

MANAGING PRECIOUS METAL VOLATILITY IN BRAZING ALLOYS

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A review of metals management strategy and an audit to reduce consumption are paramount for risk analysis and cost mitigation for users of precious metal braze alloys



The increased demand from emerging markets such as China and India, along with large investors who stockpile bullion, is driving the precious metals market.

In the last decade, gold and silver prices have risen to unprecedented levels, and on April 28, 2011, reached an all-time high of \$49.76 per troy ounce (t oz) for silver and \$1907/t oz for gold — Figs. 1, 2. While the price of both has recently subsided, the rising cost of precious metals is creating chaos in industrial markets including the brazing and soldering industries. Companies

needing silver and gold alloys to produce their products need a plan for how to manage the volatility and work with their suppliers to mitigate risk and market exposure, and to stabilize costs.

The Demand for Precious Metals

The driving forces behind the exces-

sive growth of precious metals is increased demand from emerging markets such as China and India, and from large investors who have created funds that hold large stockpiles of bullion. One of the largest is the SPDR ETF gold fund, which holds an estimated 39 million troy ounces of gold. An Exchange Traded Fund (ETF) is a way for private investors to purchase (and sell) gold

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Fig. 1 — The cost of gold over a five-year period from May 2007 to May 2012.

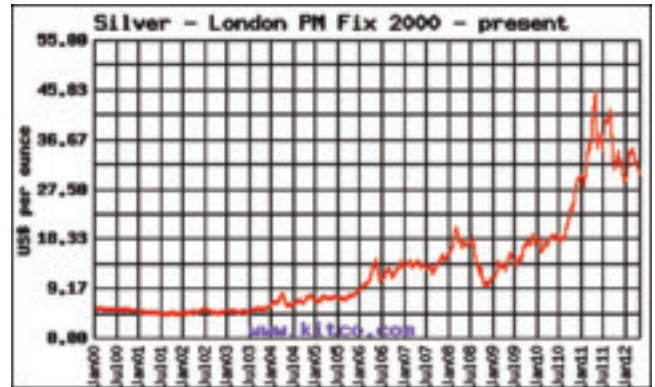


Fig. 2 — The cost of silver from January 2000 to the present.

without physically taking possession. Unlike manufacturers, this “paper” transaction still acts as a gold sale (or buy) but without the physical movement of the bullion itself. This allows large institutions to easily take both long and short positions in gold and silver. The creation of these types of funds has driven the demand — some economists claim it’s an artificial demand — for bullion as the “investment” and not actual demand or consumption. The ETF, however, does need to have the bullion in its possession in order to sell it, creating a physical shortage in the market.

Another primary driver of the increase in demand for precious metals is the rise in wealth in emerging growth nations like China and India with their newly created middle classes possessing disposable income. Gold and silver are being consumed at staggering rates in these countries mainly in karat jewelry and bullion coins. These two countries alone consume 75% of the newly mined gold every year — in excess of 600 tons of gold per year. This leaves little to no capacity for others to increase their output, thus creating a basic economic demand curve that increases cost. While many other factors determine the market price, the demand for physical bullion over the last decade has grown at an average rate of 12% per year. This, along

with the historical background as a safe haven from economic turmoil, has put gold and silver on a ten-year bull run.

Uses in Brazing and Soldering

Both gold and silver are used in brazing alloys primarily because of their metallurgical properties. They are critical in the diffusion process to create a ductile hermetic joint that is stronger than the base metals they are joining. There are many other industrial applications using precious metals including medical devices, automobile catalysts, electronic sensors, mining tools, and dental apparatus. The total consumption of silver from industrial users was more than 500 million t oz in 2011 with a year over year increase of 9%. This usage continues to grow even as companies convert to substitute products and changes in technology eliminates markets like the photographic film industry, which at one time was the world’s second-largest consumer of silver. Some of the reasons these alloys are in such demand is their electrical conductivity properties, forming capabilities, ability to be accepted within the human body, resistance to oxidation, and their ability to be radiopaque (seen under X-ray).

The Changing Market

Recently, there has been a significant pull-back in the precious metals markets, and it gives notice that volatility and turmoil will be the only constant in the commodities markets. One bullion trader was quoted recently as saying, “The market takes the stairs going up and the elevator going down.” This volatility causes even the most seasoned veterans to question their buying patterns.

