Building Your IH Toolkit

Keith Reissig
Industrial Hygienist/Project Manager
Kansas State Safety & Health Conference, 2024

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What is Industrial Hygiene?

What is an Industrial Hygienist?

An investigator,

A Detective of the Workplace

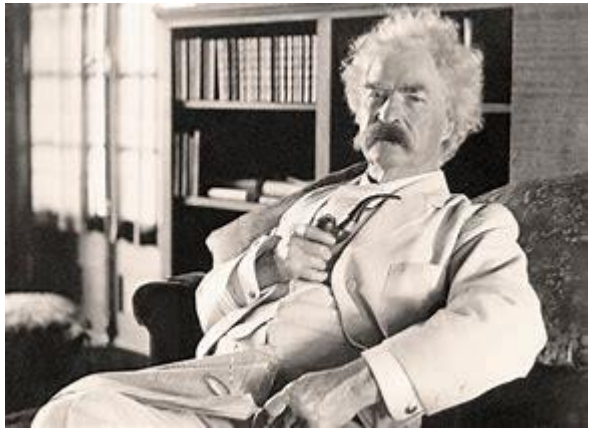
What is Industrial Hygiene?

"Industrial Hygiene is both a science and an art devoted to the anticipation, recognition, evaluation, prevention, and control of those environmental factors or stresses arising in or from the workplace which may cause sickness, impaired health and well being, or significant discomfort among workers or among citizens of the community."

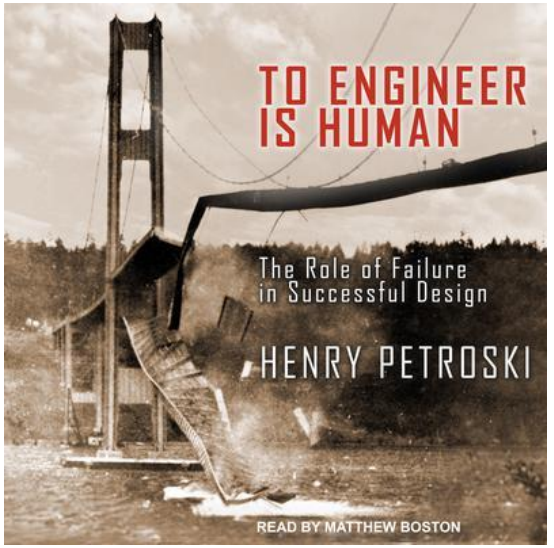
— American Industrial Hygiene Association

Professional Judgment

"Good judgment is the result of experience and experience the result of bad judgment." – Mark Twain



"But to learn from the experience of others requires those who have the experience to share the knowledge with those who follow." – Henry Petroski, To Engineer Is Human: The Role of Failure in Successful Design



Preparation

Why Do You Need a Plan?

While we all wish there was only one device that could analyze the unknown amount of an unknown chemical, the truth is, industrial hygienists must know ahead of time what they are sampling for in the process.

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Safety Data Sheet (SDS)

1. Identification
2. Hazard(s) Identification
3. Composition/Information on ingredients
4. First-aid Measures
5. Fire-fighting Measures
6. Accidental Release Measures
7. Handling and Storage
8. Exposure Controls/Personal Protection (PELs)
9. Physical and Chemical Properties
10. Stability and Reactivity
11. Toxicological Information
12. Ecological Information*
13. Disposal Information*
14. Transport Information*
15. Regulatory Information*
16. Other Information

* Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29CFR 1910.1200(g)(2)).

Safety Data Sheets

3. Composition/information on ingredients

mixture of solvents

Components

CAS-No.	Chemical name	Concentration
142-82-5	Heptane	26 - 37%
108-88-3	Toluene	16%
67-64-1	Acetone	15 - 26%
763-69-9	Ethyl 3-ethoxy propionate	15 - 26%
123-86-4	Butyl acetate	4 - 15%
1330-20-7	Xylene	4%
100-41-4	Ethylbenzene	1.0%

Any concentration shown as a range is due to batch variation.
Non-regulated ingredients 1 - 5%
OSHA Hazardous: Yes

Safety Data Sheets

8. Exposure controls/personal protection

Engineering controls and work practices

Provide adequate ventilation.This should be achieved by a good general extraction and -if practically feasible- by the use of a local exhaust ventilation.If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn.

