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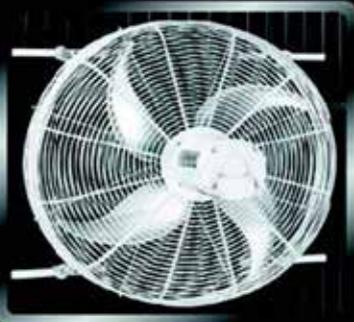
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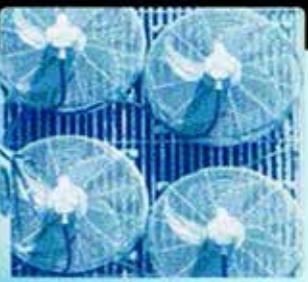
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Siemens Optimizes Entire Digital Coriolis Flowmeter Platform

Siemens is proud to announce the release of process-optimizing advantages to their entire digital Coriolis flowmeter platform. Siemens low flow FC MASS 2100 and FC300 sensors in line sizes 1/16 to 1/2 inch are offering advanced features such as advanced programming wizards, automatic dual phase flow filtering, flow batching and programmable dosing recipes all in a class 1 Division 1 enclosure with the Siemens FCT030 and FCT010 top line digital transmitters. With this major enhancement to the product line, a broad range of users from chemical to automotive applications can benefit from market-leading mass flow accuracy of 0.1%, density accuracy of 0.5 kg/m³ and 100Hz digital update rate. The high-speed update rate ensures the highest precision for applications such as the filling of beverage bottles.

Already available in sizes 1/2 inch to 3 inch, the Sitrans FCS400 sensor program has now grown to include sizes 4 and 6 inch sensors. As a result, the FCS400 portfolio is suitable for a broader spectrum of applications ranging from OEM skids and control loops in the hygienic industries to bunkering and bulk chemical measurement. The FCS400 is one of the most compact Coriolis sensors on the market, fea-

turing a robust frame almost immune to process noise with a wide array of process connectors for many of the standard, 3A hygienic and hazardous applications.

Several advancements to the transmitter line have also been implemented to provide greater flexibility in installation and simplicity in operation. The FCT030 offers a wall-mount enclosure that enables remote configurations complemented by the option for Modbus or PROFIBUS DP/PA digital communication, an ideal protocol for processes requiring fast data exchange. The fully graphical Human-Machine Interface (HMI), which already featured an intuitive menu structure and multiple setup wizards, has been redesigned with an even easier-to-navigate layout. The innovative SensorFlash® microSD card has also been enriched with an audit trail feature, which automatically stores up to 100 records of diagnostic parameters or changes made to device settings. This function allows operators to analyze the performance of each process and address any potential issues, resulting in optimized plant efficiency and higher-quality end products.

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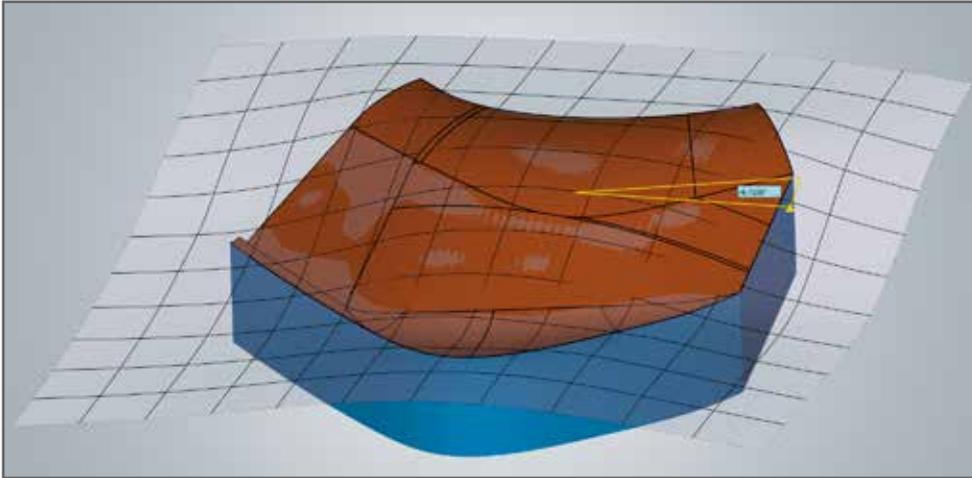


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New *HyperMILL*® 2018.1 Cam Software Offers Enhanced Functionality, Virtual Machining Simulation & More



OPEN MIND Technologies AG (www.openmind-tech.com), a leading developer of CAM software solutions worldwide, has introduced *hyperMILL*® 2018.1, a new version of its advanced, comprehensive CAM software. *hyperMILL*® 2018.1 has a range of new features and enhancements including greater blending capabilities, 3D-optimized roughing, global fitting, rotational abilities for CAD electrode applications and totally new to the industry - virtual machining simulation.

