

Sometimes It's the Steel

Sometimes it can be the steel. Frustratingly, because it came in exactly as you asked. Ask better.



Miles Free III
Director of Industry Affairs

I have been working in the steel and manufacturing industry for 49 years. I started out as a laborer in the blast furnace department right out of high school and I worked in the steel mills full time as I went to college full time. I might or might not have been full time distracted by other things in those college days as well.

As my career developed, I increasingly became more involved with customer service and problem-solving, where the first claim to be made by our customers was that "It must be the steel. There are hard spots in it." (Actually, there were none to be found.)

"It must be the steel, it only cracks at this one place on our part." (And just how is it that we know how to put a flaw at exactly that one place on every length of steel in that exact spot for each part in the miles and miles of steel that we made of that size and grade? And then gave it only to you?)

"Your steel is burning up our tools on this one machine- it must be the steel." (But that same steel is running successfully on four other machines and across three shifts but it is only failing on this one machine and destroying tools only on this one shift? Hmmm, let me think about that.)

"Your steel changed over the weekend and now we can't get it to hold size." (The experienced operator went on vacation and his replacement hadn't even been confirmed to use mic's with a Gage R&R)

Handling these types of complaints was not that difficult — there is a certain logic that fails in the complaint, and besides, I had complete confidence in the steel. I not only knew every step of the processes that made it, but I had also supervised the lab testing and reporting.

But occasionally, we would encounter a claim where there was clearly a difference in performance of steels that were by all accounts of equal quality and provision, but somehow, there was a difference that impacted its processability.

Know the Supplier

My first involvement with one of these was as a cold finisher. We could buy the hot roll steel we needed for cold drawing from a major integrated mill like USS Steel Lorain or Inland Steel. These mills had Basic Oxygen Furnace (BOF) meltshops, and at the time were ingot casting. At the time it was called "hot melt," as hot molten blast furnace iron was the basis for the steelmaking charge.

The other option that we had was to buy the hot roll steel from one of the new mini-mill operations that were springing up around the country.

These shops just re-melted scrap, so the steel had higher residuals, and because it wasn't BOF, it ran higher in nitrogen. (In the BOF process, all atmospheric nitrogen is displaced by all of the oxygen blown into the vessel). This scrap fed electric furnace continuous caster steel was called "cold melt."

Can you see where this is going? In an effort to save costs, the buyer asked us to give him half a truckload of the "good stuff" (hot melt) and fill the rest of the truck with the cold melt. The savings between the two would look great on his bottom line.

The job was the swivel shaft used in office chairs that had a section which was created with a form tool and then a very heavy square formed thread. They set the machine up using the hot melt and everybody was happy. Then they set up the second machine — using the same feed speed depth of cut- to make the identical



Photo courtesy of Ryan Kutz

part using the cold melt. Couldn't get a part in two shifts of trying. Clearly, there was a difference in the steel. BUT THE STEEL MET EVERY ORDER REQUIREMENT FOR CHEMISTRY, DIMENSION, AND PROCESS. Both materials came from my company, my plant, had my blue bands and clips packaging, and were certified to ASTM A 29 and to chemistry. Both were exactly what was ordered.

But there was a difference in the ultimate sourcing and process that produced the steel itself. Sourcing and processing differences REALLY MATTER!

Getting What You Asked For

Recently, A PMPA member asked me to look at two certs for the same grade of steel. The sizes of the items purchased were different, but otherwise they were ordered to the same grade and spec. They came from the same service center, who bought them from the same cold finisher. The member didn't tell me which steel was "good" and which was "bad," just two certs. It was pretty easy to figure out which was the "bad" steel when looking at the test reports, even though the chemistries were virtually identical. The cold finisher had sourced the two batches from different melt shops, and the hardness mechanical testing results from one of the heats and other cert information from both heats made it pretty easy to figure out that one item had in fact been cold drawn. The other had been "cold finished" — i.e. turned and polished leaving it in a gummy state as no cold work had been done to the steel.

Both items were compliant with the requirements to which they were ordered, but one item was cold finished, not cold drawn. There were some other factors that also contributed to issues that I won't get into here. In the end, yes it can be the steel. But, as both of these cases show, that problematic steel was provided EXACTLY HOW YOU ASKED FOR IT AND ACCEPTED IT.