National occupational exposure limits

CAS-No.	Chemical name	Source	Time	Type	Value	Note
142-82-5	Heptane	ACGIH	15 min	STEL	500 ppm	
		ACGIH	8 hr	TWA	400 ppm	
		OSHA	8 hr	TWA	500 ppm	
108-88-3	Toluene	OSHA		CEIL	300 ppm	
		OSHA	10 min	TWA	500 ppm	
		OSHA	8 hr	TWA	200 ppm	
67-64-1	Acetone	ACGIH	15 min	STEL	750 ppm	
		ACGIH	8 hr	TWA	500 ppm	
		OSHA	8 hr	TWA	1,000 ppm	

Personal Equipment

Basic PPE

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Not So Basic PPE

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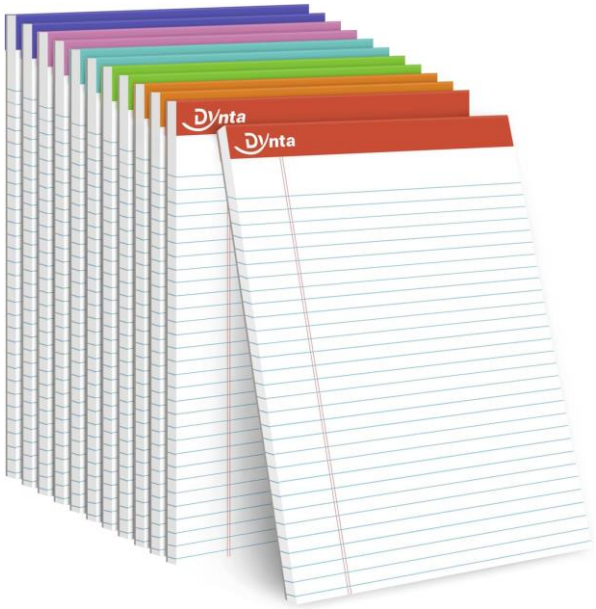
Portable Desk



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Portable Brain

- NIOSH Sound Level Meter
- IH EHS Calculator from AIHA
- OSHA-NIOSH Heat Index Calculator
- Flashlight
- Camera
- Calculator
- Stopwatch/Timer
- Internet
- NIOSH Pocket Guide
- DOT ERG
- Equipment Specific Apps

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Real Brain

- Observation
- Understand the Process
- Understand the Work Site
- Expect Issues

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Good To Have

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Chemical Monitoring

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Air Pumps

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Sampling Media

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Breakables

Abbildung ähnlich

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Calibrator

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Paperwork

INDUSTRIAL HYGIENE MONITORING FORM

Client: **Location:**

Sample #:	**Sample Type**
	☐ Personal ☐ Area
Sample Date:	☐ TWA ☐ STEL

Personnel

Name:

Identifier:

Photos:

Sample

Flow Rate	Time
Pre:	On:
Post:	Off:
Avg:	Total:
Pump Clock Time:	
Shift length:	Volume:
Shift time:	

PPE

☐	**Respirator**	Type filters: Full-face / Half-face	Dust	Supplied air: Hood Mask / PAPR
☐	**Hearing Protection**	NRR:	Earplugs Canal Caps	Muffs Radio Muffs
☐	**Head/Face Protection**	Hard hat Bump cap Hair cover/scarf	Safety glasses Goggles	Face shield Welder's helmet
☐	**Body Protection**	Coveralls Long sleeves Sleeve covers Lab coat/jacket Reflective vest	Apron Weld Leathers Fire Resistant Kevlar Steel mesh	Tyvek Saranex Cotton Leather Nomex Plastic
☐	**Foot Protection**	Rubber boots Ded Shoes	Steel Toed Shoe covers	Meta shield Heat Resistant
☐	**Gloves**	Mechanics Leather Cut Resistant	Latex Nitrile Neoprene Vinyl	Heat Resistant Cotton/knit Material Handler