“*hyperMILL*® 2018.1 demonstrates our commitment to innovation when providing CAM users with the tools they need to be successful,” said Alan Levine, Managing Director of OPEN MIND Technologies USA, Inc. “We continue to advance functionality in the *hyperMILL*® suite to keep it at the forefront of CAM technology.”

Smooth Transitions

New *hyperMILL*® 2018.1 functionality includes an enhancement to the “soft overlap” feature for blending machining marks found between steep and flat areas, or located at the boundaries of rest machining regions. Using this enhanced feature, the milling tool is briefly

lifted to blend milling paths into another, preventing visible transitions from being generated, resulting in better surface quality.

3D-Optimized Roughing

In *hyperMILL*® 2018.1, the 3D-optimized roughing cycle has been enhanced for applications with high feed cutters. The step-over

distance can be calculated from the scallop height measured against the high feed cutter geometry. A special tool path movement removes rest material from corners when there is a very large step-over. Intelligent cut division and optimized toolpaths provide greater process safety for the remaining thin ridges.

Global Fitting

A new “global fitting” feature can simplify the definition of complex surfaces or patches of surfaces. Many *hyperMILL*® CAM strategies will recognize and follow the ISO u-v orientation of the surface patch. *hyperMILL*® MAXX Machining finishing is one technique that benefits from having a simplified surface definition.

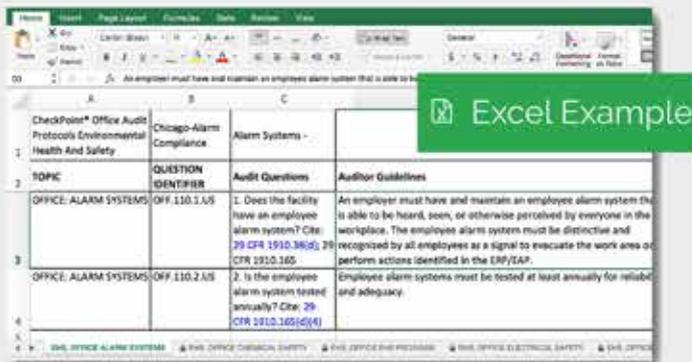
Rotational Electrode

hyperCAD®-S Electrode automates the construction and manufacturing of electrodes for die-sinking. Users can simply choose their electrodes from the face to be die-sunk within the component geometry, with no

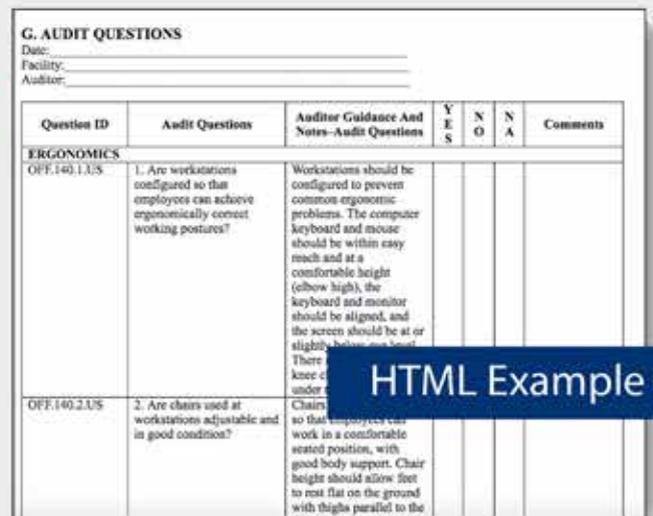


Too **many** sites? Too **hard** to coordinate? Too **costly** to send auditors? Having **difficulty comparing results** across the locations you have inspected?

If you said **yes** to any of these questions, how can you be sure that those sites are in compliance with your Global EHS compliance and risk programs?



TOPIC	QUESTION IDENTIFIER	Audit Questions	Auditor Guidelines
OFFICE ALARM SYSTEMS	OFF.110.1.US	1. Does the facility have an employee alarm system? Cite: 29 CFR 1910.38(d); 29 CFR 1910.165	An employer must have and maintain an employee alarm system that is able to be heard, seen, or otherwise perceived by everyone in the workplace. The employee alarm system must be distinctive and recognized by all employees as a signal to evacuate the work area or perform actions identified in the ERP/EAP.
OFFICE ALARM SYSTEMS	OFF.110.2.US	2. Is the employee alarm system tested annually? Cite: 29 CFR 1910.165(d)(4)	Employee alarm systems must be tested at least annually for reliability and adequacy.



