December 15, 2000

MEMORANDUM

TO: Stephen E. West, Administrator
Boise Regional Office

FROM: Bill Rogers, Air Quality Engineer
State Technical Services Office

THROUGH: Daniel Salgado
Lead Process Engineering
State Technical Services Office

SUBJECT: ***TIER II OPERATING PERMIT TECHNICAL ANALYSIS***
T2000072, Redman Home Builders, Weiser
(Production of Manufactured Homes)

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.400 (*Rules for the Control of Air Pollution in Idaho*) for issuing Tier II Operating Permits.

PROJECT DESCRIPTION

Redman Home Builders has submitted a Tier II Operating Permit (OP) application for an existing facility located at 1425 Sunny Side Road in Weiser, Idaho. The facility produces manufactured homes. Associated emissions include particulate matter (PM), volatile organic compounds (VOC's), and toxic air pollutants (TAP's).

SUMMARY OF EVENTS

On May 2, 2000, the Idaho Department of Environmental Quality (DEQ) received a Tier II OP application from Redman Home Builders (Redman). The application was determined complete on June 2, 2000. As required by IDAPA 58.01.01.404, a proposed permit was made available for public comment from September 20, 2000 through October 20, 2000. No comments were received.

DISCUSSION

1. Process Description

A photocopy of the facility plot plan is provided as Appendix A of this document to help the reader identify the locations of the various processes.

FRAME SHOP

In the Frame Shop, steel cross members are welded to steel I beams to construct the base frame. Once complete, black water-based latex frame paint is applied to the frame using airless spray guns. Emissions from this process include PM and TAP's. The frame paint contains no VOC's. Emissions from this process are uncontrolled and are vented though four (4) ceiling vents.

MILL

Raw lumber used to construct each home is cut to size in the Mill. Each saw includes an enclosed vacuum system that collects and conveys particulate matter to a baghouse. A fan located at the baghouse induces the airflow for the vacuum system. Emissions from this process are controlled.

SPRAY PAINT BOOTH

Adjacent to the Mill is a small spray paint booth used to for touch-ups and to paint soffits. Only water-based, latex paints are used. Emissions from this process include PM and TAP's. VOC emissions are negligible. Filer media surrounds the paint booth's interior exhaust stack openings; however; these stacks vent into the interior of the Manufacturing Plant. Emissions from this process are assumed to be uncontrolled.

MANUFACTURING PLANT

Exterior paint is applied to the siding in the Manufacturing Plant using airless spray guns. The guns are designed such that painting is not required within a booth (i.e. there is little overspray). Only water-based, latex paints are used. Emissions from this process include PM (non-toxic paint solids) and TAP's (hazardous ingredients in the form of PM). VOC emissions are negligible. This analysis assumes the paint transfer efficiency is 50%; however, based on the design of the spray paint guns, the transfer efficiency is much higher. It is assumed that all of the TAP's and 50% of the non-volatile solids contained in the paint are emitted to the atmosphere from the Manufacturing Plant's eight (8) ceiling exhaust vents. Emissions from this process are uncontrolled and include the spray paint booth emissions.

Flooring, wall paneling, and ceiling tiles are installed using adhesives in the Manufacturing Plant. Adhesive emissions are vented to the atmosphere though the Manufacturing Plant's ceiling exhaust vents. Emissions from this process are uncontrolled.

CABINET SHOP

Soffits and some special cabinetry are made in the Cabinet Shop. The Cabinet Shop includes saws and sanders, each of which includes an enclosed vacuum system that collects and conveys particulate matter to a dust collection system that operates similarly to a baghouse. A fan induces the airflow for the dust collection system. Emissions from this process are controlled and vent to interior of the Manufacturing Plant.

2. Facility Classification

Redman Home Builders is not a major facility as defined in IDAPA 58.01.01.006.55. The facility is not a designated facility as defined in IDAPA 58.01.01.006.27. The facility is not subject to any federal New Source Performance Standards (NSPS) in accordance with 40 CFR 60, National Emission Standards for Hazardous Air Pollutants (NESHAP) in accordance with 40 CFR 61, or National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT) in accordance with 40 CFR 63. The Standard Industrial Classification (SIC) code defining this facility is 1521 (General Contractors - Single-Family Houses), and the facility classification is B.

3. Area Classification

Redman Home Builders is located in Weiser, Idaho which is located in southwestern Washington County. Washington County is located in Air Quality Control Region (AQCR) 63 and Zone 11. This area is designated as attainment or unclassifiable for all regulated criteria air pollutants.

4. Emission Estimates

4.1 Welding

PM-10 and toxic air pollutant emissions from the welding process were estimated using emission factors from EPA's AP-42[1] and from production data supplied in the permit application. The applicable AP-42 section and welding electrode data are provided as Appendix B of this document. Per the permit application, the maximum amount of electrode that could be consumed per day is 200 pounds. For this analysis, twenty percent has been added as a safety factor.

The welding processes potential to emit PM-10 is estimated to be 0.05 pounds-per-hour (lb/hr) and 0.21 tons-per-year (T/yr). The potential to emit does not trigger major source permitting requirements. The associated ambient impacts are 0.79 ug/m3, 24-hour average, and 0.16 ug/m3, annual average. These impacts do not significantly contribute (IDAPA 58.01.01.006.93) to the ambient air quality, and when added to the 24-hour and annual statewide PM-10 background concentrations, the predicted impacts do not cause or contribute to a violation of the PM-10 NAAQS. IDAPA 58.01.01.710 (Particulate Matter - Process Equipment Emission Limitations On Or After July 1, 2000) does not apply because potential particulate matter emissions are at all times less than one pound-per-hour.

Table 1 summarizes the results of the toxic air pollutant emission analysis. As indicated, modeling is not required for ambient compliance purposes because potential emissions are less than net screening emission levels for all TAP's. The emission estimates are presented as Appendix B of this document.

Table 1. Welding Toxic Air Pollutant Emission Estimates

TOXIC AIR POLLUTANT (TAP)	CAS #	POTENTIAL TO EMIT		NET SCREENING EMISSION LEVEL (EL)	MODELING REQUIRED?	
		lb/hr	T/yr	lb/hr	YES	NO
CHROMIUM METAL IDAPA 58.01.01.585.	7440-47-3	9.2E-06	4.0E-05	0.033		✔
COBALT IDAPA 58.01.01.585	7440-48-4	9.2E-06	4.0E-05	0.0033		✔
MANGANESE IDAPA 58.01.01.585	7439-96-5	0.0029	0.0127	0.067		✔
NICKEL IDAPA 58.01.01.586	7440-02-0	9.2E-06	4.0E-05	2.7E-05		✔

[1] Compilation of Air Pollutant Emission Factors (USEPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC, 5th Ed., 1995), pp. 12.19-1 - 12.19-9.

4.2 Mill Emissions

The Mill consists of saws that are used to cut raw lumber to size. Each saw is equipped with a vacuum system that collects and conveys the sawdust to a baghouse. A 6,500 cfm fan induces the air flow through the baghouse system. The baghouse is equipped with a hopper that collects the captured sawdust. The hopper is emptied weekly.

PM-10 emissions from the Mill were estimated using the capture efficiency of the baghouse and the amount of sawdust removed from the baghouse. Per the permit application, the baghouse's collection efficiency is 99.8% for PM-10 size particulate matter. The average amount of sawdust removed per week is 1,000 pounds, which takes into account heavy production periods. For this analysis, a safety factor of twenty percent has been added. The emission estimates are presented as Appendix C of this document. Table 2 summarizes the results of the emissions analysis.