Monitoring Equipment

	Passive Monitor - Serial #		
	Sample Pump #		PPI - 2 / 4 / 8 Hour
	Colormetric Tube		Heat Stress Monitor
	Noise Dosimeter #		ToxiRae #
Media:			Other (specify)

MCE MWMCE PVC PWPVC PVC/Quartz PTFE Charcoal SilicaGel Other

Analyte(s)

Location

Department/Area:

Description of Task: **Results:**

Ventilation

	Outside		Industrial (Dilution)
	Natural (windows, doors, etc)		Lab Hood - Height Open
	Fans (Comfort)		Local Exhaust
	Comfort (A/C or Heat)		Downdraft
	Bay Doors - Open / Closed		Booth - Paint / Sanding On / Off Open / Closed

Noise Results

Peak:_____ Adj Lavg:_____ 80 dB Lavg:_____

Notes:

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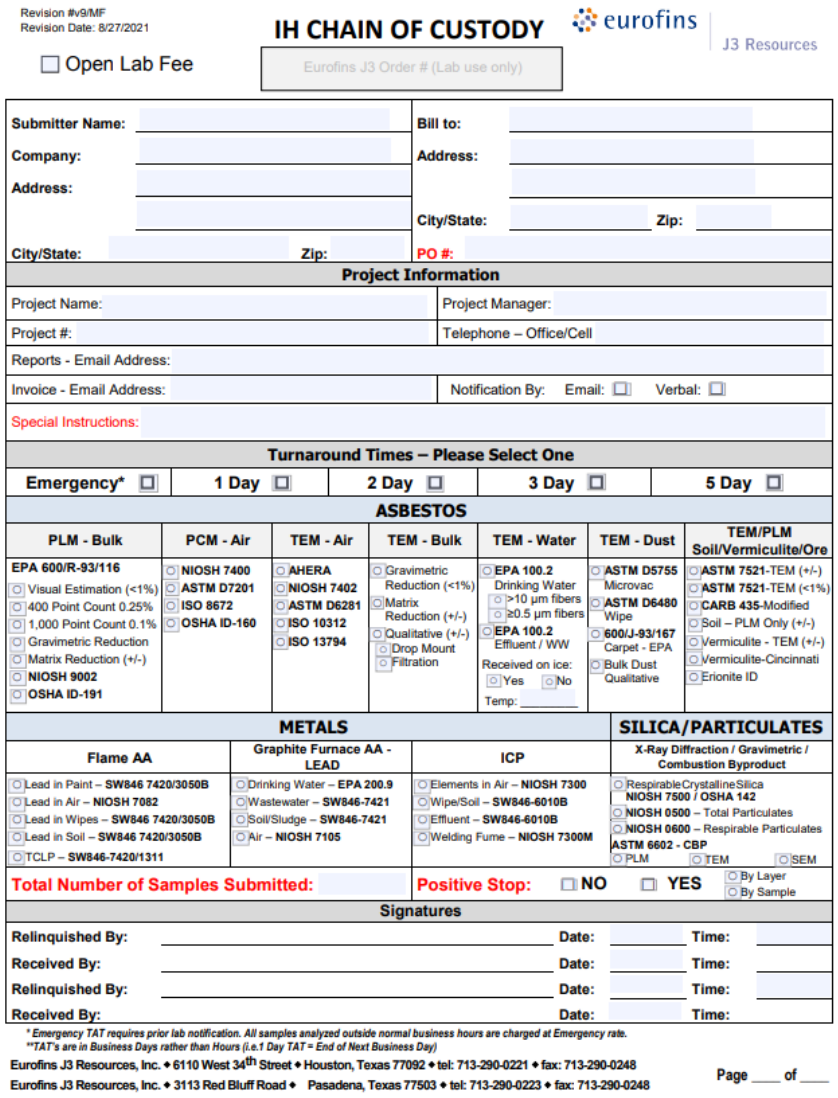

