unit. Like with selling whole units, these are areas that can contribute to misleading information and lost revenue.

In this article, we want to discuss why it is necessary to your bottom line to **Understand the Importance of Weights**. Next to knowing your unit count, the second most important aspect of selling converters is understanding the importance of weights. If you're missing weight, you're missing money.

When you sell converters by the piece, you are at the mercy of the grade and the count being accurate and the price being fair. A slight of hand in any of these areas creates lost revenue. When you sell converters by the assay method, the same is true of the count, weight, and price. If you are going to get paid on the intrinsic value of the precious metal inside the converter, you want credit for everything.

If you want to know how much money you are really making every time you sell, you must learn your true price per unit, price per pound, and average weight per unit. For those three metrics to be accurate, the burden is on you to know your count and weights and hold the converter recycling company that recycles for you accountable.

Track your shipping and arrival weight. If you want a good ending result, i.e. maximum value, you need to agree on a beginning weight. When you receive a delivery confirmation notice from the company processing your converters make sure that the weight you shipped is very close to the weight that arrived.



In converter recycling, the best recyclers are partnering with companies that educate. We encourage our customers to sell on assay. But what is an assay and how do you make sense of it? In this, the third installation of our series, *Getting the Most from Your Converters with A Process You Can Trust*, we are going to discuss, *Making Sense of the Assay Report and Final Invoice.*

What is an Assay? Simply put, an assay is a test report. It is an investigative, analytic procedure that measures the content or quality of a metal or ore. An assay is performed in a qualified laboratory with samples that have been accurately collected and represent the composition of the entire load. Since this is the basis of payment, accuracy and methodology count significantly. Therefore, how the sample is created, where the assay is performed, by whom, and by what methods, matters greatly. The process for the platinum group metals (PGMs) contained in auto catalyst, platinum (Pt), palladium (Pd), and rhodium (Rh) requires a combination of methods. A preliminary test using X-ray fluorescence (XRF) can get fairly close (+/- 5 to 10%) but that is not considered accurate enough for settlement. Fire assay or cupellation is the most exact method to collect the metals from the sample into a lead button followed by inductively coupled plasma (ICP) spectrometry and an atomic absorption (AA) finish. When done independently, at a vetted lab, you can understand why this plus de-canning, milling, and sampling takes time, 30-45 days in most instances.

Look closely at the assay report. The assay report should have several components that tie out. First, the weight reconciliation. In the first article in the series we discussed the importance of knowing your numbers before you ship: the ceramic, metallic foil, empty, and DPF count which make up the total whole units in the load. The assay report will likely be just the weight of the ceramic units after de-canning, milling, and sampling. You should see at least three weights: gross (after de-canning), net wet (after milling with any inert or trash removed), and net dry (after the moisture has been determined and the weight of the sample is subtracted). Next, you will see the test results of the assay in the form of parts per million (PPMs). The net dry weight multiplied by the parts per million for each metal will give you the contained ounces (100%). Actually the formula is: Contained troy ounces = ((net dry lbs. x PPM/1,000,000)*14.5833)). No one keeps 100% of the contained metal. Typically, the returnable ounces are somewhere around the high nineties for Pt and Pd and the high eighties/low nineties for Rh since it is the harder metal to extract. Formally, this is the contractual metal return rate. In addition to the contractual metal return rate, there is the date that the metal comes out of the refinery which is the metal due date, somewhere around 12 weeks after arrival. Typically, you are actually getting paid early on the results of the sample that has been assayed less the recycling and refining costs. By taking the payment when the assay is final and before the metal becomes due, there are interest or finance charges often included in the final settlement amount.

Understand the final invoice. The final invoice should clearly show the returnable ounces of each metal due you, the price for each metal, and the date the metals were sold. This creates the total metal value for the invoice. (Please note the metal price will be discounted from the published price of bullion. The reason for the discount is that you are selling industrial grade precious metal, called sponge, versus the investment grade precious metal, called bullion or ingot.) Normally, you can hedge or price the metal at any time 2 weeks prior to arrival at your processor and up to the metal due date, 12 weeks post arrival at the end refiner. You will receive the total metal value less the customary recycling costs.

Recycling costs include everything done to the scrap catalytic converter to turn it into precious metal for reuse. The charges can be combined into one charge or be itemized depending on how the recycling company chooses to report it. The charges may include, but are not limited to, de-canning, milling, weighing, sampling, assaying, treatment or smelting, refining, and interest charges. Much like the price tag on any consumer or durable good, the cost of the good is not itemized. As a rule of thumb, you can estimate that a ceramic converter costs approximately 10 – 12 percent to recycle and a metallic foil converter 12 – 15 percent.