Table 2. Mill Emission Estimates and Ambient Impacts

SOURCE	POTENTIAL TO EMIT		PREDICTED AMBIENT IMPACT		NAAQS	
	lb/hr	T/yr	24-hr ug/m3	ANNUAL ug/m3	24-hr ug/m3	ANNUAL ug/m3
MILL	0.02	0.09	0.39 (86.39)	0.08 (32.15)	150	50

Potential PM-10 emissions do not trigger major source permitting requirements. Likewise, the predicted impacts do not significantly contribute to the ambient air quality. When added to the state-wide PM-10 24-hour and annual background concentrations, the predicted impacts do not cause or contribute to a violation of the PM-10 NAAQS. IDAPA 58.01.01.710 does not apply because potential emissions are at all times less than one pound-per-hour.

4.3 Cabinet Shop

Special cabinetry and soffit production is performed in the Cabinet Shop using saws and sanders. Each saw and sander includes a vacuum system similar to that in the Mill. A 3,000 cfm fan induces the air flow through the system. Filtered air is vented into the interior of the Manufacturing Plant. Sawdust and sanderdust is collected in a hopper that is part of the dust collection system. The hopper is emptied monthly.

PM-10 emissions from the Cabinet Shop were estimated using the capture efficiency of the dust collection system and the amount of sawdust and sanderdust removed from the hopper. Per the permit application, the dust collection system's collection efficiency is 98% for particulate matter three microns or less. The average amount of sawdust and sanderdust removed per month is approximately 600 pounds, which takes into account heavy production periods. For this analysis, a safety factor of twenty percent has been added. The emission estimates are presented as Appendix D of this document. Table 3 summarizes the results

of the emissions analysis.

Table 3. Cabinet Shop Emission Estimates and Ambient Impacts

SOURCE	POTENTIAL TO EMIT		PREDICTED AMBIENT IMPACT		NAAQS	
	lb/hr	T/yr	24-hr ug/m3	ANNUAL ug/m3	24-hr ug/m3	ANNUAL ug/m3
CABINET SHOP	0.03	0.12	0.32 (86.32)	0.06 (32.13)	150	50

Potential PM-10 emissions do not trigger major source permit requirements. Likewise, the predicted impacts do not significantly contribute to the ambient air quality. When added to the state-wide PM-10 background concentrations, the predicted impacts do not cause or contribute to a violation of the PM-10 NAAQS. IDAPA 58.01.01.710 does not apply because potential emissions are at all times less than one pound-per-hour.

4.4 Exterior Painting

Exterior painting is performed within the Manufacturing Plant using airless spray guns. The guns are designed such that painting is not required in a spray paint booth (i.e. there is little overspray). All of the paint used by this facility is water-based latex paint. The VOC content is negligible. The emissions of concern are toxic air pollutants in the form of particulates.

A spreadsheet was developed to estimate PM-10, VOC, and TAP emissions from the painting process. Even though VOC are considered negligible, they were quantified and modeled for emission inventory and NAAQS purposes. PM-10 emissions are the non-volatile solids in the paint. The paint transfer efficiency is conservatively assumed to be 50%. The emissions analysis includes year 1999 paint throughput rates with a twenty percent safety factor added, and product information provided in the Material Safety Data Sheets (MSDS) for each paint product. Per the applicant, production in 1999 was near capacity. The following narrative explains the methodology used in developing the spreadsheet.

The hazardous compounds listed in each MSDS were compared by CAS number to Idaho's non-carcinogenic and carcinogenic toxic air pollutant increments (IDAPA 58.01.01.585 and 586, respectively) to determine those hazardous compounds that are regulated by the state of Idaho as toxic air pollutants when emitted to the atmosphere. Once identified, each TAP was listed in the spreadsheet along with it's CAS number and weight percent as indicated in the MSDS. The weight percent of each TAP was multiplied by the paint density to determine the pounds of each TAP per gallon of paint. Those values were then multiplied by the adjusted annual paint throughput to determine annual TAP emissions. Hourly TAP emissions are simply annual emissions divided by 8,760 hours-per-year of operation. Annual TAP emissions were aggregated and summed to determine if the facility is a major source for hazardous air pollutant emissions in accordance with IDAPA 58.01.01.008.10. As indicated in the spreadsheet, the total TAP emissions are 4.67 T/yr which does not meet the definition of a Title V major facility. In addition to quantifying emissions, an ambient assessment of the TAP's was conducted to demonstrate compliance or non-compliance with IDAPA 58.01.01.585 and 586. The analysis indicates that the predicted impacts are less than the allowable toxic increments. This analysis conservatively assumes that each TAP is emitted to the atmosphere uncontrolled through the Manufacturing Plant's roof vents.

PM-10 emissions for each paint were estimated by multiplying the solids volume of the paint by the paint density and the adjusted 1999 throughput rate. The solids volume was determined by subtracting the volatile volume of each paint from one. Again, the paint transfer efficiency, in terms of the paint solids is assumed to be 50%. The volatile volume is the amount of water and solvents contained in the paint. Per the paint manufacturer, the amount of solvent, propylene glycol, a non-regulated compound, is less than two percent. The volatile volumes were obtained from the MSDS'. VOC emissions were estimated by multiplying the theoretical VOC content (lb/gal) by the adjusted 1999 throughput rate. The emission estimates assume continuous operation. The spreadsheet and MSDS' are presented as Appendix E of this document. Referring to Appendix E, emissions from the painting process do not trigger major source permitting requirements and their associated ambient impacts demonstrate compliance with all applicable ambient standards.

4.5 Adhesives

Adhesives are used to install subflooring, flooring, wall paneling, and ceiling tile. The applicant supplied MSDS' for the adhesives that are used. Emissions were estimated based on the information contained in the MSDS'. Subflooring, flooring, and wall paneling are installed using a urethane adhesive manufactured by Henkel Adhesives. Ceiling tiles are installed using a two-part adhesive manufactured by Foam Supplies, Inc. One part , FoamNail Part A, is the adhesive and the other part, FoamNail Part B, is the catalyst. Both are sprayed onto a ceiling rafter simultaneously though a gun having a dual nozzle. The only hazardous ingredient contained in the adhesives is methylenediphenyl diisocyanate (MDI). However, due to it's low vapor pressure (<0.0001 mmHg @ 20C), MDI emissions are insignificant.

MDI emissions from the ceiling adhesive were estimated for the applicant by The Society of the Plastics Industry, Inc. Only FoamNail Part A contains MDI. Based on maximum production, annual MDI emissions are estimated to be 0.035 lb/yr. This value however assumes 250 days per year of operation. Because there is no enforceable limit on operations, the potential to emit has to be based on 365 days per year of operation, not 250 days per year. Therefore, the correct emission estimate should be: (0.035 lb/yr)(365/250) = 0.05 lb/yr. This equates to 5.71E-06 lb/hr assuming 8,760 hr/yr of operation. MDI emissions from the flooring/wall paneling adhesive were estimated using the annual ceiling adhesive emission rate times the ratio of flooring/wall paneling adhesive usage and ceiling tile adhesive usage. Flooring/wall paneling MDI emissions are estimated at 1.49E-06 lb/hr and 0.012 lb/yr. Combined MDI emissions from both adhesives is 7.20E-06 lb/hr and 0.062 lb/yr. The MDI emission estimates and adhesive MSDS' are presented as Appendix E of this document.

