

CUTTING FLUIDS & CLEANERS
CYCLO COOL®



CYCLO COOL Metal Machining Fluids & Cleaners

CYCLO COOL® metal machining fluids and cleaners help you lower cost and achieve higher productivity in order to be competitive in today's market. Our high-performance metal machining fluids bundled with our applications experience and CYCLO CUT® tooling product line deliver a Total Process Improvement solution – giving the competitive edge you are looking for.

From coolants to lubricants, forming fluids to process cleaners and corrosion inhibitors, our fluid line supports all your metal machining needs. Our fluid packages come in all shapes and sizes, so you only get what you need – and that's important when it comes to your bottom line. Many of our products are transparent, containing chemical lubricants, and are ideal for light to heavy-duty operations. They are also able to handle many applications and plant environments... and while they are perfect for individual machines, they work just as well in central system applications thanks to their wide ranging operating capabilities.



Count on our Comprehensive Line of CYCLO COOL Metal Machining Fluids and Cleaners for All Your Manufacturing Needs

- > Synthetic and Semi-Synthetic Cutting Fluids for a Wide Range of Applications
- > Soluble Oil Cutting Fluids for Enhanced Machining and Grinding Performance
- > Tooling Specialty Products Including Water-Soluble Tapping Paste and Liquid
- > A Full Line of Production Cleaners, Corrosion Inhibitors, and Parts for your Equipment

With our Range of Fluids, your Machining Operations will Improve Productivity and your Bottom Line!

CYCLO COOL
5ME Advanced Technology Series



CYCLO COOL 5ME Advanced Technology Series of metal machining fluids are a new line of resilient and flexible industrial manufacturing fluids created to meet present day and future manufacturing challenges. These game-changing metal machining fluids are complemented by 5ME CYCLO POWER industrial cleaners with AUTO-FILL SYSTEM, CYCLO ARMOR Corrosion Inhibitors for finished part protection, and CYCLO Lubricants. The family of CYCLO products provide facility managers with a comprehensive portfolio of process improving metal machining fluids. These fluids are not only durable, but extremely flexible for a variety of metal machining applications and materials.

Features and Benefits

- > Comprehensive Line of Metal Machining Fluids for Process Improvements
 - 5ME Advanced Technology Series
 - CYCLO POWER AUTO-FILL SYSTEM
- > The AUTO-FILL SYSTEM Eliminates the Usage, Disposal and Handling of Drums
- > All Fluids Created with Premium Raw Materials and Formulation Techniques
- > Customers can Consolidate their Fluids Purchasing Requirements to One Manufacturer



Case History - Tapping Steel Frames

- > CYCLO COOL 920 - Heavy Duty Synthetic
 - Material 4140 Steel
 - Application Tapping
 - Part Large Frames, Mining Industry
 - Success 1000 Hits/Tap
- > CYCLO COOL 540HL - Heavy Duty Soluble Oil
 - Material Proprietary Stainless Steel
 - Applications Milling, Drilling, and Tapping
 - Part Fracturing Pumps, Mining Industry
 - Success Improved Cycle Time and Tool Life

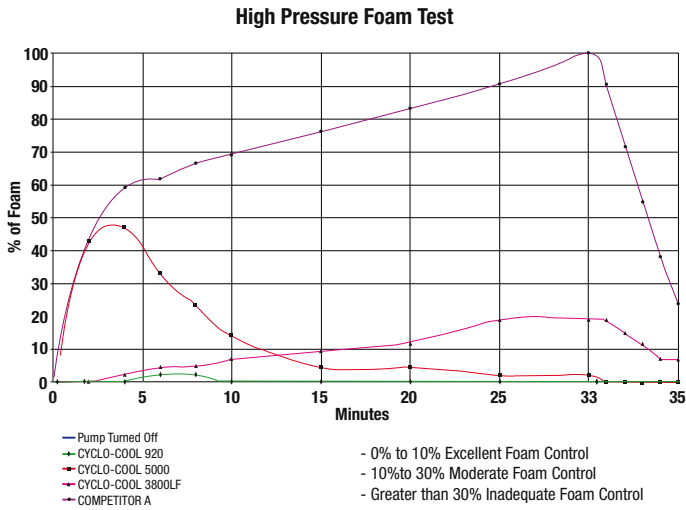
Both Case History Successes are due to the Combination of CYCLO COOL Product along with 5ME Programming.

