

THE CYANCO STANDARD

cyanco
Your Mining Solution

MARCH 2024 | ISSUE #07



The world is pivoting to the next phase of our global economy – the Circular Economy – with a focus on decarbonization and the preservation of resources.

As we transition, critical minerals and metals will be crucial to humankind's success in everything from clean energy production and storage to full implementation of the Internet of Things and 'smart living.'

As it relates to precious metal mining, many of the technical innovations required to power the Circular Economy will need materials such as gold, silver and copper for their conductive properties in semiconductors, touchscreens and the next generation of electronics. Just as important as these metals are to our future, so too is the way they're extracted and processed.

In this issue of the Cyanco Standard, learn more about the importance of a top tier vendor network, and how working with suppliers such as Cyanco will help power your mine to the future!

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Suppliers of Choice in the Circular Economy

HARTONO WIJAYA, Sr. VP of Business Development and Strategy



More than ever, the extraction of silver and gold needs a reliable and safe supply of sodium cyanide for lixiviation. As the largest supplier of sodium cyanide in the world today, Cyanco is the natural partner for precious metal miners across the globe.

For nearly 35 years, Cyanco has taken a full lifecycle view of its products: from ICMC-certified manufacturing and delivery to safe use and handling at the mine site. We also provide safety training, services and equipment to help optimize cyanide use, and detoxification technology... essentially everything our customers need to achieve a lower cost of ownership, while building a safe and sustainable path to the future.

Through our Applied Technology Group, staffed with chemists, engineers, metallurgists and Environmental, Health, Safety & Sustainability (EHSS) professionals, we offer the most advanced support at every stage of the cyanide value chain. Cyanco's team of experts can help mines:

- Minimize hazardous waste
- Reduce operating CapEx and detox costs
- Put best practices in place for employee safety
- Stay on production schedule
- Earn ICMC certification
- Connect positively with their communities

The stakes are only getting higher in mining. Choosing the right partners and strategic suppliers will help carry mines into the Circular Economy of the future, with its focus on eliminating waste and pollution, optimizing the use of materials and regenerating natural systems. The time is now to Mine On – and Cyanco can help you do that!



The Circular Economy needs **innovative, responsible suppliers** to help build and maintain sustainable mining operations

Cyanco invests in new analyzer technology

Cyanco is pleased to announce that it is expanding its portfolio of Cyanide Control Systems (CCS®) with new colorimetric technology.

For over three decades, we have offered our customers potentiometric technology to analyze “free cyanide” (CN_{FREE}) within the gold and silver leaching process – and other technologies that detect “weak acid dissociable cyanide” (CN_{WAD}) for analysis and control at detoxification.

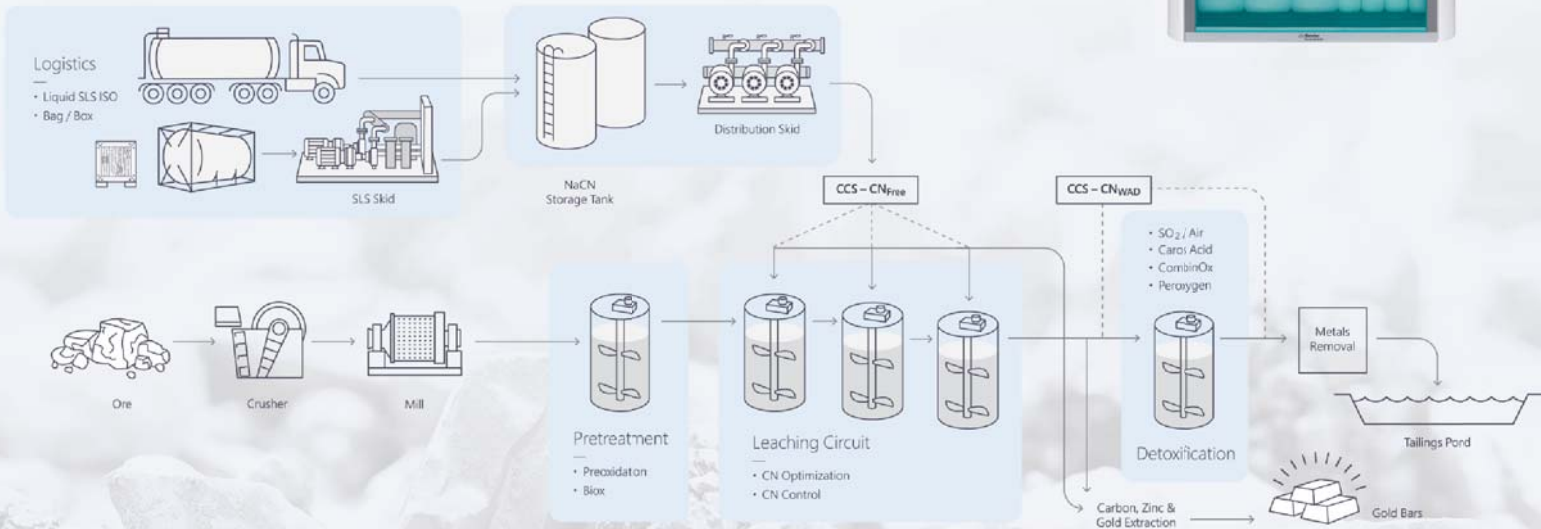
According to Roy Norcross, Director of Applied Technology, the new colorimetric technology has moved into field testing and is expected to be available in the near future.