Per IDAPA 58.01.01.585, the EL for MDI is 0.003 lb/hr. The emission estimate of 7.20E-06 lb/hr is three orders of magnitude less than the EL. Therefore, a limit on the potential to emit for this process is not required.

5. Modeling

Modeling of criteria and toxic air pollutant emissions was accomplished using the EPA approved SCREEN3 modeling program. Based on the modeled results, the predicted criteria air pollutant impacts from this facility do not cause or contribute to a violation of the NAAQS. Likewise, predicted

TAP impacts are less than all respective allowable toxic ambient increments. Hard copies of the modeling output files are located with the appendicy of each respective process.

6. Regulatory Review

The following is an explanation of the applicable air quality rules and regulations for the proposed project.

6.1 IDAPA 58.01.01.401 Tier II Operating Permit

The facility is an existing facility which requires a Tier II Operating Permit in accordance with IDAPA 58.01.01.401.01.

6.2 IDAPA 58.01.01.577 Ambient Air Quality Standards for Specific Air Pollutants

PM-10 and VOC emissions from the facility have been modeled and have been found to demonstrate compliance with the NAAQS.

6.3 IDAPA 58.01.01.585 & 586 Non-Carcinogenic and Carcinogenic Toxic Air Pollutant Standards

TAP emissions have been estimated and modeled for the interior and exterior painting processes and the adhesive process. All TAP's are shown to demonstrate compliance with their allowable toxic increments.

7. Permit Requirements

The following Section outlines each Tier II OP requirement and the regulatory/technical basis.

7.1 Facility-Wide Conditions

7.1.1 Emission Limits

All stacks, vents, and other openings at this facility must comply with the opacity rules contained in IDAPA 58.01.01.625.

7.1.2 Operating Requirements

The facility is required to reasonably control fugitive emissions per IDAPA 58.01.01.651.

The facility is required to control their emissions of odorous gases per IDAPA 58.01.01.776.

7.1.3 Monitoring Requirements

The facility is required to maintain fugitive dust and odor logs of all complaints received. Corrective action is required within 24-hours of each valid complaint.

7.2 Frame Shop

7.2.1 Welding Electrode

Specifies the welding electrode type that may be used. Several electrodes are available and some generate considerable hazardous air pollutants. Specifying the electrode is intended to limit their generation.

7.2.2 Frame Paint

Limits the ingredients of any frame paint to those indicated in the MSDS provided in the permit application.

7.3 Mill

7.3.1 Monitoring Equipment, O&M Manual, Pressure Drop

Requires the Permittee to install pressure drop monitoring equipment to measure the pressure drop across the baghouse, to develop and Operations and Maintenance Manual for the baghouse which specifies the methods and procedures that will be followed to assure optimal performance, and requires that the pressure drop across the baghouse be maintained within manufacturer's specifications.

7.4 Cabinet Shop

7.4.1 Monitoring Equipment, O&M Manual, Pressure Drop

Requires the Permittee to install pressure drop monitoring equipment to measure the pressure drop across the baghouse, to develop and Operations and Maintenance Manual for the baghouse which specifies the methods and procedures that will be followed to assure optimal performance, and requires that the pressure drop across the baghouse be maintained within manufacturer's specifications.

7.5 Manufacturing Plant

7.5.1 Paint Products

The Permittee is not allowed to use any paint product with VOC contents or HAP contents greater than those listed in the MSDS's submitted in their permit application and upon which this analysis is based. Different paint manufacturers product can be used so long as the products adhere to the above limit.

7.5.2 Adhesive Products

Same as Condition 7.5.1.

8. Permit Coordination

A draft copy of the Tier II OP and technical analysis will be made available for public comment in

accordance with IDAPA 16.01.01.404.01.c.

9. AIRS Information

Information necessary to the AIRS database is included as Attachment F of this Technical Memorandum.

FEES

Fees apply to this facility in accordance with IDAPA 58.01.01.470. The facility is subject to permit application fees of $500 for this Tier II OP.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommends that Redman Home Builders be issued proposed Tier II Operating Permit No. 087-00007 for their manufactured home production facility located in Weiser, Idaho. A public comment period is required in accordance with IDAPA 58.01.01.404.01.c.

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cc: DEQ State Office
Boise RO

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706-2239 • (208) 373-0550

Dirk Kempthorne, Governor
C. Stephen Allred, Director

December 19, 2000

MEMORANDUM

TO: Dave Sande, Accountant Supervisor
Support Services

FROM: Bill Rogers, Air Quality Engineer
DEQ State Office

SUBJECT: Permit Application Fees for Tier II Permit

The following facility has been reviewed for compliance with IDAPA 16.01.01.470 "Permit Application Fees for Tier II Permits":

Redman Home Builders - Weiser, Idaho

Champion Homes Builders facility in Weiser, Idaho, has applied for a Final Tier II Operating Permit (#087-00008) for the sources that exist at the facility. DEQ will not release the facility's Tier II Operating Permit until receipt of permit application fees. According to IDAPA 16.01.01.470, the facility is subject to permit application fees for Tier II Permits of:

Five Hundred Dollars and No Cents ($500.00)

The contact and mailing address for the above facility is:

PERSON CONTACT: Mr. Tom Spurling, Safety Coordinator
COMPANY ADDRESS: 1425 Sunnyside Road
Weiser, Idaho 83672

DS\BR:hs:cm\h:\REDMAN.WPD

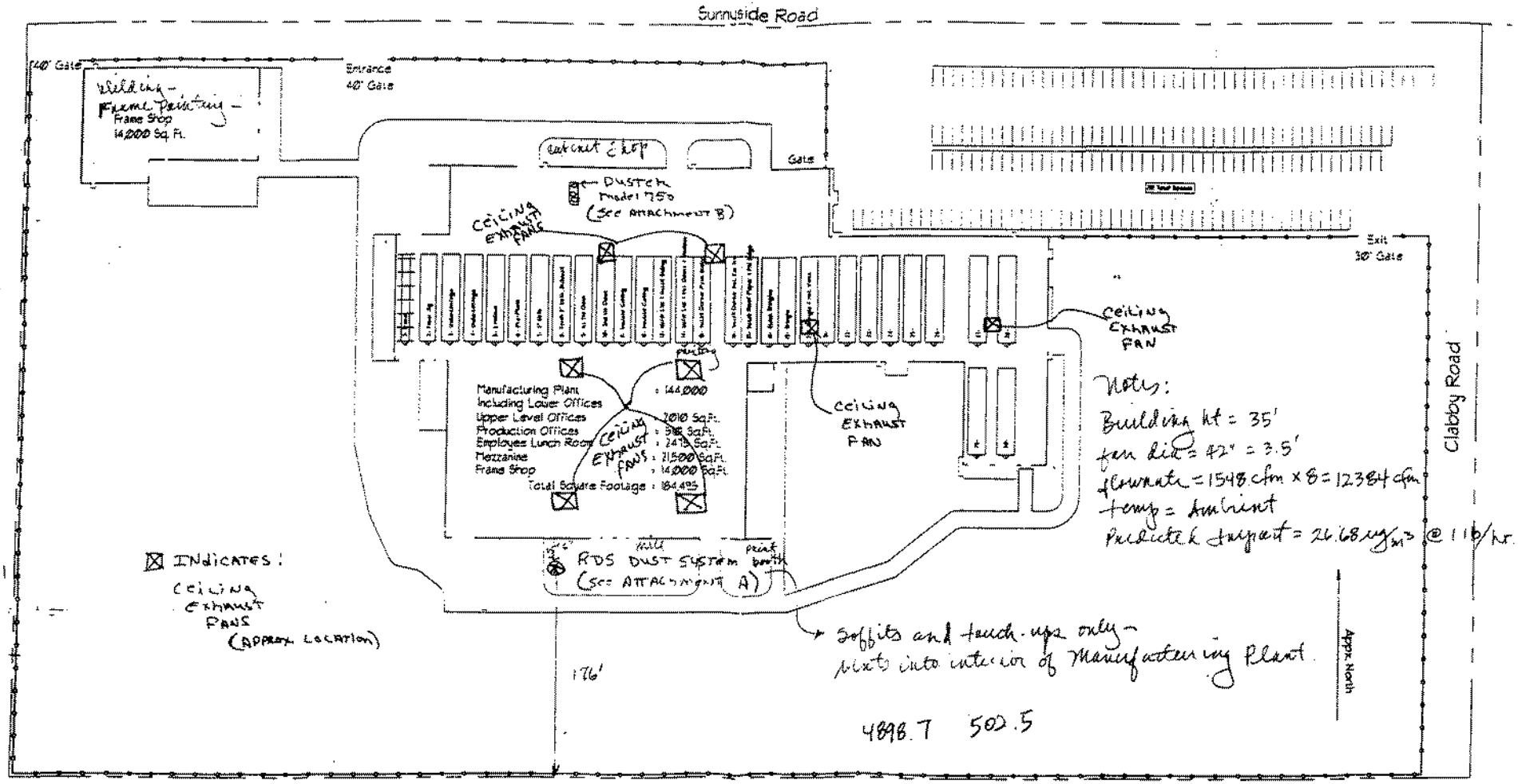
cc: DEQ Boise Regional Office
Source File
COF

