

SPECIAL POWERMAX SYNC® EDITION

SHAPING

AMERICAS

Q1 2022

Introducing Powermax SYNC

Developing a new generation of plasma

Eliminating customer pain points

Focus on learning

Offering free courses in 12 languages, the Hypertherm Cutting Institute is your one-stop resource for learning all there is to know about Powermax SYNC®. From set-up to operation, to specialty applications, learn how the Powermax SYNC will change the way you work.



**BROWSE COURSES AT THE
HYPERTHERM CUTTING INSTITUTE**

WELCOME

HELLO FROM HYPERTHERM



We're excited to bring you this special issue of our quarterly SHAPING eMagazine. This time around, we are completely focused on our newest arrival – the Powermax SYNC®.

Featuring a revolutionary single-piece cartridge consumable and automated process set-up, the Powermax SYNC series makes plasma cutting easier, streamlines consumable inventory, and provides customers with valuable performance insights.

Learn more about how this entirely new generation of plasma systems came to be, hear from our engineering team, and meet some of the people who have already used a Powermax SYNC system.

Sincerely,


A handwritten signature in black ink that reads "Michelle". The signature is fluid and cursive.

Michelle Avila, Editor

A LOOK BACK

The making of Powermax SYNC®

Hypertherm's Powermax SYNC is a series of three new air plasma systems unlike any other plasma in the world. Following years of work, the Powermax65 SYNC, Powermax85 SYNC, and Powermax105 SYNC simplifies system operation, streamlines consumable inventory, lowers operating costs, and maximizes performance.



SmartSYNC torch

- Simple, twist-on consumable installation
- Convenient power and amperage adjustment controls

Cartridge

- Single-piece
- Easy to identify
- RFID communicates amperage and process

2011

Powermax team members, reviewing data from customer visits and interviews, identify pain points associated with the current 5-piece consumable stack-up.

2013

A cross-functional team of Associates hold an innovation summit to explore the concept and feasibility of a single-piece consumable.

2016

Market research confirms customers would see value in a single-piece consumable along with other features such as automated process set-up.

2017

Product branding is finalized with marketing selecting the Powermax SYNC name and deciding on color-coded cartridges to help customers easily identify the cartridge they need.

Auto-set power supply

- Automatic process and amperage setting
- Data display



Cartridge reader

- Use with a smart phone
- Transfers performance data



2019

Field trials begin at more than 50 global locations; customers are thrilled and reluctant to return the trial systems back to Hypertherm.

2021

Powermax SYNC and single-piece cartridge consumable introduced; sales begin in Asia, Australia, and South America.

2022

Powermax SYNC and single-piece cartridge available worldwide.

**SEE THE INSPIRATION
BEHIND POWERMAX SYNC**

ASK THE EXPERT

ENGINEERING POWERMAX SYNC

Instead of answering a customer question in this issue, we decided to interview Jesse Roberts, one of the engineers who led the development of the Powermax SYNC® series of systems. Here's what he had to say about his team's work.



Q: How long did it take the team to develop the Powermax SYNC and how many people were involved?

A: Development started about 10 years ago. At first it was a small team but it grew larger as the product matured and became a reality. As we got closer to officially introducing the product to the market, I'd say we had more than 100 people working on it.

Q: What was the greatest challenge your team faced when working on Powermax SYNC?

A: Probably the most difficult challenge was finding a way to cost effectively manufacture a single piece cartridge using currently available manufacturing processes and resources.

Q: What was the best part of developing Powermax SYNC?

A: The excitement of making the product easy to use for our customers and the realization that the data collection features could help us make future products better. The team realized that they were a part of something special; a watershed moment for the way plasma cutters would be used in the future.



Q: The traditional 5-piece stack-up wears at different rates with the nozzle and electrode wearing fastest. How did you address wear rates when developing the cartridge?

A: The cartridge parts are all aligned and in tune with each other which is much more advantageous than mixing and matching old and new consumable parts. This mixing and matching is what typically happens with a traditional stack-up because, from a cost standpoint, it would be very expensive to change out all five consumable parts every time. I think people don't realize though, that when old and new parts are mixed, the cut quality is not as good nor as consistent. However, with Powermax SYNC, the components in the cartridge are all new to begin with so we are finding that it not only lasts longer but the cut quality is much better and more consistent.