“We really like what we see so far,” he said. “The colorimetric technology is proving to be quite effective at eliminating common interferences from the reading, such as copper cyanide and thiocyanide. This reduces the amount of ‘noise’ in the analysis, helping to deliver rapid, accurate results.”

“The new colorimetric option is expected to add value to mines dealing with more complex ores, with high levels of CN_{FREE} interference from sulfide and cyanide soluble metal complexes, for example,” said Roy. “These same interferences will also affect CN_{WAD} values, so the new technology should also be well suited to detoxification of this type of ore.”

“When it comes to gold and silver, a lot of the ‘low-hanging fruit’ has already been mined,” he added in summary. “That means a lot of what’s left is mixed with a larger percentage of other metals and materials. Our goal in providing this additional technology is to make extraction easier in different mining environments, while also helping to identify the economic practicalities of extracting copper, for example. As such, it is highly desirable for potential copper/gold operations.”

“As many of the bigger gold and silver miners become increasingly diverse, Cyanco’s responsibility as a supplier, is to enable their growth with products, equipment and technology that provide the safest, most efficient and sustainable path to growth.”



A Conversation with Roy Norcross, Director Applied Technology



Roy, you've been with Cyanco for over 30 years. How did you get started along this professional path?

I've been working on the enhancement of cyanide leaching and the destruction of cyanide since 1986, primarily as it relates to the extraction of gold from ore, using cyanide as a reagent.

I started my career as a research chemist at Enthone, an electroplating chemical company owned by Asarco. From there I moved into the pharmaceuticals field. It was during that time that someone left a want ad on my benchtop for a job posting at Degussa. With a footprint in both pharma and metals, Degussa seemed like a perfect match for me! They were hiring for their new mining group, with a focus on peroxygen technology for the purpose of lixiviation and detoxification. I was lucky enough to get the job.

My first assignment was to put together a lab while Degussa's peroxide plant was being built in Mobile, Alabama. Over the next few years, Degussa went through a lot of changes, eventually becoming Evonik which spun off its North American mining business under CyPlus.

In 1992 we merged our North American cyanide business with Cyanco, taking advantage of Nevada's gold and silver mining sector, which was on a massive growth trajectory. The rest is history!

Did you originally study to become a chemist?

I actually graduated with a double major in Art AND Chemistry. While this might seem like a strange combination, it all connects back to my origins as a photographer. As a college student, I made money taking photos for school brochures and the yearbook, which helped me pay for my education. I was also the photo editor for the college paper and did wedding photography on the side.

It was in the lab, developing my negatives, that I began to appreciate chemistry. The first time I got silver nitrite stains on my fingers, I knew that working with metals would be my future 'thing' one way or another!

How have things changed since you joined Cyanco all those years ago? Over the years,

Cyanco has continued to invest to keep pace with customer demand, including the addition of new manufacturing capacity and the expansion of our global distribution circuit. Today we are the world's largest supplier of sodium cyanide – and the only chemical manufacturer that exclusively serves the precious metal mining industry. Cyanco has also invested in its customer service model, creating the Applied Technology team (my team) with a single-minded focus on cyanide and every stage of the cyanidation process. We look at the entire circuit holistically, from logistics to handling to leaching optimization all the way through to detoxification and closure.

What do you like most about your job today?

We're always looking to do things better...always developing new ways to extract gold and silver more efficiently and effectively. Because we work with every single aspect of our product, and at every stage of its lifecycle, we have an intimate understanding of the entire mining circuit, as well as our customers' challenges. I really like the sense of partnership we have with customers in solving their problems and getting them to their highest levels of production and profitability.

What are some of your customers' biggest challenges?

Concerns over uninterrupted cyanide supply can be a big one. Gold and silver mines can't run out of sodium cyanide. They just can't – or they have to shut down production. Cyanco has four independent manufacturing lines in two different locations, which ensures redundancy of supply, so we never stock out our customers. Even during COVID, we never once missed a shipment. Cyanco also offers a Vendor Managed Inventory (VMI) service, which ensures customers' cyanide levels never get too low.