CYCLO COOL Metal Machining Fluids

5ME Advanced Technology Series	Application	Materials	Product Type
CYCLO COOL 920	Heavy Duty	Aerospace-Exotics	Neutral pH - Synthetic
CYCLO COOL 514	Light to Moderate	Ferrous and Non-Ferrous	Semi-Synthetic
CYCLO COOL 520	Moderate to Heavy Duty	Ferrous and Non-Ferrous	Semi-Synthetic, EP*
CYCLO COOL 590E	Moderate – Hard Water Stable	Ferrous and Non-Ferrous	Micro Emulsion
CYCLO COOL 540HL	Heavy Duty-High Heat Applications	Ferrous and Non-Ferrous	Soluble Oil - Low Foaming, EP*
CYCLO COOL 4100	Severe	Ferrous and Some Non-Ferrous	Soluble Oil, Combination of EPs*

*EP = Extreme Pressure Package

Advanced CYCLO COOL Technology



CYCLO COOL Low Foaming High Pressure Fluids

CYCLO COOL Low Foaming (LF) high pressure fluids provide superior foam control through the combination of product design, raw material selection, and innovative antifoam technology. These fluids are the result of years of experience that have identified creative methods to prevent, control, and reduce foam, even when fluids are used in high pressure delivery systems.

Benefits of High Pressure Fluid Technology

- > Increased Chip Removal Rate
- > Increased Heat Removal Rate from the Cut Zone
- > Deeper Penetration into the Cut Zone

CRYO COOL 321

Utilized in combination with 5ME patented Cryogenic Machining Technology, this unique Minimal Quantity Lubricant (MQL) is used in misting applications and is designed to withstand vast temperature ranges (-321°F to ambient). The complex formulation is extremely resilient to the demanding Cryogenic Machining process and provides excellent lubrication to the cut zone.

CYCLO GREEN

CYCLO GREEN MQL is environmentally friendly and economical. The product formula is derived from natural, renewable resources and does not contain mineral oil. Also, the Minimal Quantity Lubricators apply fluid directly to the parts, which minimizes the quantity of fluid used. This in turn, eliminates recharge and disposal costs associated with recirculating fluid systems.

CYCLO COOL Low Foaming High Pressure Fluids

Product	Severity	Material	Operations	Type	Extreme Pressure Package
CYCLO COOL 2000LF	Moderate - Heavy Duty	Multi-Metals	Milling, Drilling, Tapping	Semi-Synthetic	Yes
CYCLO COOL 590E	Moderate	Multi-Metals	Milling, Drilling, Tapping	Micro Emulsion, Hard Water Stable	No
CYCLO COOL 3900LF	Heavy Duty	Multi-Metals	Reaming Boring Tapping	Emulsion Soluble Oil	Yes

CYCLO COOL Synthetics

CYCLO COOL Synthetic metal machining fluids improve both machining and grinding applications without using mineral oil. Through pioneering research and development, as well as extensive testing, CYCLO COOL Synthetics are designed to provide durable, clean, corrosion control coupled with low foaming properties. These qualities translate to significant advantages in machine performance and product quality.



Features & Benefits of CYCLO COOL Synthetics

- > Excellent for Central Systems and Individual Machines
- > Durable and Clean
- > Low Residues
- > Excellent Corrosion Control
- > Used for Surface and Crank Grinding, Drilling, and Tapping
- > Rejects 99.9% Tramp Oil for Easy Removal
- > Machine and Operator Freindly

CYCLO COOL 920, 910A, and 900 metal machining fluids are recommended for light to severe machining and grinding operations on non-ferrous or ferrous metals. These particular synthetic fluids contain unique formulas with a near neutral pH designed for the machining of aerospace non-ferrous materials.