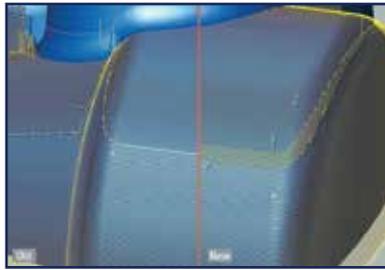
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Question ID	Audit Questions	Auditor Guidance And Notes-Audit Questions	Y E S	N O	N A	Comments
ERGONOMICS OFF.140.1.US	1. Are workstations configured so that employees can achieve ergonomically correct working postures?	Workstations should be configured to prevent common ergonomic problems. The computer keyboard and mouse should be within easy reach and at a comfortable height (elbow high), the keyboard and monitor should be aligned, and the screen should be at or slightly below eye level. There knee c under				
OFF.140.2.US	2. Are chairs used at workstations adjustable and in good condition?	Chairs so that employees can work in a comfortable seated position, with good body support. Chair height should allow feet to rest flat on the ground with thighs parallel to the				

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special expertise required. To save users time during milling and eroding, *hyperCAD@-S* in *hyperMILL@ 2018.1* includes an easy-to-use “rotational electrode” feature which facilitates the circular placement of multiple electrode geometries with different spark gaps on a holder.



improving manufacturing workflow. Machining operations can be reliably evaluated, checked and optimized before running a job by using process networking and virtual mapping found in *hyperMILL@ VIRTUAL Machining*. The *hyperMILL@ VIRTUAL*

Virtual Machining

Developed with Industry 4.0 in mind, an early release of *hyperMILL@ VIRTUAL Machining* simulation is available in version 2018.1, which enables constant real time bi-directional communication between the machine tool controller and a remote *hyperMILL@ VIRTUAL Machining* simulation, significantly

Machining NC Optimizer can enhance computed NC instructions to optimize available workspace, manage limited axes and select the best approach for asymmetric machine heads. Safety, reliability, speed and process control optimization from CAD/CAM to machine are all improved with *hyperMILL@ VIRTUAL Machining*.

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Networking with the machine

Machine and removal simulation

Each line of code is simulated

NC code display

Smart Factory

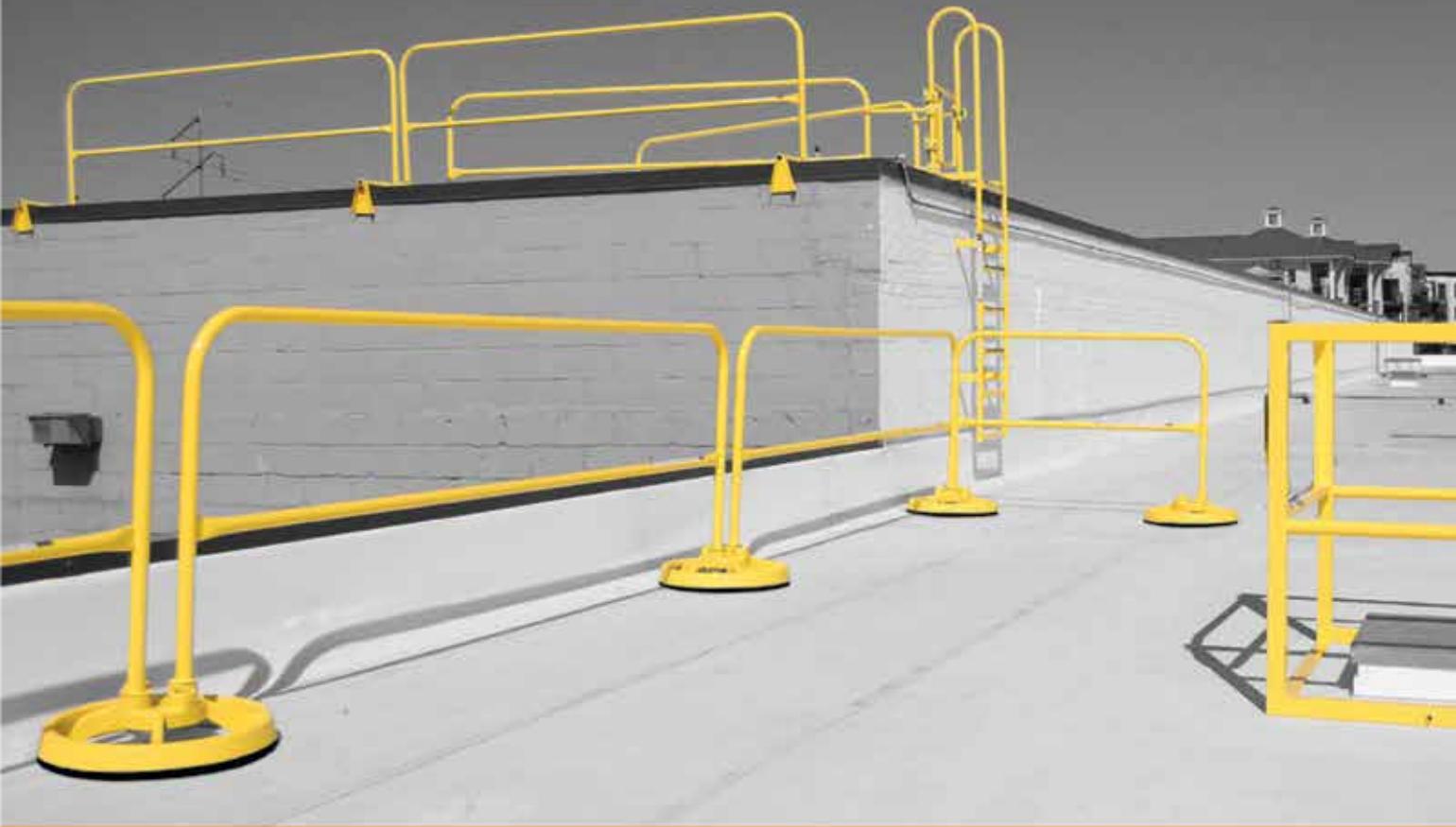
Remote control for starting and stopping

