Oil Mist Compliance

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L.J. Lazarus

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Honeywell Federal Manufacturing & Technologies
P. O. Box 419159
Kansas City, Missouri 64141-6159

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Abstract

This report summarizes activities at the KCP related to evaluating and modifying machine tools in order to be in compliance with Section 23 of DOE 10 CFR 851, Worker Safety and Health Program. Section 851.23 (a) states that “Contractors must comply with the following safety and health standards that are applicable to the hazards in their covered workplace”, and subsection 9 contains the following applicable standard: “American Congress of Governmental Industrial Hygienists (ACGIH), ‘Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices,’ (2005) (incorporated by reference, see §851.27) when the ACGIH Threshold Limit Values are lower (more protective) than permissible exposure limits in 29 CFR 1910.” In the 2005 ACGIH – Threshold Limit Value book a Notice of Change was issued for exposure to mineral oil mist used in metalworking fluids (MWFs). The effects of planning for the new facility and which machine tools would be making the transition to the new facility affected which machine tools were modified.

Summary

Two actions that happened almost simultaneously defined this project. First, DOE issued 10 CFR 851 the Worker Safety and Health Program. Section 851.23 (a) states that “Contractors must comply with the following safety and health standards that are applicable to the hazards in their covered workplace”, and subsection 9 contains the following applicable standard: “American Congress of Governmental Industrial Hygienists (ACGIH), ‘Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices,’ (2005) (incorporated by reference, see §851.27) when the ACGIH Threshold Limit Values are lower (more protective) than permissible exposure limits in 29 CFR 1910.” OSHA had been struggling with new mist requirements for metalworking fluids (MWFs), but when OSHA left the mist requirement the same (5.0 mg/M3) and just issued a best practice guide the American Congress of Governmental Industrial Hygienists (ACGIH) felt they had to take action. During 2004, ACGIH asked for comments on a proposed change to their Threshold Limit Value for mineral oil mist. In 2005, ACGIH issued their Notice of Change for mineral oil mist used in MWFs.

In order to be proactive and determine the scope of the possible problem at the KCP this study was commissioned. Machine tools were evaluated in the main machining (chip making) departments. Many of the large machine tools had been purchased in the early 1980s when OSHA Guarding requirements were minimal. Most machine tools had no enclosure and no mist control equipment. Today replacement equipment of this size costs upward of \$1,000,000. Ways of utilizing the splash shield along with adding temporary enclosures with mist collectors were evaluated. Methods of modification were tried and some proved successful in lowering employee exposure to the proposed mist requirements.

At the same time, the DOE also changed its quality standards to commercial quality so that part of its manufacturing could go to Outside Vendors (OSV). This allowed NNSA and Senior FM&T management to consider downsizing the KC Plant. During the second year of this project KCRIMS became a reality and the technical staff was downsizing the manufacturing

department based on needs. This factor, combined with reductions because of treaties and the future of weapons production, lead to giving up a significant amount of machining capability. The equipment this project addressed kept changing. From the final KCRIMS equipment list the project team was able to identify machine tools that would make the transition to the new facility. These were the machine tools the project addressed. Solutions to the mist levels over the proposed ACGIH TLV were accomplished and mist collection equipment was installed on machine tools. By utilizing mist collection equipment installed as part of SMRI project a number of machine tools were modified without purchasing additional mist collectors.

The following was accomplished during this project:

- Mist Collectors installed:
 - 5 Cortland VMC-75B Machining Centers
 - 5 American lathes w/partial enclosures
 - 4 Bostomatic Machining Centers – Not transition - KCRIMS
 - ♦ 1 transferred with mist collector
 - ♦ 1 collector redeployed to another department, Grinder & Bostomatic excessed
 - ♦ 2 other currently in use
 - 4 Hardinge CNC lathes
 - 3 Plunge Form Grinders (3 redeployed collectors)
 - 3 T-Bed lathes (with redeployed mist collectors)
 - 1 Centerless Grinder
- Evaluated 9 machine tools & determined they did not need collectors (TBT Gun Drill (2) , Okuma (2), White, (1), Hermle (2))
- Evaluated 5 machine tools before it was decided not to move them to the new facility and were dropped from list (2 VTL's, Center Drive Lathe, Hollow Spindle Lathe, Tracer lathe).
- Prototyped particle collector for jig grinder
- Measured mist level during MQL Testing included in MQL report

Scope & Purpose

On February 9, 2006 the Department of Energy published the final rules in the Federal Register for 10 CFR 850 & 851. 10 CFR 851 is the Worker Safety and Health Program. In section 851.23 subsection (a) declares that “Contractors must comply with the following safety and health standards that are applicable to the hazards in their covered workplace”, and subsection 9 contains the following applicable standard: “American Congress of Governmental Industrial Hygienists (ACGIH), ‘Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices,’ (2005) (incorporated by reference, see §851.27) when the ACGIH Threshold Limit Values are lower (more protective) than permissible exposure limits in 29 CFR 1910.” In the ACGIH 2005 Annual Report the Committees on Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) issued the notice of Intended Change (NIC) pertaining to Mineral Oil used in Metalworking Fluids lowering the exposure limit from 5 mg/M3 to 0.2 mg/M3. Mineral oil is the primary component of all oil based metalworking fluid and soluble oil and semi synthetic water-based metal working fluids. These DOE and ACGIH actions, in combination, affected all machining

operations that used metalworking fluids in all DOE facilities. This project was planned to start in the fall of 2005 to evaluate the impact of this proposed new rule at the KCP, develop a plan of action, and then implement that plan.

Prior Work

There are two primary types of metalworking fluids (MWFs); oil and water based. Water-based MWFs are broken up into three groups:

- Soluble oil which is a mix of 4 to 10% oil, emulsifiers, buffers, biocides, rust inhibitors and the balance is water.
- Semi-Synthetics in which the oil component is replaced with a mix of oils and synthetic lubricants. The additional additive package is modified.
- Synthetic in which the oil component is replaced with synthetic lubricants. The additive package is tailored to the synthetic lubricants.

Employee mist exposure and possible health effects have been a constant topic since the 1980s. Since metalworking fluids are primarily mixtures of multiple components, formulators have removed ingredients that have been designated as possible cancer causing agents. In the past, polyaromatic hydrocarbons (PAHs) and nitrosamine forming agents were removed from metalworking fluids. At the KCP, all mineral oils that are not high and severely refined (severely hydro treated or severely solvent refined) are not allowed to be used and stocked in stores. If one is allowed, a carcinogen plan must be issued for the department using the material. Presently all MWF and lubricants used in the machining departments are severely hydro treated and/or severely solvent refined.

Prior to 1993, the United Autoworkers signed collective bargaining agreements with the big three US Automobile Manufacturers (Chrysler, Ford, GM) to limit the exposure of MWF mists to the bargaining unit employees of less than 0.5 mg/M3. The automobile manufacturers and the UAW sponsored research and funded cancer studies on the effects of MWF on employee health.

In December of 1993 the UAW petitioned OSHA to reduce MWF exposure for all workers to 0.5 mg/M3. OSHA and NIOSH were funded to evaluate the MWF issues. In February 1996 OSHA made Coolant/Metalworking Fluids a targeted item, and in January 1998 NIOSH issued the criteria document "Criteria for a Recommended Standard – Occupational Exposure to Metalworking Fluids". OSHA formed the Standards Advisory Committee in May 1997 to make recommendations for a new rule. Michigan's state wide OSHA type program fined a cutting tool manufacturer based on Michigan statutes in May 1999 based on the proposed NIOSH REL. In July 1999 the OSHA Standards Advisory Committee issued their recommendation of 0.5 mg/M3. The UAW again sued OSHA in 2001 for not issuing a mist exposure standard. In December 2001, OSHA issued their Best Practice Guide.

During these years, industry and professional organizations were not ignoring the issues related to MWFs. There were many thrust activities that included the National Center for Manufacturing Sciences (NCMS) – Metalworking Fluids Project, Organizational Resources

Counselors (ORC) – Metal Removal Fluids Task Force (also sponsored by ILMA-Independent Lubricant Manufacturers Association, American Automotive Manufacturers Association) and the Society of Manufacturing Engineers’ Specialty Conferences. Two symposiums were held in Dearborn on the Industrial Metalworking Environment. Many of the publications of these organizations were quoted in the OSHA Best Practice Guide. ASTM, the American Automotive Manufacturers Association, and the Society of Automotive Engineers published standards that affect MWFs or their uses. OSHA included whole sections from the ORC guide in their document. The author has served on the MCMS Metalworking Fluids Project and the ORC MRF Task Force and the amount of literature published during this period is very large.

Today the Society of Tribologists and Lubrication Engineers (STLE) has a rigorous Certified Metalworking Fluid Specialist certification program with requirements of a Bachelor of Science Degrees, five years of experience in working with MWF, and an eight hour Certification Exam. The Society of Manufacturing Engineers has a Metalworking Fluids Community with its own web page that is up-dated twice a month with information on the metalworking fluid environment. STLE and SME also cosponsor A Metalworking Fluid Certificate Program that includes three days of classes. This program is offered at least twice per year.

Despite the vast amount of study and research, scientists can not find a smoking gun that trigger the body’s response to metalworking fluids. MWF are a mixture of many components that are constantly changing from the time they are added to the machine sump until used up and replaced. They are influenced by internal house keeping practices, hydraulic and way oil leaks, water hardness and purity, air borne bacteria and mold spores, and many other factors. It is the synergistic effects of the materials, time, and contamination that trigger the body’s response. Since all humans are different each person reacts differently to the exposure.

Activity

At the start of this project the KCP had many machine tools purchased before 1990 (Photo 1). These machines had no enclosures or mist collection accessories. Starting in the ‘90s machine tool manufacturers started to manufacture machine tools with enclosures.

Figure 1. Monarch VMC-75- At one time KCP had 19 of these machine tools

As the use of high pressure (1000 psi) coolant (MWF) spread, all machine tool manufacturers started making machines with enclosures. The problem with these designs was that they didn't include mist collectors to draw the mist out of the enclosure. When a machinist opens the enclosure to change or check a part he is being exposed to the mist that exists in the cavity. Since the TLV has been reduced to only 4% of what was legal before, the exposure from changing a part can raise the employee 8 hour exposure above the TLV.

Monitoring

All mist monitoring performed on this project was done with a Thermo Anderson Personal Data Ram (Photo 2). The literature on this instrument is included in Appendix 3 of this report. Unlike the standard requirement, the monitor was mounted between the controls of the CNC machine and where the operator worked when loading parts or observing the operation. In this way it was known what the machinist would be exposed to if he stayed at the machine. Over the course of the day the operator leaves the machine to perform other work duties. During this period, the operator is away from the operation zone where the mist levels are the highest. The machinist can still watch what is going on but the exposure will be less. Some machinists sit away from the machine to reduce their noise exposure. The pictures on the following page show where the monitor was mounted while data was being taken. All jobs monitored were being worked on production or development PIDS and product. Production jobs were run at the programmed speeds and feeds. One must also consider the type of MWF being used when evaluating the data. The requirement is on mineral oil mist. Therefore, when we are measuring the exposure on oil based MWF the instrument is reading directly. However, when we are measuring a water-based MWF, which is 6% oil, then the true exposure to mineral oil mist is 6% of the reading. The members of this project believe this would be unacceptable to our employees, and have diligently tried to limit the total exposure to 0.2 mg/M³.

Even though the unit is compact, it still is fairly large and heavy. Operators objected to its weight. In one case, when an operator wore the unit, there was a problem. This operator was a smoker. During his smoke breaks the unit recorded very high readings that over shadowed the rest of the data. The calculated TLV the instrument recorded was incorrect and an order of magnitude too high.

The unit was always started in the Process and Machining Evaluation Lab so that an idea of the machining department's background level could be established. Usually this represents less than 5 minutes of the data run. In most instances the monitor ran by the machine tool for 6 hours. Data files were down loaded from the Data Ram and plotted in Excel. The photographs on the following page show the screen available when the monitor is connected to the PC. A sampling rate of 5 points/min was used and provided approximately 6 hours of data.

Data Ram Connected to PC

Instrument Set-up Screen

Raw Data from Monitor

Graph of Raw Data

Figure 2. Data Ram and PC Screens

Modifications

The first items addressed were the new Bostomatic and Monarch VMC-75B and VMC-175B machining centers that had been purchased in the previous four years. Centrifugal Mist Collectors with HEPA filter on the exhaust were purchased and installed on these machine tools. These units have an operating flow rate of 900 cubic feet/minute. The HEPA filter also eliminates smoke particles that are generated when oil based MWFs are used.

Installation was modeled on the installation of a unit in the Reservoir production area. This unit was added after the exhaust mist began affecting the welding process occurring in the next work cell. In the case of both types of machine tools the manufacturer had designed the machine tool for installation of a mist collector but it was only included as an optional accessory. Since there was no driver, no one included the mist collector in the specification. Mist collection equipment was added to ten machine tools to bring them into compliance with the ACGIH TLV requirements. Examples of this installation are shown in Figures 3 and 4.

Cortland VMC-75B 4 Axis Machining Center
with Mist Collector

Detail of Drilling Operation
in previous picture

Figure 3. Monarch Machining Center

Bostomatic Installation

Mist collector in
back of machine tool

Figure 4. Bostomatic Machining Center.

The next target was the large older machine tools that include Vertical Turret Lathes (2 machines), the large American Lathes (6 machines), and large 5 axis Machining Centers (3 machines). These machine tools were manufactured before enclosures were offered for machine tools. All of these machines were installed in the 1980s. They have no mist collection equipment associated with them. These machine tools were typical of what was produced during World War II when the environment, safety, and health were not considered as part of machine tool design. OSHA machine guarding requirements did not exist and the environment inside of plants included rainbows when a machinist looked up at the lights (a rainbow is visible when looking up at the lights when water-based MWF is used and the mist levels are above 3.5 mg/M3). Floors were wet and slippery. Example pictures of the problems at KCP are shown on the following page.

Overall view -Vertical Turret Lathe (VTL) Mist Monitor on Operator Console VTL

Typical VTL Operations – Note the large pink droplets of MWF

Figure 5. Views of Vertical Turret Lathe

During SMRI the VTL's were moved from Heavy Machining, which was a large open area of approximately 20,000 square feet to just a room of approximately 1200 square feet. This former stores area did not have adequate air exchanges; nor was the air large enough to dilute the mist and levels continued to increase during all day operations. Monitoring showed that during the latter part of the shift, mist levels exceeded current OSHA mist exposure levels. Temporary fixes included increasing the number of air changes and opening the 12 foot sliding door to the aisle.

Plans were being made to address the situation, including: adding clear plastic extensions on the splash shield, adding clear vinyl strip curtains (similar to a shower curtain) and connecting them to the horizontal cross head, and adding two mist collectors (one for each turret). At this time the decision concerning heavy machining was made. The product scheduled on these machine tools was unclassified and it was decided to out-source this work.

Since that time only four short duration jobs have been run on these machine tools and the temporary solution has proved adequate. One of the VTLs has been placed in cold storage and FM&T plans to excess these machines in the next two years. No additional work has been done on these machine tools.

American Lathe – Mist Monitor
Hanging from MWF Line

Typical Boring Operation on American
Lathe – note the droplets

Figure 6. Large American Lathe

White Sundstrand Large 5 Axis

Detail of Drilling Operation – Note the droplets

Figure 7. White Sundstrand – Large 5 Axis Machining Center

Monitoring of the other machine tools had started as well. The decisions were being made as to which capabilities and machine tools would be included in KCRIMS. At that time it was decided that heavy machining would not be moving to the new facility. This eliminated the large 5 Axis Machining Centers, hollow spindle, large tracer and center-drive lathes, and large radial drill press from consideration.

The unclassified work scheduled for these machines was decreasing and management decided to move this work to OSV (Outside Vendors). These machine tools presented major problems in controlling mist. Most large parts are made from aluminum alloys that require high cutting speeds that sling the MWF from the rotating part or cutting tool. The large droplets seen in the pictures are not breathable, but when they hit chips they break apart into smaller size droplets that can be breathable. In addition, there are small droplets (not seen in the pictures) that are sheared away as the larger droplets are formed, and these droplets are the particles of concern in mist formation.

These machines would need some type of temporary enclosure to contain the mist so that a collector could be effective. In the case of the White Sundstrand a large portable snorkel HEPA filter combination could be used for temporary setup. We have successfully used this type of unit but metal removal rates have to be reduced to match the capacity of the unit.

73-601
1200 CFM
Mobile Fume Extractor

Our most powerful
fume extractor
also has
360° arm rotation
for maximum reach
and flexibility

**Photo For More
Information**

Figure 8. Large Portable Mist & Fume Collector

The American Lathes were going to the new building and would require a solution. The American lathes have large and wide splash shields that can be locked to the saddle and will move with the cross slide as it moves down the length of the part. By utilizing clear strip curtains to form a partial enclosure around the saddle where the turret, cutting tool, and MWF come together and generate mist the splash shield now becomes a partial enclosure and can be connected to the saddle so that the enclosure moves with the cutting tool for long parts. The figure on the following page shows a comparison of the before and after data following the installation of the strip curtain and centrifugal mist collector. The mist collector has a 900 CFM (cubic feet/minute) capability and is adequate for most operations; however, there has been some trouble with some leaded brass turning operations. The small chips come off the parts in high speed streams of small chips that impact the strip curtain and force it open allowing some mist to escape. The only way to correct the problem is to slow the cutting process down. Fortunately, it is away from the operator station and mist levels are only slightly above the 0.2 mg/M3 for eight hours. The machinist running the job did not feel the levels were bothersome and did not notify anyone. Total run time was under three days. The operation occurs once per year and we will monitor it next year and make modifications.

Figure 9. Comparative Mist Data – Large American Lathe

The same approach was used with the T-Bed lathes (1- Model Shop and 2-Tool Room). Again, the splash shield was connected to the mist collector. The air flow comes into the area where the cutting tools, MWF, and part come together and mist is formed. The configuration again proved successful.

Figure 10. Typical Installation on a T-Bed lathe using redeployed mist collectors & splash shield

The final types of lathe addressed were the Hardinge CHNC & CHNC4 lathes. The difference between these lathes is the spindle capacity (5C vs. 16C collets) and the configuration of the enclosure. An Ace Portable HEPA filter was utilized to control the mist and smoke generated within the machining cavity. On the CHNC4 the portable HEPA filter is mounted on the top of the enclosure. In the case of the CHNC the portable HEPA filter is set on the floor. Oil separators were installed between the enclosure and the HEPA filter so that large droplets would be purged from the air stream and not foul the HEPA filter element.

Figure 11. Hardinge CHNC4 with HEPA smoke and mist collector installed

The large Okuma lathes were monitored and we found the combination of splash and spindle shields were very effective. Monitoring was done during the final turning of the outside of the W80 case. Levels were below the ACGIH TLV and no further action was taken. Subsequently, this program was cancelled and these lathes were dropped from the equipment list going to the new building.

In total, eleven lathes that were designated to be moved to the new building in the KCRIMS plan were modified for mist collectors. Manual lathes were evaluated for the generation of mist. In production areas the manual lathes are used for deburring, polishing, and rework. These operations are usually performed dry and in these cases a portable HEPA filter can be used to control the particulate generated. In the case of the manual lathes used in the model shop and tool room these jobs are development jobs that usually run once. These machines are not enclosed and the tool makers do not like to be splashed. They use only enough MWF to cool the tool and they minimize splash. The monitoring that was done showed higher levels during cutting, but the jobs were never run for over an hour before they went on to a different operation. In these cases the TLV for eight hours was not exceeded. It would be a rare case when the model maker was exposed to levels above the TLV.

Another area investigated was the Sheffield Plunge Form Grinders in Reservoir Manufacturing and the training area. Three of these machine tools are used in production. All three machines are made by the same manufacturer. All have enclosures and are equipped with a Smog Hog, which is an electro static mist collector. After the new grinder was installed in the training area complaints were received from the tool room. The tool makers complained of an odor problem.

Monitoring revealed the mist was drifting across the hallway because the walls were not full height. The exhaust from the Smog Hog was above the mist TLVs. Many changes were made in the ducting trying to decrease the mist levels in the air flow. A supplemental mist collector had to be installed on the exhaust port so that it could be brought below TLV requirements.

Figure 12. Secondary mist collector installed on exhaust of Smog Hog

Previous testing conducted by the HSE department had shown that the mist levels at the operator's station were within the TLV for the plunge form grinders. Both grinders had a baffle at 90 degrees to exhaust where the machinist and/or labors place pig mat to absorb the oil in the air stream. When the back of the machine tool was monitored it was found that exhaust from the Smog Hog was also above the TLV.

A maze was added in the duct between the grinding head and the Smog Hog, but it proved to be ineffective in reducing the mist levels. Grinding operations with oils also generate aerosols with smaller particles that are caused by the condensing of oil vapor formed in the grinding process. These particles are an order of magnitude smaller than mechanically formed mist particles. Since the maze was upstream from the mist collector they might not have condensed and coalesced until after they exited from the maze. A redeployed mist collector was installed and ducting from the mist collectors run to it. This additional duct length with reduced air flow to the collector allowed the aerosol to coalesce into a mist that could be removed.

After new operating parameters were established for newer products, a second redeployed mist collector was installed because of the higher mist load. It was beneficial that these problems were discovered at an early stage because this obscure problem would have shown up in the new building where the plunge form grinders will be installed in line, and mist levels at the operating station would have been affected by the exhaust from an adjacent grinder.

Figure 13. Redeployed Mist Collector installed downstream from Smog Hogs

Other grinders without mist collectors were examined and a FX1200 Royal Filtermist unit was redeployed and installed on the Cincinnati Milacron centerless grinder. This was the only grinder that did not have mist collection equipment installed. Approximately ten months ago the decision was made to only purchase centerless ground stock and this grinder was surplused. It was decided to redeploy this mist collector to the new plunge EDM machine. Provisions have been made by Charmiles to pull all fumes generated by the electrode up the rotating spindle. It was felt with the high efficiency supplemental filter that this unit would meet the requirement.

Gun drill operations were also monitored. One department had recently installed three Nagel - TBT Gun Drills. Two of the units were twin spindle gun drills and the third was a three axis unit. All units are completely enclosed. When the part is drilled, the guide bushing presses against the piece part, forming a pressure cavity. On the dual spindle machines, when the drill breaks through the opposite side of the part, the flow and mist is trapped in the counter rotating spindle. Monitoring found low mist levels in the monitoring cavity and the 8 hour TLV was well under the 0.2 mg/M3 limit.

There was a complaint about the three axis TBT gun drill and it was monitored and found to be below the ACGIH requirement. After a backing block was put behind the work piece and the drilling was stopped while in the backing block, mist levels and odor problems disappeared.

Figure 14. Nagel – TB 3 Axis Gun Drill

Accomplishments

All NC machine tools that are designated as going to the new building have been monitored and are compliant to the new ACGIH mist TLV. Many more machines were monitored before decisions were made as to which machine tools would be moving as part of the KCRIMS project.

Manual machine tools are used for development projects and for the fabrication of tools, jigs and fixtures. Every setup is unique and the operating parameters are different. Portable HEPA filters are available to control mist in these circumstances. Monitoring will be done on a periodic basis to assure compliance with DOE rules.

Final Comments

Only the Department of Energy has made the ACGIH TLV a rule. OSHA still has a mist level of 5.0 mg/M³. The collective bargaining agreement between the United Autoworkers and Chrysler, Ford and General Motors is still at 0.5 mg/M³. The ACIH has changed their Notice of Change every year since first issued and has yet to adopt a final rule. It is expected that the final mist level approved could be between 0.2 and 0.5 mg/M³.

Machine tool builders supply mist collectors with their equipment. Some are standard equipment and some are optional accessories. Be aware that the mist collectors supplied will meet the OSHA rule and not the DOE and ACGIH TLV. The mist collector required to meet this requirement is much larger and more expensive. This project showed that secondary mist collectors had to be added to meet the new rule. Staff writing specifications for machine tools must specify the ACGIH propose mist level of 0.2 mg/M, in order to be assured that the equipment manufacturer is supplying collection equipment that meets this requirement.

Appendix 1

Mist Data

Note on the files included in this appendix:

Graphs are for all tabular data in run.

Calculated values in header are for all data in run.