The Bottom Line

You need to be quite specific about what you expect the steel that you machine to be. Cold finished can mean cold drawn, cold drawn turned and polished, turned and polished, or various other special finishes. Cold drawing adds mechanical properties that help make the chip 'crisper' and easier to make. A single supplier to you could have multiple suppliers to them for the same grade and size. Be specific on what you order and just as careful on reviewing certs and test reports. Because, yes, once in a while, it can be the steel, and that steel was provided "Just as you asked for it to be." Ask better. **PMPA**

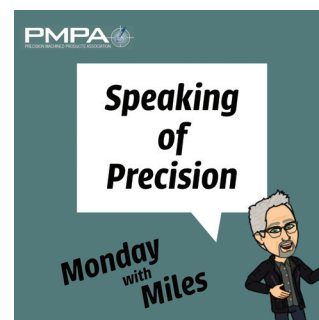
Miles Free III is the PMPA Director of Industry Affairs with over 40 years of experience in the areas of manufacturing, quality, and steelmaking. He helps answer "How?," "With what?" and "Really?" Miles' blog is at pmpaspeakingofprecision.com; email: mfree@pmpa.org; website: pmpa.org.



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A Peek Behind the Curtain

For the MPMA members (or non-members) who wonder how things get done at MPMA National, here is a little peek behind the curtain.



During our spring online MPMA Town Hall, Tom Bernstein from Torin Products wanted to know what was on my wall behind me. (They were session sheets for planning our National Technical Conference.) He said, "To the members who even think about how things are pulled off, the staff at MPMA are sort of like behind the curtain in the *Wizard of Oz* movie." So here is a peek behind the curtain. [MPMA](#)



Cate Smith working on the 2020-2021 budget. She makes sure that we are good stewards of our money and keeps the strategic plan on track to provide valuable, consierge service to our members.



Joe Jackson is in the MPMA studio serving as audio engineer for *Speaking of Precision* — Monday with Miles podcasts. He edits out the bloopers and makes us sound good!



Miles Free and I celebrating another successful podcast recording in the MPMA studio. Podcasts are usually recorded on Thursday and released on Monday unless there is an urgent update that needs to get out. We also started a Mailbag edition where I ask Miles questions to see if he can answer them.



Renee Merker is working the phones planning a valuable and fun Annual Meeting being held at the Big Cedar Lodge in Branson, MO in October.



Veronica Durden loves to shop and knows how to find a deal! She puts her skills to good use by finding all the swag for our meetings and conferences.

Carli Kistler-Miller, MBA has over 20 years of experience with communications, event/meeting planning, marketing, writing, and operations. Email cmiller@mpma.org.

Working Smarter, Not Harder

Geoff Dawson from PMPA member FANUC America talks about their history, how robots have enhanced the workspace, and about their latest automation family.

FANUC

PMPA: What is a brief history of FANUC America?

Geoff Dawson: FANUC Robotics was established in 1982 as a joint venture between General Motors and FANUC Corporation of Japan. In the early 1990's, FANUC Robotics became a wholly owned subsidiary of FANUC. In 2013, FANUC CNC and FANUC Robotics merged and became FANUC America Corporation. The company's three product families are robotics, ROBOMACHINES and CNC controls, motors and motion platforms.

PMPA: How does FANUC serve the machine industry?

GD: Our focus for the machining industry is on automation and small machines that can serve high mix/low volume. High mix/low volume has always been there, but we are seeing a larger need. Our ROBODRILL (automated machining for more versatile milling, drilling and tapping) and ROBONANO (high precision and high accuracy) benefit the industry. And our controls too — 50% or more of the world's machines have FANUC controls on them.

PMPA: How have you seen robots and automation affect the workforce?

GD: Today, robots and automation allow employees to run the equipment instead of doing the process by hand. The robots can do the dull and dirty jobs while skilled employees manage the automation.

For example, rather than actually doing the machine load/unload, an employee can operate several stations. Owners are looking at the efficiency pickup by putting automation in front of a machine, improving their spindle utilization and then giving the workforce a higher value job.

FANUC is focused on helping to create a skilled workforce through our certified education program where we work with colleges and high schools. Currently, FANUC works with over 1,000 educational institutions throughout the Americas, and that number is growing at a fast pace.

PMPA: What is the CRX robot family?

GD: The CRX robot is our latest collaborative robot designed to make installing and programming robots easier than ever before. We have been offering collaborative robots for about six years. Collaborative robots move a little slower and have power and force limited safeguards in place so they can work side-by-side with a person. If the robots contact or run into something, they stop.