Revision #v9/MF
Revision Date: 8/27/2021

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☐ Open Lab Fee

Eurofins J3 Order # (Lab use only)

Submitter Name:	**Bill to:**
Company:	**Address:**
Address:	**City/State:** **Zip:**
City/State: **Zip:**	**PO #:**

Project Information

Project Name:	Project Manager:
Project #:	Telephone – Office/Cell
Reports - Email Address:	
Invoice - Email Address:	Notification By: Email: ☐ Verbal: ☐
Special Instructions:	

Turnaround Times – Please Select One

Emergency* ☐ | 1 Day ☐ | 2 Day ☐ | 3 Day ☐ | 5 Day ☐

ASBESTOS

PLM - Bulk	PCM - Air	TEM - Air	TEM - Bulk	TEM - Water	TEM - Dust	TEM/PLM Soil/Vermiculite/Ore
EPA 600/R-93/116 ○ Visual Estimation (<1%) ○ 400 Point Count 0.25% ○ 1,000 Point Count 0.1% ○ Gravimetric Reduction ○ Matrix Reduction (+/-) ○ NIOSH 9002 ○ OSHA ID-191	○ NIOSH 7400 ○ ASTM D7201 ○ ISO 8672 ○ OSHA ID-160	○ AHERA ○ NIOSH 7402 ○ ASTM D6281 ○ ISO 10312 ○ ISO 13794	○ Gravimetric Reduction (<1%) ○ Matrix Reduction (+/-) ○ Qualitative (+/-) ○ Drop Mount ○ Filtration	○ EPA 100.2 Drinking Water ○ >10 µm fibers ○ ≥0.5 µm fibers ○ EPA 100.2 Effluent / WW Received on ice: ○ Yes ○ No Temp:	○ ASTM D5755 Microvac ○ ASTM D6480 Wipe ○ 600/J-93/167 Carpet - EPA ○ Bulk Dust Qualitative	○ ASTM 7521-TEM (+/-) ○ ASTM 7521-TEM (<1%) ○ CARB 435-Modified ○ Soil – PLM Only (+/-) ○ Vermiculite - TEM (+/-) ○ Vermiculite-Cincinnati ○ Erionite ID

METALS

Flame AA	Graphite Furnace AA - LEAD	ICP
○ Lead in Paint – SW846 7420/3050B ○ Lead in Air – NIOSH 7082 ○ Lead in Wipes – SW846 7420/3050B ○ Lead in Soil – SW846 7420/3050B ○ TCLP – SW846-7420/1311	○ Drinking Water – EPA 200.9 ○ Wastewater – SW846-7421 ○ Soil/Sludge – SW846-7421 ○ Air – NIOSH 7105	○ Elements in Air – NIOSH 7300 ○ Wipe/Soil – SW846-6010B ○ Effluent – SW846-6010B ○ Welding Fume – NIOSH 7300M

SILICA/PARTICULATES

X-Ray Diffraction / Gravimetric / Combustion Byproduct

○ Respirable Crystalline Silica NIOSH 7500 / OSHA 142
○ NIOSH 0500 – Total Particulates
○ NIOSH 0600 – Respirable Particulates
ASTM 6602 - CBP ○ PLM ○ TEM ○ SEM

Total Number of Samples Submitted: **Positive Stop:** ☐ NO ☐ YES ○ By Layer ○ By Sample

Signatures

Relinquished By:	**Date:**	**Time:**	
Received By:	**Date:**	**Time:**	
Relinquished By:	**Date:**	**Time:**	
Received By:	**Date:**	**Time:**	

** Emergency TAT requires prior lab notification. All samples analyzed outside normal business hours are charged at Emergency rate.*
***TAT's are in Business Days rather than Hours (i.e.1 Day TAT = End of Next Business Day)*