Q: The Powermax SYNC platform contains a lot of new technology—the cartridge itself, the RFID chip, automatic set-up, data collection, torch controls, etc. Which technology are you most proud of?

A: That's a tough one. It's like picking a favorite child. The team is proud of all the features as each presented a specific challenge we needed to overcome. This required tremendous tenacity and very significant financial investment.

Q: The Powermax SYNC collects data as you use it. Why did the team decide to include data collection and how did you get the data collection feature to work?

A: In talking to our customers and listening to their challenges, we knew that the ability to better track what was going on during the plasma cutting process would be very useful. Instead of having to make an educated guess as to why a particular cut was bad or why a consumable set lasted half as long as normal, we wanted to provide hard data so our customers could more easily pinpoint issues. In addition, we knew the data could likely help companies identify training or infrastructure gaps. The data is also useful to Hypertherm. The insight we gain from knowing exactly what is happening during the cutting process can help us focus our engineering efforts. How was it achieved? The short answer is that we leveraged RFID technology and features common to a lot of smart phones.

Q: You no doubt watched and talked to a lot of customers during field trials. What was it like to interact with customers using the platform your team developed?

A: It was great. I was surprised by the number of customers who did not want to give their systems back! They were thrilled by the ease of use, cut consistency, ease of inventory management, reduced operator training, and availability of data.



RELIABILITY ENGINEERING

TESTING, TESTING, AND MORE TESTING



The development of Powermax SYNC and the Hypertherm cartridge consumable required extensive testing to ensure the products would live up to Hypertherm's long-standing reputation for reliability. All told, Hypertherm's Reliability Engineering Team completed nearly 40,000 hours of testing.

This testing included subjecting systems to rapid and extreme temperature fluctuations – from very cold to very hot – with varying levels of humidity. In addition, the team conducted tests using varied air supply situations, poor air quality, and stress tests. The team also subjected the systems to extreme vibration and drop tests. The SmartSYNC torch and cartridge were subjected to even more testing including prolonged underwater cutting and splash testing.

TECHNOLOGY HIGHLIGHT

COLLECTING VALUABLE DATA



As you use your Powermax SYNC® system, it collects and stores data such as:

- Number of pilot arc starts
- Number of arc transfers
- Arc transfer rate
- Pilot arc time
- Cumulative pilot arc time
- Total arc transfer time

The system also keeps track of recent fault codes and tells you which torch type and amperage of power supply you most recently used, along with the operating mode, current, and gas pressure setting.

This data can help you compare cartridge life and spot usage trends or operator habits that impact cartridge life. You can then use this data to coach and train new operators.

You can find this data directly on your power supply or on your mobile phone or tablet with the help of a Hypertherm cartridge reader and app. In addition, it is possible to export the data to an Excel spreadsheet for further analysis.

**LEARN MORE ABOUT
DATA COLLECTION**

GOODBYE GUESSWORK.
HELLO PRODUCTIVITY.



The new Powermax SYNC® plasma cutting and gouging systems will revolutionize the way you work. The new single-piece cartridge consumable is quick and easy to install, eliminates guess work on knowing when to change consumables and simplifies inventory needs. Now you will waste less time and produce more high-quality parts every time. Available in 65, 85, 105 amp systems. Discover more at Hypertherm.com/SYNC.



PLASMA | LASER | WATERJET | AUTOMATION | SOFTWARE | CONSUMABLES

Hypertherm
SHAPING POSSIBILITY®

IN THE NEWS

PRODUCT OF THE YEAR

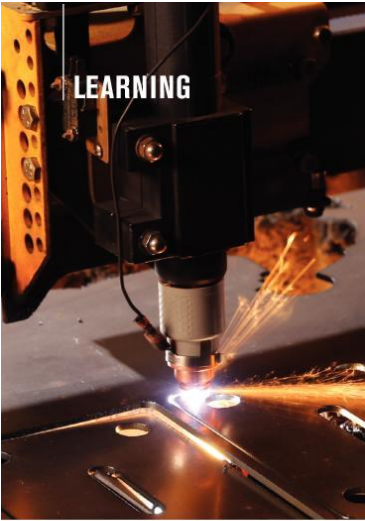
Hypertherm's Powermax SYNC series — three new plasma systems with built-in intelligence and a revolutionary single-piece cartridge consumable — is a New Hampshire Tech Alliance Product of the Year finalist.