The real focus is ease-of-use. If there is a group of CNC operators, but they have never touched a robot, we want to make it as easy as possible for them to use a robot without having to know programming. Our CRX is a drag and drop program on the interface — when the operator wants to teach a point, it can be dragged and dropped on the time line. But they can also teach the robot by moving it to the position they want. We wanted to find a way to help smaller companies overcome any challenges related to integrating robots and automation. The CRX robot family is affordable and easy to integrate and use — all key factors for small shops looking to increase their competitive position in the market.

PMPA: What is QSSR?

GD: QSSR stands for Quick and Simple Startup to Robotization. That's an interface to make it simple to connect a FANUC robot to a ROBODRILL or any FANUC CNC machine. It's plug and play. The whole idea is to make it easy to use and easy to own for life.

PMPA: How does FANUC make it easy to own?

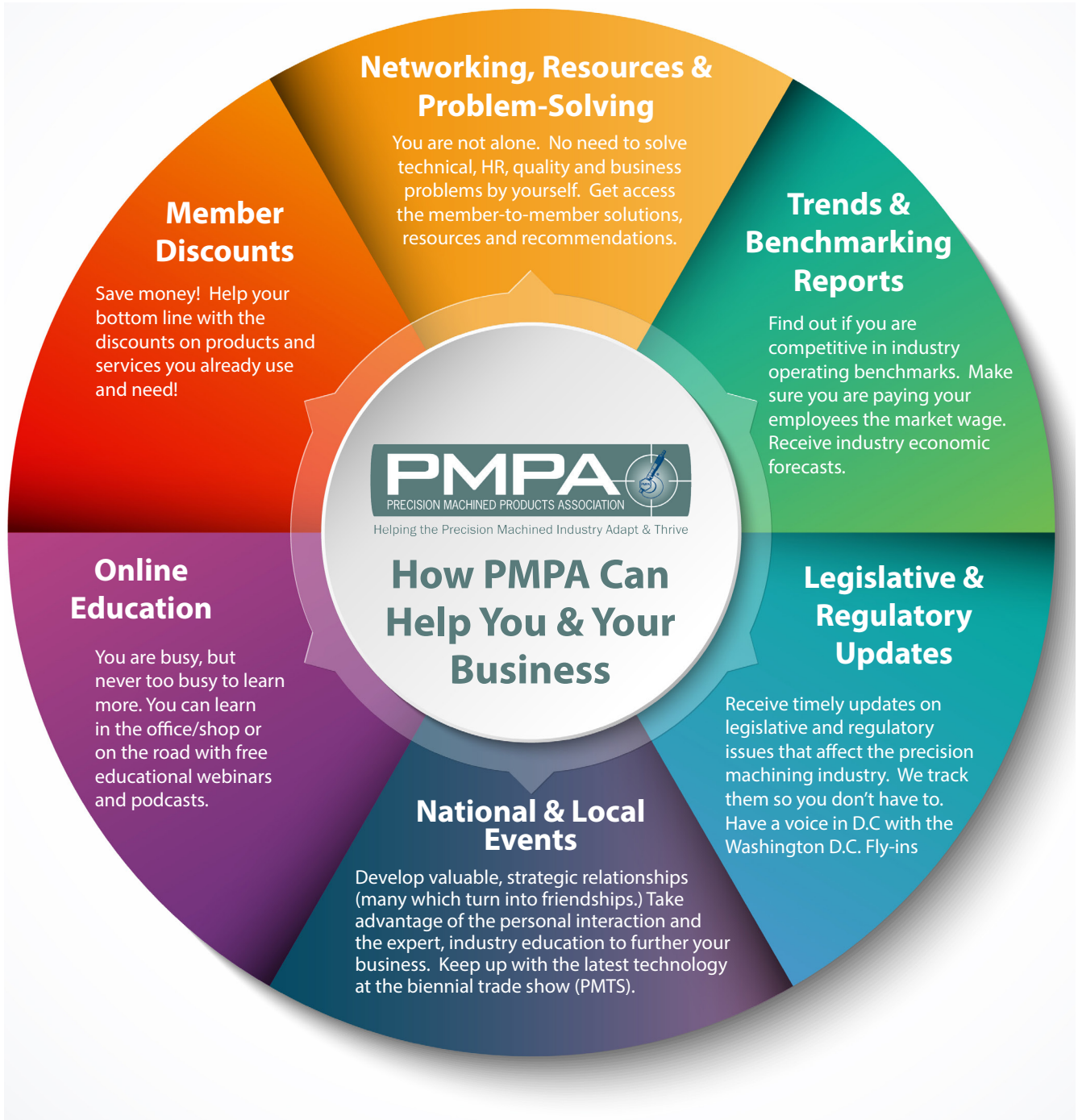
GD: We have a mantra that comes from the top and it's "service first." We service products for life — we don't obsolete anything. As long as the owner has use for the machine, we will service it. It is really great to be part of a company that feels that way.