CYCLO COOL Synthetic Ferrous Cutting Fluids

Product	Severity	Material	Operations
CYCLO COOL 1000FE	Heavy	Various Steels and Cast Iron	Grinding, Milling, Drilling, and Tapping
CYCLO COOL 700FE	Light	Mostly Cast Iron	Light Machining and Grinding

CYCLO COOL Synthetic Non-Ferrous Cutting Fluids

Product	Severity	Material	Operations
CYCLO COOL 1100	Heavy	Heat Treated Steels, Inconel, Titanium, and Aluminum Alloys	Milling, Drilling, Form and Cut Tapping
CYCLO COOL 920	Heavy	Automotive and Aerospace Series Aluminum and Exotics	Milling, Drilling, Form and Cut Tapping
CYCLO COOL 910A	Moderate	Automotive and Aerospace Series Aluminum and Exotics	Milling, Turning, Drilling, and Cut Tapping
CYCLO COOL 900	Light	Automotive and Aerospace Series Aluminum and Exotics	Milling, Turning, and Drilling

CYCLO COOL Synthetic Ferrous Carbide Grinding Fluids

Product	Severity	Material	Operations
CYCLO COOL 880C	Moderate	Carbide	Machining and Grinding

CYCLO COOL Semi-Synthetics

CYCLO COOL Semi-Synthetics include a broad range of general machining and grinding fluids which are recommended for general purpose and medium to heavy-duty operations. These cutting fluids can be used with ferrous and many non-ferrous metals. CYCLO COOL Semi-Synthetic fluids commonly contain a low to moderate amount of mineral oil and are semi-transparent when mixed with water. These products are especially useful in applications that require long fluid life and cleanliness.

CYCLO COOL Soluble Oils

CYCLO COOL Soluble Oils are designed for heavy-duty machining and grinding of both ferrous and non-ferrous metals. CYCLO COOL Soluble Oils offer long fluid life, corrosion protection, high lubricity, low foaming characteristics, and excellent rancidity control. CYCLO COOL fluids are always “machine friendly” and engineered to save money on storage, handling, mixing, charging, makeup, and maintenance costs. Many CYCLO COOL fluids contain extreme pressure packages providing for enhanced machining and grinding performance capabilities in the most difficult applications.



Features & Benefits of CYCLO COOL Semi-Synthetics & Soluble Oils

- > Very Clean and Durable
- > Excellent within Individual Machines and Central Systems
- > Excellent Biological Control
- > Low Residue and Clean Easily
- > Long Sump Life
- > Superior Low Foam Control
- > Operator and Machine Friendly

Semi-Synthetics

Product	Severity	Material	Operations	Extreme Pressure Package
CYCLO COOL 1850	Light	Ferrous	Milling and Cast Iron Machining	Non Chlorinated
CYCLO COOL 1900	Moderate	Multi-Metal	Milling, Drilling, Tapping	Non Chlorinated
CYCLO COOL 2000	Moderate to Heavy Duty	Multi-Metal	Milling, Drilling, Tapping	Combination of EPs*

Soluble Oils

Product	Severity	Material	Operations	Extreme Pressure Package
CYCLO COOL 4100	Severe	Hardened & Stainless Steels	Gun Drilling, Reaming, Boring, and Form Tapping	Combination of EPs*
CYCLO COOL 4000	Heavy Duty	Multi-Metal	Reaming, Boring, Tapping, and Drilling	Combination of EPs*
CYCLO COOL 540HD	Heavy Duty	Multi-Metal	Reaming, Boring, Tapping, and Drilling	Combination of EPs*

* EPs = Extreme Pressure Packages

CYCLO ARMOR

CYCLO ARMOR offers both water and oil-based products technologically created to protect metal surfaces from oxidation during storage and transportation. The water-based products provide a light film, and typically offer corrosion control lasting from several days to several weeks. Oil-based products provide a heavier film and offer longer corrosion protection lasting from months to years.