Intuitive operation

NC	Machine	Delay
G01 X170.543	188.728	0.0000
G01 Y40.138	200.417	0.0000
G01 Z-0.0274	204.319	0.0000
G01 X0.846	4.348	0.0000
G01 Y182.963	183.061	0.0000



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Strategies to Strengthen Subassembly Sourcing

Selecting subassembly manufacturers with specific capabilities can speed turnaround, improve product performance and functionality, and increase an OEM's bottom line.

With electrical and electronic components and features like touch screens, flex circuits, keypads and membrane switches becoming more technologically advanced, OEMs are becoming increasingly dependent on sourcing subassemblies to expert third-party suppliers.

At the same time, subassemblies are critical to the OEM's finished product and must be sourced carefully to achieve consistent quality, timely turnaround and competitive pricing. In many cases, contracting with suppliers that offer access to global manufacturing facilities and in-house engineering support can be instrumental to the success of an OEM.

One of the most significant challenges is locating reliable

suppliers that can meet these qualifications with pricing that can improve profitability. Some of the more successful OEMs point to a few uncomplicated strategies that help strengthen subassembly sourcing, achieving faster turnaround, ensuring product quality and functionality, and increasing added profitability.

1. Access to Global Resources

Selecting a domestic subassembly supplier with global manufacturing resources can provide OEMs with significant economic advantages – provided the manufacturing processes are well managed by the supplier.

For example, many OEMs that contract directly with offshore

suppliers experience communication difficulties that can lead to errors with subassembly materials or dimensions, avoidable logistical difficulties, or even cost miscalculations.

However, some OEM suppliers have no problem in providing high quality products through relationships with offshore fabricators that work seamlessly with the domestic supplier's engineering and management team.

"We have found that offshore fabricators can be effective partners in manufacturing for North American subassembly suppliers, provided the proper communications and management controls are in place," says Hector Macias, director of Northpoint Technologies, El Paso,



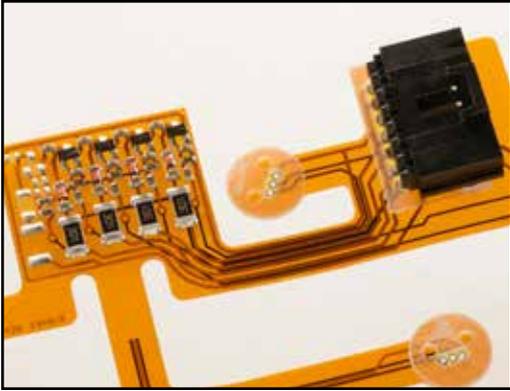
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Texas. Macias adds that such fabrication partnerships can also be financially beneficial to OEM customers by providing saving on costs and eliminating the need for capital investments.

Northpoint Technologies is a manufacturer of components and subassemblies used in electronic and electric devices

used in the medical, automotive, defense, telecommunications, industrial and consumer markets. The company's expertise includes silicon and membrane switches, flexible PCBs and assemblies, touchscreens and wire harnesses.

When Justin Blush was in search of a silicon membrane for a microscope control switch, he found Northpoint Technology. Blush, lead technician at Prescott's Inc., a remanufacturer of surgical microscope, says his company's own molding and machine shop was unable to fabricate the membrane, which was incorporated into a switch that enabled a model of microscope to zoom in and out on a subject.

Northpoint advised Blush that the membrane would be designed at its headquarters in El Paso, but would be fabricated at a plant in Asia.

"I was happy just to have a supplier and expected the fabrication and shipping process to take at least six-to-eight weeks, as with our traditional suppliers," Blush explains. "I was amazed to learn that the membrane required only a two-week turnaround, and at a fraction of the price I expected."

2. Faster, Functional Prototypes

The timely delivery of prototypes and quick turnaround of revisions are vital to expediting the manufacturing process. When subassembly suppliers with offshore manufacturing facilities can produce prototypes in-house with quick turnaround times, the process is much more efficient.