APPENDIX A

Facility Plot Plan

Redman Home Builders
Weiser, Idaho

T200072
September 2000


Sunnyside Road
40' Gate
Entrance
40' Gate
Welding –
Frame Painting –
Frame Shop
14,000 Sq. Ft.
cut out shop
Gate
Dustex
Model 750
(See ATTACHMENT B)
CEILING EXHAUST FANS
Exit
30' Gate
CEILING EXHAUST FAN
Clabby Road
Manufacturing Plant : 144,000
Including Lower Offices
Upper Level Offices : 1010 Sq.Ft.
Production Offices : 938 Sq.Ft.
Employee Lunch Room : 2419 Sq.Ft.
Mezzanine : 21500 Sq.Ft.
Frame Shop : 14,000 Sq.Ft.
Total Square Footage : 184,495
CEILING EXHAUST FANS
CEILING EXHAUST FAN
Notes:
Building ht = 35'
fan dia = 42" = 3.5'
flowrate = 1548 cfm x 8 = 12384 cfm
temp = Ambient
Predicted output = 26.68 mg/m³ @ 11 lb/hr
INDICATES:
CEILING EXHAUST FANS
(APPROX. LOCATION)
RDS DUST SYSTEM
(See ATTACHMENT A)
Soffits and touch-ups only –
Next into interior of Manufacturing Plant
176'
Approx. North
4898.7 502.5

APPENDIX B

Frame Shop
Welding and Frame Painting Emission Estimates

Redman Home Builders
Weiser, Idaho

T200072
September 2000

T200072 - Redman

Frame Shop - Frame Painting : PM-10 only

Paint = 1858 Black latex frame paint

VOC content = 0%

Non-Volatile solids = 17.5% (max)

Paint ρ = 8.90 lb/gal.

$(8.90\ lb/gal)(17.5/100) = 1.56\ lb\ PM\text{-}10/gal$

1999 Thput = 7002 gal * 1.2 = 8402.4 gal/yr (max)

$(8402.4\ gal/yr)(1.56\ lb\ PM\text{-}10/gal)(1\ yr/8760\ hr) = 1.50\ lb/hr$

$(1.50\ lb/hr)(8760\ hr/yr)(1\ T/2000\ lb) = 6.55\ T/yr$ (PTE)

SCREEN3 max 1-hr conc @ 1 lb/hr = 39.76 $\mu g/m^3$

$\therefore (1.50\ lb/hr)(39.76\ \mu g/m^3/lb.hr)(0.4) = 23.86\ \mu g/m^3$
24-hr Ave

Statewide background = 86 $\mu g/m^3$

Total impact = $(86 + 23.86)\ \mu g/m^3 = 109.8\ \mu g/m^3$

24-hr PM-10 NAAQS = 150 $\mu g/m^3$

$(1.50\ lb/hr)(39.76\ \mu g/m^3/lb.hr)(0.08) = 4.8\ \mu g/m^3$ Annual Ave

Statewide background = 32.7 $\mu g/m^3$

Total impact = $(32.7 + 4.8) = 37.5\ \mu g/m^3 < 50\ \mu g/m^3$ NAAQS

TOPS

Frame Shop - Welding (cont'd).

Mn (Cas # 7439-96-5 ~ fume) IDAPA 58.01.01.585 EL = 0.067 lb/hr

AAC = 0.05 mg/m³ = 50 µg/m³

(22 lb/day)(1 day/24 hr)(3.18E-01 lb Mn/100 lb)

= 0.00291 lb/hr < EL ∴ no modeling Rq'd

Ni (Cas # 7440-02-0) IDAPA 58.01.01.586 EL = 27E-05 lb/hr

AACC = 4.2E-03 µg/m³

(22 lb/day)(1 day/24 hr)(4.01E-01 lb Ni/100 lb)

= 9.2E-06 lb/hr < EL ∴ no modeling Rq'd

PM-10 Ambient Analysis:

SCREEN3 max 1-hr impact = 39.76 µg/m³ @ 1 lb/hr - From the frame shops ceiling exhaust vents.

(0.05 lb/hr)(39.76 µg/m³/lb·hr)(0.4) = 0.79 µg/m³ 24-hr Ave

24-hr average statewide PM-10 background conc = 32.7 µg/m³

predicted impact = (32.7 + 0.79) µg/m³ = 33.49 µg/m³

NAAQS = 50 µg/m³ 24-hr Ave.

(0.05 lb/hr)(39.76 µg/m³/lb·hr)(0.08) = 0.16 µg/m³ Annual Ave

Annual Ave statewide background = 86 µg/m³

predicted impact = (86 + 0.16) µg/m³ = 86.16 µg/m³

NAAQS = 150 µg/m³ Annual Ave.