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Noise Monitoring

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Dosimeters

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Sound Level Meters

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Calibrator

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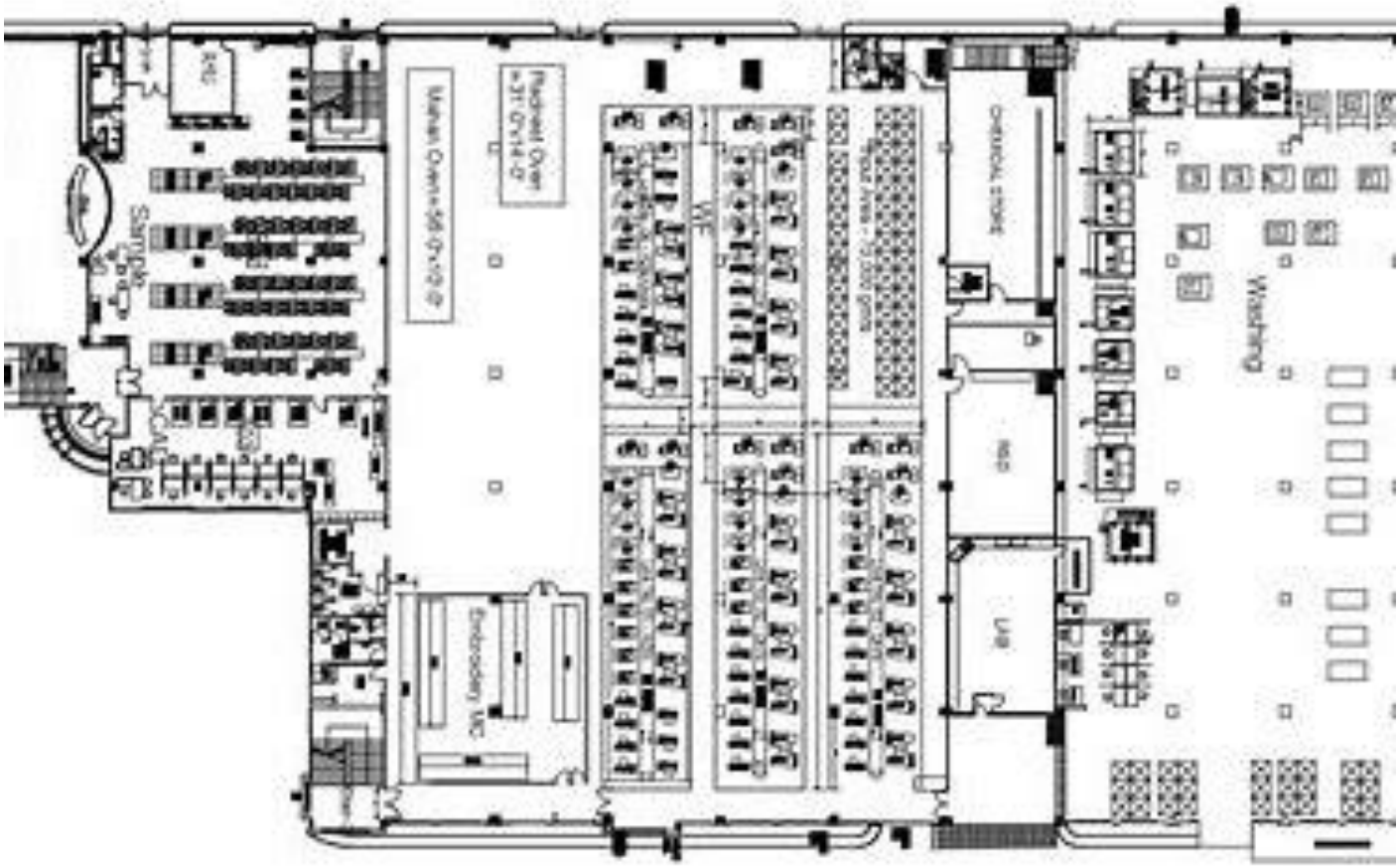
Facility Map