Only the first page of individual data points is shown. Files can contain up to 1000 individual data points. Complete files can be supplied upon request

pDR-1000			
User ID: Gun Drill			
Tag Number: 02			
Number of logged points: 159			
Start time and date: 14:20:57 26-Aug			
Elapsed time: 00:31:48			
Logging period (sec): 12			
Calibration Factor (%): 100			
Max Display Concentration: 0.281 mg/m ³			
Time at maximum: 14:47:11 Aug 26			
Max STEL Concentration: 0.085 mg/m ³			
Time at max STEL: 14:52:32 Aug 26			
Overall Avg Conc: 0.062 mg/m ³			
Logged Data:			
Point	Date	Time	Avg.(mg/m ³)
1	26-Aug	14:21:09	0.018
2	26-Aug	14:21:21	0.021
3	26-Aug	14:21:33	0.023
4	26-Aug	14:21:45	0.024
5	26-Aug	14:21:57	0.026
6	26-Aug	14:22:09	0.028
7	26-Aug	14:22:21	0.04
8	26-Aug	14:22:33	0.031
9	26-Aug	14:22:45	0.016
10	26-Aug	14:22:57	0.015
11	26-Aug	14:23:09	0.021
12	26-Aug	14:23:21	0.015
13	26-Aug	14:23:33	0.02
14	26-Aug	14:23:45	0.03
15	26-Aug	14:23:57	0.043
16	26-Aug	14:24:09	0.041
17	26-Aug	14:24:21	0.057
18	26-Aug	14:24:33	0.065
19	26-Aug	14:24:45	0.155
20	26-Aug	14:24:57	0.06
21	26-Aug	14:25:09	0.043
22	26-Aug	14:25:21	0.046
23	26-Aug	14:25:33	0.046
24	26-Aug	14:25:45	0.051
25	26-Aug	14:25:57	0.038
26	26-Aug	14:26:09	0.044
27	26-Aug	14:26:21	0.032
28	26-Aug	14:26:33	0.026
29	26-Aug	14:26:45	0.028
30	26-Aug	14:26:57	0.026
31	26-Aug	14:27:09	0.027
32	26-Aug	14:27:21	0.038
33	26-Aug	14:27:33	0.041
34	26-Aug	14:27:45	0.041
35	26-Aug	14:27:57	0.039
36	26-Aug	14:28:09	0.04
37	26-Aug	14:28:21	0.044
38	26-Aug	14:28:33	0.04
39	26-Aug	14:28:45	0.042
40	26-Aug	14:28:57	0.038
41	26-Aug	14:29:09	0.042
42	26-Aug	14:29:21	0.05
43	26-Aug	14:29:33	0.047

pDR-1000			
Tag Number: 01			
Number of logged points: 320			
Start time and date: 13:22:53 04-Aug			
Elapsed time: 02:40:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.004 mg/m ³			
Time at maximum: 15:01:44 Aug 04			
Max STEL Concentration: 0.791 mg/m ³			
Time at max STEL: 15:43:05 Aug 04			
Overall Avg Conc: 0.438 mg/m ³			
Logged Data:			
Point	Date	Time	Avg.(mg/m ³)
1	4-Aug	13:23:23	0.065
2	4-Aug	13:23:53	0.093
3	4-Aug	13:24:23	0.063
4	4-Aug	13:24:53	0.053
5	4-Aug	13:25:23	0.178
6	4-Aug	13:25:53	0.238
7	4-Aug	13:26:23	0.56
8	4-Aug	13:26:53	0.511
9	4-Aug	13:27:23	0.498
10	4-Aug	13:27:53	0.534
11	4-Aug	13:28:23	0.499
12	4-Aug	13:28:53	0.505
13	4-Aug	13:29:23	0.508
14	4-Aug	13:29:53	0.555
15	4-Aug	13:30:23	0.507
16	4-Aug	13:30:53	0.478
17	4-Aug	13:31:23	0.472
18	4-Aug	13:31:53	0.425
19	4-Aug	13:32:23	0.422
20	4-Aug	13:32:53	0.406
21	4-Aug	13:33:23	0.391
22	4-Aug	13:33:53	0.408
23	4-Aug	13:34:23	0.356
24	4-Aug	13:34:53	0.348
25	4-Aug	13:35:23	0.335
26	4-Aug	13:35:53	0.336
27	4-Aug	13:36:23	0.361
28	4-Aug	13:36:53	0.354
29	4-Aug	13:37:23	0.366
30	4-Aug	13:37:53	0.344
31	4-Aug	13:38:23	0.357
32	4-Aug	13:38:53	0.311
33	4-Aug	13:39:23	0.31
34	4-Aug	13:39:53	0.289
35	4-Aug	13:40:23	0.267
36	4-Aug	13:40:53	0.265
37	4-Aug	13:41:23	0.262

pDR-1000			
Tag Number: 03			
Number of logged points: 1000			
Start time and date: 09:42:14 21-Nov			
Elapsed time: 08:20:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.155 mg/m ³			
Time at maximum: 11:58:20 Nov 21			
Max STEL Concentration: 0.071 mg/m ³			
Time at max STEL: 10:08:48 Nov 21			
Overall Avg Conc: 0.038 mg/m ³			
Logged Data:			
Point	Date	Time	Avg.(mg/m ³)
1	21-Nov	09:42:44	0.017
2	21-Nov	09:43:14	0.04
3	21-Nov	09:43:44	0.042
4	21-Nov	09:44:14	0.045
5	21-Nov	09:44:44	0.057
6	21-Nov	09:45:14	0.057
7	21-Nov	09:45:44	0.054
8	21-Nov	09:46:14	0.056
9	21-Nov	09:46:44	0.051
10	21-Nov	09:47:14	0.051
11	21-Nov	09:47:44	0.054
12	21-Nov	09:48:14	0.048
13	21-Nov	09:48:44	0.059
14	21-Nov	09:49:14	0.054
15	21-Nov	09:49:44	0.05
16	21-Nov	09:50:14	0.054
17	21-Nov	09:50:44	0.066
18	21-Nov	09:51:14	0.064
19	21-Nov	09:51:44	0.06
20	21-Nov	09:52:14	0.061
21	21-Nov	09:52:44	0.051
22	21-Nov	09:53:14	0.056
23	21-Nov	09:53:44	0.045
24	21-Nov	09:54:14	0.059
25	21-Nov	09:54:44	0.051
26	21-Nov	09:55:14	0.055
27	21-Nov	09:55:44	0.048
28	21-Nov	09:56:14	0.067
29	21-Nov	09:56:44	0.051
30	21-Nov	09:57:14	0.077
31	21-Nov	09:57:44	0.053
32	21-Nov	09:58:14	0.057
33	21-Nov	09:58:44	0.057
34	21-Nov	09:59:14	0.067
35	21-Nov	09:59:44	0.076
36	21-Nov	10:00:14	0.052
37	21-Nov	10:00:44	0.093
38	21-Nov	10:01:14	0.075

PID 0125386
ID: 3R054-00 Outer Case
Cutting Speed 200 SFM on 11-12 inch diameter

pDR-1000			
Tag Number: 02			
Number of logged points: 78			
Start time and date: 11:40:16 04-Aug			
Elapsed time: 00:39:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.561 mg/m ³			
Time at maximum: 11:57:08 Aug 04			
Max STEL Concentration: 0.470 mg/m ³			
Time at max STEL: 12:06:51 Aug 04			
Overall Avg Conc: 0.324 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	4-Aug	11:40:46	0.048
2	4-Aug	11:41:16	0.118
3	4-Aug	11:41:46	0.152
4	4-Aug	11:42:16	0.211
5	4-Aug	11:42:46	0.216
6	4-Aug	11:43:16	0.206
7	4-Aug	11:43:46	0.209
8	4-Aug	11:44:16	0.192
9	4-Aug	11:44:46	0.178
10	4-Aug	11:45:16	0.182
11	4-Aug	11:45:46	0.191
12	4-Aug	11:46:16	0.174
13	4-Aug	11:46:46	0.175
14	4-Aug	11:47:16	0.172
15	4-Aug	11:47:46	0.164
16	4-Aug	11:48:16	0.168
17	4-Aug	11:48:46	0.167
18	4-Aug	11:49:16	0.192
19	4-Aug	11:49:46	0.259
20	4-Aug	11:50:16	0.274
21	4-Aug	11:50:46	0.306
22	4-Aug	11:51:16	0.323
23	4-Aug	11:51:46	0.383
24	4-Aug	11:52:16	0.436
25	4-Aug	11:52:46	0.421
26	4-Aug	11:53:16	0.374
27	4-Aug	11:53:46	0.356
28	4-Aug	11:54:16	0.443
29	4-Aug	11:54:46	0.475
30	4-Aug	11:55:16	0.495
31	4-Aug	11:55:46	0.55
32	4-Aug	11:56:16	0.534
33	4-Aug	11:56:46	0.563
34	4-Aug	11:57:16	0.549
35	4-Aug	11:57:46	0.51
36	4-Aug	11:58:16	0.515
37	4-Aug	11:58:46	0.513
38	4-Aug	11:59:16	0.507

pDR-1000			
Tag Number: 01			
Number of logged points: 705			
Start time and date: 10:36:19 15-Nov			
Elapsed time: 05:52:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.418 mg/m ³			
Time at maximum: 14:04:04 Nov 15			
Max STEL Concentration: 0.177 mg/m ³			
Time at max STEL: 14:15:06 Nov 15			
Overall Avg Conc: 0.049 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	15-Nov	10:36:49	0.148
2	15-Nov	10:37:19	0.148
3	15-Nov	10:37:49	0.066
4	15-Nov	10:38:19	0.104
5	15-Nov	10:38:49	0.072
6	15-Nov	10:39:19	0.109
7	15-Nov	10:39:49	0.019
8	15-Nov	10:40:19	0.021
9	15-Nov	10:40:49	0.027
10	15-Nov	10:41:19	0.028
11	15-Nov	10:41:49	0.033
12	15-Nov	10:42:19	0.049
13	15-Nov	10:42:49	0.049
14	15-Nov	10:43:19	0.1
15	15-Nov	10:43:49	0.029
16	15-Nov	10:44:19	0.028
17	15-Nov	10:44:49	0.033
18	15-Nov	10:45:19	0.022
19	15-Nov	10:45:49	0.026
20	15-Nov	10:46:19	0.026
21	15-Nov	10:46:49	0.036
22	15-Nov	10:47:19	0.029
23	15-Nov	10:47:49	0.027
24	15-Nov	10:48:19	0.032
25	15-Nov	10:48:49	0.026
26	15-Nov	10:49:19	0.025
27	15-Nov	10:49:49	0.026
28	15-Nov	10:50:19	0.026
29	15-Nov	10:50:49	0.027
30	15-Nov	10:51:19	0.027
31	15-Nov	10:51:49	0.03
32	15-Nov	10:52:19	0.026
33	15-Nov	10:52:49	0.028
34	15-Nov	10:53:19	0.026
35	15-Nov	10:53:49	0.025
36	15-Nov	10:54:19	0.034
37	15-Nov	10:54:49	0.029
38	15-Nov	10:55:19	0.036
39	15-Nov	10:55:49	0.027
40	15-Nov	10:56:19	0.025
41	15-Nov	10:56:49	0.025
42	15-Nov	10:57:19	0.027
43	15-Nov	10:57:49	0.027
44	15-Nov	10:58:19	0.027
45	15-Nov	10:58:49	0.026
46	15-Nov	10:59:19	0.026
47	15-Nov	10:59:49	0.026
48	15-Nov	11:00:19	0.027
49	15-Nov	11:00:49	0.028

CE# 53026 Okuma Lathe
 PID 0125366
 Part ID 3R054-00
 Cutting Speed 200 rpm on 11-12 inch dia
 Mobnitor mounted on top of turret housing operator side.

pDR-1000			
Tag Number: 01			
Number of logged points: 779			
Start time and date: 09:03:57 02-Dec			
Elapsed time: 06:29:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.159 mg/m ³			
Time at maximum: 12:58:03 Dec 02			
Max STEL Concentration: 0.110 mg/m ³			
Time at max STEL: 13:01:14 Dec 02			
Overall Avg Conc: 0.055 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	2-Dec	09:04:27	0.008
2	2-Dec	09:04:57	0.007
3	2-Dec	09:05:27	0.005
4	2-Dec	09:05:57	0.001
5	2-Dec	09:06:27	0.003
6	2-Dec	09:06:57	0.04
7	2-Dec	09:07:27	0.037
8	2-Dec	09:07:57	0.034
9	2-Dec	09:08:27	0.034
10	2-Dec	09:08:57	0.053
11	2-Dec	09:09:27	0.074
12	2-Dec	09:09:57	0.061
13	2-Dec	09:10:27	0.063
14	2-Dec	09:10:57	0.066
15	2-Dec	09:11:27	0.062
16	2-Dec	09:11:57	0.063
17	2-Dec	09:12:27	0.066
18	2-Dec	09:12:57	0.061
19	2-Dec	09:13:27	0.064
20	2-Dec	09:13:57	0.068
21	2-Dec	09:14:27	0.068
22	2-Dec	09:14:57	0.064
23	2-Dec	09:15:27	0.067
24	2-Dec	09:15:57	0.069
25	2-Dec	09:16:27	0.045
26	2-Dec	09:16:57	0.068
27	2-Dec	09:17:27	0.088
28	2-Dec	09:17:57	0.083
29	2-Dec	09:18:27	0.094
30	2-Dec	09:18:57	0.087
31	2-Dec	09:19:27	0.084
32	2-Dec	09:19:57	0.076
33	2-Dec	09:20:27	0.052
34	2-Dec	09:20:57	0.049
35	2-Dec	09:21:27	0.051
36	2-Dec	09:21:57	0.048
37	2-Dec	09:22:27	0.068
38	2-Dec	09:22:57	0.057
39	2-Dec	09:23:27	0.064
40	2-Dec	09:23:57	0.063
41	2-Dec	09:24:27	0.068
42	2-Dec	09:24:57	0.066
43	2-Dec	09:25:27	0.062
44	2-Dec	09:25:57	0.067
45	2-Dec	09:26:27	0.063
46	2-Dec	09:26:57	0.07
47	2-Dec	09:27:27	0.069
48	2-Dec	09:27:57	0.062
49	2-Dec	09:28:27	0.071
50	2-Dec	09:28:57	0.064

Data Ram at the end of rear splash shield rail
 Floor fan operating on opposite wall of department facing this machine tool
 Coolant: 3700T

PID 0125306
 Item ID: 3R0054-00; Outer Case
 Operation 70

CE#50744 Large American Lathe

pDR-1000			
Tag Number: 01			
Number of logged points: 487			
Start time and date: 08:21:02 03-Dec			
Elapsed time: 04:03:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.103 mg/m ³			
Time at maximum: 12:09:02 Dec 03			
Max STEL Concentration: 0.087 mg/m ³			
Time at max STEL: 12:13:20 Dec 03			
Overall Avg Conc: 0.060 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	3-Dec	08:21:32	0
2	3-Dec	08:22:02	0
3	3-Dec	08:22:32	0
4	3-Dec	08:23:02	0.015
5	3-Dec	08:23:32	0.039
6	3-Dec	08:24:02	0.039
7	3-Dec	08:24:32	0.042
8	3-Dec	08:25:02	0.041
9	3-Dec	08:25:32	0.043
10	3-Dec	08:26:02	0.058
11	3-Dec	08:26:32	0.058
12	3-Dec	08:27:02	0.058
13	3-Dec	08:27:32	0.051
14	3-Dec	08:28:02	0.04
15	3-Dec	08:28:32	0.041
16	3-Dec	08:29:02	0.04
17	3-Dec	08:29:32	0.045
18	3-Dec	08:30:02	0.036
19	3-Dec	08:30:32	0.055
20	3-Dec	08:31:02	0.05
21	3-Dec	08:31:32	0.048
22	3-Dec	08:32:02	0.048
23	3-Dec	08:32:32	0.047
24	3-Dec	08:33:02	0.046
25	3-Dec	08:33:32	0.05
26	3-Dec	08:34:02	0.052
27	3-Dec	08:34:32	0.047
28	3-Dec	08:35:02	0.049
29	3-Dec	08:35:32	0.052
30	3-Dec	08:36:02	0.057
31	3-Dec	08:36:32	0.049
32	3-Dec	08:37:02	0.051
33	3-Dec	08:37:32	0.051
34	3-Dec	08:38:02	0.054
35	3-Dec	08:38:32	0.051
36	3-Dec	08:39:02	0.054

PID: 0125386
Item ID: 3R0054-00
Item Description: Outer Case
Operation #: 70
Finish ID
20:1 Mix, 97022454

pDR-1000			
Tag Number: 04			
Number of logged points: 268			
Start time and date: 08:23:14 20-Mar			
Elapsed time: 02:14:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.095 mg/m ³			
Time at maximum: 08:27:03 Mar 20			
Max STEL Concentration: 0.074 mg/m ³			
Time at max STEL: 08:40:47 Mar 20			
Overall Avg Conc: 0.061 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	20-Mar	08:23:44	0.022
2	20-Mar	08:24:14	0.022
3	20-Mar	08:24:44	0.014
4	20-Mar	08:25:14	0.02
5	20-Mar	08:25:44	0.037
6	20-Mar	08:26:14	0.061
7	20-Mar	08:26:44	0.09
8	20-Mar	08:27:14	0.076
9	20-Mar	08:27:44	0.069
10	20-Mar	08:28:14	0.083
11	20-Mar	08:28:44	0.074
12	20-Mar	08:29:14	0.074
13	20-Mar	08:29:44	0.071
14	20-Mar	08:30:14	0.071
15	20-Mar	08:30:44	0.078
16	20-Mar	08:31:14	0.064
17	20-Mar	08:31:44	0.068
18	20-Mar	08:32:14	0.068
19	20-Mar	08:32:44	0.065
20	20-Mar	08:33:14	0.069
21	20-Mar	08:33:44	0.074
22	20-Mar	08:34:14	0.069
23	20-Mar	08:34:44	0.073
24	20-Mar	08:35:14	0.067
25	20-Mar	08:35:44	0.078
26	20-Mar	08:36:14	0.07
27	20-Mar	08:36:44	0.063
28	20-Mar	08:37:14	0.065
29	20-Mar	08:37:44	0.073
30	20-Mar	08:38:14	0.084
31	20-Mar	08:38:44	0.077
32	20-Mar	08:39:14	0.08
33	20-Mar	08:39:44	0.075
34	20-Mar	08:40:14	0.076
35	20-Mar	08:40:44	0.086
36	20-Mar	08:41:14	0.069

CE# 53480; Med American Lathe
Coolant : 97022454 20:1 Mix, Run for 5 min after RAM installed on Saddle

pDR-1000
 Tag Number: 01
 Number of logged points: 945
 Start time and date: 08:43:31 18-Aug
 Elapsed time: 07:52:30
 Logging period (sec): 30
 Calibration Factor (%): 100
 Max Display Concentration: 0.755 mg/m³
 Time at maximum: 16:31:56 Aug 18
 Max STEL Concentration: 0.449 mg/m³
 Time at max STEL: 16:32:34 Aug 18
 Overall Avg Conc: 0.085 mg/m³
 Billet 23.5 dia x 17 in Height
 6 inch Spade Drilling Operation
 ~65 to 70 RPM @ 0.01 IPR
 Followed by Boring Operation
 Open Hole to 19 in dia.

Logged Data:

Point	Date	Time	Avg. (mg/m ³)
1	18-Aug	08:44:01	0.079
2	18-Aug	08:44:31	0.014
3	18-Aug	08:45:01	0.021
4	18-Aug	08:45:31	0.045
5	18-Aug	08:46:01	0.038
6	18-Aug	08:46:31	0.063
7	18-Aug	08:47:01	0.083
8	18-Aug	08:47:31	0.085
9	18-Aug	08:48:01	0.062
10	18-Aug	08:48:31	0.07
11	18-Aug	08:49:01	0.071
12	18-Aug	08:49:31	0.073
13	18-Aug	08:50:01	0.071
14	18-Aug	08:50:31	0.071
15	18-Aug	08:51:01	0.069
16	18-Aug	08:51:31	0.071
17	18-Aug	08:52:01	0.069
18	18-Aug	08:52:31	0.066
19	18-Aug	08:53:01	0.065
20	18-Aug	08:53:31	0.067
21	18-Aug	08:54:01	0.064
22	18-Aug	08:54:31	0.07
23	18-Aug	08:55:01	0.068
24	18-Aug	08:55:31	0.066
25	18-Aug	08:56:01	0.065
26	18-Aug	08:56:31	0.063
27	18-Aug	08:57:01	0.061
28	18-Aug	08:57:31	0.058
29	18-Aug	08:58:01	0.061

pDR-1000			
Tag Number: 02			
Number of logged points: 787			
Start time and date: 09:17:53 16-Aug			
Elapsed time: 06:33:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.245 mg/m ³			
Time at maximum: 11:45:28 Aug 16			
Max STEL Concentration: 0.104 mg/m ³			
Time at max STEL: 11:45:33 Aug 16			
Overall Avg Conc: 0.084 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	16-Aug	09:18:23	0.061
2	16-Aug	09:18:53	0.066
3	16-Aug	09:19:23	0.07
4	16-Aug	09:19:53	0.066
5	16-Aug	09:20:23	0.076
6	16-Aug	09:20:53	0.072
7	16-Aug	09:21:23	0.074
8	16-Aug	09:21:53	0.07
9	16-Aug	09:22:23	0.075
10	16-Aug	09:22:53	0.073
11	16-Aug	09:23:23	0.071
12	16-Aug	09:23:53	0.07
13	16-Aug	09:24:23	0.073
14	16-Aug	09:24:53	0.073
15	16-Aug	09:25:23	0.074
16	16-Aug	09:25:53	0.073
17	16-Aug	09:26:23	0.07
18	16-Aug	09:26:53	0.074
19	16-Aug	09:27:23	0.072
20	16-Aug	09:27:53	0.078
21	16-Aug	09:28:23	0.081
22	16-Aug	09:28:53	0.074
23	16-Aug	09:29:23	0.081
24	16-Aug	09:29:53	0.074
25	16-Aug	09:30:23	0.076
26	16-Aug	09:30:53	0.08
27	16-Aug	09:31:23	0.081
28	16-Aug	09:31:53	0.086
29	16-Aug	09:32:23	0.074
30	16-Aug	09:32:53	0.078
31	16-Aug	09:33:23	0.076
32	16-Aug	09:33:53	0.073
33	16-Aug	09:34:23	0.071
34	16-Aug	09:34:53	0.07
35	16-Aug	09:35:23	0.074
36	16-Aug	09:35:53	0.076

pDR-1000			
Tag Number: 08			
Number of logged points: 263			
Start time and date: 10:28:59 26-Apr			
Elapsed time: 02:21:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.092 mg/m ³			
Time at maximum: 11:06:49 Apr 26			
Max STEL Concentration: 0.047 mg/m ³			
Time at max STEL: 11:41:38 Apr 26			
Overall Avg Conc: 0.035 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	26-Apr	10:29:29	0.018
2	26-Apr	10:29:59	0.017
3	26-Apr	10:30:29	0.017
4	26-Apr	10:30:59	0.016
5	26-Apr	10:31:29	0.014
6	26-Apr	10:31:59	0.015
7	26-Apr	10:32:29	0.017
8	26-Apr	10:32:59	0.015
9	26-Apr	10:33:29	0.015
10	26-Apr	10:33:59	0.015
11	26-Apr	10:34:29	0.016
12	26-Apr	10:34:59	0.016
13	26-Apr	10:35:29	0.018
14	26-Apr	10:35:59	0.022
15	26-Apr	10:36:29	0.014
16	26-Apr	10:36:59	0.015
17	26-Apr	10:37:29	0.018
18	26-Apr	10:37:59	0.015
19	26-Apr	10:38:29	0.017
20	26-Apr	10:38:59	0.018
21	26-Apr	10:39:29	0.039
22	26-Apr	10:39:59	0.027
23	26-Apr	10:40:29	0.049
24	26-Apr	10:40:59	0.037
25	26-Apr	10:41:29	0.033
26	26-Apr	10:41:59	0.032
27	26-Apr	10:42:29	0.036
28	26-Apr	10:42:59	0.047
29	26-Apr	10:43:29	0.034
30	26-Apr	10:43:59	0.032
31	26-Apr	10:44:29	0.04
32	26-Apr	10:44:59	0.033
33	26-Apr	10:45:29	0.031
34	26-Apr	10:45:59	0.033
35	26-Apr	10:46:29	0.031
36	26-Apr	10:46:59	0.032

Fluid: 97022466 - 6% in Water
Running Adv Metalworking Fluids ADAPT Project Testing
Drilling 304 SS with 3/8 Diameter Jobber Length Drill in Dynamometer
Orion 2200 Horizontal Spindle Machining Center

pDR-1000			
Tag Number: 04			
Number of logged points: 693			
Start time and date: 10:44:36 10-Feb			
Elapsed time: 05:46:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.227 mg/m ³			
Time at maximum: 10:59:09 Feb 10			
Max STEL Concentration: 0.170 mg/m ³			
Time at max STEL: 12:16:45 Feb 10			
Overall Avg Conc: 0.083 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	10-Feb	10:45:06	0.016
2	10-Feb	10:45:36	0.031
3	10-Feb	10:46:06	0.02
4	10-Feb	10:46:36	0.022
5	10-Feb	10:47:06	0.032
6	10-Feb	10:47:36	0.033
7	10-Feb	10:48:06	0.036
8	10-Feb	10:48:36	0.036
9	10-Feb	10:49:06	0.093
10	10-Feb	10:49:36	0.129
11	10-Feb	10:50:06	0.127
12	10-Feb	10:50:36	0.165
13	10-Feb	10:51:06	0.158
14	10-Feb	10:51:36	0.155
15	10-Feb	10:52:06	0.167
16	10-Feb	10:52:36	0.162
17	10-Feb	10:53:06	0.169
18	10-Feb	10:53:36	0.137
19	10-Feb	10:54:06	0.154
20	10-Feb	10:54:36	0.175
21	10-Feb	10:55:06	0.175
22	10-Feb	10:55:36	0.159
23	10-Feb	10:56:06	0.174
24	10-Feb	10:56:36	0.197
25	10-Feb	10:57:06	0.217
26	10-Feb	10:57:36	0.217
27	10-Feb	10:58:06	0.2
28	10-Feb	10:58:36	0.22
29	10-Feb	10:59:06	0.232
30	10-Feb	10:59:36	0.203
31	10-Feb	11:00:06	0.198
32	10-Feb	11:00:36	0.186
33	10-Feb	11:01:06	0.164
34	10-Feb	11:01:36	0.156
35	10-Feb	11:02:06	0.143
36	10-Feb	11:02:36	0.135

PID 0105413
Item ID - PRJ 706566-102
Description: Test stem for Gundrilling & Pinch Welding Evaluation
Operation 80, Crush Grind Stem
Grinding Wheel: 10109070
Grinding Fluid: 97022517

pDR-1000			
Tag Number: 06			
Number of logged points: 443			
Start time and date: 11:10:10 22-Mar			
Elapsed time: 03:41:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.310 mg/m ³			
Time at maximum: 12:17:16 Mar 22			
Max STEL Concentration: 0.137 mg/m ³			
Time at max STEL: 12:21:15 Mar 22			
Overall Avg Conc: 0.076 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	22-Mar	11:10:40	0.066
2	22-Mar	11:11:10	0.065
3	22-Mar	11:11:40	0.063
4	22-Mar	11:12:10	0.065
5	22-Mar	11:12:40	0.059
6	22-Mar	11:13:10	0.061
7	22-Mar	11:13:40	0.064
8	22-Mar	11:14:10	0.06
9	22-Mar	11:14:40	0.064
10	22-Mar	11:15:10	0.064
11	22-Mar	11:15:40	0.062
12	22-Mar	11:16:10	0.059
13	22-Mar	11:16:40	0.059
14	22-Mar	11:17:10	0.058
15	22-Mar	11:17:40	0.062
16	22-Mar	11:18:10	0.063
17	22-Mar	11:18:40	0.059
18	22-Mar	11:19:10	0.063
19	22-Mar	11:19:40	0.061
20	22-Mar	11:20:10	0.061
21	22-Mar	11:20:40	0.065
22	22-Mar	11:21:10	0.061
23	22-Mar	11:21:40	0.06
24	22-Mar	11:22:10	0.082
25	22-Mar	11:22:40	0.059
26	22-Mar	11:23:10	0.064
27	22-Mar	11:23:40	0.073
28	22-Mar	11:24:10	0.063
29	22-Mar	11:24:40	0.287
30	22-Mar	11:25:10	0.114
31	22-Mar	11:25:40	0.067
32	22-Mar	11:26:10	0.064
33	22-Mar	11:26:40	0.066
34	22-Mar	11:27:10	0.107
35	22-Mar	11:27:40	0.065
36	22-Mar	11:28:10	0.236
37	22-Mar	11:28:40	0.196
38	22-Mar	11:29:10	0.142
39	22-Mar	11:29:40	0.07
40	22-Mar	11:30:10	0.074
41	22-Mar	11:30:40	0.062
42	22-Mar	11:31:10	0.071
43	22-Mar	11:31:40	0.069
44	22-Mar	11:32:10	0.068
45	22-Mar	11:32:40	0.068
46	22-Mar	11:33:10	0.075