Product of the Year is an annual competition to recognize groundbreaking products that demonstrate excellence in innovation, performance, functionality, value, uniqueness, and ties to New Hampshire.

The Powermax SYNC is one of five Product of the Year finalists. Judges recognized the product for addressing the biggest challenges manufacturers are facing today. Those challenges include the skills gap and labor shortage, the need to become more efficient, and identify potential manufacturing issues as early as possible.



WATCH OUR PRODUCT OF THE YEAR PRESENTATION



CARTRIDGE END-OF-LIFE DETECTION

Hypertherm's new cartridge consumable provides better cut quality and lasts longer than traditional consumables. In addition, when paired with our new SmartSYNC torch, it lets you know when a new cartridge is needed. Learn how this end-of-life detection feature works.

WATCH NOW

HANDHELD CUTTING TIPS AND TRICKS

Yellow cartridges are used for handheld cutting. We offer both a standard drag cutting cartridge and a FineCut® cartridge with a narrower orifice for fine feature cutting. Learn how to get the best results when using a Powermax SYNC system and handheld torch.



WATCH NOW



GREEN IS FOR GOUGING

Though often called plasma cutters, air plasma systems like our Powermax SYNC series are great at gouging. Gouging requires a green cartridge consumable. Whether you need to remove a little material or a lot, we show you how to get the best results.

WATCH NOW

TECHNICAL TIP

FEWER FAULT CODES



Though Powermax systems are incredibly reliable, users will sometimes get a fault code they need help clearing. By far, the most common fault code we hear about is a 0-30 code.

The 0-30 code either means the electrode and nozzle cannot make electrical contact or that the electrode and nozzle are stuck together and cannot create an arc. This can happen if you:

- Installed a wrong consumable part or parts
- Installed a dirty or damaged consumable part or parts
- Overtightened the retaining cap
- Are experiencing low gas pressure
- Have a broken regulator

As you can see, three of the five potential causes of the 0-30 code are related to consumables. Hypertherm's cartridge consumable for Powermax SYNC® systems helps eliminate the 0-30 code since you no longer have five separate consumable parts to worry about.

While Powermax SYNC owners are likely to experience fewer 0-30 codes, they will start to see a new code: 0-32. Fortunately, this is a fast and easy code to fix. The 0-32 code is related to the end-of-life detection feature found in all Hypertherm cartridge consumables and simply means you need a new cartridge.



Color-coding makes it easy to find the right cartridge for the job at hand. Yellow is for drag cutting, green for gouging, gray for mechanized cutting, and black for flush cutting.

CUSTOMER SPOTLIGHT

THE INSPIRATION BEHIND POWERMAX SYNC

At Hypertherm, we know the best new product ideas come from our customers. Over the years, we've learned that it's always good business to listen! So now that we've introduced our exciting new Powermax SYNC® platform, we thought you might appreciate an inside peek at how this particular innovation came about.

The inspiration for the SYNC product line was largely the result of many, many conversations with users all over the world, a process of several years. We heard what they liked most about their Powermax systems, and where they thought we might make improvements. They told us about their changing business environment and the challenges they were facing on the job and in their businesses.