In addition to finished part protection, 5ME has a series of heat transfer fluids designed for spindle and chiller units. These CYCLO ARMOR products not only protect the spindle from overheating, but provide ferrous and non-ferrous corrosion protection.

Features and Benefits of CYCLO ARMOR Corrosion Inhibitors

- > Solvent or Water Based Technologies
- > Water Displacement Properties
- > In Process to Long Term Part Protection
- > Fingerprint Neutralizer

Features and Benefits of CYCLO ARMOR Heat Transfer Fluids

- > Contain Combination of Glycol and Inorganic Corrosion Inhibitors
- > Used on New and Legacy Machine Spindle and Ball Screw Units
- > Can be used on Ferrous and Non-Ferrous Materials
- > Sold in Concentrated and Diluted Mixes



CYCLO ARMOR Corrosion Inhibitors

Solvent Based

Product	Corrosion Protection	Ferrous	Non-Ferrous	Shipping
CYCLO ARMOR 3000	Long Term Outdoor	Yes	No	Yes, Off Shore
CYLCO ARMOR 2000	Long Term Indoor	Yes	No	Yes
CYLCO ARMOR 1000	Long Term Indoor	Yes	No	Yes

CYCLO ARMOR Spindle Chiller Unit Fluids

CYCLO ARMOR	Application	Water Type	Concentration	Chemical Properties
CYCLO ARMOR HT	Spindle Chiller Unit	DI	25% -50%	Glycol
CYCLO ARMOR CI	Spindle Chiller Unit	DI	5.0%	Inorganic Inhibitors
CYCLO ARMOR 9200	Spindle Chiller Unit	DI	Premix	Inorganic Inhibitors

CYCLO POWER AUTO-FILL SYSTEM

CYCLO POWER Industrial Cleaners meet the tough requirements of the metal machining industry. 5ME has developed specialized formulas and a wide selection of CYCLO POWER products to meet the needs of the most difficult cleaning environments. These specialized multipurpose industrial cleaners are used primarily with the AUTO-FILL SYSTEM.

Features and Benefits

- > Efficient Alternative to Handling and Disposing of Drums, Pails, and Totes
- > Usage is Regulated by Proportioner Units and Monitored
- > Convenient On-Site AUTO-FILL SYSTEM Reduces Time Associated with Ordering and Receiving Containers
- > No Cost Equipment and Technical Services

CYCLO POWER eCLEAN

CYCLO POWER eCLEAN monitoring utilizes cellular technology to provide remote inventory control and reporting solutions for total process improvement of cleaning procedures with your AUTO-FILL System. This technology allows the customer to receive, manage, and forecast inventory more efficiently through scheduled or event driven notifications that are delivered via e-mail.

Features and Benefits

- > Remotely View and Forecast Fluid Levels
- > Receive Alert Notifications on Low Level or Over-Usage
- > Eliminate Run-Outs through e-mail Notification to Plant Floor Personnel and 5ME
- > Inclusive with AUTO-FILL System



CYCLO POWER eCLEAN Cellular Technology Transmitter

CYCLO POWER Floor Cleaners

CYCLO POWER	Dilution	Floor Type	Floor Scrubber	Application	Mix pH
CYCLO POWER 5549	1-10% Typically	Concrete & Painted Floors	Yes	General Purpose (GP)	8.4
CYCLO POWER 6905	1-10% Typically	Concrete	Yes	Self-Foam Alkaline Based	13.4
CYCLO POWER 1155	1-10% Typically	Concrete & Painted Floors	Yes	GP Aluminum Safe	12.6
CYCLO POWER 63000	1-10% Typically	Concrete & Painted Floors	Yes	Low Foaming Floor Scrubber GP	10.3