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Indoor Air Quality

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Spore Traps

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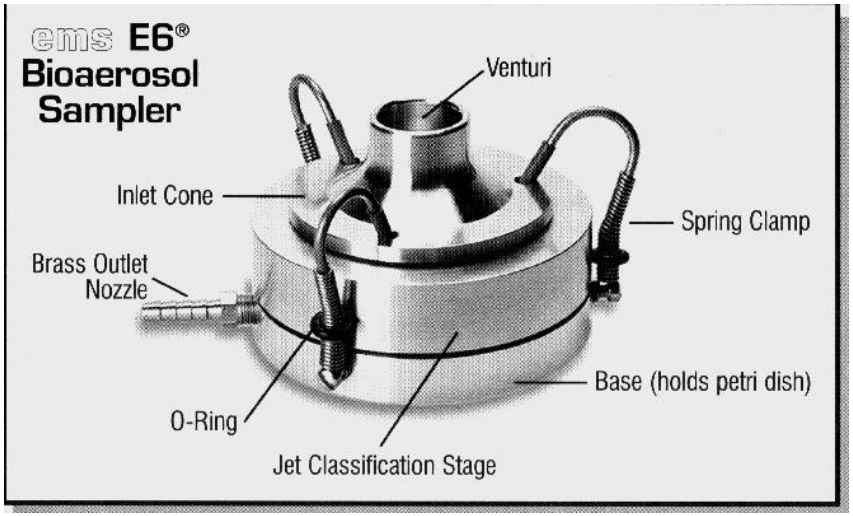
Viable Spore Sampling



