



# TACKLING GAUGING AND WORKHOLDING CHALLENGES

Euro-Tech company Freco is developing methods to ensure proper gauging based on the International Spline Interface Standard. (Courtesy: Euro-Tech)

Since 1993, Euro-Tech Corporation has provided German-engineered solutions for the aerospace/aircraft, automotive/transportation, gear-manufacturing, and small-engine industries.

By KENNETH CARTER, Gear Solutions editor

**A**s the gear industry continues its march toward specialty projects and products within the automotive and aerospace industries, it becomes an absolute necessity that companies think outside the box to develop methods that create those essential high-precision parts.

Euro-Tech Corporation, along with its sister companies Frenco and MyTEC, has been busy over the last few years developing innovative ways to meet those high-tech needs as well as reduce costs along the way.

“One of the key ways to reduce costs is going to be a lot more automation, so when you previously could put a gauge in a worker’s hands, that worker might no longer exist, so automatic gauging is going to take his or her place,” said Jerry Kowalsky, president of Euro-Tech Corporation. “What we’re seeing in our own industry is more and more requests for fully-automated gauging systems. And honestly, we haven’t sold any yet. I think there’s a lot of shopping going on at the moment, but there’s a reason for the shopping, because shoppers will eventually become buyers, and those buyers are going to be seeing more and more automation being installed in these factories.”

## MOVING BEYOND THE TRADITIONAL

With more automation on the horizon and with government mandates for more products to go electric, Kowalsky said his company is becoming more creative in moving beyond the traditional applications of gears and splines.

“We at Euro-Tech are looking for newer applications,” he said. “We’re just seeing things that might not be huge applications, but more niche-type applications. One of them is zero-backlash gear sets, which are called harmonic zero backlash gearboxes using strain wave gearing. Actually, my very first order ever for work holding was for harmonic drive gear sets about 35 years ago. Way back then, there were very, very few applications for zero-backlash gear sets, but that has changed drastically.”

Euro-Tech works with its workholding company MyTEC to produce the workholding for toothed profile zero backlash gear sets ranging from robots hit-

ting the manufacturing floor to applications involving hundreds of communications satellites now being launched annually, according to Kowalsky.

“They’re in need of hundreds of them for their future satellite programs, because every new satellite uses several of these,” he said.

Together with MyTEC, Euro-Tech has developed more precise ways to help produce these zero-backlash gear sets, according to Kowalsky.

“These gear sets have to be extremely accurately held, and we’re now doing special workholding systems that will clamp the gear set and release the pressure so there’s no distortion on it,” he said. “Then, they can



A Frenco gutring spline gauge. (Courtesy: Euro-Tech)

do their machining process and end up with a better part. That’s just one of the little niche items that we’re looking for. So, we, as a company, are looking at more niche products for these smaller gear production systems that are being used today.”

## INSPECTION METHODS

In addition to the workholding solutions, Euro-Tech has also produced an important inspection method for the zero-backlash gear systems, according to Kowalsky.

“A very important inspection for them is a dimension over one-ball or a wall thickness because it does flex in its use, and it’s got to be a very accurately held tolerance from the outside

wall of an OD to the inside of a gear,” he said. “It’s pretty custom stuff, and we’re not going to be selling 100 of them or anything like that. But you become creative when these things happen, and you see these very high-volume productions go away, but you might do a little bit for this industry and a little bit for that industry, making us much more creative and maybe making us salespeople again instead of just people that take orders from the high-volume industries.”

## E-BIKE INNOVATION

As Euro-Tech continues to find unique ways to think outside the box, Kowalsky said that innovation is manifesting through the e-bike industry.

“It’s a very small industry, and it actually involves the crank and sprockets on e-bikes, and now, it seems to be migrating over to things like the exercise bike industry,” he said. “A lot of people think it’s a sprocket with a chain over a tooth, and it’s not that important. But in reality, a very low quality of that will make the product also feel very low quality if you don’t have tight fits and low backlash. Unlike a belt drive, a sprocket and chain won’t slip, so that’s why they’re using more sprockets and chains in these systems, particularly in the e-bikes and the exercise bikes.”

Because of this need, Kowalsky said a product with such accuracy was going to need a standard, which the industry eventually created.

“It’s a difficult standard to produce, but even more difficult to gauge,” he said. “Our company, Frenco, has taken the standard, which has the unfortunate name of ISIS, I-S-I-S, which is International Spline Interface Standard, and they decided to delve deep into it to make the proper gauging.”