CYCLO POWER Machine and General Purpose

CYCLO POWER	Dilution	Aggressiveness	Materials	Application	Neat pH
CYCLO POWER 5261	1-10%	Severe (Foam)	All Metals	Shop Wide General Purpose	13.0
CYCLO POWER 5776	1-10%	Severe (Heavy Foam)	Ferrous	Shop Wide General Purpose	13.7
CYCLO POWER 1183	1-10%	Moderate Duty	Ferrous	Shop Wide General Purpose	8.4

Machine Cleaners

CYCLO POWER Machine Cleaners are recommended for cleaning individual machine and central system reservoirs, metal machining fluid lines, premix tanks, machines, and parts. It improves rancidity control by removing bio-films, dirt, grit, chip-deposits, insoluble soaps, and oils from central systems in hard water areas. The cleaners do not redeposit soil in machines or central systems – (the breeding ground for bacteria) and contain corrosion inhibiting ingredients to protect machines and parts (cast iron and steel) from rusting during cleaning.

CYCLO POWER MC 30 can be used in conjunction with power washers and steam units for machine cleaning as well as general purpose cleaning at 1:100 (1%) to 1:25 (4%) mix ratios.

CYCLO POWER MC 50 can be used to rejuvenate used fluid mix at a .5% concentration level. CYCLO POWER MC 50 contains special raw materials that raise pH and help eliminate bacteria and mold.

Floor Cleaners

CYCLO POWER Floor Cleaners range from moderate duty pH neutral products designed for ceramic, terrazzo and vinyl floors to heavy duty liquid industrial cleaning compounds formulated for use in mechanical floor scrubbers, mop buckets, and general purpose applications. The CYCLO POWER floor cleaning products effectively remove grease, oil, and shop dirt from concrete, wood block, and terrazzo floors.

Features and Benefits

Machine Cleaners

- > Excellent for Central System and Individual Machine Use
- > Removal of Tenacious Residues

Floor Cleaners

- > Effective at Removing Grease, Oil, and Machine Shop Soil from Concrete
- > Used as a General Purpose Cleaner for Equipment and Machines

Machine Cleaners

Product	Severity	Material	Operation
CYCLO POWER MC 50	Heavy	Ferrous and Non-Ferrous	Removes Bio-Films and Semi-Hard Residues
CYCLO POWER MC 40	Heavy	Ferrous and Non-Ferrous	Removes Deposits and Residues
CYCLO POWER MC 30	Heavy	Ferrous	Removes Deposits and Residues

Cleanout Procedure For Central System And Individual Machine Reservoirs

A clean metal machining fluid performs better and lasts longer than a dirty fluid. When recharging an individual machine or central system fluid tank, a cleanout of the tank is beneficial so that the fresh charge of metal machining fluid can perform with maximum efficiency.

If you do not cleanout the tank, accumulated shop waste, metal swarf, oil, mold growth, and pockets of bacteria cause deterioration of the fresh mix. In a new system, construction debris in the trenches and tanks, and chemical waste (such as welding flux from the assembly of steel trenches) must be removed. If the trenches are constructed of cement, a good cleaning helps to season them.

The cleanout, therefore, is an essential first step. It insures that your metal machining fluid has the proper environment to give maximum performance with a minimum number of problems.

The following cleanout procedures should be used whenever possible, preferably not during production.

Procedure

1. Drain the entire central system or individual tank.
2. Remove all metal swarf and other debris from sumps, return trenches, oil pans, and filtration units.
3. Fill the system or tank with water sufficient to circulate through all lines and machines. Warm water is desirable, but is not absolutely necessary.
4. Add CYCLO-POWER MC30 cleaner at 1:50 or stronger and circulate for 2 to 8 hours. During this period of circulation, brush all trenches and filter elements; scrub machines and oil pans.
 - a. **WARNING:** Protective gloves must be worn by maintenance personnel during this operation because CYCLO-POWER MC30 is highly alkaline and prolonged contact with the skin may cause irritation.
5. If possible, steam clean areas where suspected accumulation of swarf, oil, or both may not have been removed by the cleaner.
6. When the physical cleaning is complete, drain the CYCLO-POWER MC30 mix from the system.
7. Refill with enough fresh water to circulate throughout the system or tank(s) so that all traces of cleaner and swarf are removed. Drain all lines and sumps. If the rinse water is exceptionally dirty, rinse a second time.
8. Charge the system or individual tank(s) with the required amount of water.
9. Add metal machining fluid at the recommended concentration.
10. Circulate through the system to insure proper mixing before production starts. In precision grinding systems, circulate the fresh charge until it reaches room temperature. Otherwise, size control problems may be encountered by the first production shift.