Due to those factors, prototyping is one of the functions that successful suppliers seldom outsource. Macias considers prototyping a critical step in product development. These are produced via aluminum or "soft" molds, and are of such quality that they are usually considered to be product samples or the equivalent of

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“Most of our suppliers want high-volume orders, just like other industries,” explains Stoehr. “Five or six years ago we found Northpoint Technologies, which has been very good about taking on even low volume projects. That’s a real plus for us and our customers.”

4. Adding Significant Value

Finally, many OEMs are finding suppliers that provide significant value-added services, with offerings ranging from engineering assistance to recommendations for streamlining the manufacturing process.

In some cases, graphic design assistance, such as special icons or other symbols on keypads and other controls, can provide important safety or security features.

In another example, GSGR’s Stoehr found that subassembly suppliers could bring important value added through the kitting of loose piece parts. He arranged with Northpoint to have special kits, containing 20 loose keypad buttons, to be packaged in order to expedite assembly on the production line.

“Getting great value-added services through a single source is important to GSGR,” Stoehr says. “It is not only more convenient, but when you couple that with consistent quality, quick turnaround and competitive prices, it helps us provide better service to our customers, as well.”

For information contact: Northpoint Technologies, Inc.; 13321 Tobacco Rd., El Paso, TX 79938; Phone: (915) 591-6300; Sales Office: (800) 553-5087; Email: sales@northpoint.com.

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first article production pieces.

“The prototypes we require are real, functional samples that we send to customers to inspect and test,” says Terry Swick, president and co-founder, Swick-White Inc. (Davisburg, MI), a manufacturer of electric enclosures, control panels, membrane switches and graphic overlays. “Assuming they meet specifications, they can install them as finished subassemblies in products and ship them out to customers – with confidence.”

At other times OEMs will have requirements that are outside of the usual request. Suppliers who have the in-house capabilities produce complex items domestically can satisfy the extra demand by producing additional functional prototypes that have been approved for production.

For example, Stoehr says that on occasion, he made such a request. “I

said, ‘We’re doing a prototype run of 10 control panels, so can you provide 10 sample keypads?’ And they were able to do that with no delays.”

3. Look for Volume Flexibility

Whether subassemblies or piece parts are fabricated domestically or overseas, minimum volume requirements can force OEMs to purchase more parts than they require. However, a few subassembly suppliers are moving away from volume requirements to better serve the OEM.

When Steve Stoehr, Engineering Manager at GS Global Resources (GSGR) was sourcing a keypad as part of switch and control panels installed on some heavy-duty equipment such as agricultural machinery or fire trucks, he expected to make a sizable volume commitment to the keypad manufacturer.

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Cooling Tower Gearboxes Evolve to Address Customer Requirements

By Jerome Jennings, Global Product Manager, SPX Cooling Technologies, Inc.

Industries that require process heat rejection often use field-erected cooling towers to keep pace with their heat load. Cooling towers have large fans and powerful motors, which can present a host of challenges, including excessive sound, vibration and expense. Gearboxes are employed to address these challenges.

Gearboxes Play a Key Role to Multiply Torque

Gearboxes are used as speed reducers to slow the rotational speed from the incoming motor to the outgoing fan of a cooling tower. Companies that operate high-capacity production plants, such as those in the chemical process and power industries, require cooling towers with large amounts of heat rejection capacity.

Without gearbox technology, cooling tower motors would be massive to directly handle the torque required by the fan. Something so large and heavy would be too expensive and impractical. Instead, the speed reduction from the gearbox acts as a torque multiplier, keeping the motor a reasonable size and the overall mechanical system more cost-effective.

The speed reduction from gearboxes also optimizes the performance of the cooling tower fan. As fan diameters increase, the fan speed must decrease to maintain acceptable sound and vibration levels, as well as to ensure the structural integrity of the fan itself. Improper gearbox sizing as it relates to the motor and fan can result in excessive vibration, loud operation and structural damage to the tower.

In large cooling tower applications, the fan typically operates at a speed between 100-200 rpm. The most common motor speed is 1800 rpm, requiring the average gearbox to reduce motor speed by approximately 9-18 times to achieve the desired fan speed. The exact combination of this gearbox ratio, fan blade design and fan pitch contributes to the specific performance and energy efficiency of the cooling tower in a given application.

Cooling Tower Customers Seek Solutions to Common Gearbox Problems

Cooling tower operators and maintenance engineers cite several common pain points associated with gearbox operation and service:

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Issue 1: High operating temperatures, which can contribute to shorter operating cycles, premature gearbox failure and unplanned downtime.

Issue 2: Excessive sound and vibration levels, which can result in municipal noise violations, employee safety issues, equipment fatigue and premature failure.

Issue 3: Extreme temperature and humidity conditions within the cooling tower, which can quickly degrade mechanical systems, affecting sound level and life of gear sets.

Issue 4: Premature bearing failure and excessive wearing of the pinion shaft.

Issue 5: Few gearbox options and choices to support either scheduled or unscheduled maintenance and replacement.

