

JOB HAZARD ANALYSIS SUMMARY FORM Honda of America Mfg., Inc.										
Plant		Dept.		Job Process						
Sub Dept/Line		Recommended Protection Strategy								
Step	Hazard Identification	Probability Rating (PR)	Severity Rating (SR)	Risk Rating (PRxSR)	Interim Countermeasures		Final Countermeasures (Use Hierarchy of Controls: Elimination, Engineering, Administration, PPE)		Target Completion Date	Actual Completion Date
Department Management					Date		Department Safety/ Ergonomics		Date	Page of

This form summarizes process steps with a risk rating of 6 or higher found in each department and the recommended countermeasures for these hazards. After an item has been countermeasured, it is reevaluated, and the JHA Form revised.

APPENDIX A-4

STANDARDS CITED IN G.E.S. FOR SUPPLIER TO FOLLOW

STANDARD	DESCRIPTION
SECTION 0.3.1	
OSHA 1910.212	GENERAL REQUIREMENTS FOR ALL MACHINES
OSHA 1910.217	MECHANICAL POWER PRESSES
ANSI B11.1	MECHANICAL POWER PRESSES – SAFETY REQUIREMENTS
ANSI B11.2	HYDRAULIC PRESSES – SAFETY REQUIREMENTS
ANSI B11.6	LATCHES – SAFETY REQUIREMENTS
ANSI B11.8	DRILLING, MILLING & BORING MACHINES – SAFETY REQUIREMENTS
ANSI B11.9	GRINDING MACHINES – SAFETY REQUIREMENTS
ANSI B11.19	SAFEGUARDING
ANSI B11.20	MANUFACTURING SYSTEMS / CELLS – SAFETY REQUIREMENTS
OSHA 1910.107(d)	OVERHEAD AND GANTRY CRANES
ANSI B30.17-1985	OVERHEAD AND GANTRY CRANES
ANSI B30.2-1990	OVERHEAD AND GANTRY CRANES
ASME / ANSI B30.11-1988	MONORAILS AND OVERHUNG CRANES
ANSI B30.16-1987	OVERHEAD HOISTS
ASME HST4M-1985	OVERHEAD ELECTRIC WIRE ROPE HOISTS
ASME ISBN0-7918-2168-4	VIII PRESSURE VESSELS DIVISION 1
ANSI / RIA R15.06-1986	ROBOT AND ROBOT SYSTEMS
SECTION 0.3.3	
OSHA 1910-119	PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS
OSHA 1910-106(e)(2)(iV)(d)	FLAMMABLE AND COMBUSTIBLE LIQUIDS
SECTION 0.3.5	
OSHA 1910.23	GUARDING FLOOR AND WALL OPENINGS AND HOLES
OSHA 1910.24	FIXED INDUSTRIAL STAIRS
OSHA 1910.27	FIXED LADDERS
OSHA 1910.144	SAFETY COLOR CODE FOR MARKING PHYSICAL HAZARDS
SECTION 0.3.6	
OHSA 1910-147	THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT / TAGOUT)
SECTION 0.4.3	
OSHA 1910.96	IONIZING RADIATION
OSHA 1910.97	NONIONIZING RADIATION
SECTION 0.6.3	
ANSI / NFPA 79-1991	ELECTRICAL STANDARD FOR INDUSTRIAL MACHINERY
SECTION 0.6.4	
ANSI / (NFPA/JIC) T2.24.1-1991	HYDRAULIC FLUID POWER – SYSTEMS STANDARDS FOR STATIONARY INDUSTRIAL MACHINES
SECTION 0.6.5	
ANSI B93.114M-1987	PNEUMATIC FLUID POWER – SYSTEMS STANDARDS FOR INDUSTRIAL MACHINES

APPENDIX A-5

STANDARDS ORGANIZATIONS ADDRESSES

CONTACT THE FOLLOWING ORGANIZATIONS TO OBTAIN COPIES OF STANDARDS CITED IN THIS STANDARD:

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
1430 BROADWAY
NEW YORK, NEW YORK 10018

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
345 EAST 47th STREET
NEW YORK, NEW YORK 10017

NATIONAL FLUID POWER ASSOCIATION (NFPA)
3333 NORTH MAYFAIR ROAD
MILWAUKEE, WISCONSIN 53222

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
BATTERYMARCH PARK
QUINCY, MA 022969

FOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) CONTACT ONE OF THE FOLLOWING:

U.S. GOVERNMENT BOOK STORE
ROOM 207
FEDERAL BLDG.
2000 NORTH HIGH STREET
COLUMBUS, OH 43215

SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE (GPO)
WASHINGTON, D.C. 20402-9325