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Indoor Air Quality Monitor

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Visual Inspection

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Paperwork

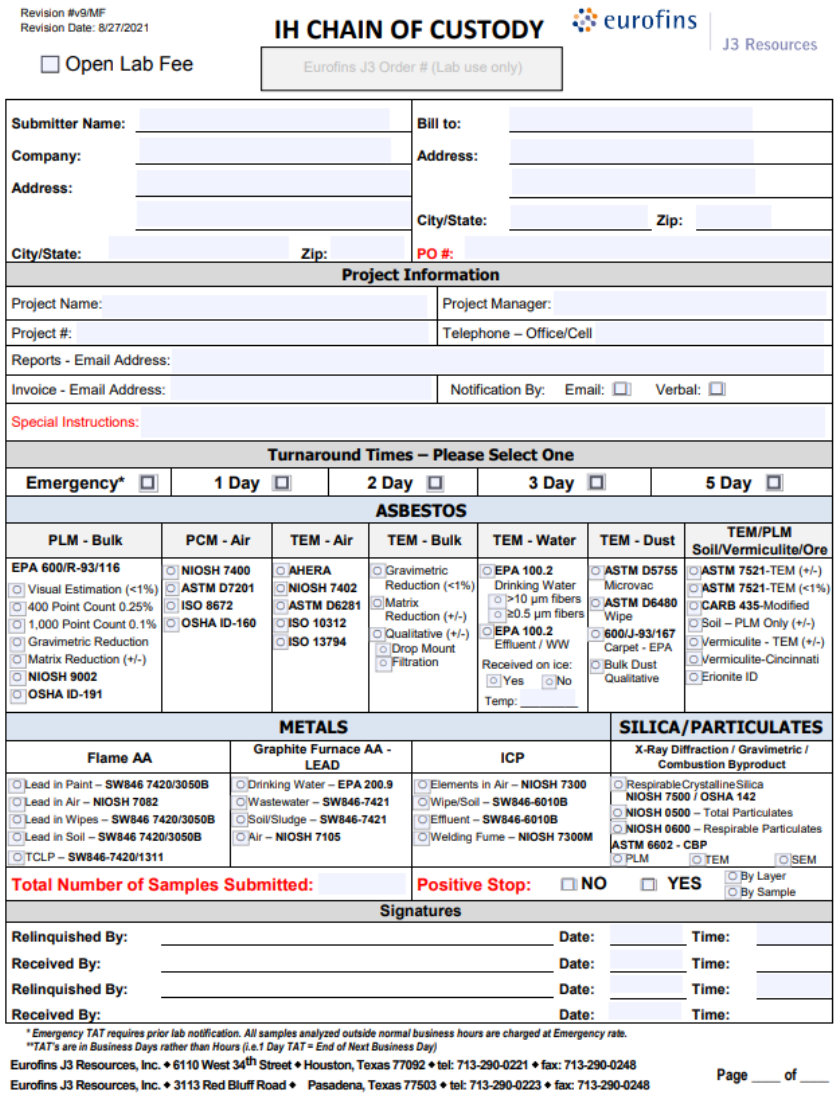
IAQ SAMPLING FIELD SHEET

CLIENT: ______________________________ **SITE:** ____ **DATE:** ________________

Sample #	Sample Type	Flow Rate/Min	Location	Dry Bulb Wet Bulb	CO_2	CO	RH	Temp	Dewpoint
#				/					
				Walls: Sheetrock Plaster Wood Panel Wallpaper Vinyl Cinderblock/brick Metal		Floor: Floor tile Carpet Wood Ceramic tile Linoleum Concrete		Ceiling: Drop ceiling Glued/Groove Sheetrock Wood Plaster Metal	
Pictures:									
#				/					
				Walls: Sheetrock Plaster Wood Panel Wallpaper Vinyl Cinderblock/brick Metal		Floor: Floor tile Carpet Wood Ceramic tile Linoleum Concrete		Ceiling: Drop ceiling Glued/Groove Sheetrock Wood Plaster Metal	
Pictures:									
#				/					
				Walls: Sheetrock Plaster Wood Panel Wallpaper Vinyl Cinderblock/brick Metal		Floor: Floor tile Carpet Wood Ceramic tile Linoleum Concrete		Ceiling: Drop ceiling Glued/Groove Sheetrock Wood Plaster Metal	
Pictures:									
#				/					
				Walls: ☐ Sheetrock Plaster Wood Panel Wallpaper Vinyl Cinderblock/brick Metal		Floor: Floor tile Carpet Wood Ceramic tile Linoleum Concrete		Ceiling: Drop ceiling Glued/Groove Sheetrock Wood Plaster Metal	
Pictures:									

Sample Types: AF = Anderson Fungal Z = Zefon Air-O-Cell T = Tape S = Swab BK = Bulk

Paperwork



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Emergency* ☐ | 1 Day ☐ | 2 Day ☐ | 3 Day ☐ | 5 Day ☐

ASBESTOS

PLM - Bulk	PCM - Air	TEM - Air	TEM - Bulk	TEM - Water	TEM - Dust	TEM/PLM Soil/Vermiculite/Ore
EPA 600/R-93/116 ○ Visual Estimation (<1%) ○ 400 Point Count 0.25% ○ 1,000 Point Count 0.1% ○ Gravimetric Reduction ○ Matrix Reduction (+/-) ○ NIOSH 9002 ○ OSHA ID-191	○ NIOSH 7400 ○ ASTM D7201 ○ ISO 8672 ○ OSHA ID-160	○ AHERA ○ NIOSH 7402 ○ ASTM D6281 ○ ISO 10312 ○ ISO 13794	○ Gravimetric Reduction (<1%) ○ Matrix Reduction (+/-) ○ Qualitative (+/-) ○ Drop Mount ○ Filtration	○ EPA 100.2 Drinking Water ○ >10 µm fibers ○ ≥0.5 µm fibers ○ EPA 100.2 Effluent / WW Received on ice: ○ Yes ○ No Temp:	○ ASTM D5755 Microvac ○ ASTM D6480 Wipe ○ 600/J-93/167 Carpet - EPA ○ Bulk Dust Qualitative	○ ASTM 7521-TEM (+/-) ○ ASTM 7521-TEM (<1%) ○ CARB 435-Modified ○ Soil – PLM Only (+/-) ○ Vermiculite - TEM (+/-) ○ Vermiculite-Cincinnati ○ Erionite ID

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X-Ray Diffraction / Gravimetric / Combustion Byproduct

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ASTM 6602 - CBP ○ PLM ○ TEM ○ SEM

Total Number of Samples Submitted: **Positive Stop:** ☐ NO ☐ YES ○ By Layer ○ By Sample

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Ventilation Survey

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Velometers

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Exhaust/Booth Face Measurements