Advancements in Gearbox Design Address User Needs

Continuous product research and development activities have led to several recent design innovations and product enhancements. SPX Cooling Technologies' engineers identified the following solutions to address the five gearbox operational issues most often cited by plant managers and maintenance engineers:

Solution #1: To address high operating temperatures, select a gear drive with integral "cooling fins" designed into the housing. In lieu of a smooth casting, the cooling fins increase surface area, allowing better heat rejection as air is pulled over the gearbox by the cooling tower fan. For example, Marley Geareducer® brand

gearboxes include cooling fins, which increase the surface area by 25-47 percent compared to other cooling tower gear drives. Geareducers also incorporate large internal oil ports to keep oil well circulated and contribute to overall cooler operating temperatures. The results: Oil life is extended, fewer oil changes are required, and gears and bearings are properly lubricated to maximize performance and service life.

Solution #2: To dampen excessive sound and vibration levels associated with gearboxes, select for robust metal castings. Choose a gearbox engineered to minimize the case deflection associated with the immense torque and thrust loads specific to cooling tower duty. For example, Marley Geareducers feature up to 40 percent thicker castings and are designed and built expressly for cooling tower service. The results: Quieter, safer working conditions, less metal fatigue and longer service life.

Solution #3: To counteract the extreme temperature and humidity conditions that cooling tower gear drives are subjected to, steel shims at case connection points offer advantages. Steel shims, in lieu of plastic versions, are incorporated into all Marley Geareducer designs, for example. Plastic shims exposed to temperature and humidity conditions within the tower can creep over time, causing changes in tolerance that affect the sound and life of the gear sets. The results: Steel shims maintain proper gear settings and control gear sound under extreme operating conditions.

Solution #4: To guard against premature bearing failure and excessive wearing of the pinion shaft, use heavy-duty double row interstage bearings. Bearing life of 100,000 hours is routinely achievable. A premium-grade isolator-type bearing oil seal with fixed stator sealing surface to prevent shaft wear is also recommended in lieu of a lip type seal that wears against the pinion shaft. To illustrate, Marley Geareducers incorporate an Inpro/Seal* bearing isolator which extends seal life without the downside of excess wearing of the shaft. The results: The use of heavy-duty double row bearings and oil seals can protect gearboxes from premature wear and extend service life.





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Solution #5: To expand gearbox repair or replacement options and choices for either scheduled or unscheduled maintenance, choose a reliable supplier with specific knowledge of gear drives and an extensive inventory of cooling tower componentry. For example, SPX Cooling Technologies offers a dedicated in-house gearbox evaluation team, experienced in the inspection, repair and rebuilding of both Marley and Amarillo brand gearboxes. Gearbox repairs are completed at the SPX manufacturing plant, rather than contracted to job shops. To speed completion, avoid delays and additional costs, transportation to and from the plant is included.

A New Option to Simplify the Replacement Process

A recent SPX engineering innovation has been the expansion of the Marley Geareducer line. The new M Series Geareducer, which debuted in early 2017, simplifies replacement of gearboxes in field-erected towers that do not currently employ a Marley Geareducer. The M Series is a direct “drop-in” replacement for Amarillo brand gearboxes, with a matching footprint that greatly simplifies gearbox change-out procedures.

A viable new alternative for gearbox replacements is important to plant operators. The M Series eliminates time-consuming conversion parts, such as fan hubs, driveshafts and adapter plates and the added material costs and field labor time they require. The reduced time and effort onsite means a safer installation and less

overall downtime for the tower, and a more reliable and affordable installation for the plant.

The M Series combines the proven longevity and performance of robust housings and bearings with modern seal enhancements and built-in vibration transducer mounting. It can be expected to provide reliable service for 12 to 15 years with proper maintenance before major repairs or rebuilding is a factor. It doesn't require any external pumps, filters or coolers to run properly, sparing customers extra unexpected costs and other add-on components that could become problematic. The M Series Geareducer provides the solutions customers want from an industrial grade cooling tower gearbox.

Reliable Gearboxes Alleviate “Service Anxiety”

Plant operators and maintenance engineers must effectively manage a variety of cooling tower service issues, whether scheduled or unplanned. Finding common-sense, long-term solutions to the most common pain-points not only simplifies routine maintenance and repair operations, but goes a long way to alleviate service anxiety. Reliable gearboxes and dependable suppliers provide a sense of security that maintenance and service issues can be managed methodically instead of in crisis mode.