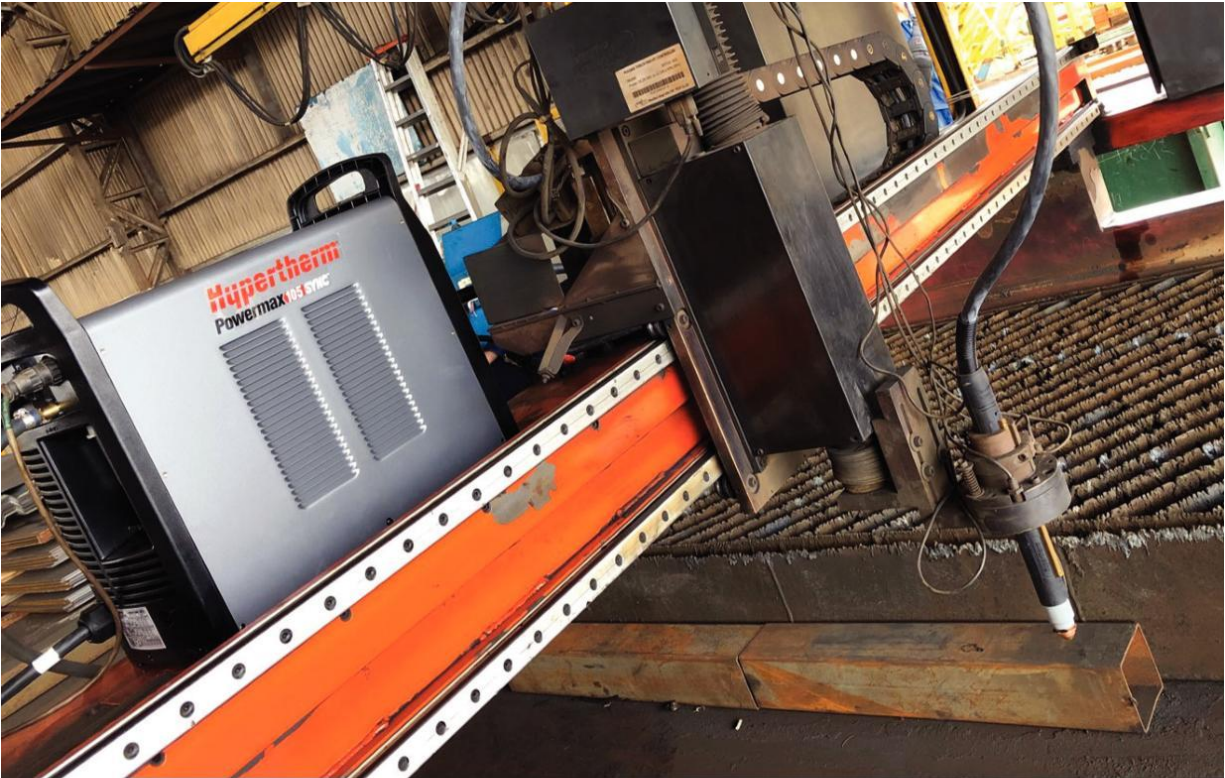
Our engineers got to work, and the conversations continued as we ran ideas by our user groups, first in a series of one-on-one discussions and later with extensive, formalized research studies. As the ideas developed into actual products, we validated and fine-tuned them with one of our largest field trials ever—a two-year effort that involved more than 50 customers across different markets, industries, and applications in North America, Mexico, China, Spain, France, India, and Brazil.

Customer challenges

Technical service data, user interviews, and market survey work all pointed to several common pain points that customers currently deal with when it comes to plasma system operation. These include:

- Setup time. The operator has to move from the workpiece over to the power supply to set up or make adjustments. This can be inconvenient in the middle of a job, and results in unnecessary downtime.
- Consumable mixups. It happens, unfortunately. The operator grabs the wrong plasma parts for the job at hand, leading to costly errors, wasted consumables, and aggravation.
- Inventory management. Particularly in a large cutting operation, it can be difficult to manage consumable supplies, and to know what needs to be ordered, and when.
- System optimization. Operators don't always select the correct consumables and power supply settings for specific tasks, leading to less-than-optimum results and premature consumable wear.
- Inefficient processes. When users can't easily switch between consumables for different processes, the versatility and value of the plasma system aren't fully realized.

All of these challenges are made worse by the labor shortage. Customers are having trouble finding both skilled and unskilled operators; they're looking to automated solutions to increase productivity, reduce operating costs, and help reduce the expense associated with frequent operator turnover and training. Automation also lets customers leverage operational data to help make their businesses more efficient. And where automation isn't an option, there's an industry-wide need to make equipment easier to use for less skilled operators.