Frame Shop – Welding Emission Estimates

- Max. electrode consumption = 220 lb/day
- Electrode = E70S

Total Fume as PM-10

$$\left(220\ \text{lb/day}\right)\left(1\ \text{day}/24\ \text{hr}\right)\left(5.2\ \text{lb PM-10}/1000\ \text{lb}\right) = 0.05\ \text{lb PM-10/hr}$$

$$\left(0.05\ \text{lb PM-10/hr}\right)\left(8760\ \text{hr/yr}\right)\left(1\ \text{T}/2000\ \text{lb}\right) = 0.21\ \text{T PM-10/yr (PTE)}$$

HAP Emission Estimates:

Cr (Cas # 7440-47-3) IDAPA 58.01.01.585 EL = 0.033 lb/hr

AAC = 0.025 mg/m³ = 25 µg/m³

$$\left(220\ \text{lb/day}\right)\left(1\ \text{day}/24\ \text{hr}\right)\left(0.01\text{E-}01\ \text{lb Cr}/1000\ \text{lb}\right)$$

$$= 9.2\text{E-}06\ \text{lb/hr} < \text{EL}$$

∴ no modeling Req'd

CO (Cas # 7440-48-4) IDAPA 58.01.01.585 EL = 0.0033 lb/hr

AAC = 0.0025 mg/m³ = 2.5 µg/m³

$$\left(220\ \text{lb/day}\right)\left(1\ \text{day}/24\ \text{hr}\right)\left(0.01\text{E-}01\ \text{lb CO}/1000\ \text{lb}\right)$$

$$= 9.2\text{E-}06\ \text{lb/hr} < \text{EL}$$

∴ no modeling Req'd

WELDING & CUTTING PRODUCTS

Products Navigation

SELECT SECTION

Click Link Below

- Stick
- FluxCored - Gas Shielded
- FluxCored - Self Shielded
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- Submerged Arc
- Aluminum
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- Hardfacing
- Cast Iron/Alloys
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Go!

Type in a keyword to quickly find what you want.

MIG Wires

Access Material Safety Data Sheets

Product Name	AWS Class	Description
MILD STEEL WIRE		
SuperArc L-50 SuperGlide S3	ER70S-3	Our most popular MIG wires, SuperArc L-50 and SuperGlid S3 are excellent Choices for a broad spectrum of single-pass sheet-metal welding applications. They're also solid performe for multi-pass welds on thick steel sections. These Lincoln MIG wires enjoy a reputation for exceptional a characteristics and trouble-free performance. Typical applications include industrial, farming, construction, and mining equipment. They're also a great choice when welding pipe, pressure vessels, pre-engineered steel buildings and structural steel components. Manufacturers - including furniture and automotive compone producers all over the globe - rely on the consistent performance of our SuperArc L-50 and SuperGlide S3 wires.
SuperArc L-52	ER70S-2	Lincoln's premium triple deoxidized wire (aluminum, titaniu and zirconium). Our highest level of deoxidizers make SuperArc L-52 MIG w and outstanding performer when your application calls for welding with CO_2 gas, or on mild steels that are dirty, rusty, scaled. SuperArc L-52's less-fluid puddle makes it a great MIG wire choice when welding out-of-position, or on small diameter pi where puddle control is essential.
SuperArc L-54	ER70S-4	SuperArc L-54 offers a mid-range level of deoxidizers (manganese and silicon) - significantly higher than SuperArc L-50, but below the levels of SuperArc L-56. Thus, SuperArc L-54 is a perfect choice when welding on metals with a low-to-medium presence of dirt, rust or mill sca SuperArc L-54 wire delivers enhanced wetting action, and an excellent bead profile.
SuperArc L-56 SuperGlide S6	ER70S-6	SuperArc L-56 and SuperGlide S6 wires offer a higher conte of deoxidizers (manganese and silicon) than our L-54 produc Choose these MIG wires when your welding applications involve metals with a medium-to-high presence of dirt, rust o mill scale. SuperArc L-56 and SuperGlide S6 are excellent choices whe spatter-control is important. These wires also produce a more fluid puddle and an excellen bead profile.

bead profile.

LOW ALLOY WIRE

SuperArc LA-75	ER80S-Ni1	Lincoln SuperArc LA-75 is a copper coated MIG wire containing 1% nickel This wire is a steady performer for welding weathering steel on bridges an buildings, or on cryogenic vessels or chillers.
SuperArc LA-90	"ER80S-D2 and ER90S-D2. Also meets ER90S-G."	SuperArc LA-90 is a low carbon, high manganese, high silicon, .5% molybdenum wire. This quality produc is an excellent choice for applications where tensiles are in excess of 80-90,0 psi, or when strength after stress relief crucial. Typical applications include hi temperature service piping and blower cranes, construction equipment and power plants.
SuperArc LA-100	ER100S-G and also meets ER110S-G and MIL-100S01.	SuperArc LA-100 produces deposits with a minimum 82,000 psi yield strength when welded at high heat inpu This low alloy wire is designed for optimum performance on HY-80 and steels, military ships and submarines.

12.19 Electric Arc Welding

NOTE: Because of the many Source Classification Codes (SCCs) associated with electric arc welding, the text of this Section will give only the first 3 of the 4 SCC number fields. The last field of each applicable SCC will be found in Tables 12.19-1 and 12.19-2 below.

12.19.1 Process Description[1-2]

Welding is the process by which 2 metal parts are joined by melting the parts at the points of contact and simultaneously forming a connection with molten metal from these same parts or from a consumable electrode. In welding, the most frequently used methods for generating heat employ either an electric arc or a gas-oxygen flame.

There are more than 80 different types of welding operations in commercial use. These operations include not only arc and oxyfuel welding, but also brazing, soldering, thermal cutting, and gauging operations. Figure 12.19-1 is a diagram of the major types of welding and related processes, showing their relationship to one another.

Of the various processes illustrated in Figure 12.19-1, electric arc welding is by far the most often found. It is also the process that has the greatest emission potential. Although the national distribution of arc welding processes by frequency of use is not now known, the percentage of electrodes consumed in 1991, by process type, was as follows:

Shielded metal arc welding (SMAW) - 45 percent
Gas metal arc welding (GMAW) - 34 percent
Flux cored arc welding (FCAW) - 17 percent
Submerged arc welding (SAW) - 4 percent

12.19.1.1 Shielded Metal Arc Welding (SMAW)[3] -

SMAW uses heat produced by an electric arc to melt a covered electrode and the welding joint at the base metal. During operation, the rod core both conducts electric current to produce the arc and provides filler metal for the joint. The core of the covered electrode consists of either a solid metal rod of drawn or cast material or a solid metal rod fabricated by encasing metal powders in a metallic sheath. The electrode covering provides stability to the arc and protects the molten metal by creating shielding gases by vaporization of the cover.

12.19.1.2 Gas Metal Arc Welding (GMAW)[3] -

GMAW is a consumable electrode welding process that produces an arc between the pool of weld and a continuously supplied filler metal. An externally supplied gas is used to shield the arc.

12.19.1.3 Flux Cored Arc Welding (FCAW)[3] -

FCAW is a consumable electrode welding process that uses the heat generated by an arc between the continuous filler metal electrode and the weld pool to bond the metals. Shielding gas is provided from flux contained in the tubular electrode. This flux cored electrode consists of a metal sheath surrounding a core of various powdered materials. During the welding process, the electrode core material produces a slag cover on the face of the weld bead. The welding pool can be protected from the atmosphere either by self-shielded vaporization of the flux core or with a separately supplied shielding gas.