U.S. GOVERNMENT BOOK STORE
ROOM 1653
FEDERAL BLDG.
1240 E. 9th STREET
CLEVELAND, OH 44199

U.S. GOVERNMENT BOOK STORE
ROOM 190
FEDERAL BLDG.
517 E. WISCONSIN AVE.
MILWAUKEE, WI 53202

U.S. GOVERNMENT BOOK STORE
401 SOUTH STATE STREET, SUITE 124
CHICAGO, IL 60605

APPENDIX A-7 MIST CONTROL

Purpose

The purpose of this specification is to clearly communicate to anyone involved in mist collection activities Honda's expectations for both new and existing machines. The Anna Engine Plant expects high quality mist collection equipment that will meet or exceed OSHA's recommended limit of .5mg/m³ "total" particulate for an 8-hour time weighted average. In addition, the mist collector exhaust shall be designed to emit less than .03 grains of particulate per dry standard cubic feet of exhaust gas. The installation should also be designed to meet exemption criteria set forth in OAC3745-31-03 (A) (Y). All mist collectors are to be rated at less than 4000 ACFM unless otherwise specified and shall be vented inside the building. It is the supplier's responsibility to meet these requirements utilizing this specification, as well as, the supplier's own experience and knowledge. All mist collection projects will be turnkey installations unless otherwise specified. The Anna Engine Plant will not accept mist collection installations that do not meet this specification. Also, the Anna Engine Plant will not purchase collection units that require frequent filter replacement and servicing or units that are oversized to meet the filter life. The supplier is responsible for its sub-contractors equipment and quality of work. Furthermore, it is the supplier's responsibility to provide this specification to its sub contractors.

Project Details

This is a general list of information the supplier shall verify with each mist collection project. Each mist collection supplier shall use his or her experience and knowledge to expand on this list if necessary.

- Type of coolant - i.e. mineral oil, synthetic, water-soluble oils, etc.
- Machine operations – i.e. grinding, machining, honing, etc.
- Determine the components of the mist – i.e. vapor, smoke, mist, strong odors, chips, swarf, etc.
- Type of collection (source capture or enclosure)
- Desired mounting location of mist collector.
- Machine layout and ductwork connection points.
- Project specifications for detailed information in addition to this document.
- Determine if mist collection is needed for the coolant system.
- Determine where the mist collector drains will deposit the fluid.
- Calculate volume of air blow to sufficiently size the mist collectors.
- The mist collector and capture sheet metal shall be painted Honda green. Specification number HES 542 (available at Sidney Sherwin Williams – 937-492-8351) unless otherwise specified.

Metal Removal Equipment Considerations

- Coolant pressure and flow as well as air blow operations should be minimized within the machine to reduce the amount of mist being generated. The machine shall be designed to carry away the chips and resist chip build-up with minimal flow.
- Coolant and air blow operations should be cycled on and off to also reduce the amount of mist generated.
- The machine should be enclosed as tight as possible to minimize the size of the mist collector and yet effectively capture the mist.
- Machine enclosures shall be designed for safe removal/replacement in areas where service is required. Consider the size, weight and lifting points of guarding.
- Machine enclosures shall not leak coolant onto the floor. The machine shall avoid pooling and chip build-up, which can cause leaks.

- Draft openings should be located lower than the machining operation in order to move the mist toward the mist collector. Draft openings shall not allow coolant and chips to exit from the machine.
- The velocity of air entering the draft openings shall not allow mist to escape. Air velocity shall be a minimum of 150 feet per minute. More velocity may be needed if air blow operations or other special conditions exist inside the machine.
- The duct connection point at the machine should be located to pull the mist away from electrical items and major components. – (i.e. switches, motors, cabling, spindles and tool changers)
- Motors with fans shall use flexible ducting to supply clean air from outside the machine to improve motor life.
- The duct connection point leading to the mist collector shall have a baffle to deflect chips and coolant from entering the ductwork.
- A non-disposable method for removing a major portion of mist at the connection point between the machine and ductwork with automatic or manual wash down capabilities is desirable. (i.e. Chevron & Munter or similar style filter)
- Coolant systems whether stand-alone or central systems shall be covered and have a mist collector connection point. Stand-alone coolant systems shall be connected to the machine mist collector while central coolant systems will have a dedicated mist collector.