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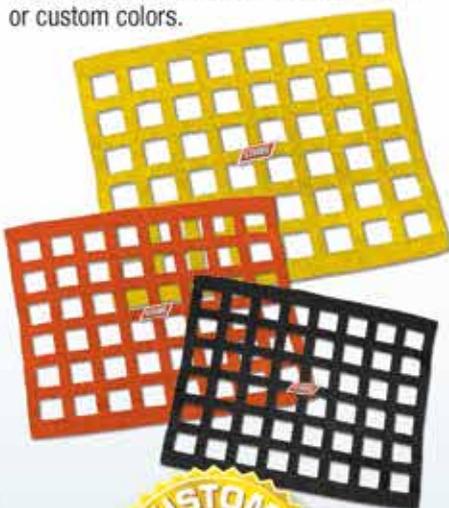
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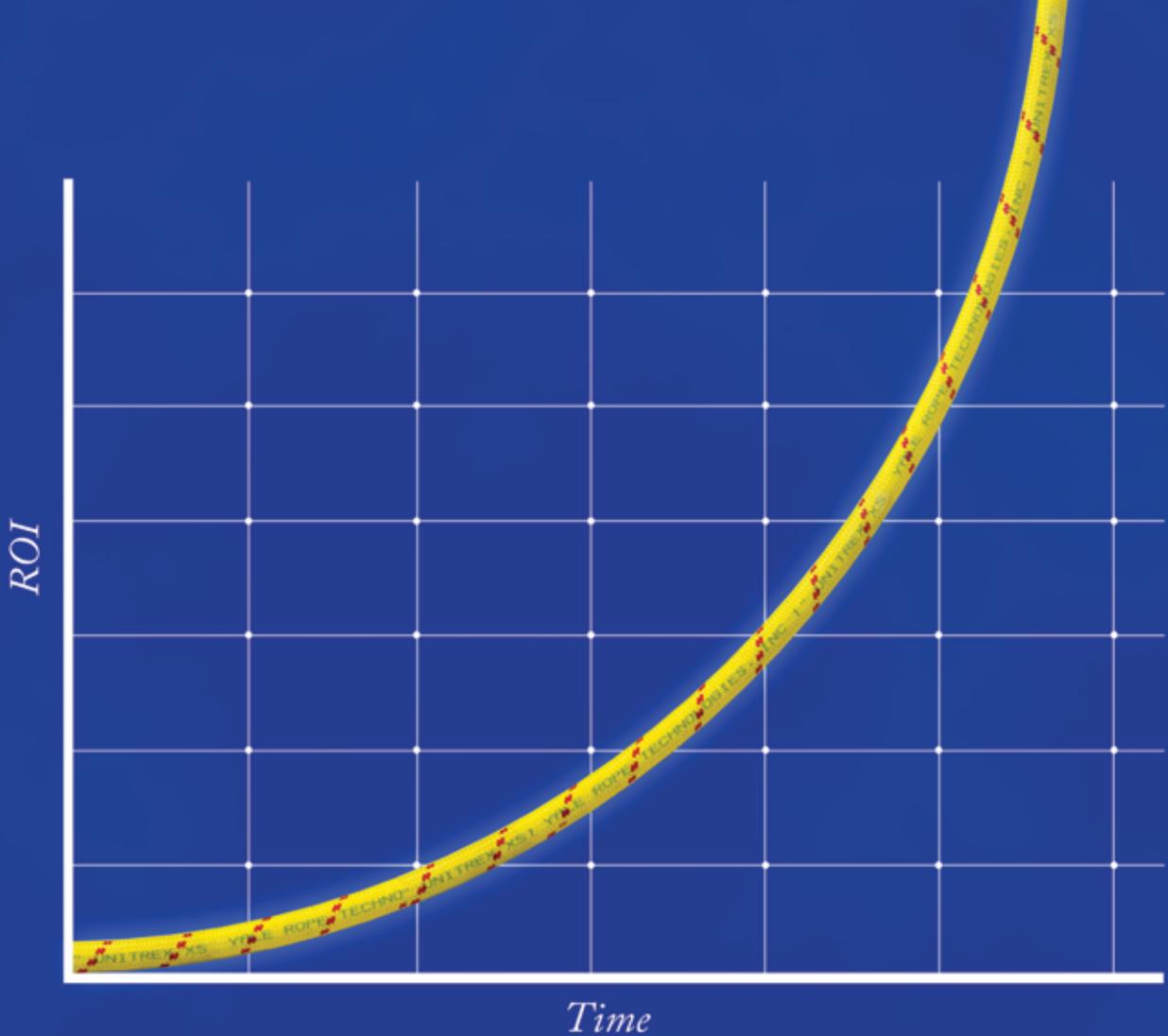
Hexagon Manufacturing Intelligence Releases PC-DMIS 2018 R1

PC-DMIS 2018 R1 Makes Tool Improvements and Adds the User Community's Most Requested Enhancements

Hexagon Manufacturing Intelligence today launched PC-DMIS 2018 R1, the latest edition of the world's most popular measurement software. This is the first of two major releases scheduled for PC-DMIS in 2018, with continued service pack updates to ensure maximum reliability of the platform.