The innovative solution: Powermax SYNC

Hypertherm's response to these challenges, its Powermax SYNC platform, is an evolution of the trusted Powermax line. It simplifies the consumable platform into a single-piece cartridge design, so that customers can minimize their consumable inventory needs and easily identify which consumable they should be using.

RFID technology in both the cartridge and the new SmartSYNC torches enables automated process set-up. It saves time and minimizes potential mistakes while optimizing both process and alignment for improved cut quality and maximum consumable life. Convenient hand torch controls for amperage adjustments and cycling of power minimizes downtime because the operator

no longer needs to return to the power supply during operation or for consumable change-outs. The power supply also captures cartridge utilization data that provides valuable usage insights and eliminates any confusion about when the consumable should be changed.

The verdict

The response from our test customers in every industry has been consistently enthusiastic. A few of them had anticipated drawbacks to a single-piece cartridge. How would this affect cut quality and operational efficiency? Would the potential cost outweigh the benefits? Happily, none of these problems materialized, and the product more than proved its value in the field trials.

CUSTOMER SPOTLIGHT

Structural steel fabricator – United States

A structural steel fabricator with locations throughout the United States was given an opportunity to use an early version of the Powermax105 SYNC® at its location in Augusta, Maine. Managers immediately saw a significant improvement in consumable life, a trend that continued throughout their year-long testing period. The company was so impressed, its managers plan to purchase their own Powermax SYNC system and retrofit five older Powermax systems to the cartridge consumable platform. They also plan to use cartridge data to coach new and existing operators.

Aluminum dock manufacturer – United States

During its busy season, this dock manufacturer in Naples, Maine uses a Powermax plasma on a small CNC table to cut various thicknesses of aluminum. Instead of using their usual Powermax, this company was recently given an opportunity to try out a Powermax SYNC system. Operators loved it and say they were especially impressed with the automatic set-up features and the improved cut quality they experienced while cutting with the system.

Metal recycler – France

A metal recycler with locations throughout France replaced a Powermax105 with a Powermax105 SYNC. The company says the system has allowed it to cut thicker metal and that the cartridge consumable is lasting three times longer than the standard stack-up it had been using. Perhaps the biggest win for his company though is the system's ease-of-use. The company cycles through a lot of employees and often has temporary workers filling in so the ability to save on training time was hugely appreciated.





Container manufacturer – China

This container manufacturer was working to produce key components for a multinational technology corporation. Facing a tight timeline and the need for better cut quality, the manufacturer opted to purchase a Powermax105 SYNC. The new system enabled the manufacturer to cut 30 percent faster and achieve better and more consistent cut quality. In addition, the manufacturer enjoyed longer consumable life, reporting that the cartridge was lasting four times longer than the consumable stack-up in its older system.

Automotive parts manufacturer – South Korea

This manufacturer of automotive parts purchased a plasma cutter on a robot in early 2021. Unfortunately, the company soon discovered that the system's consumables life span was short and unstable. Cut quality would deteriorate after cutting 20 workpieces, leading to near constant work stoppages so operators could install new consumables, and significant re-work. Since switching over to a Powermax105 SYNC, the company reports that the consumable cartridge is lasting more than seven times longer than before. It says the robot was able to cut 143 workpieces with one cartridge and no drop in cut quality.

Milling equipment producer – India

This producer of grain milling equipment swapped out six Powermax systems for the Powermax85 SYNC which it used on a CNC table. After weeks of testing, it reported the cartridges were lasting much longer than the traditional 5-piece consumable set it used before. The report of longer life was even more surprising because the company was already using CopperPlus electrodes, which are known to last twice as long as a standard electrode.

CUSTOMER SPOTLIGHT



"Everybody [is] impressed so far. We are in week five now with the original cartridge still being used. We recommend the [Powermax] SYNC machines."