Sometimes it is not possible to drain the system because of production demands or a manpower shortage. However, try to incorporate as much of the cleanout procedure as possible into one of the alternate methods (during shutdown or during production) shown below to achieve a good cleanout.

Used Fluid – During Shutdown

After production stops, add one gallon CYCLO-POWER MC30 to each 50 gallons of dirty fluid in the machine reservoir or central system. Circulate the mixture for 4 hours or longer through all lines and machine tools. Drain, rinse, and recharge with a fresh mix.

Used Fluid – During Production

Not recommended for individual machines unless carefully supervised. During production, add 1 gallon CYCLO-POWER MC30 to each 100 gallons of dirty fluid in the machine reservoir or central system. Circulate the mixture for 4 – 8 hours through all lines and machine tools. Drain, rinse, and recharge with a fresh mix.

NOTE: CYCLO-POWER MC40 must be used for aluminum applications.

CYCLO COOL Equipment

Prolonging the life of the metal machining fluid and optimizing its performance are very dependent on the controls of the metal machining fluid system. This control includes maintenance of the mechanical components (filtration), maintaining recommended concentration, removal of tramp oil, as well as the proper metal machining fluid recommendation. The problems that beset metal machining fluids in central system applications are the same as those in individual machines, only the magnitude is greater. CYCLO COOL equipment helps prolong fluid life by maintaining proper concentration and removal of extraneous tramp oils.



Water Powered Proportioning Pump For Long Distance Mix Delivery

- > Durable and Accurate
- > Wall Mounted
- > Maximum Viscosity 500 SUS
- > 800" Lateral Max Delivery
- > 20" Vertical Max Delivery
- > 10-75 psi, Fittings-NPT 3/4 In and Out
- > One Year Warranty with Pre-Pump Filter

Standard Metal Manufacturing Fluid Proportioner

- > 14 Metering Tips
- > Maximum Viscosity 500 SUS
- > 48" Discharge Hose
- > 25-75 psi

Bronze Metal Manufacturing Fluid Proportioner

- > Water Shut Off Valve
- > Solid Bronze Casting
- > Galvanized Steel Stand Pipe
- > 40" Discharge Hose
- > 25-75 psi, Fittings-NPT 3/8 In and 1/2 Out
- > Lifetime Warranty

CYCLO COOL Oil Skimmer Units - Belt Skimmer

- > Steel Heavy-Duty Rugged Construction
- > Range of Belt Length: 12" - 60"
- > Self-Tensioning Belt on Hanging and Fixed Lower Pulley
- > Continuous Duty Self-Cooled Fan Motor
- > Available with Integrated Timer

CYCLO COOL Equipment

Proportioner Type	GPM	Mix Range %		Fitting and NPT	Part No.
		Low	High		
Proportioner Pump	7.0	1.40	12.0	-	PLMIXPP518-5ME
Proportioner Pump	12.0	4.70	33.0	-	PLMIXPP585-5ME
Proportioner Pump	25.0	1.60	13.5	-	PLMIXPP520V-5ME
Bronze MWF Proportion	3.0	0.00	25.0	3/8 In and 1/2 Out	PLMIXU03725-5ME
Bronze MWF Proportion	10.0	0.00	7.0	1/2 In and 3/4 Out	PLMIX1027-5ME
Bronze MWF Proportion	4.8	0.25	22.2	3/4 GHT and 1/2 NPT	PLMIX05120-5ME