Pick your recycling partner carefully. To reiterate the major point of this series of articles, you can get the most from your converters with a process you can trust. Assay-based selling offers you this opportunity to participate directly in the recycling and refining process to maximize your bottom line. Again, the best recyclers partner with companies that educate. It is possible with assay-based selling as with selling by the piece, to introduce layers of companies that make margin on you. When you know your numbers before you sell, understand the importance of weights, make sense of the assay report and final invoice, learn to track your key metrics, and pick a reliable partner, you will be far less likely to fall prey to unethical trade practices and leave money on the table.



The Scoop on Interest & Metal Price Discounts

In converter recycling, the best recyclers are partnering with companies that educate. We encourage our customers to sell on assay, the analytic procedure that measures the content or quality of a metal or ore contained in the catalytic converters. In this, the fourth installation of our series, **Getting the Most from Your Converters with A Process You Can Trust**, we are going to discuss, **The Scoop on Interest and Metal Price Discounts.**

In the first article of this series, Getting the Most from Your Converters with A Process You Can Trust, we emphasized Know Your Numbers. We strongly advise our customers to know their count before they sell. If you don't have an accurate unit count, you won't know your true average. In the second article, we discussed why it is necessary to your bottom line to Understand the Importance of Weights. If you're missing weight during processing, you're missing money. In the third article we explored Making Sense of the Assay Report and Final Invoice. Both can look like mumbo-jumbo, but when you understand what should be on them, you are less likely to fall prey to any unethical practices and leave money on the table.

Assay reports and final invoices are complex no matter how they are reported to you. Interest and metal price discounts only add to their complexity.

What is interest? Why do some companies charge interest and others don't? The bottom line in refining converters is that you are getting paid on the assay result of the sample which of typically takes 3 to 5 weeks; but the **physical**

metal is not available for approximately 10 to 12 weeks which is called the **metal out turn date**. Therefore, any time you take a payment before the metal out turn date, there is interest. Basically, the refiner sells its metal early to make a payment for your metal which is not yet available. For this reason, the refiner charges you a simple interest amount on the number of days you use the metal and money before the metal out turn date. For example: \$80,000 x .06 / 360 = \$13.33 / day interest. \$13.33 x 90 days = \$1,200.00. The bottom line is that whether a company shows the interest on your invoice or not, it exists. And if you need the payment to buy more cars or pay overhead, it is just a costdoing business. The increased margin you are realizing by selling on assay should help make up for any interest charges. If you do not need the payment right away, you can save the interest by waiting to take payment until metal out turn date.

If I wait to take payment will I be exposed to market price fluctuation? The answer is no. If you choose not to take an advance payment, with most companies, you can still hedge (lockin) your metal prices even before you take any money. In this way, you have guaranteed your price against a downward market, but, likewise, you have also limited yourself against gains in an upward market. Remaining open, or playing the market, is considered speculating and should be a strategy only if you can afford to lose. Otherwise, locking in your metal prices, and continuous selling into the market when you ship, is risk neutral and resembles dollar-cost averaging in investing.

Why is the metal price on my invoice not the same as the price I see on the internet? The price you see published on the internet is the buy and sell price for investment grade metal or **bullion**. When you recycle scrap catalytic converters on assay and refining terms, you produce an industrial grade of precious metal known as **sponge**. This form of precious metal is sold back into the market place to make fresh applications. Precious metal in this form is discounted when it is sold. It is important for you to ask your processor how much they are discounting each metal on average so that you can track the price. Several factors can affect this discount. Because you are selling metal at a date in the future, your price is likely based on a futures price versus a spot (immediate cash) price. Expect the discount for Rhodium to be

significantly more than Platinum or Palladium for two reasons: it is in shorter supply, and it has a miniscule trading volume. Often the price quoted for Rhodium is spot or whatever the refiner or trading desk can get for the metal that day versus a futures contract.

Selling on assay with refining terms is the best way to recycle scrap catalytic converters. In fact, it is the only way to recycle a converter. It happens once it leaves your facility whether you sell it this way or not. Learning the way assay and refining works and how to avoid unethical trading practices takes time, but if done properly with a reliable recycling partner, yields much greater value. Get the most from your converters with a process you can trust.