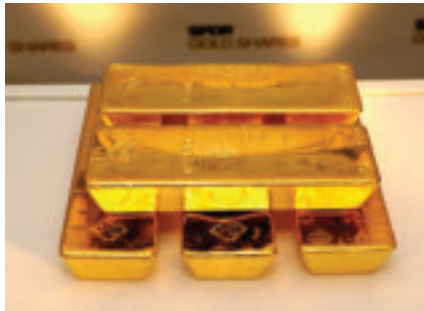
You may remember the Hunt brothers, who in the 1980s tried to corner the silver market by buying tens of millions of ounces of silver. They drove the price above \$50/t oz only to watch it come crashing back down to below \$3.50/t oz after it seemed every piece of grandma’s cutlery and Indian nickel was being cashed in to the refiners. A similar “gold rush” has occurred recently with hundreds of cash-for-gold outlets opening up in most neighborhood strip malls.

While all signs are pointing toward a rising market, there are economists who take an opposite position regarding the current price points. One of the primary arguments is that precious metals can be recovered, and the amount of refined gold and silver is more than three times what is taken out of the ground. Once discovered, gold and silver never leave;

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Fig. 3 — Many countries, including the United States, have vast stockpiles of gold and silver bullion that could be sold on the open market, thus affecting pricing.

Fig. 4 — Brazing preforms, such as the parts shown here, can reduce consumption by up to 75% from traditional methods.



they continue to be recycled and refined, to be reused over and over again. For instance, the same gold worn in Egyptian times could be in your computer processor. With both gold and silver mining technologies becoming more efficient, and new advancements occurring in refining and recovery processes, more bullion is entering the market to meet the increased demand. In addition, many countries, the United States being the largest, have vast stockpiles of bullion in reserves — Fig. 3. Libya, for example, possessed nearly 3.2 million troy ounces of gold bullion when the government was overthrown. At any time, these governments could sell their reserves on the open market.

Reducing Costs

This “new normal” doesn’t make purchasing brazing alloys any easier. Buyers having to meet their purchasing price variance from one buying cycle to the next are under constant strain to reduce or maintain their pricing structures. The price of Bag-7 (56% silver) wire five years ago cost \$7.44/t oz; today, the same material costs \$18.68/t oz. When silver was at its peak, it was selling at \$30.50/t oz. This leaves purchasing departments and financial forecasting sailing in very rough seas.

Many in our industry need to absorb the rising costs and combat the volatility along with the challenge of trying to pass the additional costs on to their customers. This is extremely difficult for firms who have offered firm pricing, long-term agreements, or have not yet built the items they have already sold. Some have resorted to buying large

quantities (a year’s worth or more) to try and fix the price. Most firms find this to be extremely difficult due to cash-flow constraints, inventory management, and the ever-present fear of the price rapidly declining.

Some brazing manufacturers have created ways to mitigate the volatility and risk by offering bullion programs that can “fix” pricing at the time of order and offer firm pricing over several months. Most firms who take advantage of these firm price programs are also locked into agreements with their customers. Others have to offer “catalog” pricing that is fixed prior to production. They have no escalation clauses where they can capture lost margins due to market increases, and with many firms facing ever more competitive environments, locking in profits becomes a necessity.

Many braze alloy manufacturers have the ability and the resources to offer such programs, which do vary among suppliers. The best (forward thinking) suppliers offer the most dynamic programs, including firm pricing for up to one year, metal pool accounts, advanced bullion purchases, supplier-owned inventory (consignment), and precious metal recovery programs to capture precious metals within the value-stream and offer cost stabilization. Many firms perform “braze audits” and become modern-day treasure hunters, seeking out any reclaimable precious metal scrap materials. In the manufacturing environment, there are many areas where scrap precious metals can be recovered. This includes spent paste syringes, rejected brazed components, unused preforms, webbing from cut or stamped parts, obso-

lete inventory, floor sweeps, and braze drips. All of these examples can reduce your overall cost by applying the proceeds from precious metals reclamation.

Another way to reduce cost is to convert to a braze filler metal containing less precious metal. There are several hundred common alloys to choose from and, if warranted, a custom alloy can be developed. There are challenges in converting to a new alloy mainly due to melting temperature changes and alloy flow characteristics. In most cases, the more you lower your precious metal percentage, the more difficult brazing becomes.

One final consideration in reducing cost is to limit your alloy consumption. This can be done by converting to a brazing preform — Fig. 4. A preformed shape is designed to meet the exact requirements of your component. Either in a formed ring or a stamped washer (or similar), an infinite amount of specifically made shapes and sizes can be produced to meet your specifications. A preform allows you to calculate your exact cost per part as well as provide better inventory management. Preforms are designed to give the right amount of alloy to the joint interface. Most torch brazing operations using rods or wire exceed the joint requirement by 75%.

A thorough review of your metals management strategy and a braze audit to reduce consumption are paramount for risk analysis and cost mitigation if you are a user of precious metal braze alloys. Seeking support from your braze supplier and investigating alternative programs will allow you to evaluate your needs and options toward building a successful strategy. ♦