Redrock Machinery Ltd – Northern Ireland

"We purchased the Powermax105 SYNC three months ago and are really impressed with this system. Prior to this, we used oxyfuel and had tried several other brands of plasma that did not meet our needs. We work to cut scrap metal and the amount of material we cut every day is very high. Our operation became much faster and cheaper after we acquired the Powermax SYNC, as in addition to being able to work with a single cartridge for many hours, we can also get information about the cuts we have made to further optimize our processes."

Aço e Ferro Comércio de Aço – Brazil



"With this machine you can cut anywhere you go...you just need the right consumable in your pocket. You can just do your job!"

LaForge 2.0 – France



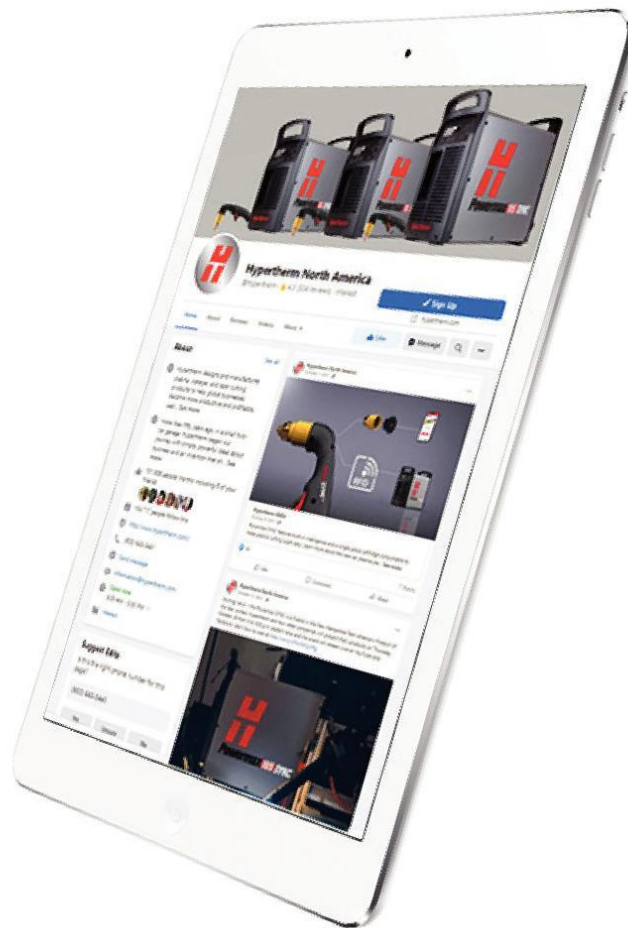
IMPRESSIVE METAL ART BY RAE RIPPLE

"I've been using the new Powermax65 SYNC since last summer. Honestly, I can't even put into words how freaking rad this thing is. Since the day I got it, I've been dying to use it on a car. Granted the 45XP is great but this, this is going to completely change the industry. One cartridge. Yes, I cut this entire car with ONE cartridge. No slag, beautiful lines, even fine ones. So if you're on the fence about getting one, let this be your sign to just go for it!"

Rae Ripple – United States

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DID YOU KNOW

THE CLEARING IN THE WOODS

An old tank is enjoying a new life thanks to artist and Metal Shop Masters finalist Ivan Iler. Iler found an old, rusted tank buried on his property that he estimated had been there for 100 years. Rather than turn the tank into scrap, he decided to use his Powermax65 SYNC® to turn it into art.

Except for the ivy vine twisting its way around the tank, the entire piece—including a working staircase—was made using only metal from the tank. Iler calls his piece “The Clearing in the Woods”. A large opening welcomes children to Iler’s magical forest, complete with fanciful trees and ivy. While children explore inside the tank, grown-ups can climb the steps for a view up top.

Of the Powermax SYNC he used to construct his art, Iler says, “The new SYNC plasma cutter that Hypertherm sent me is a dream, even on this rusty old tank. It’s the easiest set-up I’ve ever used, which to be honest isn’t that important to me, but it’s also the best cut quality I’ve ever had and that is important to me.”



**LEARN MORE ABOUT
IVAN ILER AND HIS WORK**

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SHAPE THE WORLD.**



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