American Lathe CE#53480
 Prototype Mist Collector System Installed with Clear Plastic Flexible Door Installed
 Mist Collector: Running to determine improvement
 Floor Fan: Floor fan located 30 feet from lathe blowing horizontally toward lathe
 Fan not running

PID 143049
 Item ID 1A4102-00-N4
 Item Desc Ballast, Aft, Type 3C
 Operation# 50
 Workpiece 304 Stainless Steel
 Collant: 97022454 CimStar 3700T duluted to a 5% solution
 Blank Size 12.50 inch diameter
 Final Size 6.20 Diameter
 Depth of Cut: 0.125 inch
 Feed 0.010 in/Rev
 Speed : ~150 RPM

pDR-1000			
Tag Number: 06			
Number of logged points: 437			
Start time and date: 11:44:37 21-Mar			
Elapsed time: 03:38:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.229 mg/m ³			
Time at maximum: 14:09:13 Mar 21			
Max STEL Concentration: 0.139 mg/m ³			
Time at max STEL: 14:15:18 Mar 21			
Overall Avg Conc: 0.075 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	21-Mar	11:45:07	0.049
2	21-Mar	11:45:37	0.051
3	21-Mar	11:46:07	0.054
4	21-Mar	11:46:37	0.05
5	21-Mar	11:47:07	0.054
6	21-Mar	11:47:37	0.048
7	21-Mar	11:48:07	0.048
8	21-Mar	11:48:37	0.05
9	21-Mar	11:49:07	0.047
10	21-Mar	11:49:37	0.049
11	21-Mar	11:50:07	0.049
12	21-Mar	11:50:37	0.048
13	21-Mar	11:51:07	0.048
14	21-Mar	11:51:37	0.047
15	21-Mar	11:52:07	0.048
16	21-Mar	11:52:37	0.045
17	21-Mar	11:53:07	0.046
18	21-Mar	11:53:37	0.05
19	21-Mar	11:54:07	0.047
20	21-Mar	11:54:37	0.047
21	21-Mar	11:55:07	0.054
22	21-Mar	11:55:37	0.047
23	21-Mar	11:56:07	0.055
24	21-Mar	11:56:37	0.055
25	21-Mar	11:57:07	0.059
26	21-Mar	11:57:37	0.063
27	21-Mar	11:58:07	0.071
28	21-Mar	11:58:37	0.075
29	21-Mar	11:59:07	0.083
30	21-Mar	11:59:37	0.09
31	21-Mar	12:00:07	0.093
32	21-Mar	12:00:37	0.084
33	21-Mar	12:01:07	0.083
34	21-Mar	12:01:37	0.066
35	21-Mar	12:02:07	0.081
36	21-Mar	12:02:37	0.088
37	21-Mar	12:03:07	0.087
38	21-Mar	12:03:37	0.11
39	21-Mar	12:04:07	0.123
40	21-Mar	12:04:37	0.09
41	21-Mar	12:05:07	0.09
42	21-Mar	12:05:37	0.086
43	21-Mar	12:06:07	0.086

American Lathe CE#53480
 Prototype Mist Collector System Installed with Clear Plastic Flexible Door Installed
 Mist Collector: Running to determine improvement

PID 143049
 Item ID 1A4102-00-N4
 Item Desc Ballast, Alt, Type 3C
 Operation# 50
 Workpiece 304 Stainless Steel
 Collant: 97022454 CimStar 3700T diluted to a 5% solution
 Blank Size 12.50 inch diameter
 Final Size 6.20 Diameter
 Depth of Cut: 0.125 inch
 Feed 0.010 in/Rev
 Speed : ~150 RPM

pDR-1000			
Tag Number: 04			
Number of logged points: 349			
Start time and date: 08:15:13 22-Mar			
Elapsed time: 02:54:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.134 mg/m ³			
Time at maximum: 08:31:48 Mar 22			
Max STEL Concentration: 0.272 mg/m ³			
Time at max STEL: 08:44:15 Mar 22			
Overall Avg Conc: 0.084 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	22-Mar	08:15:43	0.016
2	22-Mar	08:16:13	0.026
3	22-Mar	08:16:43	0.019
4	22-Mar	08:17:13	0.016
5	22-Mar	08:17:43	0.018
6	22-Mar	08:18:13	0.018
7	22-Mar	08:18:43	0.022
8	22-Mar	08:19:13	0.014
9	22-Mar	08:19:43	0.013
10	22-Mar	08:20:13	0.027
11	22-Mar	08:20:43	0.058
12	22-Mar	08:21:13	0.062
13	22-Mar	08:21:43	0.058
14	22-Mar	08:22:13	0.057
15	22-Mar	08:22:43	0.057
16	22-Mar	08:23:13	0.057
17	22-Mar	08:23:43	0.057
18	22-Mar	08:24:13	0.057
19	22-Mar	08:24:43	0.056
20	22-Mar	08:25:13	0.054
21	22-Mar	08:25:43	0.055
22	22-Mar	08:26:13	0.057
23	22-Mar	08:26:43	0.055
24	22-Mar	08:27:13	0.054
25	22-Mar	08:27:43	0.054
26	22-Mar	08:28:13	0.054
27	22-Mar	08:28:43	0.054
28	22-Mar	08:29:13	0.214
29	22-Mar	08:29:43	0.416
30	22-Mar	08:30:13	0.569
31	22-Mar	08:30:43	0.665
32	22-Mar	08:31:13	0.996
33	22-Mar	08:31:43	1.178
34	22-Mar	08:32:13	0.724
35	22-Mar	08:32:43	0.571
36	22-Mar	08:33:13	0.603
37	22-Mar	08:33:43	0.128
38	22-Mar	08:34:13	0.108
39	22-Mar	08:34:43	0.102
40	22-Mar	08:35:13	0.081

American Lathe CE#53480
 Prototype Mist Collector System Installed with Clear Plastic Flexible Door Installed
 Mist Collector: Running to determine improvement

PID 143049
 Item ID 1A4102-00-N4
 Item Desc Ballast, Alt, Type 3C
 Operation# 50
 Workpiece 304 Stainless Steel
 Collant: 97022454 CimStar 3700T diluted to a 5% solution
 Blank Size 12.50 inch diameter
 Final Size 6.20 Diameter
 Depth of Cut: 0.125 inch
 Feed 0.010 in/Rev
 Speed: ~150 RPM

pDR-1000			
Tag Number: 04			
Number of logged points: 408			
Start time and date: 08:14:43 21-Mar			
Elapsed time: 03:24:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 7.269 mg/m ³			
Time at maximum: 11:02:14 Mar 21			
Max STEL Concentration: 3.118 mg/m ³			
Time at max STEL: 11:08:03 Mar 21			
Overall Avg Conc: 0.915 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	21-Mar	08:15:13	0.009
2	21-Mar	08:15:43	0.019
3	21-Mar	08:16:13	0.003
4	21-Mar	08:16:43	0.017
5	21-Mar	08:17:13	0.044
6	21-Mar	08:17:43	0.045
7	21-Mar	08:18:13	0.043
8	21-Mar	08:18:43	0.041
9	21-Mar	08:19:13	0.045
10	21-Mar	08:19:43	0.049
11	21-Mar	08:20:13	0.043
12	21-Mar	08:20:43	0.051
13	21-Mar	08:21:13	0.042
14	21-Mar	08:21:43	0.036
15	21-Mar	08:22:13	0.041
16	21-Mar	08:22:43	0.034
17	21-Mar	08:23:13	0.04
18	21-Mar	08:23:43	0.037
19	21-Mar	08:24:13	0.036
20	21-Mar	08:24:43	0.037
21	21-Mar	08:25:13	0.036
22	21-Mar	08:25:43	0.036
23	21-Mar	08:26:13	0.034
24	21-Mar	08:26:43	0.035
25	21-Mar	08:27:13	0.036
26	21-Mar	08:27:43	0.039
27	21-Mar	08:28:13	0.035
28	21-Mar	08:28:43	0.037
29	21-Mar	08:29:13	0.035
30	21-Mar	08:29:43	0.039
31	21-Mar	08:30:13	0.036
32	21-Mar	08:30:43	0.036
33	21-Mar	08:31:13	0.04
34	21-Mar	08:31:43	0.035
35	21-Mar	08:32:13	0.039
36	21-Mar	08:32:43	0.035
37	21-Mar	08:33:13	0.036
38	21-Mar	08:33:43	0.037
39	21-Mar	08:34:13	0.035
40	21-Mar	08:34:43	0.037
41	21-Mar	08:35:13	0.034
42	21-Mar	08:35:43	0.037
43	21-Mar	08:36:13	0.035

American Lathe CE#53480

Prototype Mist Collector System Installed with Clear Plastic Flexible Door Installed

Mist Collector: Not running to establish baseline

PID 143049

Item ID 1A4102-00-N4

Item Desc Ballast, Alt, Type 3C

Operation# 50

Workpiece 304 Stainless Steel

Collant: 97022454 CimStar 3700T diluted to a 5% solution

Blank Size 12.50 inch diameter

Final Size 6.20 Diameter

Depth of Cut: 0.125 inch

Feed 0.010 in/Rev

Speed : ~150 RPM

pDR-1000			
Tag Number: 02			
Number of logged points: 969			
Start time and date: 09:16:46 18-Nov			
Elapsed time: 08:04:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.102 mg/m ³			
Time at maximum: 15:56:59 Nov 18			
Max STEL Concentration: 0.077 mg/m ³			
Time at max STEL: 13:31:03 Nov 18			
Overall Avg Conc: 0.044 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	18-Nov	09:17:16	0.009
2	18-Nov	09:17:46	0.009
3	18-Nov	09:18:16	0.054
4	18-Nov	09:18:46	0.045
5	18-Nov	09:19:16	0.047
6	18-Nov	09:19:46	0.041
7	18-Nov	09:20:16	0.043
8	18-Nov	09:20:46	0.041
9	18-Nov	09:21:16	0.041
10	18-Nov	09:21:46	0.039
11	18-Nov	09:22:16	0.041
12	18-Nov	09:22:46	0.04
13	18-Nov	09:23:16	0.042
14	18-Nov	09:23:46	0.039
15	18-Nov	09:24:16	0.041
16	18-Nov	09:24:46	0.039
17	18-Nov	09:25:16	0.041
18	18-Nov	09:25:46	0.041
19	18-Nov	09:26:16	0.039
20	18-Nov	09:26:46	0.037
21	18-Nov	09:27:16	0.038
22	18-Nov	09:27:46	0.037
23	18-Nov	09:28:16	0.041
24	18-Nov	09:28:46	0.038
25	18-Nov	09:29:16	0.038
26	18-Nov	09:29:46	0.036
27	18-Nov	09:30:16	0.039
28	18-Nov	09:30:46	0.04
29	18-Nov	09:31:16	0.038
30	18-Nov	09:31:46	0.039
31	18-Nov	09:32:16	0.037
32	18-Nov	09:32:46	0.04
33	18-Nov	09:33:16	0.04
34	18-Nov	09:33:46	0.039
35	18-Nov	09:34:16	0.04
36	18-Nov	09:34:46	0.04
37	18-Nov	09:35:16	0.04
38	18-Nov	09:35:46	0.043
39	18-Nov	09:36:16	0.038
40	18-Nov	09:36:46	0.038
41	18-Nov	09:37:16	0.04
42	18-Nov	09:37:46	0.038
43	18-Nov	09:38:16	0.04
44	18-Nov	09:38:46	0.039
45	18-Nov	09:39:16	0.04
46	18-Nov	09:39:46	0.039
47	18-Nov	09:40:16	0.039
48	18-Nov	09:40:46	0.041

Morie Seiki CE#210693
 PID: 0126763
 ID: 1A1067-00-Dev, 76 Fireset Operation 400

American Lathe CE#50744
 PID: 0125386, Issue 6
 ID: 3R0054-00 Outer case; Operation 70
 Between point 406 and 650

pDR-1000			
Tag Number: 05			
Number of logged points: 1000			
Start time and date: 07:47:51 17-Aug			
Elapsed time: 08:20:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.091 mg/m ³			
Time at maximum: 16:08:18 Aug 17			
Max STEL Concentration: 0.087 mg/m ³			
Time at max STEL: 14:30:49 Aug 17			
Overall Avg Conc: 0.070 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	17-Aug	07:48:21	0.023
2	17-Aug	07:48:51	0.022
3	17-Aug	07:49:21	0.026
4	17-Aug	07:49:51	0.037
5	17-Aug	07:50:21	0.058
6	17-Aug	07:50:51	0.053
7	17-Aug	07:51:21	0.054
8	17-Aug	07:51:51	0.053
9	17-Aug	07:52:21	0.053
10	17-Aug	07:52:51	0.051
11	17-Aug	07:53:21	0.053
12	17-Aug	07:53:51	0.052
13	17-Aug	07:54:21	0.052
14	17-Aug	07:54:51	0.051
15	17-Aug	07:55:21	0.053
16	17-Aug	07:55:51	0.053
17	17-Aug	07:56:21	0.053
18	17-Aug	07:56:51	0.055
19	17-Aug	07:57:21	0.057
20	17-Aug	07:57:51	0.055
21	17-Aug	07:58:21	0.055
22	17-Aug	07:58:51	0.054
23	17-Aug	07:59:21	0.05
24	17-Aug	07:59:51	0.055
25	17-Aug	08:00:21	0.058
26	17-Aug	08:00:51	0.056
27	17-Aug	08:01:21	0.055
28	17-Aug	08:01:51	0.054
29	17-Aug	08:02:21	0.056
30	17-Aug	08:02:51	0.054
31	17-Aug	08:03:21	0.053
32	17-Aug	08:03:51	0.055
33	17-Aug	08:04:21	0.055
34	17-Aug	08:04:51	0.055
35	17-Aug	08:05:21	0.055
36	17-Aug	08:05:51	0.052
37	17-Aug	08:06:21	0.054
38	17-Aug	08:06:51	0.053
39	17-Aug	08:07:21	0.055
40	17-Aug	08:07:51	0.055
41	17-Aug	08:08:21	0.053
42	17-Aug	08:08:51	0.055
43	17-Aug	08:09:21	0.055

Personal Data Ram started in D621 PMEL lab @FT40

Medium sized American Lathe next to this lathe was running

pDR-1000			
Tag Number: 05			
Number of logged points: 944			
Start time and date: 07:25:42 18-Aug			
Elapsed time: 07:52:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.145 mg/m ³			
Time at maximum: 13:54:40 Aug 18			
Max STEL Concentration: 0.143 mg/m ³			
Time at max STEL: 14:01:10 Aug 18			
Overall Avg Conc: 0.074 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	18-Aug	07:26:12	0.03
2	18-Aug	07:26:42	0.029
3	18-Aug	07:27:12	0.024
4	18-Aug	07:27:42	0.027
5	18-Aug	07:28:12	0.034
6	18-Aug	07:28:42	0.073
7	18-Aug	07:29:12	0.071
8	18-Aug	07:29:42	0.07
9	18-Aug	07:30:12	0.071
10	18-Aug	07:30:42	0.073
11	18-Aug	07:31:12	0.073
12	18-Aug	07:31:42	0.072
13	18-Aug	07:32:12	0.072
14	18-Aug	07:32:42	0.071
15	18-Aug	07:33:12	0.071
16	18-Aug	07:33:42	0.072
17	18-Aug	07:34:12	0.071
18	18-Aug	07:34:42	0.072
19	18-Aug	07:35:12	0.072
20	18-Aug	07:35:42	0.072
21	18-Aug	07:36:12	0.072
22	18-Aug	07:36:42	0.073
23	18-Aug	07:37:12	0.073
24	18-Aug	07:37:42	0.072
25	18-Aug	07:38:12	0.071
26	18-Aug	07:38:42	0.073
27	18-Aug	07:39:12	0.074
28	18-Aug	07:39:42	0.077
29	18-Aug	07:40:12	0.073
30	18-Aug	07:40:42	0.072
31	18-Aug	07:41:12	0.073
32	18-Aug	07:41:42	0.071
33	18-Aug	07:42:12	0.074
34	18-Aug	07:42:42	0.072
35	18-Aug	07:43:12	0.071
36	18-Aug	07:43:42	0.071
37	18-Aug	07:44:12	0.072
38	18-Aug	07:44:42	0.071
39	18-Aug	07:45:12	0.07
40	18-Aug	07:45:42	0.072
41	18-Aug	07:46:12	0.071
42	18-Aug	07:46:42	0.07
43	18-Aug	07:47:12	0.071

pDR-1000			
Tag Number: 02			
Number of logged points: 658			
Start time and date: 08:55:50 30-Nov			
Elapsed time: 05:29:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.223 mg/m ³			
Time at maximum: 14:25:35 Nov 30			
Max STEL Concentration: 0.284 mg/m ³			
Time at max STEL: 14:24:14 Nov 30			
Overall Avg Conc: 0.058 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	30-Nov	08:56:20	0.008
2	30-Nov	08:56:50	0.009
3	30-Nov	08:57:20	0.004
4	30-Nov	08:57:50	0.012
5	30-Nov	08:58:20	0.024
6	30-Nov	08:58:50	0.032
7	30-Nov	08:59:20	0.03
8	30-Nov	08:59:50	0.032
9	30-Nov	09:00:20	0.047
10	30-Nov	09:00:50	0.032
11	30-Nov	09:01:20	0.027
12	30-Nov	09:01:50	0.036
13	30-Nov	09:02:20	0.041
14	30-Nov	09:02:50	0.034
15	30-Nov	09:03:20	0.031
16	30-Nov	09:03:50	0.033
17	30-Nov	09:04:20	0.04
18	30-Nov	09:04:50	0.037
19	30-Nov	09:05:20	0.033
20	30-Nov	09:05:50	0.033
21	30-Nov	09:06:20	0.036
22	30-Nov	09:06:50	0.028
23	30-Nov	09:07:20	0.032
24	30-Nov	09:07:50	0.036
25	30-Nov	09:08:20	0.032
26	30-Nov	09:08:50	0.036
27	30-Nov	09:09:20	0.032
28	30-Nov	09:09:50	0.03
29	30-Nov	09:10:20	0.049
30	30-Nov	09:10:50	0.036
31	30-Nov	09:11:20	0.033
32	30-Nov	09:11:50	0.035
33	30-Nov	09:12:20	0.034
34	30-Nov	09:12:50	0.036
35	30-Nov	09:13:20	0.039
36	30-Nov	09:13:50	0.033
37	30-Nov	09:14:20	0.035
38	30-Nov	09:14:50	0.034
39	30-Nov	09:15:20	0.033

Using auxillary wash off hose to get more coolant on part
 Splashed on monitor and it shut down
 Run terminated

pDR-1000			
Tag Number: 03			
Number of logged points: 786			
Start time and date: 08:16:55 01-Dec			
Elapsed time: 06:32:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 16.111 mg/m ³			
Time at maximum: 08:25:11 Dec 01			
Max STEL Concentration: 2.923 mg/m ³			
Time at max STEL: 08:38:51 Dec 01			
Overall Avg Conc: 0.808 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	1-Dec	08:17:25	0.01
2	1-Dec	08:17:55	0.013
3	1-Dec	08:18:25	0.08
4	1-Dec	08:18:55	0.024
5	1-Dec	08:19:25	0.06
6	1-Dec	08:19:55	0.068
7	1-Dec	08:20:25	0.058
8	1-Dec	08:20:55	0.058
9	1-Dec	08:21:25	0.058
10	1-Dec	08:21:55	0.053
11	1-Dec	08:22:25	0.058
12	1-Dec	08:22:55	0.054
13	1-Dec	08:23:25	0.054
14	1-Dec	08:23:55	4.57
15	1-Dec	08:24:25	14.67
16	1-Dec	08:24:55	14.78
17	1-Dec	08:25:25	10.95
18	1-Dec	08:25:55	0.664
19	1-Dec	08:26:25	0.158
20	1-Dec	08:26:55	0.264
21	1-Dec	08:27:25	2.232
22	1-Dec	08:27:55	1.557
23	1-Dec	08:28:25	1.047
24	1-Dec	08:28:55	0.602
25	1-Dec	08:29:25	0.519
26	1-Dec	08:29:55	1.829
27	1-Dec	08:30:25	0.831
28	1-Dec	08:30:55	1.084
29	1-Dec	08:31:25	0.88
30	1-Dec	08:31:55	0.922
31	1-Dec	08:32:25	0.95
32	1-Dec	08:32:55	1.993
33	1-Dec	08:33:25	0.971
34	1-Dec	08:33:55	2.567
35	1-Dec	08:34:25	2.018
36	1-Dec	08:34:55	2.372
37	1-Dec	08:35:25	2.166
38	1-Dec	08:35:55	1.343
39	1-Dec	08:36:25	2.773
40	1-Dec	08:36:55	2.573
41	1-Dec	08:37:25	2
42	1-Dec	08:37:55	5.21
43	1-Dec	08:38:25	3.208
44	1-Dec	08:38:55	1.975
45	1-Dec	08:39:25	4.32
46	1-Dec	08:39:55	2.322

Operation 10 Rough Inside Diameter
 4 Tools
 1.5 in diameter insert drill
 Bore 0.170/pass
 3 inch diameter insert drill 6 inches deep
 Bore 0.170/pass to 6 inch diameter
 Repeat twice

High peaks are the 3 inch diameter insert drill.

pDR-1000			
Tag Number: 01			
Number of logged points: 839			
Start time and date: 10:09:12 06-Jan			
Elapsed time: 06:59:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.295 mg/m ³			
Time at maximum: 16:19:00 Jan 06			
Max STEL Concentration: 0.139 mg/m ³			
Time at max STEL: 16:20:08 Jan 06			
Overall Avg Conc: 0.100 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	6-Jan	10:09:42	0.012
2	6-Jan	10:10:12	0.011
3	6-Jan	10:10:42	0.012
4	6-Jan	10:11:12	0.019
5	6-Jan	10:11:42	0.049
6	6-Jan	10:12:12	0.066
7	6-Jan	10:12:42	0.078
8	6-Jan	10:13:12	0.085
9	6-Jan	10:13:42	0.079
10	6-Jan	10:14:12	0.07
11	6-Jan	10:14:42	0.071
12	6-Jan	10:15:12	0.067
13	6-Jan	10:15:42	0.064
14	6-Jan	10:16:12	0.067
15	6-Jan	10:16:42	0.067
16	6-Jan	10:17:12	0.067
17	6-Jan	10:17:42	0.064
18	6-Jan	10:18:12	0.068
19	6-Jan	10:18:42	0.069
20	6-Jan	10:19:12	0.069
21	6-Jan	10:19:42	0.06
22	6-Jan	10:20:12	0.091
23	6-Jan	10:20:42	0.07
24	6-Jan	10:21:12	0.155
25	6-Jan	10:21:42	0.063
26	6-Jan	10:22:12	0.104
27	6-Jan	10:22:42	0.117
28	6-Jan	10:23:12	0.09
29	6-Jan	10:23:42	0.107
30	6-Jan	10:24:12	0.108
31	6-Jan	10:24:42	0.073
32	6-Jan	10:25:12	0.092
33	6-Jan	10:25:42	0.079
34	6-Jan	10:26:12	0.065
35	6-Jan	10:26:42	0.099
36	6-Jan	10:27:12	0.103
37	6-Jan	10:27:42	0.067
38	6-Jan	10:28:12	0.089
39	6-Jan	10:28:42	0.083
40	6-Jan	10:29:12	0.088
41	6-Jan	10:29:42	0.064
42	6-Jan	10:30:12	0.064
43	6-Jan	10:30:42	0.086
44	6-Jan	10:31:12	0.087
45	6-Jan	10:31:42	0.083
46	6-Jan	10:32:12	0.11

PID 0141650
Item ID: 1A4184-00
Description: CAN MMU
Operation 50 Finish -A- & ID
Coolant: 97022454
Max Spindle Speed 350 RPM