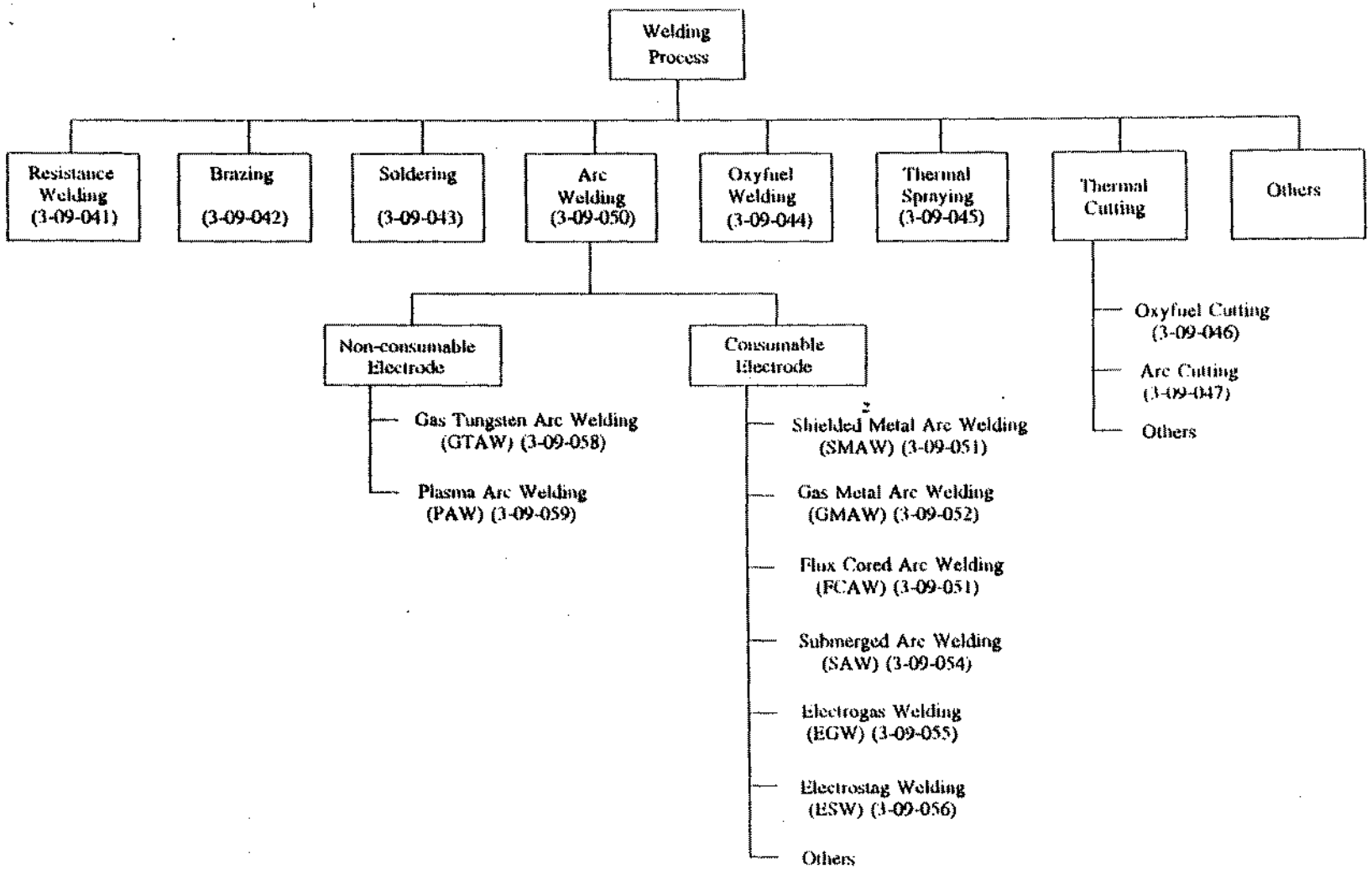

Figure 12.19-1. Welding and allied processes. (Source Classification Codes in parentheses.)

12.19.1.4 Submerged Arc Welding (SAW)[4] -

SAW produces an arc between a bare metal electrode and the work contained in a blanket of granular fusible flux. The flux submerges the arc and welding pool. The electrode generally serves as the filler material. The quality of the weld depends on the handling and care of the flux. The SAW process is limited to the downward and horizontal positions, but it has an extremely low fume formation rate.

12.19.2 Emissions And Controls[4-8]

12.19.2.1 Emissions -

Particulate matter and particulate-phase hazardous air pollutants are the major concerns in the welding processes. Only electric arc welding generates these pollutants in substantial quantities. The lower operating temperatures of the other welding processes cause fewer fumes to be released. Most of the particulate matter produced by welding is submicron in size and, as such, is considered to be all PM-10 (i. e., particles ≤ 10 micrometers in aerodynamic diameter).

The elemental composition of the fume varies with the electrode type and with the workpiece composition. Hazardous metals designated in the 1990 Clean Air Act Amendments that have been recorded in welding fume include manganese (Mg), nickel (Ni), chromium (Cr), cobalt (Co), and lead (Pb).

Gas phase pollutants are also generated during welding operations, but little information is available on these pollutants. Known gaseous pollutants (including "greenhouse" gases) include carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides (NO_x), and ozone (O_3).

Table 12.19-1 presents PM-10 emission factors from SMAW, GMAW, FCAW, and SAW processes, for commonly used electrode types. Table 12.19-2 presents similar factors for hazardous metal emissions. Actual emissions will depend not only on the process and the electrode type, but also on the base metal material, voltage, current, arc length, shielding gas, travel speed, and welding electrode angle.

12.19.2.2 Controls -

The best way to control welding fumes is to choose the proper process and operating variables for the given task. Also, capture and collection systems may be used to contain the fume at the source and to remove the fume with a collector. Capture systems may be welding booths, hoods, torch fume extractors, flexible ducts, and portable ducts. Collection systems may be high efficiency filters, electrostatic precipitators, particulate scrubbers, and activated carbon filters.

Table 12.19-2 (cont.).

Welding Process	Electrode Type (With Last 2 Digits Of SCC)		HAP Emission Factor (10^{-1} g/kg [10^{-1} lb/10^3 lb] Of Electrode Consumed)[b]						EMISSION FACTOR RATING
			Cr	Cr(VI)	Co	Mn	Ni	Pb	
FCAW[f,g] (SCC 3-09-053)	E110	(-06)[y]	0.02	ND	ND	20.2	1.12	ND	D
	E11018	(-08)[z]	9.69	ND	ND	7.04	1.02	ND	C
	E308	(-12)	ND	ND	ND	ND	ND	ND	ND
	E316	(-20)[aa]	9.70	1.40	ND	5.90	0.93	ND	B
	E70T	(-54)[bb]	0.04	ND	ND	8.91	0.05	ND	B
	E71T	(-55)[cc]	0.02	ND	< 0.01	6.62	0.04	ND	B
SAW[h] (SCC 3-09-054)	EM12K	(-10)	ND	ND	ND	ND	ND	ND	ND

[a] References 7-18. SMAW = shielded metal arc welding; GMAW = gas metal arc welding; FCAW = flux cored arc welding; SAW = submerged arc welding. SCC = Source Classification Code. ND = no data.

[b] Mass of pollutant emitted per unit mass of electrode consumed. Cr = chromium. Cr(VI) = chromium +6 valence state. Co = cobalt. Mn = manganese. Ni = nickel. Pb = lead. All HAP emissions are in the PM-10 size range (particles ≤ 10 μm in aerodynamic diameter).

[c] Current = 102 to 225 A; voltage = 21 to 34 V.

[d] Current = 275 to 460 A; voltage = 19 to 32 V.

[e] Type of shielding gas employed will influence emission factors.

[f] Current = 160 to 275 A; voltage = 22 to 34 V.

[g] Current = 450 to 550 A; voltage = 31 to 32 V.