This step was essential in ensuring the product is made correctly, according to Kowalsky.

“If they can’t gauge it, they don’t know if they’ve made it right,” he said. “It’s a very difficult gauge because it’s both a go and a no-go gauge at the same time. It has two features on it, and when they place the gauge on, it’s got to fit in a certain way, and if it doesn’t fit in a certain way for certain clearances, the part is either undersized or oversized, and it won’t function properly.”

## WORKHOLDING JOBS

With these niche applications growing, Kowalsky said Euro-Tech, along with Frenco and MyTEC, have been working to stay ahead of its competition by creating workholding and gauging solutions for this new industry standard in higher automation.

“We’re now seeing additional worldwide requests for precision workholding because what we make is so accurate,” he said. “Our supplier is doing business with many in China and a couple of producers in the United States, and because of the explosion of robotics, you’re really seeing the majority of these being used there. But they’re also used heavily in aerospace applications, like satellites. It is an increasing industry for sure.”

One particular point of pride that Kowalsky mentioned was MyTEC’s involvement with Sikorsky’s 53K King Stallion helicopter, the biggest heavy lift helicopter Sikorsky has ever built.

“They’ve got orders for 45 units right now,” he said. “The military will start to show them off soon because they are delivering beyond the prototype into the manufactured items. And every gear in that gearbox was held by MyTEC GmbH’s workholding product so that they could do the shaping of the gears, and virtually every other rotating component was machined on our hydraulic expansion arbor and chuck systems. We actually produced all of the workholding for much of their dynamic components. It’s such a large, heavy lift helicopter that even the tail rotor transmission in it is larger



Together with MyTEC, Euro-Tech has developed more precise ways to help produce zero-backlash gear sets. (Courtesy: Euro-Tech)

**“I’m going to tell someone honestly if I think there is someone out there with a better, faster, more reasonable solution. We actually love the challenges where someone is having an issue or a problem and they come to us because we’ve been providing solutions for so long. We’re going to be very honest about our abilities and what we’re going to be able to do or not do.”**



A close-up of the Frenco external gear and spline inspection instrument. (Courtesy: Euro-Tech)

than the previous main rotor transmission that they made on the earlier Blackhawk models.”

## CUSTOMER-SERVICE ORIENTED

Even along with all the company’s newest developments as well as its existing products, Kowalsky said he still is proud of Euro-Tech’s ability to be approachable, friendly, and customer-service oriented.

“We have no voicemail,” he said. “When you call, we answer almost immediately. Our seasoned staff, some with us over 25 years, are cross-trained employees who can pitch in on all the aspects of the company. When you reach out to us, we’d like you to be able to finish with an answer to the reason you called no matter who answers the phone.”

Part of that approachable nature of Euro-Tech comes from having a factory-trained technician at the company’s headquarters who can perform necessary repairs on the hydraulic expansion arbors and chucks, as well as the spline gauging hand tools, according to Kowalsky.

“Many of those can be repaired right in our facility in Menomonee Falls,” he said. “That, in many cases, will circumvent the need to send the product back to Germany. That round-trip transportation can be very costly and time consuming just to have a repair that can be done in Menomonee Falls. We’ve actually had customers, local customers in the Menomonee Falls/Milwaukee area — a major one like Harley-Davidson — who have actually had a hydraulic expansion arbor used for hobbing needing an adjustment. They will hand-carry it in, enjoy a cup of coffee in our lunchroom while our service tech gets the tool

back up to snuff so it goes back into immediate service when the guy leaves. It’s only about 10 minutes from us to the Harley plant.”

## HONESTY AND INTEGRITY

With all that Euro-Tech can offer, customers are appreciative of the company’s overall honesty and integrity, according to Kowalsky.

“I’m going to tell someone honestly if I think there is someone out there with a better, faster, more reasonable solution,” he said. “We actually love the challenges where someone is having an issue or a problem and they come to us because we’ve been providing solutions for so long. We’re going to be very honest about our abilities and what we’re going to be able to do or not do.”

And part of that honest reliability comes from the quality products that Euro-Tech offers, according to Kowalsky.

“Someone once said that these products coming out of Germany are usually so beautiful, that if they didn’t weigh 35 pounds you could put a chain on them and wear it around their neck for jewelry,” he said. “It’s usually a fantastic solution that gets us a lot of kudos when the product arrives and gets opened up and put out on the shop floor. We’ve had people say, ‘It’s actually too pretty to use.’ They’re not your run-of-the-mill ‘open up a catalog and order an item’ products.”

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