Operation 60 Finish C and OD
on CE#83480
Coolant 97022454

pDR-1000			
Tag Number: 01			
Number of logged points: 690			
Start time and date: 10:57:25 09-Aug			
Elapsed time: 04:55:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.161 mg/m ³			
Time at maximum: 15:45:34 Aug 09			
Max STEL Concentration: 0.197 mg/m ³			
Time at max STEL: 15:50:16 Aug 09			
Overall Avg Conc: 0.097 mg/m ³			
Logged Data:			
Part No: 40Y290220			
Part Name: Dummy Load Armature			
Pre bar to go on American Lathe			
to be turned to size.			
Coolant : 97022454 - 5% Mix			
Point	Date	Time	Avg (mg/m ³)
1	9-Aug	10:57:55	0.045
2	9-Aug	10:58:25	0.046
3	9-Aug	10:58:55	0.042
4	9-Aug	10:59:25	0.045
5	9-Aug	10:59:55	0.035
6	9-Aug	11:00:25	0.083
7	9-Aug	11:00:55	0.087
8	9-Aug	11:01:25	0.085
9	9-Aug	11:01:55	0.087
10	9-Aug	11:02:25	0.085
11	9-Aug	11:02:55	0.084
12	9-Aug	11:03:25	0.082
13	9-Aug	11:03:55	0.081
14	9-Aug	11:04:25	0.08
15	9-Aug	11:04:55	0.079
16	9-Aug	11:05:25	0.079
17	9-Aug	11:05:55	0.08
18	9-Aug	11:06:25	0.082
19	9-Aug	11:06:55	0.08
20	9-Aug	11:07:25	0.081
21	9-Aug	11:07:55	0.079
22	9-Aug	11:08:25	0.078
23	9-Aug	11:08:55	0.079
24	9-Aug	11:09:25	0.082
25	9-Aug	11:09:55	0.08
26	9-Aug	11:10:25	0.081
27	9-Aug	11:10:55	0.079
28	9-Aug	11:11:25	0.08
29	9-Aug	11:11:55	0.077
30	9-Aug	11:12:25	0.078
31	9-Aug	11:12:55	0.08
32	9-Aug	11:13:25	0.079
33	9-Aug	11:13:55	0.078

pDR-1000			
Tag Number: 04			
Number of logged points: 196			
Start time and date: 12:42:52 23-Mar			
Elapsed time: 01:39:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 4.639 mg/m ³			
Time at maximum: 13:09:21 Mar 23			
Max STEL Concentration: 2.024 mg/m ³			
Time at max STEL: 13:10:58 Mar 23			
Overall Avg Conc: 0.495 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	23-Mar	12:43:22	0.019
2	23-Mar	12:43:52	0.014
3	23-Mar	12:44:22	0.034
4	23-Mar	12:44:52	0.066
5	23-Mar	12:45:22	0.033
6	23-Mar	12:45:52	0.036
7	23-Mar	12:46:22	0.034
8	23-Mar	12:46:52	0.282
9	23-Mar	12:47:22	0.305
10	23-Mar	12:47:52	0.376
11	23-Mar	12:48:22	0.754
12	23-Mar	12:48:52	0.843
13	23-Mar	12:49:22	1.196
14	23-Mar	12:49:52	1.021
15	23-Mar	12:50:22	1.136
16	23-Mar	12:50:52	1.134
17	23-Mar	12:51:22	1.274
18	23-Mar	12:51:52	1.641
19	23-Mar	12:52:22	1.608
20	23-Mar	12:52:52	2.002
21	23-Mar	12:53:22	1.907
22	23-Mar	12:53:52	1.713
23	23-Mar	12:54:22	1.938
24	23-Mar	12:54:52	1.684
25	23-Mar	12:55:22	1.818
26	23-Mar	12:55:52	1.663
27	23-Mar	12:56:22	1.769
28	23-Mar	12:56:52	1.674
29	23-Mar	12:57:22	1.782
30	23-Mar	12:57:52	1.761
31	23-Mar	12:58:22	1.551
32	23-Mar	12:58:52	1.69
33	23-Mar	12:59:22	1.371
34	23-Mar	12:59:52	1.809
35	23-Mar	13:00:22	1.627
36	23-Mar	13:00:52	1.66
37	23-Mar	13:01:22	1.777
38	23-Mar	13:01:52	2.166
39	23-Mar	13:02:22	1.957
40	23-Mar	13:02:52	1.887
41	23-Mar	13:03:22	1.741
42	23-Mar	13:03:52	1.834
43	23-Mar	13:04:22	1.491
44	23-Mar	13:04:52	1.626
45	23-Mar	13:05:22	1.587
46	23-Mar	13:05:52	1.621
47	23-Mar	13:06:22	1.906
48	23-Mar	13:06:52	1.229
49	23-Mar	13:07:22	1.288
50	23-Mar	13:07:52	0.884
51	23-Mar	13:08:22	3.151
52	23-Mar	13:08:52	4.91
53	23-Mar	13:09:22	4.2

pDR-1000			
Tag Number: 06			
Number of logged points: 190			
Start time and date: 14:22:21 23-Mar			
Elapsed time: 01:35:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 2.892 mg/m ³			
Time at maximum: 15:26:32 Mar 23			
Max STEL Concentration: 1.022 mg/m ³			
Time at max STEL: 15:27:58 Mar 23			
Overall Avg Conc: 0.250 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
73	23-Mar	14:58:51	0.042
74	23-Mar	14:59:21	0.029
75	23-Mar	14:59:51	0.029
76	23-Mar	15:00:21	0.026
77	23-Mar	15:00:51	0.029
78	23-Mar	15:01:21	0.031
79	23-Mar	15:01:51	0.027
80	23-Mar	15:02:21	0.028
81	23-Mar	15:02:51	0.03
82	23-Mar	15:03:21	0.029
83	23-Mar	15:03:51	0.026
84	23-Mar	15:04:21	0.027
85	23-Mar	15:04:51	0.05
86	23-Mar	15:05:21	0.262
87	23-Mar	15:05:51	0.271
88	23-Mar	15:06:21	0.572
89	23-Mar	15:06:51	0.491
90	23-Mar	15:07:21	0.745
91	23-Mar	15:07:51	0.68
92	23-Mar	15:08:21	0.601
93	23-Mar	15:08:51	0.704
94	23-Mar	15:09:21	0.698
95	23-Mar	15:09:51	0.804
96	23-Mar	15:10:21	0.705
97	23-Mar	15:10:51	0.673
98	23-Mar	15:11:21	0.653
99	23-Mar	15:11:51	0.747
100	23-Mar	15:12:21	1.046
101	23-Mar	15:12:51	0.745
102	23-Mar	15:13:21	0.668
103	23-Mar	15:13:51	0.834
104	23-Mar	15:14:21	0.797
105	23-Mar	15:14:51	0.693
106	23-Mar	15:15:21	0.724
107	23-Mar	15:15:51	0.802
108	23-Mar	15:16:21	0.6
109	23-Mar	15:16:51	0.792
110	23-Mar	15:17:21	0.856
111	23-Mar	15:17:51	0.724
112	23-Mar	15:18:21	0.737
113	23-Mar	15:18:51	0.7
114	23-Mar	15:19:21	0.565
115	23-Mar	15:19:51	0.701
116	23-Mar	15:20:21	0.583
117	23-Mar	15:20:51	0.858
118	23-Mar	15:21:21	1.048
119	23-Mar	15:21:51	1.011
120	23-Mar	15:22:21	1.122
121	23-Mar	15:22:51	1.129
122	23-Mar	15:23:21	1.185
123	23-Mar	15:23:51	0.889
124	23-Mar	15:24:21	0.557
125	23-Mar	15:24:51	0.452

Monarch VMC-75B Machining Center

pDR-1000			
Tag Number: 01			
Number of logged points: 470			
Start time and date: 10:04:29 20-Jun			
Elapsed time: 03:55:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 22.588 mg/m ³			
Time at maximum: 13:29:13 Jun 20			
Max STEL Concentration: 16.670 mg/m ³			
Time at max STEL: 13:12:51 Jun 20			
Overall Avg Conc: 3.675 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	20-Jun	10:04:59	0.136
2	20-Jun	10:05:29	0.126
3	20-Jun	10:05:59	0.13
4	20-Jun	10:06:29	0.131
5	20-Jun	10:06:59	0.132
6	20-Jun	10:07:29	0.12
7	20-Jun	10:07:59	0.122
8	20-Jun	10:08:29	0.124
9	20-Jun	10:08:59	0.127
10	20-Jun	10:09:29	0.126
11	20-Jun	10:09:59	0.121
12	20-Jun	10:10:29	0.123
13	20-Jun	10:10:59	0.122
14	20-Jun	10:11:29	0.12
15	20-Jun	10:11:59	0.115
16	20-Jun	10:12:29	0.116
17	20-Jun	10:12:59	0.118
18	20-Jun	10:13:29	0.117
19	20-Jun	10:13:59	0.117
20	20-Jun	10:14:29	0.113
21	20-Jun	10:14:59	0.113
22	20-Jun	10:15:29	0.115
23	20-Jun	10:15:59	0.118
24	20-Jun	10:16:29	0.105
25	20-Jun	10:16:59	0.076
26	20-Jun	10:17:29	0.073
27	20-Jun	10:17:59	0.076
28	20-Jun	10:18:29	0.069
29	20-Jun	10:18:59	0.074
30	20-Jun	10:19:29	0.071
31	20-Jun	10:19:59	0.112
32	20-Jun	10:20:29	0.084
33	20-Jun	10:20:59	4.016
34	20-Jun	10:21:29	15.43
35	20-Jun	10:21:59	15.29
36	20-Jun	10:22:29	16.23
37	20-Jun	10:22:59	16.15
38	20-Jun	10:23:29	16.37
39	20-Jun	10:23:59	16.11
40	20-Jun	10:24:29	16.55
41	20-Jun	10:24:59	16.21
42	20-Jun	10:25:29	17.05
43	20-Jun	10:25:59	16.85
44	20-Jun	10:26:29	17.14
45	20-Jun	10:26:59	17.36
46	20-Jun	10:27:29	17.22
47	20-Jun	10:27:59	17.41
48	20-Jun	10:28:29	17.67
49	20-Jun	10:28:59	17.88
50	20-Jun	10:29:29	17.85
51	20-Jun	10:29:59	17.03
52	20-Jun	10:30:29	17.64
53	20-Jun	10:30:59	18.35
54	20-Jun	10:31:29	17.91
55	20-Jun	10:31:59	18.45

pDR-1000			
Tag Number: 01			
Number of logged points: 470			
Start time and date: 10:04:29 20-Jun			
Elapsed time: 03:55:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 22.588 mg/m ³			
Time at maximum: 13:29:13 Jun 20			
Max STEL Concentration: 16.670 mg/m ³			
Time at max STEL: 13:12:51 Jun 20			
Overall Avg Conc: 3.675 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	20-Jun	10:04:59	0.136
2	20-Jun	10:05:29	0.126
3	20-Jun	10:05:59	0.13
4	20-Jun	10:06:29	0.131
5	20-Jun	10:06:59	0.132
6	20-Jun	10:07:29	0.12
7	20-Jun	10:07:59	0.122
8	20-Jun	10:08:29	0.124
9	20-Jun	10:08:59	0.127
10	20-Jun	10:09:29	0.126
11	20-Jun	10:09:59	0.121
12	20-Jun	10:10:29	0.123
13	20-Jun	10:10:59	0.122
14	20-Jun	10:11:29	0.12
15	20-Jun	10:11:59	0.115
16	20-Jun	10:12:29	0.116
17	20-Jun	10:12:59	0.118
18	20-Jun	10:13:29	0.117
19	20-Jun	10:13:59	0.117
20	20-Jun	10:14:29	0.113
21	20-Jun	10:14:59	0.113
22	20-Jun	10:15:29	0.115
23	20-Jun	10:15:59	0.118
24	20-Jun	10:16:29	0.105
25	20-Jun	10:16:59	0.076
26	20-Jun	10:17:29	0.073
27	20-Jun	10:17:59	0.076
28	20-Jun	10:18:29	0.069
29	20-Jun	10:18:59	0.074
30	20-Jun	10:19:29	0.071
31	20-Jun	10:19:59	0.112
32	20-Jun	10:20:29	0.084
33	20-Jun	10:20:59	4.016
34	20-Jun	10:21:29	15.43
35	20-Jun	10:21:59	15.29
36	20-Jun	10:22:29	16.23
37	20-Jun	10:22:59	16.15
38	20-Jun	10:23:29	16.37
39	20-Jun	10:23:59	16.11
40	20-Jun	10:24:29	16.55
41	20-Jun	10:24:59	16.21
42	20-Jun	10:25:29	17.05
43	20-Jun	10:25:59	16.85
44	20-Jun	10:26:29	17.14
45	20-Jun	10:26:59	17.36
46	20-Jun	10:27:29	17.22
47	20-Jun	10:27:59	17.41
48	20-Jun	10:28:29	17.67
49	20-Jun	10:28:59	17.88
50	20-Jun	10:29:29	17.85
51	20-Jun	10:29:59	17.03
52	20-Jun	10:30:29	17.64
53	20-Jun	10:30:59	18.35
54	20-Jun	10:31:29	17.91
55	20-Jun	10:31:59	18.45

pDR-1000			
Tag Number: 03			
Number of logged points: 252			
Start time and date: 12:26:43 18-Jul			
Elapsed time: 02:06:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 14.958 mg/m ³			
Time at maximum: 12:56:42 Jul 18			
Max STEL Concentration: 9.600 mg/m ³			
Time at max STEL: 13:07:54 Jul 18			
Overall Avg Conc: 4.079 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	18-Jul	12:27:13	0.043
2	18-Jul	12:27:43	0.04
3	18-Jul	12:28:13	0.058
4	18-Jul	12:28:43	0.041
5	18-Jul	12:29:13	0.041
6	18-Jul	12:29:43	0.026
7	18-Jul	12:30:13	0.013
8	18-Jul	12:30:43	0.012
9	18-Jul	12:31:13	0.013
10	18-Jul	12:31:43	0.012
11	18-Jul	12:32:13	0.012
12	18-Jul	12:32:43	0.013
13	18-Jul	12:33:13	8.68
14	18-Jul	12:33:43	13.56
15	18-Jul	12:34:13	12.91
16	18-Jul	12:34:43	13.71
17	18-Jul	12:35:13	14.44
18	18-Jul	12:35:43	14.27
19	18-Jul	12:36:13	14.63
20	18-Jul	12:36:43	14.54
21	18-Jul	12:37:13	14.33
22	18-Jul	12:37:43	14.67
23	18-Jul	12:38:13	14.85
24	18-Jul	12:38:43	14.43
25	18-Jul	12:39:13	14.79
26	18-Jul	12:39:43	14.72
27	18-Jul	12:40:13	14.39
28	18-Jul	12:40:43	14.19
29	18-Jul	12:41:13	14.5
30	18-Jul	12:41:43	9.29
31	18-Jul	12:42:13	0.151
32	18-Jul	12:42:43	0.086
33	18-Jul	12:43:13	0.069
34	18-Jul	12:43:43	0.25
35	18-Jul	12:44:13	0.254
36	18-Jul	12:44:43	0.243
37	18-Jul	12:45:13	0.231
38	18-Jul	12:45:43	0.207
39	18-Jul	12:46:13	0.194
40	18-Jul	12:46:43	0.188

pDR-1000			
Tag Number: 03			
Number of logged points: 327			
Start time and date: 13:02:48 03-Oct			
Elapsed time: 02:43:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.232 mg/m ³			
Time at maximum: 13:41:49 Oct 03			
Max STEL Concentration: 0.114 mg/m ³			
Time at max STEL: 13:50:24 Oct 03			
Overall Avg Conc: 0.039 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	3-Oct	13:03:18	0.031
2	3-Oct	13:03:48	0.026
3	3-Oct	13:04:18	0.025
4	3-Oct	13:04:48	0.035
5	3-Oct	13:05:18	0.038
6	3-Oct	13:05:48	0.041
7	3-Oct	13:06:18	0.041
8	3-Oct	13:06:48	0.049
9	3-Oct	13:07:18	0.052
10	3-Oct	13:07:48	0.046
11	3-Oct	13:08:18	0.048
12	3-Oct	13:08:48	0.053
13	3-Oct	13:09:18	0.05
14	3-Oct	13:09:48	0.045
15	3-Oct	13:10:18	0.048
16	3-Oct	13:10:48	0.042
17	3-Oct	13:11:18	0.045
18	3-Oct	13:11:48	0.045
19	3-Oct	13:12:18	0.043
20	3-Oct	13:12:48	0.047
21	3-Oct	13:13:18	0.045
22	3-Oct	13:13:48	0.04
23	3-Oct	13:14:18	0.042
24	3-Oct	13:14:48	0.039
25	3-Oct	13:15:18	0.042
26	3-Oct	13:15:48	0.046
27	3-Oct	13:16:18	0.046
28	3-Oct	13:16:48	0.044
29	3-Oct	13:17:18	0.043
30	3-Oct	13:17:48	0.042
31	3-Oct	13:18:18	0.041
32	3-Oct	13:18:48	0.042
33	3-Oct	13:19:18	0.04
34	3-Oct	13:19:48	0.038
35	3-Oct	13:20:18	0.036
36	3-Oct	13:20:48	0.039
37	3-Oct	13:21:18	0.039
38	3-Oct	13:21:48	0.035
39	3-Oct	13:22:18	0.039
40	3-Oct	13:22:48	0.041
41	3-Oct	13:23:18	0.038

Date: Oct. 3, 2006; L/JL

pDR-1000			
Tag Number: 01			
Number of logged points: 728			
Start time and date: 09:58:40 17-May			
Elapsed time: 06:04:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 17.229 mg/m ³			
Time at maximum: 11:01:52 May 17			
Max STEL Concentration: 11.831 mg/m ³			
Time at max STEL: 11:05:52 May 17			
Overall Avg Conc: 2.428 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	17-May	09:59:10	0.027
2	17-May	09:59:40	0.027
3	17-May	10:00:10	0.026
4	17-May	10:00:40	0.032
5	17-May	10:01:10	0.026
6	17-May	10:01:40	0.048
7	17-May	10:02:10	0.041
8	17-May	10:02:40	0.07
9	17-May	10:03:10	0.201
10	17-May	10:03:40	0.159
11	17-May	10:04:10	0.142
12	17-May	10:04:40	0.14
13	17-May	10:05:10	0.077
14	17-May	10:05:40	0.078
15	17-May	10:06:10	0.073
16	17-May	10:06:40	0.074
17	17-May	10:07:10	0.071
18	17-May	10:07:40	0.063
19	17-May	10:08:10	0.057
20	17-May	10:08:40	0.058
21	17-May	10:09:10	0.053
22	17-May	10:09:40	0.05
23	17-May	10:10:10	0.049
24	17-May	10:10:40	0.048
25	17-May	10:11:10	0.046
26	17-May	10:11:40	0.047
27	17-May	10:12:10	0.044
28	17-May	10:12:40	0.043
29	17-May	10:13:10	0.041
30	17-May	10:13:40	0.041
31	17-May	10:14:10	0.04
32	17-May	10:14:40	0.039
33	17-May	10:15:10	0.038
34	17-May	10:15:40	0.035
35	17-May	10:16:10	0.037
36	17-May	10:16:40	0.037
37	17-May	10:17:10	0.035
38	17-May	10:17:40	0.034
39	17-May	10:18:10	0.034
40	17-May	10:18:40	0.032
41	17-May	10:19:10	0.032
42	17-May	10:19:40	0.03
43	17-May	10:20:10	0.03
44	17-May	10:20:40	0.03
45	17-May	10:21:10	0.03
46	17-May	10:21:40	0.029
47	17-May	10:22:10	0.054
48	17-May	10:22:40	13.88
49	17-May	10:23:10	15.5
50	17-May	10:23:40	15.71

PID ID #: 0153655
Part No.: 1470106-103
Part Name: 1K Stem
Operation 60

MIE personal Data RAM located on wall 30 inches from exhaust port

pDR-1000			
Tag Number: 04			
Number of logged points: 214			
Start time and date: 16:16:54 02-Dec			
Elapsed time: 01:47:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.292 mg/m ³			
Time at maximum: 16:21:24 Dec 02			
Max STEL Concentration: 0.146 mg/m ³			
Time at max STEL: 17:06:30 Dec 02			
Overall Avg Conc: 0.081 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	2-Dec	16:17:24	0.121
2	2-Dec	16:17:54	0.232
3	2-Dec	16:18:24	0.103
4	2-Dec	16:18:54	0.173
5	2-Dec	16:19:24	0.128
6	2-Dec	16:19:54	0.186
7	2-Dec	16:20:24	0.136
8	2-Dec	16:20:54	0.297
9	2-Dec	16:21:24	0.264
10	2-Dec	16:21:54	0.139
11	2-Dec	16:22:24	0.12
12	2-Dec	16:22:54	0.154
13	2-Dec	16:23:24	0.115
14	2-Dec	16:23:54	0.094
15	2-Dec	16:24:24	0.1
16	2-Dec	16:24:54	0.101
17	2-Dec	16:25:24	0.048
18	2-Dec	16:25:54	0.115
19	2-Dec	16:26:24	0.25
20	2-Dec	16:26:54	0.1
21	2-Dec	16:27:24	0.137
22	2-Dec	16:27:54	0.111
23	2-Dec	16:28:24	0.152
24	2-Dec	16:28:54	0.174
25	2-Dec	16:29:24	0.117
26	2-Dec	16:29:54	0.076
27	2-Dec	16:30:24	0.153
28	2-Dec	16:30:54	0.125
29	2-Dec	16:31:24	0.068
30	2-Dec	16:31:54	0.09
31	2-Dec	16:32:24	0.077
32	2-Dec	16:32:54	0.118
33	2-Dec	16:33:24	0.202
34	2-Dec	16:33:54	0.085
35	2-Dec	16:34:24	0.075
36	2-Dec	16:34:54	0.058
37	2-Dec	16:35:24	0.088
38	2-Dec	16:35:54	0.184
39	2-Dec	16:36:24	0.196
40	2-Dec	16:36:54	0.086
41	2-Dec	16:37:24	0.064
42	2-Dec	16:37:54	0.064
43	2-Dec	16:38:24	0.198
44	2-Dec	16:38:54	0.089
45	2-Dec	16:39:24	0.097
46	2-Dec	16:39:54	0.102
47	2-Dec	16:40:24	0.118

CE 212914 Jones & Shipman Surface Grinder
PID 0128688
Item ID 1A2413-00-PPI Cap Housing Assembly
Operation 490
Coolant: Cimtech 200; 57010043
Mix 20:1

pDR-1000		CE#95492	
Tag Number: 01			
Number of logged points: 364			
Start time and date: 13:47:12 15-Jul			
Elapsed time: 02:08:00			
Logging period (sec): 20			
Calibration Factor (%): 100			
Max Display Concentration: 2.169 mg/m³			
Time at maximum: 14:27:37 Jul 15			
Max STEL Concentration: 1.744 mg/m³			
Time at max STEL: 14:35:48 Jul 15			
Overall Avg Conc: 0.700 mg/m³			
Logged Data:			
Point	Date	Time	Avg (mg/m³)
1	15-Jul	13:47:32	0.037
2	15-Jul	13:47:52	0.031
3	15-Jul	13:48:12	0.074
4	15-Jul	13:48:32	0.135
5	15-Jul	13:48:52	0.127
6	15-Jul	13:49:12	0.198
7	15-Jul	13:49:32	0.152
8	15-Jul	13:49:52	0.191
9	15-Jul	13:50:12	0.18
10	15-Jul	13:50:32	0.191
11	15-Jul	13:50:52	0.192
12	15-Jul	13:51:12	0.249
13	15-Jul	13:51:32	0.23
14	15-Jul	13:51:52	0.22
15	15-Jul	13:52:12	0.313
16	15-Jul	13:52:32	0.668
17	15-Jul	13:52:52	0.367
18	15-Jul	13:53:12	0.317
19	15-Jul	13:53:32	0.697
20	15-Jul	13:53:52	0.788
21	15-Jul	13:54:12	0.429
22	15-Jul	13:54:32	0.733
23	15-Jul	13:54:52	0.624
24	15-Jul	13:55:12	0.486
25	15-Jul	13:55:32	0.638
26	15-Jul	13:55:52	0.701
27	15-Jul	13:56:12	0.712
28	15-Jul	13:56:32	0.779
29	15-Jul	13:56:52	0.668
30	15-Jul	13:57:12	1.116
31	15-Jul	13:57:32	0.72
32	15-Jul	13:57:52	0.924
33	15-Jul	13:58:12	1.063
34	15-Jul	13:58:32	0.824
35	15-Jul	13:58:52	1.096
36	15-Jul	13:59:12	1.244
37	15-Jul	13:59:32	1.066
38	15-Jul	13:59:52	1.219
39	15-Jul	14:00:12	1.365
40	15-Jul	14:00:32	1.304
41	15-Jul	14:00:52	1.326
42	15-Jul	14:01:12	1.311
43	15-Jul	14:01:32	1.334
44	15-Jul	14:01:52	1.493
45	15-Jul	14:02:12	1.668
46	15-Jul	14:02:32	1.227

pDR-1000			
Tag Number: 02			
Number of logged points: 807			
Start time and date: 08:26:27 23-Jun			
Elapsed time: 06:43:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.309 mg/m ³			
Time at maximum: 09:06:24 Jun 23			
Max STEL Concentration: 0.855 mg/m ³			
Time at max STEL: 09:07:00 Jun 23			
Overall Avg Conc: 0.141 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	23-Jun	08:26:57	0.021
2	23-Jun	08:27:27	0.022
3	23-Jun	08:27:57	0.03
4	23-Jun	08:28:27	0.025
5	23-Jun	08:28:57	0.065
6	23-Jun	08:29:27	0.562
7	23-Jun	08:29:57	0.624
8	23-Jun	08:30:27	0.57
9	23-Jun	08:30:57	0.098
10	23-Jun	08:31:27	0.084
11	23-Jun	08:31:57	0.093
12	23-Jun	08:32:27	0.087
13	23-Jun	08:32:57	0.072
14	23-Jun	08:33:27	0.115
15	23-Jun	08:33:57	0.076
16	23-Jun	08:34:27	0.077
17	23-Jun	08:34:57	0.062
18	23-Jun	08:35:27	0.087
19	23-Jun	08:35:57	0.078
20	23-Jun	08:36:27	0.074
21	23-Jun	08:36:57	0.078
22	23-Jun	08:37:27	0.08
23	23-Jun	08:37:57	0.073
24	23-Jun	08:38:27	0.153
25	23-Jun	08:38:57	0.077
26	23-Jun	08:39:27	0.079
27	23-Jun	08:39:57	0.078
28	23-Jun	08:40:27	0.071
29	23-Jun	08:40:57	0.084
30	23-Jun	08:41:27	0.187
31	23-Jun	08:41:57	0.158
32	23-Jun	08:42:27	0.132
33	23-Jun	08:42:57	0.08
34	23-Jun	08:43:27	0.083
35	23-Jun	08:43:57	0.086
36	23-Jun	08:44:27	0.186
37	23-Jun	08:44:57	0.492
38	23-Jun	08:45:27	0.249
39	23-Jun	08:45:57	0.198
40	23-Jun	08:46:27	0.295
41	23-Jun	08:46:57	0.41
42	23-Jun	08:47:27	0.457