PMPA: Why do you value your PMPA membership?

GD: Our membership allows us to keep up with industry trends and better understand what our customers want and need. Our goal is to help people solve their problems, and PMPA allows us to do that. It makes us a better company. **PMPA**



An operator teaches the CRX Collaborative Robot by guiding it manually.



Recently we received a complaint-for a part that went to several different customers- but only one had difficulties. We turned to the PMPA, where the expertise of PMPA staff and the expertise of PMPA members willing to share their experiences allowed us to add real value to the customer's problem solving process. PMPA helped us solve a customer problem that could have cost us more than 50 years of dues we pay to be PMPA members- keeping the customer and our bottom line.

- Charlie Kerr, Kerr Lakeside

CRAFTSMAN'S CRIBSHEET



Unleaded Brass for Plumbing Use

Laws have outlawed the provision of plumbing systems containing significant amounts of lead.

AB1953 California

California Assembly Bill 1953 (AB1953) prohibits the use of any pipe, pipe or plumbing fitting, or fixture intended to convey or dispense water for human consumption through drinking water or cooking that is not lead free in California. Products that do not meet the criteria as outlined by AB1953 by January 1, 2010, cannot be sold in the State of California. bit.ly/PMPA-PM8a

S.3874

Reduction of Lead in Drinking Water Act

“Reduction of Lead in Drinking Water Act — Amends the Safe Drinking Water Act to exempt from prohibitions on the use or sale of lead pipes, solder, and flux: (1) pipes or pipe or plumbing fittings or fixtures, including backflow preventers, that are used exclusively for nonpotable services such as manufacturing, industrial processing, irrigation, outdoor watering or any other uses where the water is not anticipated to be used for human consumption; or (2) toilets, bidets, urinals, fill valves, flushometer valves, tub fillers, shower valves, service saddles, or water distribution main gate valves that are two inches in diameter or larger.

Redefines “lead free” under such Act to mean: (1) not containing more than 0.2% lead when used with respect to solder and flux (current law); and (2) not more than a weighted average of 0.25% lead when used with respect to the wetted surfaces of pipes and pipe and plumbing fittings and fixtures. Establishes a formula to calculate the weighted average lead content of a pipe or pipe or plumbing fitting or fixture. bit.ly/PMPA-PM8b

LII U.S. Code Title 42. The Public Health and Welfare.

Chapter 6A. Public Health Service

Subchapter XII. Safety of Public Water Systems

Part B. Public Water Systems

Section 300g-6. Prohibition on use of lead pipes, solder, and flux

“No person may use any pipe, any pipe or plumbing fitting or fixture, any solder, or any flux, after June 19, 1986, in the installation or repair of — (i) any public water system; or (ii) any plumbing in a residential or nonresidential facility providing water for human consumption, that is not lead free (within the meaning of subsection (d)). PMPA

PMPA Member Unleaded Brass Suppliers Table

What brasses are available for plumbing applications to meet these no lead/low lead requirements?

Low Lead/ Lead-Free Grade	ASTM Spec	PMPA Mill Supplier	Machining Enhancer	Scrap Compatible with Leaded 360 Scrap
C69300	B371	Wieland Chase	silicon	No. Must segregate
C69300	B371	Franconia Industries	silicon	No. Must segregate
C87850	B30	Wieland Chase	silicon	No. Must segregate
C89836	B584	purchased castings	bismuth, tin	Yes. Compatible with leaded scrap
C27450	—	Mueller Brass Co.	.25% max lead	Yes. Compatible with leaded scrap
89835	—	Concast Metal Products Co.	bismuth	No. Must segregate
C27451DZR	—	Mueller Brass Co.	.25% max lead	Yes. Compatible with leaded scrap