PC-DMIS 2018 R1 allows users to easily convert AutoFeatures to points or quickly use the measured hits for new Constructions and Dimensions, available for Plane, Circle, and Cylinder AutoFeatures. By converting each hit to a vector point, Optimize Path can be used to enhance the order of point measurement, reducing the number of probe tip changes and overall measurement time. New support for Q-DAS Traces enables easier analysis of PC-DMIS data. The new QuickSet control allows users to use both QuickFeature and GD&T Selection and still have the ability to modify measurement strategies.

"With PC-DMIS 2018 R1, we fulfill our commitment to add the most highly-requested items from the user 'Idea Center,'" states Ken Woodbine, Product Line Manager for Metrology Software at Hexagon Manufacturing Intelligence. "These include the graphical point manipulation feature, and the 'push to points' AutoFeature functionality. We also introduce seamless integration with the industry-standard Q-DAS software so key process parameters affecting



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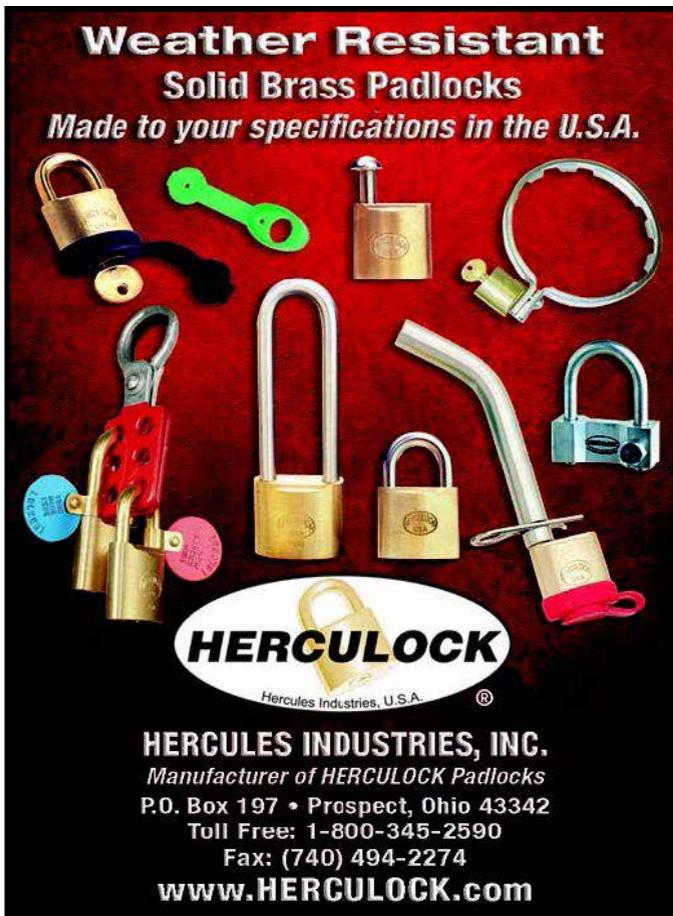
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quality can be easily identified and tracked. Additionally, we focus on optimizing key elements of the measurement routine creation workflow, including front and center visual access to key measurement strategy parameters with our new QuickSet widget technology.”

Enhanced speed of QuickFeature measurement enables users to create multiple circles and cylinders with just one click, optimized for bolt hole patterns or whenever surfaces contain multiple features of the same size and shape. The latest edition also introduces improved Flush and Gap AutoFeature workflow for point cloud inspection. This improved workflow makes it even faster to extract multiple Flush and Gap AutoFeatures from an existing cloud of points object, most helpful when inspecting sheet metal seams. INSPECT has also been improved to include CAD and LIVE views from PC-DMIS and the ability to create Playlists including one or more routines to be executed a specified number of times.

Other notable improvements within PC-DMIS include a new CAD Rotation Widget for resizable one-click CAD rotation, Added (M) for Coaxiality/Concentricity, Leica Absolute Scanner LASlaser scanner support, improved 4K monitor support, improved QuickFeature laser support, Datakit 2017.3 implementation, user interface refresh, and improved tracker user experience. PC-DMIS 2018 R1 is available to download immediately. More information is available through local Hexagon commercial operations and dealers.

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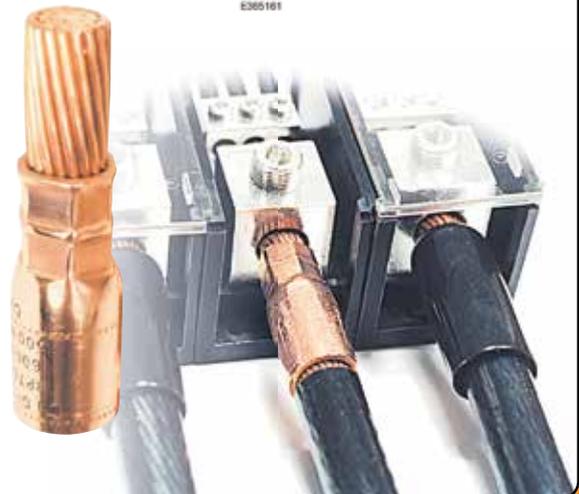
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