PID 0161271	Material
Item ID: 458333-00	14682270-1
Item Des: Mid Case Long JTS2	Extrusion Mid Case
Operation: Rough ID	
Gisholt Center Drive Lathe	
CE#: 16854	
Coolant: 97022454	
Monitor mounted on Top of turret	
Monitor moved when second turret was used	

pDR-1000			
Tag Number: 01			
Number of logged points: 820			
Start time and date: 07:39:49 26-Jun			
Elapsed time: 06:50:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.687 mg/m ³			
Time at maximum: 13:54:33 Jun 26			
Max STEL Concentration: 0.409 mg/m ³			
Time at max STEL: 13:54:58 Jun 26			
Overall Avg Conc: 0.080 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	26-Jun	07:40:19	0.016
2	26-Jun	07:40:49	0.03
3	26-Jun	07:41:19	0.032
4	26-Jun	07:41:49	0.011
5	26-Jun	07:42:19	0.012
6	26-Jun	07:42:49	0.012
7	26-Jun	07:43:19	0.011
8	26-Jun	07:43:49	0.013
9	26-Jun	07:44:19	0.034
10	26-Jun	07:44:49	0.02
11	26-Jun	07:45:19	0.039
12	26-Jun	07:45:49	0.044
13	26-Jun	07:46:19	0.073
14	26-Jun	07:46:49	0.036
15	26-Jun	07:47:19	0.034
16	26-Jun	07:47:49	0.108
17	26-Jun	07:48:19	0.204
18	26-Jun	07:48:49	0.216
19	26-Jun	07:49:19	0.097
20	26-Jun	07:49:49	0.046
21	26-Jun	07:50:19	0.212
22	26-Jun	07:50:49	0.378
23	26-Jun	07:51:19	0.091
24	26-Jun	07:51:49	0.044
25	26-Jun	07:52:19	0.038
26	26-Jun	07:52:49	0.042
27	26-Jun	07:53:19	0.041
28	26-Jun	07:53:49	0.039
29	26-Jun	07:54:19	0.068
30	26-Jun	07:54:49	0.038
31	26-Jun	07:55:19	0.053
32	26-Jun	07:55:49	0.041
33	26-Jun	07:56:19	0.038
34	26-Jun	07:56:49	0.035
35	26-Jun	07:57:19	0.033
36	26-Jun	07:57:49	0.037
37	26-Jun	07:58:19	0.037
38	26-Jun	07:58:49	0.033
39	26-Jun	07:59:19	0.034
40	26-Jun	07:59:49	0.033
41	26-Jun	08:00:19	0.036
42	26-Jun	08:00:49	0.035

PID 0161271	Material
Item ID: 468333-00	14682270-1
Item Des: Mid Case Long JTS2	Extrusion Mid Case
Operation: Rough ID	
Gisholt Center Drive Lathe	
CE# 16854	
Coolant: 97022454	
Monitor on second turret	

pDR-1000			
Tag Number: 01			
Number of logged points: 703			
Start time and date: 10:13:31 01-Aug			
Elapsed time: 05:51:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.965 mg/m ³			
Time at maximum: 10:17:41 Aug 01			
Max STEL Concentration: 0.824 mg/m ³			
Time at max STEL: 10:31:35 Aug 01			
Overall Avg Conc: 0.328 mg/m ³			
CE3 55674 North G&L - VTL			
Part Size 22.5 Dia x 16 Tall			
Finished Part 11.75 Dia x 15.25 in			
Speed (1000 SFM) Material 601-T6			
Depth of Cut 0.24 in			
Feed: 0.023 IPR			
Using 97022454 MWF @ 5% Mix			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	1-Aug	10:14:01	0.03
2	1-Aug	10:14:31	0.029
3	1-Aug	10:15:01	0.029
4	1-Aug	10:15:31	0.024
5	1-Aug	10:16:01	0.057
6	1-Aug	10:16:31	0.107
7	1-Aug	10:17:01	0.869
8	1-Aug	10:17:31	0.96
9	1-Aug	10:18:01	0.939
10	1-Aug	10:18:31	0.922
11	1-Aug	10:19:01	0.931
12	1-Aug	10:19:31	0.914
13	1-Aug	10:20:01	0.907
14	1-Aug	10:20:31	0.926
15	1-Aug	10:21:01	0.9
16	1-Aug	10:21:31	0.88
17	1-Aug	10:22:01	0.854
18	1-Aug	10:22:31	0.844
19	1-Aug	10:23:01	0.842
20	1-Aug	10:23:31	0.845
21	1-Aug	10:24:01	0.831
22	1-Aug	10:24:31	0.816
23	1-Aug	10:25:01	0.803
24	1-Aug	10:25:31	0.801
25	1-Aug	10:26:01	0.764
26	1-Aug	10:26:31	0.762
27	1-Aug	10:27:01	0.76
28	1-Aug	10:27:31	0.76
29	1-Aug	10:28:01	0.778
30	1-Aug	10:28:31	0.735
31	1-Aug	10:29:01	0.743
32	1-Aug	10:29:31	0.731
33	1-Aug	10:30:01	0.694
34	1-Aug	10:30:31	0.712
35	1-Aug	10:31:01	0.735
36	1-Aug	10:31:31	0.73
37	1-Aug	10:32:01	0.692
38	1-Aug	10:32:31	0.676
39	1-Aug	10:33:01	0.674
40	1-Aug	10:33:31	0.669
41	1-Aug	10:34:01	0.675
42	1-Aug	10:34:31	0.669
43	1-Aug	10:35:01	0.655

Other G&L-VTL was being set up with Outter Case
Prt No.: 3R0054-00 on PID 0125366

Start time and date: 09:06:39 18-May			
Elapsed time: 06:23:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.130 mg/m³			
Time at maximum: 09:10:14 May 18			
Max STEL Concentration: 1.077 mg/m³			
Time at max STEL: 09:51:44 May 18			
Overall Avg Conc: 0.301 mg/m³			
Logged Data:			
Point	Date	Time	Avg.(mg/m³)
1	18-May	09:07:09	0.876
2	18-May	09:07:39	0.664
3	18-May	09:08:09	1.085
4	18-May	09:08:39	1.106
5	18-May	09:09:09	1.12
6	18-May	09:09:39	1.128
7	18-May	09:10:09	1.129
8	18-May	09:10:39	1.111
9	18-May	09:11:09	1.132
10	18-May	09:11:39	1.122
11	18-May	09:12:09	1.122
12	18-May	09:12:39	1.118
13	18-May	09:13:09	1.095
14	18-May	09:13:39	1.093
15	18-May	09:14:09	1.096
16	18-May	09:14:39	0.47
17	18-May	09:15:09	0.068
18	18-May	09:15:39	0.067
19	18-May	09:16:09	0.063
20	18-May	09:16:39	0.06
21	18-May	09:17:09	0.062
22	18-May	09:17:39	0.057
23	18-May	09:18:09	0.057
24	18-May	09:18:39	0.054
25	18-May	09:19:09	0.052
26	18-May	09:19:39	0.053
27	18-May	09:20:09	0.05
28	18-May	09:20:39	0.052
29	18-May	09:21:09	0.05
30	18-May	09:21:39	0.046
31	18-May	09:22:09	0.045
32	18-May	09:22:39	0.045
33	18-May	09:23:09	0.042
34	18-May	09:23:39	0.043
35	18-May	09:24:09	0.042
36	18-May	09:24:39	0.041
37	18-May	09:25:09	0.041
38	18-May	09:25:39	0.039
39	18-May	09:26:09	0.04
40	18-May	09:26:39	0.041
41	18-May	09:27:09	0.04
42	18-May	09:27:39	0.04
43	18-May	09:28:09	0.039
44	18-May	09:28:39	0.039
45	18-May	09:29:09	0.038

PID ID #0156609
Item ID #: 423247-00
Item ID Test Stem, Forward, Stem F
Operation: 60

Sheffield PF20 wit SMOG Hog SH-10-PE

Grinding Oil 97022517, ILOCUT 5713 Hydrotreated light paraffinic oil

personal data ram located 30 inches above outlet of smog hog

pDR-1000			
Tag Number: 04			
Number of logged points: 250			
Start time and date: 15:13:50 01-Dec			
Elapsed time: 02:05:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.141 mg/m ³			
Time at maximum: 16:28:01 Dec 01			
Max STEL Concentration: 0.085 mg/m ³			
Time at max STEL: 16:40:26 Dec 01			
Overall Avg Conc: 0.033 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	1-Dec	15:14:20	0.066
2	1-Dec	15:14:50	0.018
3	1-Dec	15:15:20	0.019
4	1-Dec	15:15:50	0.018
5	1-Dec	15:16:20	0.019
6	1-Dec	15:16:50	0.018
7	1-Dec	15:17:20	0.018
8	1-Dec	15:17:50	0.024
9	1-Dec	15:18:20	0.018
10	1-Dec	15:18:50	0.019
11	1-Dec	15:19:20	0.021
12	1-Dec	15:19:50	0.018
13	1-Dec	15:20:20	0.018
14	1-Dec	15:20:50	0.036
15	1-Dec	15:21:20	0.02
16	1-Dec	15:21:50	0.024
17	1-Dec	15:22:20	0.024
18	1-Dec	15:22:50	0.018
19	1-Dec	15:23:20	0.019
20	1-Dec	15:23:50	0.02
21	1-Dec	15:24:20	0.018
22	1-Dec	15:24:50	0.018
23	1-Dec	15:25:20	0.018
24	1-Dec	15:25:50	0.018
25	1-Dec	15:26:20	0.019
26	1-Dec	15:26:50	0.018
27	1-Dec	15:27:20	0.019
28	1-Dec	15:27:50	0.018
29	1-Dec	15:28:20	0.018
30	1-Dec	15:28:50	0.019
31	1-Dec	15:29:20	0.018
32	1-Dec	15:29:50	0.025
33	1-Dec	15:30:20	0.072
34	1-Dec	15:30:50	0.076
35	1-Dec	15:31:20	0.047
36	1-Dec	15:31:50	0.063
37	1-Dec	15:32:20	0.071
38	1-Dec	15:32:50	0.074
39	1-Dec	15:33:20	0.066
40	1-Dec	15:33:50	0.062
41	1-Dec	15:34:20	0.071
42	1-Dec	15:34:50	0.078
43	1-Dec	15:35:20	0.105
44	1-Dec	15:35:50	0.101
45	1-Dec	15:36:20	0.038

Coolant: CimTech 200 (57010043) 5% Solution

pDR-1000
 Tag Number: 07
 Number of logged points: 1000
 Start time and date: 07:44:25 12-Mar
 Elapsed time: 01:40:00
 Logging period (sec): 6
 Calibration Factor (%): 100
 Max Display Concentration: 0.071 mg/m³
 Time at maximum: 08:36:13 Mar 12
 Max STEL Concentration: 0.044 mg/m³
 Time at max STEL: 08:38:59 Mar 12
 Overall Avg Conc: 0.032 mg/m³

Logged Data:

Point	Date	Time	Avg (mg/m ³)
1	12-Mar	07:44:31	0.002
2	12-Mar	07:44:37	0.006
3	12-Mar	07:44:43	0
4	12-Mar	07:44:49	0.001
5	12-Mar	07:44:55	0.001
6	12-Mar	07:45:01	0.002
7	12-Mar	07:45:07	0.003
8	12-Mar	07:45:13	0.022
9	12-Mar	07:45:19	0.025
10	12-Mar	07:45:25	0.003
11	12-Mar	07:45:31	0.001
12	12-Mar	07:45:37	0.004
13	12-Mar	07:45:43	0.006
14	12-Mar	07:45:49	0.006
15	12-Mar	07:45:55	0.005
16	12-Mar	07:46:01	0.007
17	12-Mar	07:46:07	0.004
18	12-Mar	07:46:13	0.006
19	12-Mar	07:46:19	0.012
20	12-Mar	07:46:25	0.01
21	12-Mar	07:46:31	0.011
22	12-Mar	07:46:37	0.004
23	12-Mar	07:46:43	0.006
24	12-Mar	07:46:49	0.007
25	12-Mar	07:46:55	0.018
26	12-Mar	07:47:01	0.003
27	12-Mar	07:47:07	0.014
28	12-Mar	07:47:13	0.01
29	12-Mar	07:47:19	0.005
30	12-Mar	07:47:25	0.002
31	12-Mar	07:47:31	0.002
32	12-Mar	07:47:37	0.006
33	12-Mar	07:47:43	0.009
34	12-Mar	07:47:49	0.013
35	12-Mar	07:47:55	0.013
36	12-Mar	07:48:01	0.024
37	12-Mar	07:48:07	0.026
38	12-Mar	07:48:13	0.029
39	12-Mar	07:48:19	0.033
40	12-Mar	07:48:25	0.026
41	12-Mar	07:48:31	0.036
42	12-Mar	07:48:37	0.028
43	12-Mar	07:48:43	)
44	12-Mar	07:48:49	0.036
45	12-Mar	07:48:55	0.024
46	12-Mar	07:49:01	0.028
47	12-Mar	07:49:07	0.033
48	12-Mar	07:49:13	0.031
49	12-Mar	07:49:19	0.037
50	12-Mar	07:49:25	0.025

CE# 211912 Nagel TBT Twin Spindle Gun Drill

PID 0193962

Part No.: 423277-00 1K Weld Sample

Tool No: TC1470106-021-B Drill Masters/Elderado Tool

50-50 Oil Mix @ 95 F & 177 Bar

Spindle Speed 11,000 RPM

Feed: 0.5 IPM

Counter Rotating Spindles: 200 RPM

Running 2 part at a time:

Production run 12 parts

Cycle time 5:30 min.

Change Drill after 3rd part.

Average mist level when only gun drill running 0.030 mg/cu M

pDR-1000			
Tag Number: 01			
Number of logged points: 603			
Start time and date: 09:14:21 17-Dec			
Elapsed time: 05:01:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.251 mg/m ³			
Time at maximum: 10:06:31 Dec 17			
Max STEL Concentration: 0.186 mg/m ³			
Time at max STEL: 10:10:28 Dec 17			
Overall Avg Conc: 0.129 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	17-Dec	09:14:51	0.077
2	17-Dec	09:15:21	0.064
3	17-Dec	09:15:51	0.067
4	17-Dec	09:16:21	0.061
5	17-Dec	09:16:51	0.06
6	17-Dec	09:17:21	0.051
7	17-Dec	09:17:51	0.05
8	17-Dec	09:18:21	0.053
9	17-Dec	09:18:51	0.06
10	17-Dec	09:19:21	0.048
11	17-Dec	09:19:51	0.049
12	17-Dec	09:20:21	0.049
13	17-Dec	09:20:51	0.048
14	17-Dec	09:21:21	0.051
15	17-Dec	09:21:51	0.05
16	17-Dec	09:22:21	0.062
17	17-Dec	09:22:51	0.128
18	17-Dec	09:23:21	0.134
19	17-Dec	09:23:51	0.139
20	17-Dec	09:24:21	0.153
21	17-Dec	09:24:51	0.167
22	17-Dec	09:25:21	0.166
23	17-Dec	09:25:51	0.175
24	17-Dec	09:26:21	0.171
25	17-Dec	09:26:51	0.191
26	17-Dec	09:27:21	0.163
27	17-Dec	09:27:51	0.165
28	17-Dec	09:28:21	0.21
29	17-Dec	09:28:51	0.17
30	17-Dec	09:29:21	0.152
31	17-Dec	09:29:51	0.254
32	17-Dec	09:30:21	0.238
33	17-Dec	09:30:51	0.201
34	17-Dec	09:31:21	0.163
35	17-Dec	09:31:51	0.149
36	17-Dec	09:32:21	0.158
37	17-Dec	09:32:51	0.181
38	17-Dec	09:33:21	0.197
39	17-Dec	09:33:51	0.173
40	17-Dec	09:34:21	0.243
41	17-Dec	09:34:51	0.157
42	17-Dec	09:35:21	0.173

PID: 0143683 Issue 3
 Item No: 1E0202-00-LPPI
 Item Description: Body
 Material: Stainless Steel
 Coolant: 50-50 Oil Mix
 97022341 & 97021270
 Drill Speed: 6300 RPM
 Feed: 0.0002 in/Rev

pDR-1000			
User ID: Gun Drill			
Tag Number: 10			
Number of logged points: 506			
Start time and date: 12:58:25 12-Mar			
Elapsed time: 02:06:30			
Logging period (sec): 15			
Calibration Factor (%): 100			
Max Display Concentration: 0.086 mg/m ³			
Time at maximum: 13:27:00 Mar 12			
Max STEL Concentration: 0.056 mg/m ³			
Time at max STEL: 13:38:28 Mar 12			
Overall Avg Conc: 0.047 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	12-Mar	12:58:40	0.05
2	12-Mar	12:58:55	0.048
3	12-Mar	12:59:10	0.051
4	12-Mar	12:59:25	0.051
5	12-Mar	12:59:40	0.055
6	12-Mar	12:59:55	0.053
7	12-Mar	13:00:10	0.05
8	12-Mar	13:00:25	0.058
9	12-Mar	13:00:40	0.054
10	12-Mar	13:00:55	0.051
11	12-Mar	13:01:10	0.052
12	12-Mar	13:01:25	0.058
13	12-Mar	13:01:40	0.051
14	12-Mar	13:01:55	0.054
15	12-Mar	13:02:10	0.052
16	12-Mar	13:02:25	0.066
17	12-Mar	13:02:40	0.052
18	12-Mar	13:02:55	0.048
19	12-Mar	13:03:10	0.046
20	12-Mar	13:03:25	0.049
21	12-Mar	13:03:40	0.052
22	12-Mar	13:03:55	0.05
23	12-Mar	13:04:10	0.05
24	12-Mar	13:04:25	0.051
25	12-Mar	13:04:40	0.057
26	12-Mar	13:04:55	0.05
27	12-Mar	13:05:10	0.051
28	12-Mar	13:05:25	0.062
29	12-Mar	13:05:40	0.051
30	12-Mar	13:05:55	0.055
31	12-Mar	13:06:10	0.05
32	12-Mar	13:06:25	0.055
33	12-Mar	13:06:40	0.05
34	12-Mar	13:06:55	0.045
35	12-Mar	13:07:10	0.049
36	12-Mar	13:07:25	0.053
37	12-Mar	13:07:40	0.049
38	12-Mar	13:07:55	0.046
39	12-Mar	13:08:10	0.053
40	12-Mar	13:08:25	0.045
41	12-Mar	13:08:40	0.051
42	12-Mar	13:08:55	0.046
43	12-Mar	13:09:10	0.047

CE#211912 Nagel TBT Twin Spindle Gun Drill

PID 0207520

Part No.: 1K0169-01 1M/2M Test Stem

Tool No: TC1470106-021 Drill Masters/Elderado Tool

50-50 Oil Mix @ 95 F & 177 Bar

Spindle Speed 11,000 RPM

Feed: 0.5 IPM

Counter Rotating Spindles: 200 RPM

Running 2 part at a time:

Production run 6 parts

Cycle time 4:30 min.

Change Drill after 3rd part.

pDR-1000

Tag Number: 01

Number of logged points: 1000

Start time and date: 09:52:11 02-Sep

Elapsed time: 08:20:00

Logging period (sec): 30

Calibration Factor (%): 100

Max Display Concentration: 0.626 mg/m³

Time at maximum: 14:40:44 Sep 02

Max STEL Concentration: 0.456 mg/m³

Time at max STEL: 14:44:32 Sep 02

Overall Avg Conc: 0.152 mg/m³

Logged Data:

Point	Date	Time	Avg. (mg/m ³)
1	2-Sep	09:52:41	0.026
2	2-Sep	09:53:11	0.018
3	2-Sep	09:53:41	0.028
4	2-Sep	09:54:11	0.077
5	2-Sep	09:54:41	0.196
6	2-Sep	09:55:11	0.262
7	2-Sep	09:55:41	0.238
8	2-Sep	09:56:11	0.277
9	2-Sep	09:56:41	0.277
10	2-Sep	09:57:11	0.269
11	2-Sep	09:57:41	0.274
12	2-Sep	09:58:11	0.304
13	2-Sep	09:58:41	0.297
14	2-Sep	09:59:11	0.297
15	2-Sep	09:59:41	0.332
16	2-Sep	10:00:11	0.325
17	2-Sep	10:00:41	0.342
18	2-Sep	10:01:11	0.32
19	2-Sep	10:01:41	0.36
20	2-Sep	10:02:11	0.356
21	2-Sep	10:02:41	0.35
22	2-Sep	10:03:11	0.33
23	2-Sep	10:03:41	0.3
24	2-Sep	10:04:11	0.347
25	2-Sep	10:04:41	0.361
26	2-Sep	10:05:11	0.412
27	2-Sep	10:05:41	0.448
28	2-Sep	10:06:11	0.468
29	2-Sep	10:06:41	0.429
30	2-Sep	10:07:11	0.402
31	2-Sep	10:07:41	0.41
32	2-Sep	10:08:11	0.368
33	2-Sep	10:08:41	0.369
34	2-Sep	10:09:11	0.373
35	2-Sep	10:09:41	0.424
36	2-Sep	10:10:11	0.389
37	2-Sep	10:10:41	0.33
38	2-Sep	10:11:11	0.38
39	2-Sep	10:11:41	0.392
40	2-Sep	10:12:11	0.395
41	2-Sep	10:12:41	0.462
42	2-Sep	10:13:11	0.404
43	2-Sep	10:13:41	0.451
44	2-Sep	10:14:11	0.476
45	2-Sep	10:14:41	0.697
46	2-Sep	10:15:11	0.514

pDR-1000			
Tag Number: 02			
Number of logged points: 1000			
Start time and date: 08:08:12 28-Jun			
Elapsed time: 08:20:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.548 mg/m ³			
Time at maximum: 14:19:51 Jun 28			
Max STEL Concentration: 0.580 mg/m ³			
Time at max STEL: 14:33:41 Jun 28			
Overall Avg Conc: 0.147 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	28-Jun	08:08:42	0.102
2	28-Jun	08:09:12	0.104
3	28-Jun	08:09:42	0.099
4	28-Jun	08:10:12	0.11
5	28-Jun	08:10:42	0.115
6	28-Jun	08:11:12	0.123
7	28-Jun	08:11:42	0.11
8	28-Jun	08:12:12	0.11
9	28-Jun	08:12:42	0.124
10	28-Jun	08:13:12	0.114
11	28-Jun	08:13:42	0.112
12	28-Jun	08:14:12	0.103
13	28-Jun	08:14:42	0.109
14	28-Jun	08:15:12	0.112
15	28-Jun	08:15:42	0.12
16	28-Jun	08:16:12	0.151
17	28-Jun	08:16:42	0.125
18	28-Jun	08:17:12	0.135
19	28-Jun	08:17:42	0.111
20	28-Jun	08:18:12	0.132
21	28-Jun	08:18:42	0.109
22	28-Jun	08:19:12	0.101
23	28-Jun	08:19:42	0.11
24	28-Jun	08:20:12	0.111
25	28-Jun	08:20:42	0.115
26	28-Jun	08:21:12	0.122
27	28-Jun	08:21:42	0.11
28	28-Jun	08:22:12	0.121
29	28-Jun	08:22:42	0.114
30	28-Jun	08:23:12	0.099
31	28-Jun	08:23:42	0.11
32	28-Jun	08:24:12	0.116
33	28-Jun	08:24:42	0.11
34	28-Jun	08:25:12	0.122
35	28-Jun	08:25:42	0.124
36	28-Jun	08:26:12	0.129
37	28-Jun	08:26:42	0.134
38	28-Jun	08:27:12	0.12
39	28-Jun	08:27:42	0.112
40	28-Jun	08:28:12	0.113
41	28-Jun	08:28:42	0.123

PID 0161271
 Item ID: 458333-00
 Item Des: Mid Case Long JTS2
 Operation 30: Rough ID
 CE# 62701
 Hollow Spindle Lathe
 Coolant: 97022454

pDR-1000			
Tag Number: 01			
Number of logged points: 1000			
Start time and date: 07:18:57 29-Jun			
Elapsed time: 08:20:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.990 mg/m ³			
Time at maximum: 08:57:33 Jun 29			
Max STEL Concentration: 0.865 mg/m ³			
Time at max STEL: 10:25:43 Jun 29			
Overall Avg Conc: 0.407 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	29-Jun	07:19:27	0.018
2	29-Jun	07:19:57	0.02
3	29-Jun	07:20:27	0.017
4	29-Jun	07:20:57	0.024
5	29-Jun	07:21:27	0.129
6	29-Jun	07:21:57	0.173
7	29-Jun	07:22:27	0.174
8	29-Jun	07:22:57	0.166
9	29-Jun	07:23:27	0.163
10	29-Jun	07:23:57	0.144
11	29-Jun	07:24:27	0.168
12	29-Jun	07:24:57	0.246
13	29-Jun	07:25:27	0.301
14	29-Jun	07:25:57	0.268
15	29-Jun	07:26:27	0.33
16	29-Jun	07:26:57	0.268
17	29-Jun	07:27:27	0.354
18	29-Jun	07:27:57	0.404
19	29-Jun	07:28:27	0.382
20	29-Jun	07:28:57	0.368
21	29-Jun	07:29:27	0.414
22	29-Jun	07:29:57	0.408
23	29-Jun	07:30:27	0.43
24	29-Jun	07:30:57	0.427
25	29-Jun	07:31:27	0.372
26	29-Jun	07:31:57	0.404
27	29-Jun	07:32:27	0.363
28	29-Jun	07:32:57	0.424
29	29-Jun	07:33:27	0.364
30	29-Jun	07:33:57	0.399
31	29-Jun	07:34:27	0.392
32	29-Jun	07:34:57	0.393
33	29-Jun	07:35:27	0.385
34	29-Jun	07:35:57	0.372
35	29-Jun	07:36:27	0.442
36	29-Jun	07:36:57	0.418
37	29-Jun	07:37:27	0.396
38	29-Jun	07:37:57	0.377
39	29-Jun	07:38:27	0.377
40	29-Jun	07:38:57	0.435
41	29-Jun	07:39:27	0.41
42	29-Jun	07:39:57	0.476
43	29-Jun	07:40:27	0.435
44	29-Jun	07:40:57	0.424