Safety is another huge concern. Let's face it: the stakes are incredibly high in both the mining and industrial chemical industries. If something goes wrong with our product, people can get hurt. That's why Cyanco is 100% invested in the safe manufacture and delivery of sodium cyanide – as well as the safe use and handling of cyanide at each customer site.

As a founding signatory of the International Cyanide Management Code (ICMC), Cyanco is an industry leader in making sure the cyanidation process is implemented as safely as possible across the globe. We also help customers achieve and maintain their own ICMC accreditation.

Besides safety and security of supply, what do customers worry most about?

Really two things: costs and sustainability. On the cost side, Cyanco helps customers optimize cyanide use with our online analyzer technology. Automated readings throughout the circuit ensure proper cyanide dosage – avoiding the additional raw material costs associated with overdosing, and the operational inefficiencies related to underdosing, such as lower yields.

Regarding sustainability, Cyanco offers several different processes for detoxification. We engage with customers to design and implement the most cost-effective detoxification systems, best suited to their mines' specific characteristics. Of course, in addition to destroying the residual cyanide left in mine effluent and tailings, implementing best safety practices and maintaining ICMC compliance are also critical aspects of a mine's sustainability performance.

We're currently field testing a new analyzer technology, with the goal of further customizing our Cyanide Control Systems (CCS® - CN_{FREE} and CCS® - CN_{WAD}), giving our customers additional options for how best to process and detoxify their ore, respectively.

What's the most important thing customers should know about Cyanco?

Cyanco is here to establish true partnerships with our customers. We want to make sure we can help them along every step of the way, including the areas we know right now – and other potential areas where we might be of service in the future. Drop us a line to let us know how we can help you!

mine on
with
cyanco



WANT TO WIN SOME SWAG?

Be sure to visit Cyanco's Mine On page to solve our word puzzle! Simply sort out the secret phrase to win a Cyanco jacket or thermal mug!

Click here to play.

New Winnemucca Plant Manager, Dan Barrett, talks leadership and teamwork



Empowering Your People

I'm not one to use catch phrases or buzz words very much. You won't often hear me saying things like 'employee empowerment' because I don't believe the words themselves hold much power. Quite the opposite, in fact. If people hear them too often without any action behind them, it can diminish trust.

The easiest thing to do as a leader is to grab the reins and tell everyone exactly what to do, exactly the way you want it done. It's even more natural to leap into a command-and-control position when something has gone wrong...to grab the reins and yank them back – hard. However, unless you're dealing with an emergency, that stance immediately diminishes any sense of empowerment you've built with your people, and the next time an incident occurs, they won't know what to do.

While safety can never be compromised, leaders must be genuinely OK with people making some mistakes, or they won't be able to learn and grow.

In a manufacturing environment, especially, it's important to help your supervisors and crew leads build the confidence and understanding needed to make decisions on their own, relying on the knowledge that has been shared with them and trusting they won't face repercussions for possibly taking a misstep.

Knowledge is Power

You can't make decisions or function as a team without proper knowledge and information. As such, communication and connectivity are critical priorities. We can only make excellence happen when everyone has the knowledge they need to do their jobs effectively.

That knowledge sharing should go both ways. Speaking for myself, if I haven't taken the steps to understand the current state...if I haven't walked enough in other people's shoes or fully understood a situation (like watching an actual piece of equipment run)...I can make faulty assumptions, which can turn into mistakes.

Trust is built when the lines of communication are open and flowing both up and down – and when people believe they can make decisions (and sometimes make mistakes) without fear of being punished. Trust leads to accountability and commitment, which in turn leads to great team performance.

The Human Side of Management

Stephen Covey, author of *'The 7 Habits of Highly Effective People,'* defines leadership in a way that particularly resonates with me: "Leadership is communicating to people their worth and potential so clearly that they are inspired to see it in themselves." It really shows how important it is to see individuals as having both personal and professional lives – and nurturing both.

That's a key part of leadership.

Nobody becomes an automaton once they walk through the gate – very much including management. Building a high-functioning team requires us all to bring our authentic selves to the table in an open and trusting manner. Otherwise, nobody will trust YOU. Nobody will share knowledge with you or feel confident enough to make their own decisions without your direct oversight.



If you're trying to build a strong and engaged team, employees need to buy in. Trust and accountability are your table stakes. For longer term retention, people need to see a path to personal and professional growth. Their workplace experience must be positive today, and they must see a future for themselves tomorrow. If you can achieve these things, your team will be able to tackle any challenge thrown their way!

CYANCO VALUES AT WORK



ONE TEAM. ONE GOAL.
SAFE PRODUCTION.



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Your Mining Solution

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Certified according to
the International Cyanide
Management Code