[h] Includes E11018-M

[j] Includes E308-16 and E308L-15

[k] Includes E310-15

[m] Includes E316-15, E316-16, and E316L-16

[n] Includes E410-16

[p] Includes 8018C3

[q] Includes 9018B3

[r] Includes ENiCrMo-3 and ENiCrMo-4

[s] Includes ENi-Cu-2

[t] Includes E308LSi

[u] Includes E70S-3, E70S-5, and E70S-6

[v] Includes ER316I-Si

[w] Includes ERNiCrMo-3 and ERNiCrMo-4

[x] Includes ERNiCu-7

[y] Includes E110TS-K3

[z] Includes E11018-M

[aa] Includes E316LT-3

[bb] Includes E70T-1, E70T-2, E70T-4, E70T-5, E70T-7, and E70T-G

[cc] Includes E71T-1 and E71T-11

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13. R. K. Tandon, *et al.*, "Chemical Investigation Of Some Electric Arc Welding Fumes And Their Potential Health Effects", *Australian Welding Research, 13*:55-60, December 1984.

14. R. K. Tandon, *et al.*, "Fume Generation And Melting Rates Of Shielded Metal Arc Welding Electrodes", *Welding Journal, 63*(8):263s-266s, August 1984.

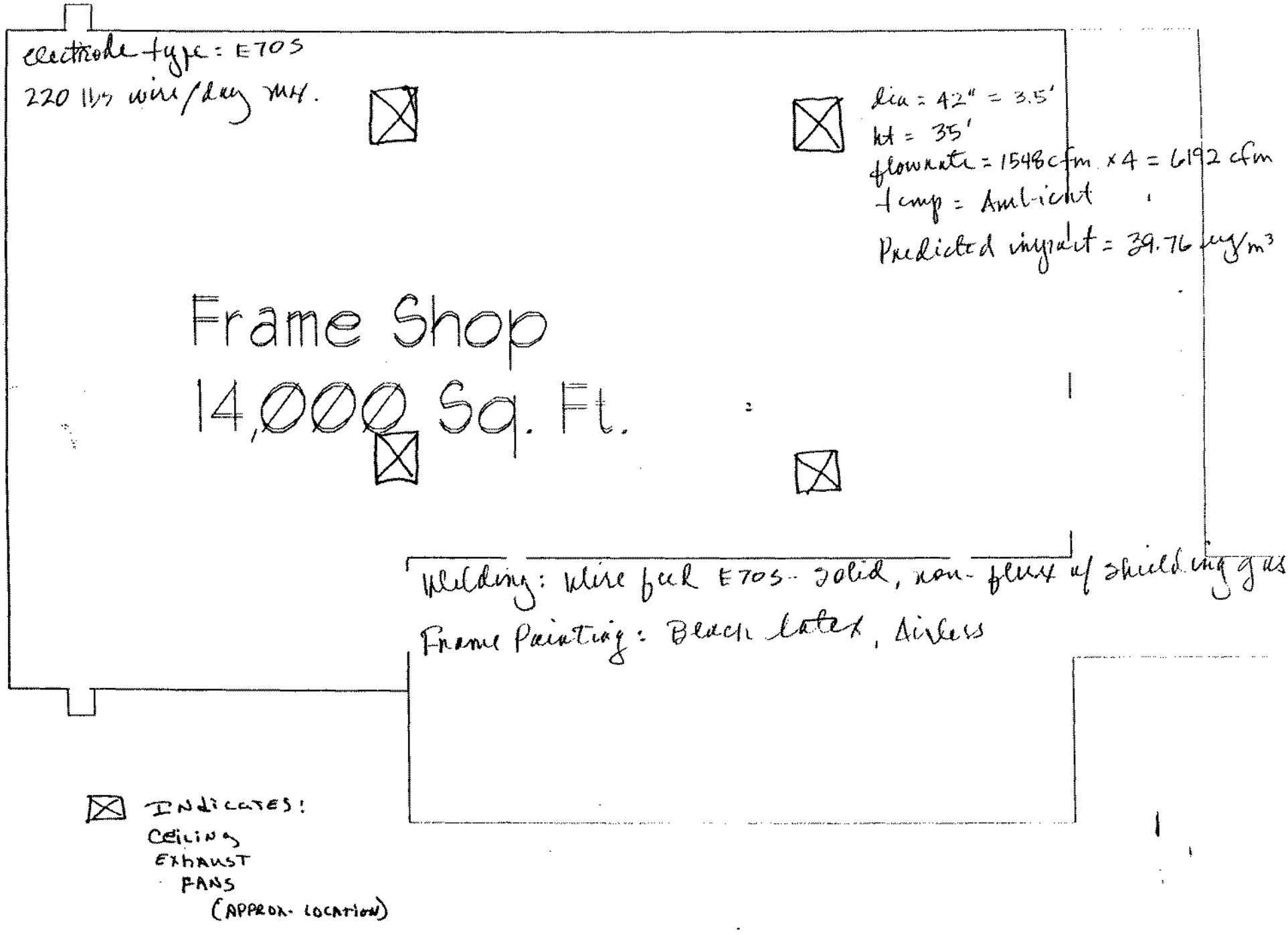
electrode type: E70S
220 lb/hr wire/day MH.
dia = 42" = 3.5'
ht = 35'
flowrate = 1548 cfm x 4 = 6192 cfm
temp = Ambient
Predicted impact = 39.76 µg/m³
Frame Shop
14,000 Sq. Ft.
Welding: wire feed E70S - solid, non-flux w/ shielding gas
Frame Painting: Beach Latex, Airless
INDICATES:
CEILING
EXHAUST
FANS
(APPROX. LOCATION)

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Table 12.19-1 (Metric And English Units). PM-10 EMISSION FACTORS FOR WELDING OPERATIONS[a]

Welding Process	Electrode Type (With Last 2 Digits Of SCC)		Total Fume Emission Factor (g/kg [lb/10^3 lb] Of Electrode Consumed)[b]	EMISSION FACTOR RATING
SMAW[c] (SCC 3-09-051)	14Mn-4Cr	(-04)	81.6	C
	E11018	(-08)[h]	16.4	C
	E308	(-12)[j]	10.8	C
	E310	(-16)[k]	15.1	C
	E316	(-20)[m]	10.0	C
	E410	(-24)[n]	13.2	D
	E6010	(-28)	25.6	B
	E6011	(-32)	38.4	C
	E6012	(-36)	8.0	D
	E6013	(-40)	19.7	B
	E7018	(-44)	18.4	C
	E7024	(-48)	9.2	C
	E7028	(-52)	18.0	C
	E8018	(-56)[p]	17.1	C
	E9015	(-60)[q]	17.0	D
	E9018	(-64)[r]	16.9	C
	ECoCr	(-68)[s]	27.9	C
	ENi-Cl	(-72)	18.2	C
	ENiCrMo	(-76)[t]	11.7	C
	ENi-Cu	(-80)[u]	10.1	C
GMAW[d,e] (SCC 3-09-052)	E308L	(-12)[v]	5.4	C
	E70S	(-54)[w]	5.2	A
	ER1260	(-10)	20.5	D
	ER5154	(-26)	24.1	D
	ER316	(-20)[x]	3.2	C
	ERNiCrMo	(-76)[y]	3.9	C
	ERNiCu	(-80)[z]	2.0	C

Table 12.19-1 (cont.).