PID 0161271	Material
Item ID: 458333-00	14582270-1
Item Des: Mid Case Long JTS2	Extrusion Mid Case
Operation: Rough ID	
Hollow Spindle Lathe	
CE# 62701	
Cutting with 46 in long Boring Bar, Boring Bar is 6.25 in diameter	
Coolant: 97022454	

pDR-1000			
Tag Number: 03			
Number of logged points: 1000			
Start time and date: 08:29:57 27-Sep			
Elapsed time: 08:20:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.124 mg/m ³			
Time at maximum: 14:01:25 Sep 27			
Max STEL Concentration: 0.041 mg/m ³			
Time at max STEL: 14:01:21 Sep 27			
Overall Avg Conc: 0.033 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	27-Sep	08:30:27	0.019
2	27-Sep	08:30:57	0.023
3	27-Sep	08:31:27	0.014
4	27-Sep	08:31:57	0.019
5	27-Sep	08:32:27	0.027
6	27-Sep	08:32:57	0.035
7	27-Sep	08:33:27	0.032
8	27-Sep	08:33:57	0.039
9	27-Sep	08:34:27	0.034
10	27-Sep	08:34:57	0.037
11	27-Sep	08:35:27	0.042
12	27-Sep	08:35:57	0.038
13	27-Sep	08:36:27	0.036
14	27-Sep	08:36:57	0.029
15	27-Sep	08:37:27	0.034
16	27-Sep	08:37:57	0.028
17	27-Sep	08:38:27	0.034
18	27-Sep	08:38:57	0.03
19	27-Sep	08:39:27	0.032
20	27-Sep	08:39:57	0.041
21	27-Sep	08:40:27	0.03
22	27-Sep	08:40:57	0.03
23	27-Sep	08:41:27	0.037
24	27-Sep	08:41:57	0.032
25	27-Sep	08:42:27	0.036
26	27-Sep	08:42:57	0.029
27	27-Sep	08:43:27	0.03
28	27-Sep	08:43:57	0.03
29	27-Sep	08:44:27	0.031
30	27-Sep	08:44:57	0.029
31	27-Sep	08:45:27	0.027
32	27-Sep	08:45:57	0.03
33	27-Sep	08:46:27	0.029
34	27-Sep	08:46:57	0.028
35	27-Sep	08:47:27	0.024
36	27-Sep	08:47:57	0.026
37	27-Sep	08:48:27	0.026
38	27-Sep	08:48:57	0.029
39	27-Sep	08:49:27	0.034
40	27-Sep	08:49:57	0.029
41	27-Sep	08:50:27	0.027
42	27-Sep	08:50:57	0.028
43	27-Sep	08:51:27	0.035
44	27-Sep	08:51:57	0.029
45	27-Sep	08:52:27	0.03
46	27-Sep	08:52:57	0.035

Work Order No.: TDS 0005132-001
 Operation 0030
 Speed 250 RPM
 Feed: 0.003 IPR
 Coolant: 97022454

pDR-1000

Tag Number: 01

Number of logged points: 745

Start time and date: 10:36:46 11-Aug

Elapsed time: 06:12:30

Logging period (sec): 30

Calibration Factor (%): 100

Max Display Concentration: 2.090 mg/m³

Time at maximum: 15:59:23 Aug 11

Max STEL Concentration: 1.200 mg/m³

Time at max STEL: 15:59:56 Aug 11

Overall Avg Conc: 0.297 mg/m³

Logged Data:

Point	Date	Time	Avg. (mg/m ³)
1	11-Aug	10:37:16	0.093
2	11-Aug	10:37:46	0.149
3	11-Aug	10:38:16	0.097
4	11-Aug	10:38:46	0.096
5	11-Aug	10:39:16	0.096
6	11-Aug	10:39:46	0.1
7	11-Aug	10:40:16	0.094
8	11-Aug	10:40:46	0.099
9	11-Aug	10:41:16	0.097
10	11-Aug	10:41:46	0.097
11	11-Aug	10:42:16	0.098
12	11-Aug	10:42:46	0.099
13	11-Aug	10:43:16	0.101
14	11-Aug	10:43:46	0.097
15	11-Aug	10:44:16	0.099
16	11-Aug	10:44:46	0.099
17	11-Aug	10:45:16	0.097
18	11-Aug	10:45:46	0.098
19	11-Aug	10:46:16	0.097
20	11-Aug	10:46:46	0.098
21	11-Aug	10:47:16	0.096
22	11-Aug	10:47:46	0.103
23	11-Aug	10:48:16	0.1
24	11-Aug	10:48:46	0.102
25	11-Aug	10:49:16	0.102
26	11-Aug	10:49:46	0.1
27	11-Aug	10:50:16	0.099
28	11-Aug	10:50:46	0.102
29	11-Aug	10:51:16	0.1
30	11-Aug	10:51:46	0.097
31	11-Aug	10:52:16	0.098
32	11-Aug	10:52:46	0.096
33	11-Aug	10:53:16	0.095
34	11-Aug	10:53:46	0.095
35	11-Aug	10:54:16	0.095
36	11-Aug	10:54:46	0.093
37	11-Aug	10:55:16	0.093
38	11-Aug	10:55:46	0.09
39	11-Aug	10:56:16	0.091
40	11-Aug	10:56:46	0.092
41	11-Aug	10:57:16	0.09
42	11-Aug	10:57:46	0.089

pDR-1000			
Tag Number: 02			
Number of logged points: 1000			
Start time and date: 09:19:26 17-Nov			
Elapsed time: 08:20:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.153 mg/m ³			
Time at maximum: 14:35:27 Nov 17			
Max STEL Concentration: 0.116 mg/m ³			
Time at max STEL: 14:47:22 Nov 17			
Overall Avg Conc: 0.030 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	17-Nov	09:19:56	0.021
2	17-Nov	09:20:26	0.025
3	17-Nov	09:20:56	0.029
4	17-Nov	09:21:26	0.025
5	17-Nov	09:21:56	0.019
6	17-Nov	09:22:26	0.02
7	17-Nov	09:22:56	0.067
8	17-Nov	09:23:26	0.019
9	17-Nov	09:23:56	0.021
10	17-Nov	09:24:26	0.019
11	17-Nov	09:24:56	0.021
12	17-Nov	09:25:26	0.02
13	17-Nov	09:25:56	0.022
14	17-Nov	09:26:26	0.021
15	17-Nov	09:26:56	0.025
16	17-Nov	09:27:26	0.02
17	17-Nov	09:27:56	0.06
18	17-Nov	09:28:26	0.024
19	17-Nov	09:28:56	0.025
20	17-Nov	09:29:26	0.026
21	17-Nov	09:29:56	0.026
22	17-Nov	09:30:26	0.027
23	17-Nov	09:30:56	0.027
24	17-Nov	09:31:26	0.027
25	17-Nov	09:31:56	0.025
26	17-Nov	09:32:26	0.024
27	17-Nov	09:32:56	0.023
28	17-Nov	09:33:26	0.027
29	17-Nov	09:33:56	0.029
30	17-Nov	09:34:26	0.025
31	17-Nov	09:34:56	0.034
32	17-Nov	09:35:26	0.024
33	17-Nov	09:35:56	0.022
34	17-Nov	09:36:26	0.025
35	17-Nov	09:36:56	0.036
36	17-Nov	09:37:26	0.027
37	17-Nov	09:37:56	0.026
38	17-Nov	09:38:26	0.024
39	17-Nov	09:38:56	0.025
40	17-Nov	09:39:26	0.026
41	17-Nov	09:39:56	0.025
42	17-Nov	09:40:26	0.046
43	17-Nov	09:40:56	0.029
44	17-Nov	09:41:26	0.026
45	17-Nov	09:41:56	0.026
46	17-Nov	09:42:26	0.026

PID: 0128763
Item: 1A1067-00-DEV, Housing, Full Machine
Operation 400 Issue 2
Housing mounted on face plate with clamps. Heard clicking sound, hit e-stop, opened door to survey damage
System has a mist collector operating when machine tool is running
Cut was ~ on a 5 inch diameter @400 rpm
Coolant 3700 T 97022454

pDR-1000			
Tag Number: 06			
Number of logged points: 625			
Start time and date: 11:06:49 20-Mar			
Elapsed time: 05:12:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.970 mg/m ³			
Time at maximum: 11:06:52 Mar 20			
Max STEL Concentration: 0.302 mg/m ³			
Time at max STEL: 11:50:24 Mar 20			
Overall Avg Conc: 0.083 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	20-Mar	11:07:19	0.621
2	20-Mar	11:07:49	0.254
3	20-Mar	11:08:19	0.209
4	20-Mar	11:08:49	0.195
5	20-Mar	11:09:19	0.178
6	20-Mar	11:09:49	0.138
7	20-Mar	11:10:19	0.082
8	20-Mar	11:10:49	0.081
9	20-Mar	11:11:19	0.115
10	20-Mar	11:11:49	0.1
11	20-Mar	11:12:19	0.206
12	20-Mar	11:12:49	0.098
13	20-Mar	11:13:19	0.087
14	20-Mar	11:13:49	0.125
15	20-Mar	11:14:19	0.097
16	20-Mar	11:14:49	0.086
17	20-Mar	11:15:19	0.09
18	20-Mar	11:15:49	0.086
19	20-Mar	11:16:19	0.084
20	20-Mar	11:16:49	0.09
21	20-Mar	11:17:19	0.084
22	20-Mar	11:17:49	0.154
23	20-Mar	11:18:19	0.337
24	20-Mar	11:18:49	0.095
25	20-Mar	11:19:19	0.08
26	20-Mar	11:19:49	0.084
27	20-Mar	11:20:19	0.082
28	20-Mar	11:20:49	0.073
29	20-Mar	11:21:19	0.065
30	20-Mar	11:21:49	0.062
31	20-Mar	11:22:19	0.065
32	20-Mar	11:22:49	0.054
33	20-Mar	11:23:19	0.051
34	20-Mar	11:23:49	0.054
35	20-Mar	11:24:19	0.054
36	20-Mar	11:24:49	0.051
37	20-Mar	11:25:19	0.047
38	20-Mar	11:25:49	0.046
39	20-Mar	11:26:19	0.048
40	20-Mar	11:26:49	0.049
41	20-Mar	11:27:19	0.046
42	20-Mar	11:27:49	0.045
43	20-Mar	11:28:19	0.047
44	20-Mar	11:28:49	0.048
45	20-Mar	11:29:19	0.045
46	20-Mar	11:29:49	0.046

TDS Order No. 0003161-001
Item ID: 1E1434-00
Item Description: Shell Assembly 76-1
Machine Tool: CE 22324, T-Bed Lathe w/Open Architecture Control
Coolant: Fresh 57010059 TrimSol 20:1 Mix
Tool path starts at pole and goes to diameter.
Starting at 1500 RPM and slowing to 800 RPM
Material: 6061-T6 Aluminum

pDR-1000
 Tag Number: 01
 Number of logged points: 664
 Start time and date: 10:45:13 12-Aug
 Elapsed time: 05:32:00
 Logging period (sec): 30
 Calibration Factor (%): 100
 Max Display Concentration: 1.468 mg/m³
 Time at maximum: 10:51:35 Aug 12
 Max STEL Concentration: 0.945 mg/m³
 Time at max STEL: 11:14:48 Aug 12
 Overall Avg Conc: 0.252 mg/m³

Logged Data:

Point	Date	Time	Avg.(mg/m ³)
1	12-Aug	10:45:43	0.007
2	12-Aug	10:46:13	0.01
3	12-Aug	10:46:43	0.008
4	12-Aug	10:47:13	0.015
5	12-Aug	10:47:43	0.078
6	12-Aug	10:48:13	0.358
7	12-Aug	10:48:43	0.859
8	12-Aug	10:49:13	0.832
9	12-Aug	10:49:43	0.974
10	12-Aug	10:50:13	1.325
11	12-Aug	10:50:43	1.424
12	12-Aug	10:51:13	1.417
13	12-Aug	10:51:43	1.434
14	12-Aug	10:52:13	1.12
15	12-Aug	10:52:43	0.936
16	12-Aug	10:53:13	0.81
17	12-Aug	10:53:43	0.756
18	12-Aug	10:54:13	0.649
19	12-Aug	10:54:43	0.665
20	12-Aug	10:55:13	0.779
21	12-Aug	10:55:43	0.758
22	12-Aug	10:56:13	0.55
23	12-Aug	10:56:43	0.692
24	12-Aug	10:57:13	0.749
25	12-Aug	10:57:43	0.63
26	12-Aug	10:58:13	0.688
27	12-Aug	10:58:43	0.704
28	12-Aug	10:59:13	0.746
29	12-Aug	10:59:43	0.893
30	12-Aug	11:00:13	0.944
31	12-Aug	11:00:43	0.953
32	12-Aug	11:01:13	1.028
33	12-Aug	11:01:43	1.057
34	12-Aug	11:02:13	1.024
35	12-Aug	11:02:43	1.097
36	12-Aug	11:03:13	1.068
37	12-Aug	11:03:43	1.007

pDR-1000			
Tag Number: 01			
Number of logged points: 484			
Start time and date: 07:04:24 13-Aug			
Elapsed time: 04:02:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.084 mg/m ³			
Time at maximum: 10:17:19 Aug 13			
Max STEL Concentration: 0.079 mg/m ³			
Time at max STEL: 10:26:39 Aug 13			
Overall Avg Conc: 0.042 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	13-Aug	07:04:54	0.002
2	13-Aug	07:05:24	0
3	13-Aug	07:05:54	0
4	13-Aug	07:06:24	0.004
5	13-Aug	07:06:54	0.006
6	13-Aug	07:07:24	0.011
7	13-Aug	07:07:54	0.02
8	13-Aug	07:08:24	0.021
9	13-Aug	07:08:54	0.02
10	13-Aug	07:09:24	0.018
11	13-Aug	07:09:54	0.021
12	13-Aug	07:10:24	0.02
13	13-Aug	07:10:54	0.02
14	13-Aug	07:11:24	0.017
15	13-Aug	07:11:54	0.017
16	13-Aug	07:12:24	0.016
17	13-Aug	07:12:54	0.016
18	13-Aug	07:13:24	0.014
19	13-Aug	07:13:54	0.016
20	13-Aug	07:14:24	0.019
21	13-Aug	07:14:54	0.017
22	13-Aug	07:15:24	0.016
23	13-Aug	07:15:54	0.014
24	13-Aug	07:16:24	0.018
25	13-Aug	07:16:54	0.014
26	13-Aug	07:17:24	0.018
27	13-Aug	07:17:54	0.023
28	13-Aug	07:18:24	0.014
29	13-Aug	07:18:54	0.013
30	13-Aug	07:19:24	0.016
31	13-Aug	07:19:54	0.018
32	13-Aug	07:20:24	0.014
33	13-Aug	07:20:54	0.015
34	13-Aug	07:21:24	0.013
35	13-Aug	07:21:54	0.016
36	13-Aug	07:22:24	0.016
37	13-Aug	07:22:54	0.015
38	13-Aug	07:23:24	0.016
39	13-Aug	07:23:54	0.015
40	13-Aug	07:24:24	0.015
41	13-Aug	07:24:54	0.016
42	13-Aug	07:25:24	0.015
43	13-Aug	07:25:54	0.011
44	13-Aug	07:26:24	0.014
45	13-Aug	07:26:54	0.018

pDR-1000			
Tag Number: 02			
Number of logged points: 579			
Start time and date: 11:07:53 13-Aug			
Elapsed time: 04:49:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.097 mg/m ³			
Time at maximum: 14:16:26 Aug 13			
Max STEL Concentration: 0.091 mg/m ³			
Time at max STEL: 14:24:38 Aug 13			
Overall Avg Conc: 0.060 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	13-Aug	11:08:23	0.041
2	13-Aug	11:08:53	0.04
3	13-Aug	11:09:23	0.039
4	13-Aug	11:09:53	0.039
5	13-Aug	11:10:23	0.036
6	13-Aug	11:10:53	0.039
7	13-Aug	11:11:23	0.036
8	13-Aug	11:11:53	0.036
9	13-Aug	11:12:23	0.036
10	13-Aug	11:12:53	0.035
11	13-Aug	11:13:23	0.037
12	13-Aug	11:13:53	0.034
13	13-Aug	11:14:23	0.034
14	13-Aug	11:14:53	0.04
15	13-Aug	11:15:23	0.032
16	13-Aug	11:15:53	0.03
17	13-Aug	11:16:23	0.033
18	13-Aug	11:16:53	0.033
19	13-Aug	11:17:23	0.032
20	13-Aug	11:17:53	0.032
21	13-Aug	11:18:23	0.031
22	13-Aug	11:18:53	0.034
23	13-Aug	11:19:23	0.031
24	13-Aug	11:19:53	0.03
25	13-Aug	11:20:23	0.03
26	13-Aug	11:20:53	0.03
27	13-Aug	11:21:23	0.03
28	13-Aug	11:21:53	0.03
29	13-Aug	11:22:23	0.03
30	13-Aug	11:22:53	0.03
31	13-Aug	11:23:23	0.029
32	13-Aug	11:23:53	0.03
33	13-Aug	11:24:23	0.03
34	13-Aug	11:24:53	0.027
35	13-Aug	11:25:23	0.028
36	13-Aug	11:25:53	0.027
37	13-Aug	11:26:23	0.027
38	13-Aug	11:26:53	0.028
39	13-Aug	11:27:23	0.03
40	13-Aug	11:27:53	0.031
41	13-Aug	11:28:23	0.032
42	13-Aug	11:28:53	0.032
43	13-Aug	11:29:23	0.032
44	13-Aug	11:29:53	0.032
45	13-Aug	11:30:23	0.033
46	13-Aug	11:30:53	0.035

pDR-1000			
Tag Number: 01			
Number of logged points: 841			
Start time and date: 08:16:57 15-Aug			
Elapsed time: 07:00:30			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.174 mg/m ³			
Time at maximum: 14:01:43 Aug 15			
Max STEL Concentration: 0.096 mg/m ³			
Time at max STEL: 14:14:23 Aug 15			
Overall Avg Conc: 0.046 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	15-Aug	08:17:27	0.017
2	15-Aug	08:17:57	0.017
3	15-Aug	08:18:27	0.011
4	15-Aug	08:18:57	0.027
5	15-Aug	08:19:27	0.041
6	15-Aug	08:19:57	0.041
7	15-Aug	08:20:27	0.04
8	15-Aug	08:20:57	0.043
9	15-Aug	08:21:27	0.054
10	15-Aug	08:21:57	0.04
11	15-Aug	08:22:27	0.05
12	15-Aug	08:22:57	0.048
13	15-Aug	08:23:27	0.047
14	15-Aug	08:23:57	0.041
15	15-Aug	08:24:27	0.044
16	15-Aug	08:24:57	0.038
17	15-Aug	08:25:27	0.039
18	15-Aug	08:25:57	0.048
19	15-Aug	08:26:27	0.043
20	15-Aug	08:26:57	0.042
21	15-Aug	08:27:27	0.04
22	15-Aug	08:27:57	0.042
23	15-Aug	08:28:27	0.065
24	15-Aug	08:28:57	0.041
25	15-Aug	08:29:27	0.051
26	15-Aug	08:29:57	0.049
27	15-Aug	08:30:27	0.038
28	15-Aug	08:30:57	0.04
29	15-Aug	08:31:27	0.04
30	15-Aug	08:31:57	0.048
31	15-Aug	08:32:27	0.046
32	15-Aug	08:32:57	0.042
33	15-Aug	08:33:27	0.049
34	15-Aug	08:33:57	0.067
35	15-Aug	08:34:27	0.055
36	15-Aug	08:34:57	0.049
37	15-Aug	08:35:27	0.052
38	15-Aug	08:35:57	0.055
39	15-Aug	08:36:27	0.048
40	15-Aug	08:36:57	0.05
41	15-Aug	08:37:27	0.047
42	15-Aug	08:37:57	0.055
43	15-Aug	08:38:27	0.047
44	15-Aug	08:38:57	0.048
45	15-Aug	08:39:27	0.044
46	15-Aug	08:39:57	0.045

pDR-1000			
Tag Number: 03			
Number of logged points: 568			
Start time and date: 10:03:42 08-Aug			
Elapsed time: 04:54:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.099 mg/m ³			
Time at maximum: 12:02:17 Aug 08			
Max STEL Concentration: 0.063 mg/m ³			
Time at max STEL: 11:29:20 Aug 08			
Overall Avg Conc: 0.043 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	8-Aug	10:04:12	0.028
2	8-Aug	10:04:42	0.026
3	8-Aug	10:05:12	0.029
4	8-Aug	10:05:42	0.031
5	8-Aug	10:06:12	0.027
6	8-Aug	10:06:42	0.026
7	8-Aug	10:07:12	0.031
8	8-Aug	10:07:42	0.028
9	8-Aug	10:08:12	0.029
10	8-Aug	10:08:42	0.027
11	8-Aug	10:09:12	0.029
12	8-Aug	10:09:42	0.028
13	8-Aug	10:10:12	0.029
14	8-Aug	10:10:42	0.031
15	8-Aug	10:11:12	0.031
16	8-Aug	10:11:42	0.029
17	8-Aug	10:12:12	0.03
18	8-Aug	10:12:42	0.03
19	8-Aug	10:13:12	0.03
20	8-Aug	10:13:42	0.027
21	8-Aug	10:14:12	0.028
22	8-Aug	10:14:42	0.028
23	8-Aug	10:15:12	0.027
24	8-Aug	10:15:42	0.028
25	8-Aug	10:16:12	0.029
26	8-Aug	10:16:42	0.029
27	8-Aug	10:17:12	0.037
28	8-Aug	10:17:42	0.027
29	8-Aug	10:18:12	0.03
30	8-Aug	10:18:42	0.03
31	8-Aug	10:19:12	0.031
32	8-Aug	10:19:42	0.029
33	8-Aug	10:20:12	0.028
34	8-Aug	10:20:42	0.029
35	8-Aug	10:21:12	0.03
36	8-Aug	10:21:42	0.031
37	8-Aug	10:22:12	0.029
38	8-Aug	10:22:42	0.029
39	8-Aug	10:23:12	0.029
40	8-Aug	10:23:42	0.03
41	8-Aug	10:24:12	0.029
42	8-Aug	10:24:42	0.03
43	8-Aug	10:25:12	0.03
44	8-Aug	10:25:42	0.03
45	8-Aug	10:26:12	0.029
46	8-Aug	10:26:42	0.03
47	8-Aug	10:27:12	0.029
48	8-Aug	10:27:42	0.029
49	8-Aug	10:28:12	0.054
50	8-Aug	10:28:42	0.029
51	8-Aug	10:29:12	0.031
52	8-Aug	10:29:42	0.03
53	8-Aug	10:30:12	0.03
54	8-Aug	10:30:42	0.03
55	8-Aug	10:31:12	0.03
56	8-Aug	10:31:42	0.03
57	8-Aug	10:32:12	0.031
58	8-Aug	10:32:42	0.031
59	8-Aug	10:33:12	0.033
60	8-Aug	10:33:42	0.03

Mist Level without mist collector	0.054362 mg/cuM
Mist Level with Mist Collector	0.04259 mg/cuM

Logged Data			
Point	Date	Time	Avg (mg/m ³)
1	3-Apr	10:11:06	0.016
2	3-Apr	10:11:36	0.026
3	3-Apr	10:12:06	0.02
4	3-Apr	10:12:36	0.063
5	3-Apr	10:13:06	0.117
6	3-Apr	10:13:36	0.094
7	3-Apr	10:14:06	0.09
8	3-Apr	10:14:36	0.09
9	3-Apr	10:15:06	0.085
10	3-Apr	10:15:36	0.07
11	3-Apr	10:16:06	0.091
12	3-Apr	10:16:36	0.069
13	3-Apr	10:17:06	0.067
14	3-Apr	10:17:36	0.066
15	3-Apr	10:18:06	0.069
16	3-Apr	10:18:36	0.067
17	3-Apr	10:19:06	0.066
18	3-Apr	10:19:36	0.058
19	3-Apr	10:20:06	0.061
20	3-Apr	10:20:36	0.062
21	3-Apr	10:21:06	0.076
22	3-Apr	10:21:36	0.061
23	3-Apr	10:22:06	0.05
24	3-Apr	10:22:36	0.055
25	3-Apr	10:23:06	0.051
26	3-Apr	10:23:36	0.055
27	3-Apr	10:24:06	0.066
28	3-Apr	10:24:36	0.051
29	3-Apr	10:25:06	0.06
30	3-Apr	10:25:36	0.058
31	3-Apr	10:26:06	0.052
32	3-Apr	10:26:36	0.05
33	3-Apr	10:27:06	0.044
34	3-Apr	10:27:36	0.049
35	3-Apr	10:28:06	0.062
36	3-Apr	10:28:36	0.05
37	3-Apr	10:29:06	0.045
38	3-Apr	10:29:36	0.043
39	3-Apr	10:30:06	0.049
40	3-Apr	10:30:36	0.044
41	3-Apr	10:31:06	0.043
42	3-Apr	10:31:36	0.047
43	3-Apr	10:32:06	0.045
44	3-Apr	10:32:36	0.048
45	3-Apr	10:33:06	0.043
46	3-Apr	10:33:36	0.049

pDR-1000			
Tag Number: 02			
Number of logged points: 252			
Start time and date: 14:46:31 19-Dec			
Elapsed time: 02:06:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 0.078 mg/m ³			
Time at maximum: 14:47:48 Dec 19			
Max STEL Concentration: 0.046 mg/m ³			
Time at max STEL: 15:02:03 Dec 19			
Overall Avg Conc: 0.038 mg/m ³			
Logged Data:			
Point	Date	Time	Avg. (mg/m ³)
1	19-Dec	14:47:01	0.024
2	19-Dec	14:47:31	0.116
3	19-Dec	14:48:01	0.038
4	19-Dec	14:48:31	0.036
5	19-Dec	14:49:01	0.041
6	19-Dec	14:49:31	0.042
7	19-Dec	14:50:01	0.063
8	19-Dec	14:50:31	0.042
9	19-Dec	14:51:01	0.026
10	19-Dec	14:51:31	0.065
11	19-Dec	14:52:01	0.039
12	19-Dec	14:52:31	0.067
13	19-Dec	14:53:01	0.043
14	19-Dec	14:53:31	0.051
15	19-Dec	14:54:01	0.048
16	19-Dec	14:54:31	0.05
17	19-Dec	14:55:01	0.063
18	19-Dec	14:55:31	0.05
19	19-Dec	14:56:01	0.04
20	19-Dec	14:56:31	0.042
21	19-Dec	14:57:01	0.042
22	19-Dec	14:57:31	0.042
23	19-Dec	14:58:01	0.04
24	19-Dec	14:58:31	0.037
25	19-Dec	14:59:01	0.039
26	19-Dec	14:59:31	0.041
27	19-Dec	15:00:01	0.032
28	19-Dec	15:00:31	0.044
29	19-Dec	15:01:01	0.037
30	19-Dec	15:01:31	0.03
31	19-Dec	15:02:01	0.04
32	19-Dec	15:02:31	0.037
33	19-Dec	15:03:01	0.042
34	19-Dec	15:03:31	0.046
35	19-Dec	15:04:01	0.038
36	19-Dec	15:04:31	0.048
37	19-Dec	15:05:01	0.031
38	19-Dec	15:05:31	0.089
39	19-Dec	15:06:01	0.037
40	19-Dec	15:06:31	0.033
41	19-Dec	15:07:01	0.055
42	19-Dec	15:07:31	0.036
43	19-Dec	15:08:01	0.084
44	19-Dec	15:08:31	0.034
45	19-Dec	15:09:01	0.042
46	19-Dec	15:09:31	0.033