Source Capture

- Capture vents should be as close to the mist source as possible, with consideration to tool changes and maintenance. Movable source capture is permissible as long as it can be moved safely with easy access and maintains its mist collection integrity.
- Capture vents should use slots instead of large openings to draw mist into the ductwork. Velocity at the slot opening should be 3,000 feet per minute or greater if needed in order to capture the mist. If air blow operations occur within the process, additional velocity may be needed.
- The duct velocity shall be approx. 2,000 feet per minute.
- Capture vents shall have chip and coolant deflectors. Cleaning of the capture vents should be made possible by easy access or pipe connections for flushing the chips and coolant from the vent.

Ductwork

- All installations shall use Nordfab style ductwork.
- As stated in the source capture section the duct velocity shall be approx. 2000 feet per minute.
- 45° and “Y” fittings are to be used and 90° fittings should be minimized to reduce air disturbances within the ductwork. “T” fittings are not acceptable under any condition. A minimum number of fittings shall be used to reduce air turbulence and cost.
- The ductwork should be as straight as possible with minimal elevation changes.
- Blast gates shall be used to balance the system. Once the system is balanced, the blast gates shall be marked in order to maintain the gate position in case of maintenance or cleaning.
- Gaskets and seals shall be compatible with the fluids that are collected from the process to prevent leaks.
- Ductwork shall be installed in a manner that prevents pooling of fluids.
- Flexible duct is only permitted at the machine connection point and shall be kept as short as possible without loops that cause pooling. Applications that may require longer runs of flexible duct shall be approved the buyer.
- A fire Damper shall be installed where the ductwork meets the mist collector on systems that operate with straight oils.

Mist Collector

Mounting

- Mist collectors that are supported from the trusses shall have design approval from the Anna Engine Plant Facilities Department.
- The contractor is responsible for installing additional structural support for the mist collector if needed.

- If threaded rod is used to suspend the mist collector from the truss, double nuts are to be used and cotter pinned to prevent movement from vibration. Vibration dampers should be used to minimize fatigue of the mounting structure, threaded rods and to maximize mist collector component life, i.e. fan and motor life.
- When mounting the mist collector to the floor the unit shall be lagged securely.
- Mounting hardware shall not interfere with maintenance points on the collector.
- If the mist collector is mounted to the trusses, filters and other maintenance points such as motors shall be accessible by a man lift.

Collector Design

- The fan shall be located in a clean air stream after filters.
- The fan shall be a direct drive backward incline fan that is capable of handling high static loads.
- Noise level of less than 80 dB
- The first stage pre-filter should be a non-disposable mist separator with manual or automatic wash down capability if chips are present or coolant is excessive. The filter type should be a chevron or Munters impingement filter or other similar device. It is preferred that this device is mounted at the machine enclosure to minimize mist and chips in the ductwork, if mounting the filter at the machine is not possible then the filter shall be located at the mist collector.
- All filtration stages shall be designed with equal airflow across the filter and designed specifically for the type of mist being produced.
- The final filter shall be at least a 95 DOP media filter. The final filter shall have a life of 2 years or 10,000 hours.
- Fluids with strong odors such as mineral spirits shall have a carbon filter to trap the vapors.
- Filters prior to the 95 DOP shall have approximately 10,000 hours between filter cleaning and filter life of approximately 8 to 10 years.
- Sizing of proper airflow to capture the mist shall be accomplished when the filter is at the end of 10,000 hours. The mist collector shall not be oversized in order to obtain filter life.
- A re-settable 5-digit hour meter shall be provided to track filter life for cleaning, replacement and performance monitoring purposes. An additional fixed hour meter is preferred for unit life monitoring.
- A differential magnehelic gauge shall be used for each filter stage to monitor filter condition and compare against hour meter readings.
- All seals shall be compatible with the fluid being collected.
- A minimum of an 1 1/2-inch drain trap shall be provided with the mist collector and shall be sized properly to prevent airflow through the drain. The contractor shall fill the drain trap with water or coolant at installation.
- The drain trap shall be installed with unions for easy disassembly and cleaning.

Acceptance Testing

For each mist collection installation there will be three areas designated for Industrial Hygiene air sampling. Each sample (3) shall be analyzed using ASTM PS 42-97 and be calculated as an 8-hour TWA. All samples shall be below 0.5 mg/m³ for Metalworking Fluids (MWF1). Honda Personnel will take all air samples with the equipment installed at Honda.

The three sampling areas shall include:

- At / near the operators workstation. This will measure the success of the enclosure, appropriate air flow and operators exposure.
- On the operator, in their breathing zone. This will measure the area in which the operator works.
- At / near the exhaust point of the mist collector. This will measure against the 0.5 mist spec that shall be met for acceptance.

(MWF1) - Based on OSHA's MWF Standard Advisory Committee recommendation, July, 15th 1999.