CYCLO COOL Oil Skimmer Units

Skimmer Type	Access	Reach	Capacity	Part No.
Belt Skimmer	2.0"	12.0"	1 gal/hr	BPF 112-5ME
Belt Skimmer	2.0"	18.0"	1 gal/hr	BPF 118-5ME
Disk Skimmer	1.0 x 12.0"	4.5"	5 gal/hr	LH300-5ME
Disk Skimmer	1.0" x 18.0"	7.0"	5 gal/hr	LH460-5ME

CYCLO COOL Cutting Fluids and Cleaners

CYCLO COOL

Soluble Oils

Product	Severity of Operation	Ferrous	Non-Ferrous	Extreme Pressure Package
CYCLO COOL 4100	Heavy	Yes	Yes	Yes
CYCLO COOL 4000	Heavy	Yes	Yes	Yes

Semi-Synthetics

Product	Severity of Operation	Ferrous	Non-Ferrous	Extreme Pressure Package
CYCLO COOL 2000	Moderate – Heavy	Yes	Yes	Yes
CYCLO COOL 1900	Moderate – Heavy	Yes	Yes	No
CYCLO COOL 1850	Light – Moderate	Yes	No	No

Synthetics

Product	Severity of Operation	Ferrous	Non-Ferrous	Extreme Pressure Package
CYCLO COOL 1100	Moderate – Heavy	Yes	Yes	No
CYCLO COOL 1000FE	Moderate – Heavy	Yes	No	No
CYCLO COOL 920	Heavy	Yes	Yes	No
CYCLO COOL 910A	Moderate	Yes	Yes	No
CYCLO COOL 900	Light	Yes	Yes	No
CYCLO COOL 700FE	Light – Moderate	Yes	No	No

High Pressure Fluid Technology

Product	Severity of Operation	Ferrous	Non-Ferrous	Extreme Pressure Package
CYCLO COOL 3900 LF	Heavy	Yes	Yes	Yes
CYCLO COOL 2000 LF	Moderate	Yes	Yes	Yes
CYCLO COOL 1700 LF	Moderate	Yes	Yes	No

CYCLO POWER Cleaners

Machine Cleaners

Product	Severity of Operation	Ferrous	Non-Ferrous
CYCLO POWER MC 50	Heavy	Yes	Yes
CYCLO POWER MC 40	Heavy	Yes	Yes
CYCLO POWER MC 30	Heavy	Yes	No

CYCLO COOL Metal Machining Fluids

5ME Advanced Technology Series	Application	Materials	Product Type
CYCLO COOL 514	Light to Moderate	Ferrous and Non-Ferrous	Semi-Synthetic
CYCLO COOL 520	Moderate to Heavy Duty	Ferrous and Non-Ferrous	Semi-Synthetic, EP*
CYCLO COOL 590E	Moderate – Hard Water Stable	Ferrous and Non-Ferrous	Micro Emulsion
CYCLO COOL 540HL	Heavy Duty-High Heat Applications	Ferrous and Non-Ferrous	Soluble Oil - Low Foaming, EP*
CYCLO COOL 4100	Severe	Ferrous and Some Non-Ferrous	Soluble Oil, Combination of EPs*

*EP = Extreme Pressure Package

Technical data subject to change without notice

Transforming Production to Productivity

eWARE™ – Software Suite for Manufacturing and Maintenance Efficiency

Provides a Comprehensive Tool Set for

- > Data Acquisition
- > Asset Management
- > Process Optimization
- > Predictive Maintenance Strategies

eLOG™ – Present, Analyze, and Report Critical Asset Data

- > Visualization and Interpretation of Production Data in Real Time
 - In Cycle / Out of Cycle, Alarms / Alerts, Speeds / Feeds
 - Utilization, Availability, Performance, OEE