PID 0141650
Item No.: 1A4184
Description: CAN MMU
Operation #: 40 Face Tooling Flange
Monarch Large Tracer Lathe
Coolant: 20:1 Mix of 97022454

pDR-1000

Tag Number: 01

Number of logged points: 716

Start time and date: 09:12:30 16-Dec

Elapsed time: 05:58:00

Logging period (sec): 30

Calibration Factor (%): 100

Max Display Concentration: 3.020 mg/m³

Time at maximum: 11:16:09 Dec 16

Max STEL Concentration: 2.613 mg/m³

Time at max STEL: 11:29:49 Dec 16

Overall Avg Conc: 0.563 mg/m³

Logged Data:

Point	Date	Time	Avg (mg/m ³)
1	16-Dec	09:13:00	0.006
2	16-Dec	09:13:30	0.009
3	16-Dec	09:14:00	0.009
4	16-Dec	09:14:30	0.006
5	16-Dec	09:15:00	0.009
6	16-Dec	09:15:30	0.006
7	16-Dec	09:16:00	0.013
8	16-Dec	09:16:30	0.715
9	16-Dec	09:17:00	2.024
10	16-Dec	09:17:30	1.907
11	16-Dec	09:18:00	2.131
12	16-Dec	09:18:30	2.148
13	16-Dec	09:19:00	2.068
14	16-Dec	09:19:30	1.887
15	16-Dec	09:20:00	1.912
16	16-Dec	09:20:30	2.001
17	16-Dec	09:21:00	1.81
18	16-Dec	09:21:30	1.737
19	16-Dec	09:22:00	1.652
20	16-Dec	09:22:30	1.556
21	16-Dec	09:23:00	1.475
22	16-Dec	09:23:30	1.423
23	16-Dec	09:24:00	1.431
24	16-Dec	09:24:30	1.242
25	16-Dec	09:25:00	1.271
26	16-Dec	09:25:30	1.276
27	16-Dec	09:26:00	1.212
28	16-Dec	09:26:30	1.116
29	16-Dec	09:27:00	1.16
30	16-Dec	09:27:30	1.119
31	16-Dec	09:28:00	1.203
32	16-Dec	09:28:30	1.108
33	16-Dec	09:29:00	1.056
34	16-Dec	09:29:30	0.974
35	16-Dec	09:30:00	1.008
36	16-Dec	09:30:30	0.93
37	16-Dec	09:31:00	0.872
38	16-Dec	09:31:30	0.779
39	16-Dec	09:32:00	0.802
40	16-Dec	09:32:30	0.752
41	16-Dec	09:33:00	0.694
42	16-Dec	09:33:30	0.604
43	16-Dec	09:34:00	0.574
44	16-Dec	09:34:30	0.662
45	16-Dec	09:35:00	0.514
46	16-Dec	09:35:30	0.495

Increase speed on finish cut from 100 to 300 RPM
see VTL-CANM file from yesterday

pDR-1000			
Tag Number: 01			
Number of logged points: 808			
Start time and date: 09:31:19 15-Dec			
Elapsed time: 06:44:00			
Logging period (sec): 30			
Calibration Factor (%): 100			
Max Display Concentration: 1.845 mg/m ³			
Time at maximum: 14:09:00 Dec 15			
Max STEL Concentration: 1.574 mg/m ³			
Time at max STEL: 14:21:10 Dec 15			
Overall Avg Conc: 0.314 mg/m ³			
Logged Data:			
Point	Date	Time	Avg (mg/m ³)
1	15-Dec	09:31:49	0.004
2	15-Dec	09:32:19	0.005
3	15-Dec	09:32:49	0.009
4	15-Dec	09:33:19	0.005
5	15-Dec	09:33:49	0.014
6	15-Dec	09:34:19	0.408
7	15-Dec	09:34:49	0.638
8	15-Dec	09:35:19	0.615
9	15-Dec	09:35:49	0.796
10	15-Dec	09:36:19	0.675
11	15-Dec	09:36:49	0.652
12	15-Dec	09:37:19	0.598
13	15-Dec	09:37:49	0.551
14	15-Dec	09:38:19	0.485
15	15-Dec	09:38:49	0.458
16	15-Dec	09:39:19	0.407
17	15-Dec	09:39:49	0.391
18	15-Dec	09:40:19	0.375
19	15-Dec	09:40:49	0.335
20	15-Dec	09:41:19	0.341
21	15-Dec	09:41:49	0.298
22	15-Dec	09:42:19	0.312
23	15-Dec	09:42:49	0.289
24	15-Dec	09:43:19	0.238
25	15-Dec	09:43:49	0.255
26	15-Dec	09:44:19	0.241
27	15-Dec	09:44:49	0.227
28	15-Dec	09:45:19	0.21
29	15-Dec	09:45:49	0.192
30	15-Dec	09:46:19	0.225
31	15-Dec	09:46:49	0.192
32	15-Dec	09:47:19	0.194
33	15-Dec	09:47:49	0.154
34	15-Dec	09:48:19	0.146
35	15-Dec	09:48:49	0.136
36	15-Dec	09:49:19	0.143
37	15-Dec	09:49:49	0.126
38	15-Dec	09:50:19	0.143
39	15-Dec	09:50:49	0.117
40	15-Dec	09:51:19	0.129
41	15-Dec	09:51:49	0.12
42	15-Dec	09:52:19	0.116
43	15-Dec	09:52:49	0.094
44	15-Dec	09:53:19	0.108
45	15-Dec	09:53:49	0.106
46	15-Dec	09:54:19	0.103
47	15-Dec	09:54:49	0.078

G&L VTL CE# 64350 Can-MMU Oper. 20 Rough OD

PID: 0141850 Issue 01
 Item ID: 1A4184-00
 Item Description: CAN MMU
 Operation: 0020 Issue 1; Rough ID
 Workpiece Mat: 303Se
 G&L VTL South @ FY34
 CE# 64350
 Coolant 20:1 Mix 97022454 CimStar 3700T

pDR-1000

Tag Number: 01

Number of logged points: 1000

Start time and date: 08:22:38 19-Aug

Elapsed time: 08:20:00

Logging period (sec): 30

Calibration Factor (%): 100

Max Display Concentration: 1.294 mg/m³

Time at maximum: 14:32:44 Aug 19

Max STEL Concentration: 0.754 mg/m³

Time at max STEL: 14:34:35 Aug 19

Overall Avg Conc: 0.214 mg/m³

Logged Data:

Point	Date	Time	Avg. (mg/m ³)
1	19-Aug	08:23:08	0.001
2	19-Aug	08:23:38	0.006
3	19-Aug	08:24:08	0.003
4	19-Aug	08:24:38	0.001
5	19-Aug	08:25:08	0.011
6	19-Aug	08:25:38	0.016
7	19-Aug	08:26:08	0.042
8	19-Aug	08:26:38	0.05
9	19-Aug	08:27:08	0.046
10	19-Aug	08:27:38	0.068
11	19-Aug	08:28:08	0.063
12	19-Aug	08:28:38	0.061
13	19-Aug	08:29:08	0.047
14	19-Aug	08:29:38	0.053
15	19-Aug	08:30:08	0.052
16	19-Aug	08:30:38	0.061
17	19-Aug	08:31:08	0.055
18	19-Aug	08:31:38	0.048
19	19-Aug	08:32:08	0.048
20	19-Aug	08:32:38	0.049
21	19-Aug	08:33:08	0.046
22	19-Aug	08:33:38	0.047
23	19-Aug	08:34:08	0.045
24	19-Aug	08:34:38	0.047
25	19-Aug	08:35:08	0.048
26	19-Aug	08:35:38	0.044
27	19-Aug	08:36:08	0.055
28	19-Aug	08:36:38	0.052
29	19-Aug	08:37:08	0.044
30	19-Aug	08:37:38	0.045
31	19-Aug	08:38:08	0.05
32	19-Aug	08:38:38	0.05
33	19-Aug	08:39:08	0.047
34	19-Aug	08:39:38	0.048
35	19-Aug	08:40:08	0.054
36	19-Aug	08:40:38	0.057
37	19-Aug	08:41:08	0.053
38	19-Aug	08:41:38	0.04
39	19-Aug	08:42:08	0.05
40	19-Aug	08:42:38	0.042
41	19-Aug	08:43:08	0.04
42	19-Aug	08:43:38	0.046
43	19-Aug	08:44:08	0.045
44	19-Aug	08:44:38	0.042
45	19-Aug	08:45:08	0.044
46	19-Aug	08:45:38	0.044

pDR-1000

Tag Number: 01

Number of logged points: 667

Start time and date: 09:10:37 19-Dec

Elapsed time: 05:33:30

Logging period (sec): 30

Calibration Factor (%): 100

Max Display Concentration: 0.039 mg/m³

Time at maximum: 09:14:47 Dec 19

Max STEL Concentration: 0.032 mg/m³

Time at max STEL: 09:45:10 Dec 19

Overall Avg Conc: 0.024 mg/m³

Logged Data:

Point	Date	Time	Avg (mg/m ³)
1	19-Dec	09:11:07	0
2	19-Dec	09:11:37	0.002
3	19-Dec	09:12:07	0.004
4	19-Dec	09:12:37	0.007
5	19-Dec	09:13:07	0.02
6	19-Dec	09:13:37	0
7	19-Dec	09:14:07	0.042
8	19-Dec	09:14:37	0.026
9	19-Dec	09:15:07	0.026
10	19-Dec	09:15:37	0.024
11	19-Dec	09:16:07	0.024
12	19-Dec	09:16:37	0.023
13	19-Dec	09:17:07	0.026
14	19-Dec	09:17:37	0.027
15	19-Dec	09:18:07	0.025
16	19-Dec	09:18:37	0.032
17	19-Dec	09:19:07	0.029
18	19-Dec	09:19:37	0.027
19	19-Dec	09:20:07	0.026
20	19-Dec	09:20:37	0.032
21	19-Dec	09:21:07	0.027
22	19-Dec	09:21:37	0.028
23	19-Dec	09:22:07	0.032
24	19-Dec	09:22:37	0.029
25	19-Dec	09:23:07	0.032
26	19-Dec	09:23:37	0.028
27	19-Dec	09:24:07	0.027
28	19-Dec	09:24:37	0.027
29	19-Dec	09:25:07	0.028
30	19-Dec	09:25:37	0.03
31	19-Dec	09:26:07	0.029
32	19-Dec	09:26:37	0.032
33	19-Dec	09:27:07	0.03
34	19-Dec	09:27:37	0.028
35	19-Dec	09:28:07	0.03
36	19-Dec	09:28:37	0.03
37	19-Dec	09:29:07	0.029
38	19-Dec	09:29:37	0.029
39	19-Dec	09:30:07	0.028
40	19-Dec	09:30:37	0.028
41	19-Dec	09:31:07	0.032
42	19-Dec	09:31:37	0.032
43	19-Dec	09:32:07	0.033
44	19-Dec	09:32:37	0.032
45	19-Dec	09:33:07	0.032
46	19-Dec	09:33:37	0.033

White Sundstrand CE# 50208 Operation 90 Finish Mill

PID #: PID 0125490

Issue 10

Item #: 3R0054-00

Description No:

Outer Case

Operation #90

4 different end mills (up to 1.25 Dia) and 1 drill

Whit Sundstrand 5 Axis Mill

CE#50208

Coolant: 97022454 20:1 mix

Appendix 2

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Appendix 3

Supplier Technical Data

on

MIE Personal Data Ram
&
Mist Collectors

pDR-1000AN

Hand-held and fixed-point, real-time aerosol monitor/data logger

Measure airborne particulate concentration in real-time

The *personalDataRAM* (pDR-1000AN) measures mass concentrations of dust, smoke, mists, and fumes in real time, and sounds an audible alarm whenever the user-defined level is exceeded. With conventional air quality monitoring methods, the indication that you have reached dangerous levels or are out of compliance is not available in real-time. In contrast, the pDR-1000AN alerts you to a problem within seconds, allowing you to take immediate action. With the logging enabled, this instrument automatically tags and time stamps the data collected, then stores it for subsequent retrieval/printout/graphing through a computer.

Highest performance of any real-time personal particulate monitor

With a measurement range from 0.001 to 400 mg/m³ (auto-ranging), an optically feedback-stabilized sensing system, ultra-low power consumption, the pDR-1000AN sets the standard for sensitivity, long-term stability, and reliability. Air surrounding the monitor circulates freely through the open sensing chamber by natural convection, diffusion, and background air motion.

Rugged and extremely compact

The palm-sized pDR-1000AN weighs only 18 oz (0.5 kilogram) and can be attached to a belt or a shoulder strap, hand held, operated on a table top, or mounted on a tripod. The absence of any moving parts (pumps, motors, valves, etc.) and the use of low-power semiconductors and a ruggedized case ensures long life and dependable operation.

High correlation with gravimetric measurement

The pDR-1000AN is a light-scattering photometer (i.e. nephelometer), which incorporates a pulsed, high output, near-infrared light emitting diode source, a silicon detector/hybrid preamplifier, collimating optics, and a source reference feedback PIN silicon detector. The intensity of the light scattered over the forward angle of 45° to 95° by airborne particles passing through the sensing chamber is linearly proportional to their concentration. This optical configuration produces optimal response to particles in the size range of 0.1-10 µm, achieving high correlation with standard gravimetric measurements of the respirable and thoracic fractions.

Simple zeroing and calibration

The pDR-1000AN comes gravimetrically calibrated (NIST traceable) in mg/m³ using standard SAE Fine (ISO Fine) test dust. Zeroing with particle-free air is accomplished quickly and effectively under field conditions using the zeroing kit included with the instrument. Internal firmware controls an automatic calibration check referenced to the optical background which is factory set. Gravimetric field calibration can be performed by comparison with a filter sampler and by programming of the calibration constant.

Safety Approvals and Certifications

The pDR-1000AN complies with US FCC rules (Part 15) and has received CE certification. It also has intrinsic safety approval from the US Mine Safety and Health Administration (MSHA) for use in coal mining environments containing methane gas. The MSHA Type 2G approval closely resembles the standard intrinsic safety rating as defined by Class 1, Division 1, Groups D. In addition, it meets US FCC and European CE rules.

Standard Accessories

- Universal voltage power supply
- PC communications software disk
- Zeroing kit
- Belt clip kit
- Instruction manual
- Carrying case
- Analog signal output cable

Optional accessories

- Rechargeable (NiMH) battery pack
- Active sampling kit (converts pDR-1000AN to pDR-1200)
- Portable pump unit
- Shoulder strap
- Remote alarm unit
- Wall mounting bracket

*personalDataRAM*TM - Series

pDR-1000AN

pDR-1200

pDR-PU

pDR-BP

Applications

- Indoor air quality monitoring
- Walkthrough surveys
- Personal exposure monitoring
- Time & motion Studies
- Workplace & plant monitoring
- Fixed-point continuous monitoring
- Remediation personal surveillance
- Remote alarming
- Mobile monitoring in vehicles & aircraft
- Toxicology & epidemiology studies
- Emergency response

The world's
smallest,
most versatile,
real-time
aerosol monitor.

pDR-1000AN

Hand-held and fixed-point, real-time aerosol monitor/data logger

Measure airborne particulate concentration in real-time

The *personalDataRAM* (pDR-1000AN) measures mass concentrations of dust, smoke, mists, and fumes in real time, and sounds an audible alarm whenever the user-defined level is exceeded. With conventional air quality monitoring methods, the indication that you have reached dangerous levels or are out of compliance is not available in real-time. In contrast, the pDR-1000AN alerts you to a problem within seconds, allowing you to take immediate action. With the logging enabled, this instrument automatically tags and time stamps the data collected, then stores it for subsequent retrieval/printout/graphing through a computer.

Highest performance of any real-time personal particulate monitor

With a measurement range from 0.001 to 400 mg/m³ (auto-ranging), an optically feedback-stabilized sensing system, ultra-low power consumption, the pDR-1000AN sets the standard for sensitivity, long-term stability, and reliability. Air surrounding the monitor circulates freely through the open sensing chamber by natural convection, diffusion, and background air motion.

Rugged and extremely compact

The palm-sized pDR-1000AN weighs only 18 oz (0.5 kilogram) and can be attached to a belt or a shoulder strap, hand held, operated on a table top, or mounted on a tripod. The absence of any moving parts (pumps, motors, valves, etc.) and the use of low-power semiconductors and a ruggedized case ensures long life and dependable operation.

High correlation with gravimetric measurement

The pDR-1000AN is a light-scattering photometer (i.e. nephelometer), which incorporates a pulsed, high output, near-infrared light emitting diode source, a silicon detector/hybrid preamplifier, collimating optics, and a source reference feedback PIN silicon detector. The intensity of the light scattered over the forward angle of 45° to 95° by airborne particles passing through the sensing chamber is linearly proportional to their concentration. This optical configuration produces optimal response to particles in the size range of 0.1-10 µm, achieving high correlation with standard gravimetric measurements of the respirable and thoracic fractions.

Simple zeroing and calibration

The pDR-1000AN comes gravimetrically calibrated (NIST traceable) in mg/m³ using standard SAE Fine (ISO Fine) test dust. Zeroing with particle-free air is accomplished quickly and effectively under field conditions using the zeroing kit included with the instrument. Internal firmware controls an automatic calibration check referenced to the optical background which is factory set. Gravimetric field calibration can be performed by comparison with a filter sampler and by programming of the calibration constant.

Safety Approvals and Certifications

The pDR-1000AN complies with US FCC rules (Part 15) and has received CE certification. It also has intrinsic safety approval from the US Mine Safety and Health Administration (MSHA) for use in coal mining environments containing methane gas. The MSHA Type 2G approval closely resembles the standard intrinsic safety rating as defined by Class 1, Division 1, Groups D. In addition, it meets US FCC and European CE rules.

Standard Accessories

- Universal voltage power supply
- PC communications software disk
- Zeroing kit
- Belt clip kit
- Instruction manual
- Carrying case
- Analog signal output cable

Optional accessories

- Rechargeable (NiMH) battery pack
- Active sampling kit (converts pDR-1000AN to pDR-1200)
- Portable pump unit
- Shoulder strap
- Remote alarm unit
- Wall mounting bracket

Active aerosol monitor/data logger, plus aerodynamic sizing

Designed for active particulate monitoring applications

The personalDataRam™, the world's smallest, most versatile, real-time aerosol monitor, is now available for active sampling applications and aerosol sizing. The pDR-1200 uses a pump module (pDR-PU) or other sampling pump to perform particle size selective measurements under field conditions with this filter. With optional inlet accessories, the pDR-1200 is excellent for ambient air measurements under variable wind and high humidity conditions. Compact, lightweight, and easy to use, it is ideal for respirable, thoracic, and PM_{2.5} monitoring, as well as continuous emission and test chamber monitoring. With an Isokinetic Sampling Set, the pDR-1200 can be used for stack and duct extractive sampling/monitoring. Use membrane filters to capture particles for chemical analysis.

Aerodynamic particle sizing

The pDR-1200 incorporates an optimally designed metal cyclone (BGI Model GK 2.05) with sharp, well defined particle separation characteristics. By operating the pump at specific sampling flow rates, the pDR-1200 cyclone preseparator provides precisely defined particle size cuts. (See chart on right)

Primary calibration and particle samples by filter collection

An integral filter holder directly downstream of the photometric sensing stage accepts 37 mm filters. The calibration constant of the pDR-1200 is simply adjusted to coincide with the filter-determined concentration. Primary gravimetric calibration of the instrument concentration readout is easily accomplished under actual field conditions by means of this integral filter. Use membrane filters for chemical analysis or concurrent gravimetric measurements.

pDR-PU Attachable pump module

This optional accessory is designed for use with the personalDataRAM Series. It incorporates a dual-chamber diaphragm pump, a volumetric flow sensing and control unit. The pump module operates from either an optional, rechargeable NiMH battery pack or from AC line current using the power supply/charger supplied with the personalDataRAM. The pDR-PU is designed as a modular unit which can be used in various combinations.

- Flow rate (user adjustable): 1 to 5 liters/min.
- Maximum pressure drop: 10 in H₂O (25 mbar)
- Precision of constant flow rate control: ± 2%
- Power: 9 VDC, 200 mA @ 4 liters/min. (approximate)
- Dimensions: 4 in. (100 mm) H x 3.6 in. (90 mm) W x 1.8 in. (45 mm) D
- Weight: 1 lb. (0.45 kg)

pDR-BP Rechargeable battery pack

This rechargeable nickel-metal-hydride (NiMH) battery is designed to provide d.c. power to the pDR-1000AN, and/or pDR-PU, allowing it to operate for extended periods of time without requiring line power or battery replacement. It is recharged by means of the AC power supply provided as standard accessory with the pDR-1000AN.

- Rated capacity @ 68°F (20°C): 1.9 ampere-hrs.
- Full charging time: 2 hrs.
- Operating time to power the pDR-1000AN @ 68°F (20°C): 70 hrs. (typical)
- Operating time to power the pDR-1200 & pDR-PU @ 68°F (20°C): 36 hrs. (typical)
- Weight: 1 lb. (0.45 kg)

GK 2.05 Cyclone Cut Point (50%)
as a Function of Flow Rate

pDR-1000AN/pDR-1200

Hand-held and fixed-point, real-time aerosol monitor/data logger

Specifications

Concentration measurement range (auto-ranging):

Referred to gravimetric calibration with SAE Fine test dust
($m_{std} = 2$ to 3 μm , $sg = 2.5$, as aerosolized)
0.001 to 400 mg/m^3

Scattering coefficient range:

1.1 $\times 10^{-6}$ to 0.6 m^{-1} (approximately) @ $\lambda=680$ nm

Precision/repeatability (2-sigma at constant temperature):

$\pm 5 \mu g/m^3$ for 1-sec. averaging
 $\pm 1.5 \mu g/m^3$ for 10-sec. averaging

Accuracy:

Referred to gravimetric calibration with SAE Fine test dust
($m_{std} = 2$ to 3 μm , $sg = 2.5$, as aerosolized)
 $\pm 5\%$ of reading $\pm$ precision

Resolution:

0.1% of reading or 0.001 mg/m^3 , whichever is larger

Particle size range of maximum response:

0.1 to 10 μm

Concentration display updating interval:

1 sec.

Alarm level adjustment range (user selectable):

selectable over entire measurement range

Alarm averaging time (user selectable):

real-time (1 to 60 sec.) or STEL (15 min.)

Data logging averaging periods (user selectable):

1 sec. to 4 hrs.

Total number of data points in memory:

13,000

Number of data tags:

99

Readout display:

LCD 16 characters (4 mm height) x 2 lines

Serial interface:

RS232, 4800 baud

Analog signal output:

0 to 5V and 4 to 20 mA, with selectable full scale ranges
between 0.1 and 400 mg/m^3

Computer requirements:

IBM-compatible PC, 286 or higher; Windows™ 3.1,
3.11, or *95; 2 MB memory or more; hard drive;
3.5" or 5.25" floppy drive; VGA or higher resolution monitor

Power:

- Internal battery: 9V alkaline, 20-hr run time (typical)
9V lithium, 40-hr run time (typical)
- AC source: universal voltage adapter (included)
100-250 volts, 50-60 Hz (CE marked)
- Optional battery pack: rechargeable NiMH, 70-hr run time (typical)

Operating environment:

14°F to 122°F (-10°C to 50°C), 10 to 95% RH, non-condensing

Storage environment:

-4°F to 158°F (-20°C to 70°C)

Dimensions:

6.0 in. (153 mm) H x 3.6 in. (92 mm) W x 2.5 in. (63 mm) D

Weight:

18 oz. (0.5 kg)

500 Technology Court Smyrna, GA 30082

800-241-6898 (toll free in USA) ■ 770-319-9999 (outside USA) ■ 770-319-0336 (fax)

www.thermoandersen.com ■ sales@thermoandersen.com

A Thermo Electron business

Thermo Andersen

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AER

Control Systems

90 River Street • New Haven, CT 06513 • local: 203-772-4700 • toll free: 866-265-2372 • fax: 203-772-0020 • www.aercontrolsystems.com

**CM Centrifugal
Mist Collector**

Fundamentals.

Our traits transcend to value.

Mist and smoke generated from screw machines, CNC lathes, bar machines, grinders and machining centers contaminate in-plant air. AER Control Systems Centrifugal Mist Collectors eliminate, trap, and recover those contaminants right where they start – at the source. Designed to work on a variety of equipment using either petro-based or synthetic coolants the AER Control Systems Series Centrifugal Mist Collectors are compact, efficient, economical, and ready for direct machine mount. Our mist collector's direct machine mount capability makes installation simple, eliminates unsightly ductwork, reduces fire hazards, prevents cross contamination of coolants, and reduces plant costs. AER Control Systems Mist Collectors work to provide clean, contaminant-free air, so plants can operate and promote cleaner, safer, and healthier work environments.