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Paperwork

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Ventilation Survey

Date: _____ Hood/Booth #_____

Time: _____ Megahelic Reading: _____

Instrument: _____ Average FPM: _____

Surveyed By: _____

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Ergonomics

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Ergonomic Troubles

Ergonomic injuries can stem from a combination of three things:

1. **Excessive force**
2. **Poor postures**
3. **High Repetition**

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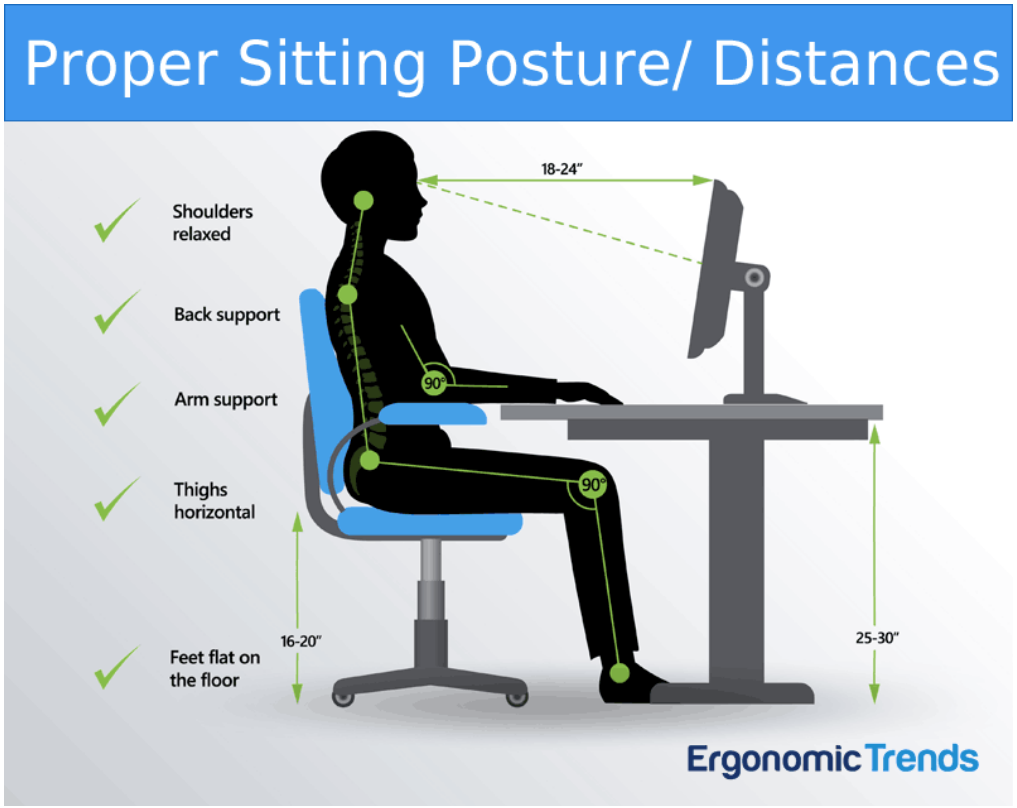
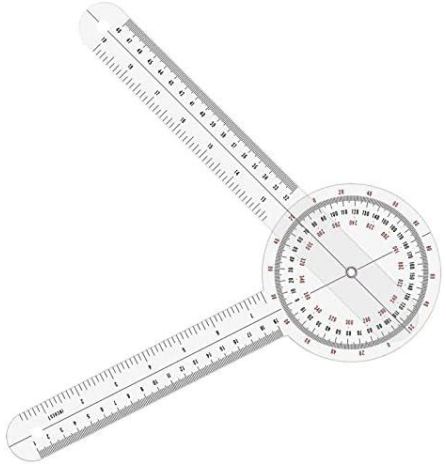
Force

- This requires some kind of measuring device and a knowledge of how much force is too much

Work Station Layout





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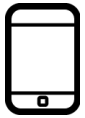
Contact iSi

Feedback@iSiEnvironmental.com



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Online at iSiEnvironmental.com

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Feedback Survey

Your feedback is important to me!

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