eSCOPE™ – Real Time Maintenance Data & Analysis Utility

- > Access to Machine Data for Troubleshooting and Diagnosis

eMONITOR™ – Condition Based Monitoring Utility

- > Synchronous Real Time Acquisition of Signals and Sensor Data
- > Lifespan Prediction and Trend Analysis

eENERGY™ – Monitor and Analyze Energy Consumption

- > Correlation of Energy Consumption to Production Conditions
 - Energy Consumption by Cycle
 - Energy Consumption by Tool
 - Energy Consumption by Part
 - Energy Consumption by Value Stream

eCELL™ – Control for Automated Palletized Manufacturing

- > Manages Production Resources
- > Automates Manual Operations

Breakthrough Patented Cryogenic Machining Technology

The 5ME Cryogenic System cools the cutting edge of tools more efficiently than ever before. Developed in partnership with the U.S. Navy, Creare, NavAir, and Lockheed Martin... the multi-patented development utilizes a unique through-spindle / through-turret, through-cutting tool cooling system. Through-cutting tool cooling provides the most efficient heat transfer model.

- > 5ME Cryogenic Technology uses Small Flow Rates of Liquid Nitrogen (LN2) Applied Near the Cutting Edge, Directly and Indirectly to Maximize Cooling Effectiveness (~0.1 L/Min/Cutting Edge)
- > The Liquid Nitrogen is Cooled to -321° F (-196° C)
- > Through-Spindle / Through-Turret Cryogenic Cooling is Applicable to 3, 4, & 5-Axis HMC, VMC, HBM, HTC, and VTC Machine Tool Platforms
- > 5ME™ Cryogenic Cutting Tools are Designed to Deliver Optimum Performance from the 5ME Cryogenic System
- > LN2 is not a Greenhouse Gas and Eliminates Disposal, Management, and Infrastructure Associated with Flood Coolants
- > 5ME Cryogenic Technology Enables Faster Cutting Speeds, Higher Throughput, and Enhanced Tool Life





About 5ME

5ME brings a proven suite of capabilities to industry, solely focused on increasing customers' manufacturing efficiency as a means of building profitable, competitive, and sustainable businesses. Today, that mission is more critical than ever as manufacturers are under increasing pressure from agile competitors, capacity constraints, material cost increases, and skilled labor shortages. But there are still significant opportunities to improve existing operations and return lost profit to the bottom line. 5ME addresses five critical components –the five "M's" of man, material, machines, methods and metrics – to improve a manufacturing enterprise's efficiency (the "E").

Comprehensive Analytical Approach to Manufacturing

5ME services and products are brand agnostic, allowing solutions to be applied to all types of machinery and manufacturing systems.

- > Higher Productivity
- > Reduced Cycle Times
- > Improved Quality
- > Lower Working Capital
- > More Efficient Machining of Challenging Materials
- > Reduced Energy Consumption
- > Improved Worker Health & Safety

www.5ME.com

The tools shown are examples. Actual tools may vary based on selected options

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Suite of Solutions for the Entire Manufacturing Enterprise

Cryogenic Machining - Environmentally friendly metal-cutting technology that increases productivity, quality, and tool life while reducing energy consumption. Facilitates a safer work environment for plant floor personnel.

Manufacturing Efficiency Solutions – Comprehensive portfolio of manufacturing consumables such as tooling, tool holders, and coolants, as well as process technology solutions ranging from process optimization, work-holding / fixture design, clamping, automation, and turnkey systems.

Freedom eWARE™ - Suite of software focused on manufacturing and maintenance efficiency that integrates seamlessly into production and business systems to provide full transparency into manufacturing processes such as asset utilization, performance, quality, "OEE", in addition to machine health, process health, and energy consumption.

Solutions & Applications

- > Turning
- > Milling
- > Boring
- > Drilling
- > Tapping
- > Threading
- > Grooving
- > Workholding
- > Tool Management
- > Process Technology
- > Cryogenic Machining Technology
- > Manufacturing Efficiency Software
- > Metal Machining Fluids & Cleaners