Features & Benefits

We manufacture AER Control Systems Mist Collectors with all the features that benefit not only the quality and appearance of your plant but it's morale and productivity.

Basic units include four stages of filtration. First, and inexpensive, easy to replace, first stage throw-away filter acts as a preventive barrier, removing the majority of the solid particles in the collected mist. The second-stage, primary filter is behind the throwaway filter and consists of a special, high efficiency media designed to efficiently coalesce ultra-fine mist particles. The first two stages are housed in the rotating drum assembly. After exiting the drum, air passes through the third-stage filter, then exits through the fourth-stage exhaust filter.

Minimal gap between the cover and aerodynamic drum inlet minimizes potential bypass and ensures that the maximum amount of contaminant-laden air passes through the drum filters. The perforated drum is heavily reinforced and coated for durability and long life.

Manufactured with tough 16-gauge open steel, the powder-coated housing withstands rough industrial environments.

Constructed to make installation and maintenance virtually effortless, units weigh from 74 to 124 lbs. AER Control Systems Mist Collectors are compact and easily machine mounted. Floor mounted pedestal stands are available if machine mounting is not possible.

Quiet operation, standard unit noise levels range from 70 to 76 dBA at 3'.*

Direct mount capability saves floor space, simplifies installation, reduces ducting and the potential spread of fire should oil ignition occur.

Energy savings provide a rapid return of initial investment. Cleaned air returns back to the plant environment eliminating the need to exhaust air outside, the necessity for make-up air including associated heating and/or cooling costs.

Meets or exceeds OSHA requirements so plants comply with the tough clean air standards. The end result, a clean, healthy plant environment with improved morale and productivity.

*Noise levels can vary depending upon the size and nature of the installation.

Options. What separates us from the rest.

Prefilters

Integrate a prefilter to improve unit performance and reduce maintenance. Prefilters remove larger solid particles that may be suspended in the captured mist. To prevent chips, turnings and a majority of the fines from “soft” metals or grinding swarf from entering and prematurely blocking off the drum filters, choose a high-performance, add-on, modular prefilter. The low cost, easy-to-replace, disposable filter discs can be used in single or multiple stages to tailor individual levels of pre-filtration.

In-Cover Prefilter Trap

In-Cover Prefilter Traps & In-Cover Impingers

HEIGHT IN IN	APPLICABILITY	A"	B"
In-Cover Prefilter Trap	Models CM-100, CM-200, CM-300, CM-500	4	14 ¹ / ₂
In-Cover Prefilter Trap	Models CM-700, CM-900, CM-1200	4	18 ¹ / ₂

HEPA Post Filters

We understand that every manufacturing plant is different – from what it produces to how it made, so we’ve designed not just one mist collector model, but an entire modular line to support the variety of needs in the marketplace. A number of add-on pre and post filter modules are available allowing plants to customize in-plant systems. Modules are easily added and/or modified in the field, providing the ultimate in adaptability.

Oil mist is not the only contaminant produced in machining environments. Smoke is another difficult and typical byproduct from today’s high-speed operations. If you produce both mist and smoke, then our HEPA post filter is the right choice for your air filtration needs. Adding a HEPA filter to our standard unit, licenses our mist collector to handle the combination of sub-micronic mist and smoke – a contaminant composition often associated with high speed or heavy metal removal

CMH Models Available

MODEL	A"	B"	C"
CMH-100	31	15	12 ¹ / ₂
CMH-200	31	15	12 ¹ / ₂
CMH-300	36	24 ¹ / ₂	13 ¹ / ₂
CMH-500	36	24 ¹ / ₂	13 ¹ / ₂
CMH-700	38	24 ¹ / ₂	13 ¹ / ₂
CMH-900	38	24 ¹ / ₂	13 ¹ / ₂
CMH-1200	38	24 ¹ / ₂	13 ¹ / ₂

Note: Dimensions are for standard size HEPA equipped CMH units. Hi-Capacity HEPA filter modules are available for Models 300 thru 1200.

applications and or thermal processes like EDM, oil quenching or lube oil sump reservoirs. When equipped with a HEPA filter the particulate efficiency rating increases from 98% efficiency at one micron – standard model rating – to 99.97% efficiency at 0.3 microns. Higher efficiencies available. Our HEPA filter assemblies are factory installed or field retrofitted.

Carbon & Gas Vapor Filters

In addition to mist and smoke, some operations may generate gas/vapors or "odors" that require control with gas/vapor filters such as carbon. A variety of gas/vapor filters and/or filter modules are available for control of these contaminants. On most typical applications, our standard, high capacity, refillable carbon filter module can be utilized. High quality, high capacity coconut shell carbon is standard but alternate media such as treated or reactive coals, potassium permanganate/activated alumina pellets, zeolite or combinations of all three (CPZ) can be provided for more difficult applications. The standard carbon modules are available for use with the basic CM unit (Models CM/C) or for units with HEPA post filters (Models CMHC) or can be field retrofitted.

Floor Mounted Pedestals & Other Options

For applications on machines where there is limited access, mounting space or where direct machine mounting is not advisable, optional Floor Mounted Pedestal stands are available. Standard Pedestals have predrilled, 12" square top and bottom mount/base plates and are available in 18" or 6' 6" heights (other heights available). Other available CM options include machine specific mounting brackets, hoods, non-sparking drums, heaters, special motors, spray wash nozzles and specialized inlet and outlet fittings.

Optional Floor Mounted Pedestal Stand

Special OEM units

Lube Sump Reservoir Packages – special inlet and outlet fittings such as collars, flanges, 150 lb. flanges and NPT fittings.

Full Factory Service and Refurbishment program.

Technical support, application and design engineering.

Performance. It's in the force.

We've integrated the law of centrifugal force into the design of our mist collectors.

How it works

During operation the perforated drum/radial blade fan assembly spins at a high speed, providing air movement as well as filtration. Mist laden air enters the Centrifugal Mist Collector through a flexible hose or air duct. As air passes through the filter media, coalescence occurs and sub-micron mist particles are trapped and retained until they have grown to droplet size. The droplets are

thrown free of the perforated drum to the inner wall of the casing by centrifugal force. High velocity air drives the liquids along the inner wall of the collector forcing them into the circumferential slot of the primary drain chamber. The higher air pressure in the chamber force drains liquids from the system for reuse or disposal while clean air is exhausted or returned to the plant environment.

Aer Control Systems Centrifugal Mist Collector Specifications

MODEL	NOMINAL CAPACITY (CFM)**	W/TS (DIA.)	W/TS CHARACTERISTICS	WEIGHT (LBS.)	LENGTH (IN.)
CM-100	100	3 7/8	1/2 HP, 3450 RPM	74	70
CM-200	200	3 7/8	230/460 VAC, 60 Hz 3-phase, TEFC 190/380 VAC, 3-phase 50 Hz*		
CM-300	300	3 7/8	1 HP, 3450 RPM	95	72
CM-500	500	5 7/8	230/460 VAC, 60 Hz 3-phase, TEFC 190/380 VAC, 3-phase 50 Hz*		
CM-700	700	5 7/8	3 HP, 3450 RPM	120	74
CM-900	900	5 7/8	230/460 VAC, 60 Hz 3-phase, TEFC 190/380 VAC, 3-phase 50 Hz*		
CM-1200	1200	5 7/8	3 HP, 3450 RPM 230/460 VAC, 60 Hz 3-phase, TEFC 190/380 VAC, 3-phase 50 Hz*	125	76

*Redesignated CFM by 5/6 @ 50 Hz, consult Application Engineer for fan curves
 ** at 1.0" negative static pressure (in 12.0)

Models CM-100 and CM-200

Models CM-300 and CM-500

Models CM-700, CM-900 and CM-1200

AER Control Systems, LLC
 90 River St.
 New Haven, CT 06513
 203-772-4700 Phone
 203-772-0020 Fax
 866-265-2372 Toll-Free
www.aercontrolsystems.com

ROYAL FILTERMIST FX Series

Catalog and Price List

**Low Cost, Highly
Efficient Mist
and Smoke
Collectors
Designed
Specifically
for the
Metalworking
Industry**

HOW DOES THE ROYAL FILTERMIST WORK?

The principle of impaction can be easily understood by considering a car passing through a fog bank. As the fog hits the windshield, tiny mist particles begin to grow into water droplets which are then shed off.

The Royal Filtermist uses the principle of centrifugal impaction to eliminate mist. With only three main components: a drum, a motor, and the housing, its operation is quite simple.

1. A three-phase motor rotates the internal drum at high speed, creating a vacuum which draws mist particles into the center of the drum.
2. The mist particles then collide with the rotating drum's vanes and are forced together with other particles, causing them to coalesce and form larger, droplet-sized particles.
3. As the particles grow into droplets, they pass through the perforations in the rotating drum and centrifugal force causes them to be thrown onto the inner wall of the housing.
4. The particles are then forced, under pressure, up the walls of the housing to the oil return channel, where they are subsequently drained back to the machine's coolant tank.
5. Clean, oil-free air blows past the motor and is returned to the shop.
6. Since this process relies on the mechanical principle of centrifugal impaction and the rotational speed remains constant, the Royal Filtermist maintains a continuous high efficiency.
7. For certain applications that produce smoke and/or very fine mist particles, an after filter may be required. This filter easily mounts to the top of the Filtermist unit by slipping over the motor and it is secured in place with two toggle clips. An after filter mounted to a Royal Filtermist typically enjoys a comparably long service life because most contaminants are removed by the impaction process prior to reaching the filter.

Turning

CNC lathes are relatively easy applications to tackle because the machines are usually well enclosed and direct mounting is often possible. On any well enclosed machine, it is recommended that the Filtermist intake point be located as far from the machining action as possible so that the mist is drawn from an area of heavy concentration to an area of lighter concentration. On CNC lathes, therefore, the ideal intake location is on the right side of the machine, near the tailstock. On subspindle lathes where the right-hand wall moves along the z-axis, it might be necessary for the Filtermist to have a more central location.

Milling

For enclosed machining centers, the Filtermist intake position should be located in an upper corner of the enclosure. Installation on open-top machines is not as clear-cut. If enclosing the machine is not possible, a successful installation can often be accomplished by suspending the Filtermist unit above the machine and running ducting down into the enclosure. It may be necessary to adjust the intake location so that it is close enough to the spindle to collect the mist, yet far enough away to keep chips from being drawn in. A Y-junction may be used to draw mist from both sides of the spindle, and a chip deflector may also come in handy.

High-Pressure Coolant

More and more machine tools today are equipped with high-pressure coolant systems. Machines running with high-pressure coolant tend to create more mist, and the particle size also tends to be smaller than normal. For most high-pressure coolant applications, the standard rules apply and Filtermist works very well. However, in some unique situations it may be necessary to take a different approach. Here are two ideas that may be worth considering:

- Downsize the Filtermist unit. On many high-pressure applications, we have seen the smaller models FX-275 and FX-550 work extremely well on large machines that would normally require a model FX-1200. Before downsizing, please speak to one of our applications engineers to ensure that this approach is the best one for your application.
- Add a cyclonic swarf separator. Although this device was designed for removing solid particles from the mist stream, it has proven itself to be quite adept as a pre-filter for high-pressure coolant applications. A large portion of the mist is actually removed by the cyclone, leaving the balance to be easily handled by the Filtermist unit.

EFFICIENCY

When evaluating the effectiveness of any mist collection system, two major aspects must be considered:

- The unit must be capable of handling the full volume of mist produced by the application.
- The unit must be efficient at capturing particles of all sizes.

Independent testing has proven the Royal Filtermist FX Series to be very effective at handling large volumes of mist and highly efficient at dealing with the full spectrum of particle sizes found in typical metalworking mist concentrations.

While a typical metalworking mist concentration is made up of many different-sized particles, 80–90% of these particles are larger than one micron in size. Fewer than 10% of the particles are smaller than 0.5 micron in size.

In order to effectively eliminate mist, the Royal Filtermist incorporates a two-phase process:

1. The first phase utilizes the mechanical process of centrifugal impaction. This centrifugal impaction process is the heart of the Filtermist's operating principle and it is highly effective at handling large volumes of mist.

The centrifugal impaction process is almost 100% efficient at handling particles larger than one micron, which make up the bulk of the mist. When considering a weighted average of the particle size in a typical metalworking mist concentration, overall efficiency of the impaction process is roughly 98%.

2. Many may consider an efficiency of 98% to be adequate for their needs. However, if additional efficiency is required, the Royal Filtermist FX Series units may be equipped with an after filter to handle the small amount of residual mist that bypasses the impaction process. Royal after filters use a carefully selected grade of media that provides an effective balance between being fine enough to capture the smallest of particles while still allowing the filter to enjoy a comparatively long service life. **Overall efficiency of a Royal Filtermist FX Series unit equipped with an after filter exceeds 99.5%.**

OSHA and NIOSH Standards

The OSHA and NIOSH limits on airborne mist particles are currently set at 5mg/m³. It is believed that in the coming years this level will be reduced by a factor of ten to a new level of 0.5 mg/m³. The Royal Filtermist FX is so efficient that when equipped with an after filter, it easily meets not only the current limit, but even the stricter proposed limit.

Location	Concentration (mg / m ³)
Ambient Shop Air	0.75
FX-1200 Inlet	8.0 – 10.0
FX-1200 Exhaust	0.18

In a recent test carried out by an independent contractor, a Mori Seiki SL75ML was fitted with a model FX-1200 Filtermist unit and after filter. Particle counters were set up to monitor the air at three locations during machining — the ambient shop air, the Filtermist intake, and the Filtermist exhaust. The test results confirm that the Filtermist easily meets the challenge. Particle concentration levels at the Filtermist exhaust were well below 0.5 mg/m³. In fact, the air at the Filtermist exhaust was four-times cleaner than the ambient shop air!

IMPORTANT — The Royal Filtermist is designed to help your shop meet current and future air quality standards. It must be understood, however, that there are many variables involved in controlling shop pollution and we cannot guarantee that the Filtermist alone will prevent occupational diseases to workers. It is your responsibility to establish an effective overall industrial hygiene program designed to comply with OSHA and NIOSH standards. If you have any questions regarding this issue, please contact us at 1-800-645-4174.

MODEL FX-1200

- For use on enclosed machines with an internal volume of 120 cu. ft. or larger.
- Popular for machines requiring Y-junction and two intake points.
- Excellent choice for large machining centers.
- Unit can be mounted directly to the machine, on stands, on brackets, or suspended. See pages 12-13 for mounting options.

FX-1200 Specifications

Airflow	1200 cfm
Fits machines with enclosure volume of:	120 cubic feet or larger
Motor	3 HP, 3-Phase, 50/60 Hz. Voltage & Current @ 60Hz. 208V - 8.8A 230V - 8.2A 460V - 4.1A
Weight	64 lbs.
Noise Level	72 dBA
Inlet Diameter	8"

Mounting Options — FX-1200

Direct Mount	use 30304 — FX-1200 Direct Mount Kit
Floor Stand	use 30315 — Floor Stand "B"
Machine Top Stand	use 30314 — Machine Stand "B"
Wall Mount	use 30320 — Wall Bracket "B"
Machine Side Mount	N/A
Suspended	use 30310 — Suspension Kit "B"

Filtermist Units

Description	Cat. No.	Price
FX-1200 Filtermist Unit Order performance and mounting accessories separately.	30130	\$2,395
FX-1200 Stainless Steel Unit See page 10 for additional information.	30170	\$4,065

Performance Accessories

Description	Cat. No.	Price
After Filter "B" Used for collecting dry smoke and very fine mist particles.	30205	\$234
Cyclonic Swarf Separator For use on applications such as grinding and cast iron machining where very fine solid particles are entrained in the mist stream. Also acts as a great pre-filter for high pressure coolant applications.	30210	\$643
Noise Attenuator Decreases the noise level by approximately 5 dB. Cannot be used in conjunction with after filters.	30215	\$483
Chip Deflector Protects intake from coolant splash and chips.	30220	\$44

Mounting Accessories

Description	Cat. No.	Price
Direct Mount Kit (FX-1200) Includes 8" collar seal, set of rigid mounting studs, and hardware.	30304	\$97
Floor Stand "B" Adjusts from 6 ft. to 9 ft. Bolts to floor for safety.	30315	\$719
Machine Top Stand "B" 3 ft. tall stand bolts to the top of a machine.	30314	\$453
Wall Bracket "B" Can be used to mount unit to a wall or other suitable mounting surface.	30320	\$279
Suspension Kit "B" Includes 30 ft. of chain, 4 eyebolts, 8 split links, and 1 adjustable link.	30310	\$98
Oil Return Hose 3/4" diameter.	30335	\$3 per ft.
Ducting Flexible vinyl with heavy wire support.	8" 30344 6" 30342 4" 30340	\$11 per ft. \$9 per ft. \$8 per ft.
Warning — never use sheet metal ducting or any other type that could leak and cause a hazardous condition.
Hose Clamps For securing ducting to accessories.	8" 30354 6" 30352 4" 30350	\$5 \$5 \$4
Y-Junctions For multiple pickup locations.	A B 8" 6" 30368 8" 4" 30366 6" 6" 30364 6" 4" 30362 4" 4" 30360	\$231 \$283 \$213 \$203 \$168
Flange Adapters For securing ducting directly to an enclosed machine.	8" 30374 6" 30372 4" 30370	\$61 \$56 \$49
Reducers	A B 8" 6" 30382 6" 4" 30380	\$93 \$88
Fishfalls For use on open machines.	A B 8" 11.75" x 5" 30394 6" 10" x 4.5" 30392 4" 8.25" x 3.5" 30390	\$167 \$149 \$137

FILTERMIST MAINTENANCE

One of the most popular features of the Royal Filtermist is the fact that it requires minimal maintenance. Unlike media-type systems and electrostatic units, the Royal Filtermist works almost as well when it is dirty as it does when it is clean.

For safety purposes, it is necessary to periodically inspect the main components of the Royal Filtermist for wear or damage, especially if the unit is making loud noises or exhibiting vibration. Additionally, we recommend that these simple maintenance procedures be carried out every 2,000 operating hours, (every 1,000 hours for more demanding applications):

- Replace the drum pads. The pads that line the Filtermist drum are made from a specially manufactured foam containing thousands of tiny pores. These pores provide direct pathways from one side of the pad to the other for optimum airflow. They also assist in the coalescence of the mist particles for improved fluid collection. It is important that the pores of the drum pads be kept open for maximum flow.
- Inspect and replace the motor mounts and torque limiting straps if worn or damaged.
- Inspect silencer and replace if worn or damaged. If the silencer is saturated with oil, it is important to investigate the reason why. This could be the result of a clogged oil return channel or incorrect drum rotation. Important — the Filtermist will create suction regardless of which way the drum spins, but it will only properly collect and return oil mist if the drum is spinning in the proper direction as indicated by the arrow on the housing.
- Inspect the housing seal and replace if necessary. This is especially important on older series units. The redesigned housing of the Filtermist FX Series virtually eliminates the chance of leakage around the seal area.
- Check all mounting fixtures such as stands and suspension kits for damage or signs of fatigue. Repair or replace as necessary.
- Check all other accessories for wear and/or damage (ducting, flange adapters, etc.). Repair or replace as necessary.
- For your convenience, Royal Products offers complete maintenance kits for all Filtermist units. These value-priced kits include a drum pad set, a motor mount set, a silencer, and a housing seal. These items are also available separately.

Important — The recommended maintenance schedule and procedures outlined above are meant to serve as a guide for most common Filtermist applications. More detailed information is provided in the Royal Filtermist Installation and Maintenance Manual. When dealing with any equipment of this type, common sense must prevail. Any unsafe conditions pertaining to the Royal Filtermist must be immediately attended to. It is also important to understand that when Royal Filtermist units are used in demanding applications such as grinding or cast iron machining, more frequent maintenance may be required. If you have any questions regarding the maintenance or operation of your Royal Filtermist units, please refer to the Royal Filtermist Installation and Maintenance Manual or contact one of our engineers at 1-800-645-4174.

Maintenance Items

Description	FX-275		FX-550		FX-900		FX-1200	
	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
Complete Maintenance Kit Complete kit provides a cost savings over individual components. Includes the following: drum pad set, silencer, housing seal, and motor mount set.	30400	\$110	30406	\$129	30402	\$158	30404	\$167
Drum Pad Set	30410	\$26	30416	\$41	30412	\$49	30414	\$55
Silencer	30420	\$60	30420	\$60	30422	\$98	30422	\$98
Housing Seal	30430	\$12	30430	\$12	30432	\$15	30432	\$15
Motor Mount Set	30440	\$44	30440	\$44	30442	\$51	30442	\$51

See page 28 for maintenance items for older series Filtermist units.

ROYAL FILTERMIST FX Series

Catalog and Price List

**Low Cost, Highly Efficient Mist
and Smoke Collectors Designed
Specifically for the
Metalworking Industry**

Division of Cumman Manufacturing Corporation

200 Oser Avenue
Hauppauge, New York 11788

Tel: 1-631-273-1010
Fax: 1-631-273-1066

Toll-Free USA and Canada
Tel: 1-800-645-4174
Fax: 1-800-424-2082

Email: info@royalprod.com
www.royalprod.com

ACE 73-200G PORTABLE FUME EXTRACTOR

226 CFM, high vacuum fume extraction & filtration capacity

Designed for field and bench work, this unit lightweight, portable, and easy to use

10 ft. extraction hose w/ flexible steel tube and nozzle assembly

Magnetic support base for hands free operation

Specialty filters available for odor and oil mist control

Heavy Duty steel construction
Built in spark trap for fire safety

Filter status LED light

Optional two-operator feature available

UL Listed

Made in USA

Two year limited warranty

Dim. : 27"L x 12"H x 12"W

Weight: 40 lbs

Our most versatile portable extractor, and the choice of welders, mechanical contractors, and rental fleets for over twenty years

DESCRIPTION	PART #
MAIN UNIT	
<i>(Main Unit includes (1) pre-filter, customer to add (1) Main Filter)</i>	
Portable Fume Extractor, 226 CFM, 10' Hose, Flex Arm, Nozzle, Magnet Base	73-200G
PRE-FILTERS	
<i>(Ace Portable Fume Extractors require (1) pre-filter as determined by work application)</i>	
Pre-Filter, General Use , 12" x 12" x 1" (carbon adsorb)	66011
Pre-Filter, Economy Grade , 12" x 12" x 1"	66039
Pre-Filter, Bulk Wrap, 12" x 250 Yard	91-963
Pre-Filter, Charcoal Odor Control, 12" x 12" x 1"	66037
Pre-Filter, Charcoal Odor Control w/ Zeolite, 12" x 12" x 1" (carbon adsorb)	66044
Pre-Filter, Aluminum Oil Mist Control, 12" x 12" x 1"	66013
MAIN FILTERS	
<i>(Ace Portable Fume Extractors require (1) main filter as determined by work application)</i>	
Main Filter, HEPA Grade, Critical Use & Hexavalent Chromium, 12" x 12" x 12"	66010
Main Filter, 95% Efficiency, General Welding, 12" x 12" x 12"	66009
Main Filter, 65% Efficiency, Grinding, 12" x 12" x 12"	66008
PARTS	
Motor, Portable Fume Extractor	66001
Motor Gasket, Portable Fume Extractor	66002
Motor Brush Kit, Pair, Portable Fume Extractor, Original Version, Contact Factory	66007
Motor Brush Kit, Pair, Portable Fume Extractor, New Version, Contact Factory	66077
Power Switch, Portable Fume Extractor	66005
Power Cord, Portable Fume Extractor	66065
Filter Status Light, Portable Fume Extractor	66004
Pressure Differential Switch, Portable Fume Extractor	66006
Nozzle/Hose/Arm Assembly, Portable Fume Extractor	66076

ACE 73-601 MOBILE FUME EXTRACTOR

1200 cfm, high volume fume extraction & filtration capacity

Designed for shopfloor use with the mobility to move from workstation to workstation

10 ft. extraction arm with articulated joints designed to hold position for hands free use

Wide mouth source capture hood

Heavy Duty steel construction
Built in spark trap for fire safety

Durable casters, two that swivel and lock for stability

Filter status gauge

Built in AC outlet to power other tools or accessories

Optional two-operator feature available

Optional automatic on/off feature available

UL Listed

Made in USA

Our most powerful mobile fume extractor also has 360° arm rotation for maximum reach and

DESCRIPTION	PART #
MAIN UNIT	
<i>(Main Unit DOES NOT include filters; select (1) Pre-Filter and (1) Main Filter from below)</i>	
Mobile Air Cleaner, 1200 CFM, 10' Extraction Arm, Horizontal Orientation	73-601
PRE FILTERS	
<i>(Main Unit requires 4 inches of pre-filtration, (1) 4" filter or (2) 2" filters)</i>	
Pre-Filter, General Use, 20" x 24" x 4"	91-956
Pre-Filter, General Use, 20" x 24" x 2" (use (1) with (1) 91-937 or (1) 91-958)	91-955
Pre-Filter, Bulk Wrap, 24" x 250 Yards	91-962
Pre-Filter, Charcoal Odor Control, 20" x 24" x 2" (use w/ 91-955)	91-937
Pre-Filter, Aluminum Oil Mist Control, 20" x 24" x 2" (use w/ 91-955)	91-958
MAIN FILTERS	
<i>(Main Unit requires (1) main filter as determined by the work application)</i>	
Main Filter, HEPA Grade, Stainless Steel / Hexavalent Chromium, 20" x 24" x 12"	91-999
Main Filter, 95% Efficiency, General Welding, 20" x 24" x 12"	91-853
Main Filter, 65% Efficiency, Grinding, 20" x 24" x 12"	91-854
PARTS	
Motor, 1 HP, Belt Drive, Mobile Fume Extractor	65024
Blower Assembly, Mobile Fume Extractor	65035
V-Belt, Mobile Fume Extractor	65056
Power Switch, Mobile Fume Extractor	65026
Filter Status Gauge, Mobile Fume Extractor	65027
Power Cord, Mobile Fume Extractor	65055
Power Socket, Mobile Fume Extractor	65025
Nozzle/Hose/Arm Assembly, Mobile Fume Extractor	65028
10' Replacement Hose, Mobile Fume Extractor	65029