Welding Process	Electrode Type (With Last 2 Digits Of SCC)		Total Fume Emission Factor (g/kg [lb/10^3 lb] Of Electrode Consumed)[b]	EMISSION FACTOR RATING
FCAW[f,g] (SCC 3-09-053)	E110	(-06)[aa]	20.8	D
	E11018	(-08)	57.0	D
	E308LT	(-12)[bb]	9.1	C
	E316LT	(-20)[cc]	8.5	B
	E70T	(-54)[dd]	15.1	B
	E71T	(-55)[ee]	12.2	B
SAW[g] (SCC 3-09-054)	EM12K	(-10)[ff]	0.05	C

[a] References 7-18. SMAW = shielded metal arc welding; GMAW = gas metal arc welding; FCAW = flux cored arc welding; SAW = submerged arc welding. SCC = Source Classification Code.

[b] Mass of pollutant emitted per unit mass of electrode consumed. All welding fume is considered to be PM-10 (particles ≤ 10 μm in aerodynamic diameter).

[c] Current = 102 to 229 A; voltage = 21 to 34 V.

[d] Current = 160 to 275 A; voltage = 20 to 32 V.

[e] Current = 275 to 460 A; voltage = 19 to 32 V.

[f] Current = 450 to 550 A; voltage = 31 to 32 V.

[g] Type of shielding gas employed will influence emission factor.

[h] Includes E11018-M

[j] Includes E308-16 and E308L-15

[k] Includes E310-16

[m] Includes E316-15, E316-16, and E316L-16

[n] Includes E410-16

[p] Includes E8018C3

[q] Includes E9015B3

[r] Includes E9018B3 and E9018G

[s] Includes ECoCr-A

[t] Includes ENiCrMo-4

[u] Includes ENi-Cu-2

[v] Includes E308LSi

[w] Includes E70S-3, E70S-5, and E70S-6

[x] Includes ER316I-Si and ER316L-Si

[y] Includes ENiCrMo-3 and ENi-CrMo-4

[z] Includes ERNiCu-7

[aa] Includes E110TS-K3

[bb] Includes E308LT-3

[cc] Includes E316LT-3

[dd] Includes E70T-1, E70T-2, E70T-4, E70T-5, E70T-7, and E70T-G

[ee] Includes E71T-1 and E71T-11

[ff] Includes EM12K1 and F72-EM12K2

Table 12.19-2. HAZARDOUS AIR POLLUTANT (HAP) EMISSION FACTORS FOR WELDING OPERATIONS[a]

Welding Process	Electrode Type (With Last 2 Digits Of SCC)		HAP Emission Factor (10^{-1} g/kg [10^{-1}/10^{3} lb] Of Electrode Consumed)[b]						EMISSION FACTOR RATING
			Cr	Cr(VI)	Co	Mn	Ni	Pb	
SMAW[c] (SCC 3-09-051)	14Mn-4Cr	(-04)	13.9	ND	ND	232	17.1	ND	C
	E11018	(-08)[h]	ND	ND	ND	13.8	ND	ND	C
	E308	(-12)[j]	3.93	3.59	0.01	2.52	0.43	ND	D
	E310	(-16)[k]	25.3	18.8	ND	22.0	1.96	0.24	C
	E316	(-20)[m]	5.22	3.32	ND	5.44	0.55	ND	D
	E410	(-24)[n]	ND	ND	ND	6.85	0.14	ND	C
	E6010	(-28)	0.03	0.01	ND	9.91	0.04	ND	B
	E6011	(-32)	0.05	ND	0.01	9.98	0.05	ND	C
	E6012	(-36)	ND	ND	ND	ND	ND	ND	ND
	E6013	(-40)	0.04	ND	< 0.01	9.45	0.02	ND	B
	E7018	(-44)	0.06	ND	< 0.01	10.3	0.02	ND	C
	E7024	(-48)	0.01	ND	ND	6.29	ND	ND	C
	E7028	(-52)	0.13	ND	ND	8.4612	ND	1.62	C
	E8018	(-56)[p]	0.17	ND	ND	0.3	0.51	ND	C
	E9016	(-60)	ND	ND	ND	ND	ND	ND	ND
	E9018	(-64)[q]	2.12	ND	ND	7.83	0.13	ND	C
	ECoCr	(-68)	ND	ND	ND	ND	ND	ND	ND
	ENi-Cl	(-72)	ND	ND	ND	0.39	8.90	ND	C
	ENiCrMo	(-76)[r]	4.20	ND	ND	0.43	2.47	ND	C
	ENi-Cu-2	(-80)[s]	ND	ND	ND	2.12	4.23	ND	C
GMAW[d,e] (SCC 3-09-052)	E308	(-12)[t]	5.24	ND	< 0.01	3.46	1.84	ND	C
	E70S	(-54)[u]	0.01	ND	< 0.01	3.18	0.01	ND	A
	ER1260	(-10)	0.04	ND	ND	ND	ND	ND	D
	ER5154	(-26)	0.10	ND	ND	0.34	ND	ND	D
	ER316	(-20)[v]	5.28	0.10	ND	2.45	2.26	ND	D
	ERNiCrMo	(-76)[w]	3.53	ND	ND	0.70	12.5	ND	B
	ERNiCu	(-80)[x]	< 0.01	ND	ND	0.22	4.51	ND	C

FAX
REDMAN HOMES

TO: BILL ROGERS **FROM:** TOM SPURLING

FAX: (208) 373-0417 **DATE:** 5/12/00

PHONE: (208) 373-0437 **PAGES:** 4

RE: MSDS - Frame Paint **CC:**

☒ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

COMMENTS:

Bill, Here is the MSDS on the Frame Paint used in the Welding Bay.

Questions?

Please Call Tom Spurling @ 549-1410, EXT. 236

Thanks -

Tom Spurling

THE REYNOLDS COMPANY * Adhesives and Coatings

10 GATES STREET * P.O. BOX 1925 * GREENVILLE, S.C. 29602

PHONE (864) 232-6791 FAX (864) 242-6804

DATE: 5/12/2000

SPECIFICATIONS SHEET

PRODUCT NAME

1859 FRAME PAINT

PHYSICAL PROPERTIES

VISCOSITY @ 72°F (BROOKFIELD VISCOMETER): 600 - 800 cps. SPINDLE: 2 RPM: 20

BASE:	ACRYLIC LATEX
COLOR:	FLAT BLACK
NON-VOLATILE SOLIDS:	15.5 - 17.5% as pm
pH:	8.50 - 9.50 "
LBS. / GAL.:	8.90 +/- 0.20 LBS
CLEAN UP SOLVENT:	WATER WHILE WET
STORAGE LIFE:	3 MONTHS
CONTAINERS:	DRUMS OR TOTES
SPECIAL INSTRUCTIONS:	STORE AT ROOM TEMPERATURE. PROTECT FROM FREEZING.

Welding

B

SUGGESTED USE

SPRAY DIPPING OR BRUSH APPLICATION OF MOBILE HOME FRAMES.
MAKE SURE ALL STEEL IS FREE OF DIRT, WATER, RUST AND OIL.
FOR BEST RESULTS, USE A TIP WITH A 21 / 1000'S +/- ORIFICE. CHECK TIPS OCCASIONALLY FOR WEAR. REPLACE AND/OR CLEAN PERIODICALLY.
WHEN NOT IN USE, PAINT GUN SHOULD BE PLACED IN WATER TO PREVENT DRYING OUT OF FLUID ON TIPS.
MAKE SURE FRAME IS COMPLETELY DRY BEFORE PAINTING AND/OR EXPOSING TO INCLEMENT WEATHER; OTHERWISE PAINT MAY WASH OFF.
RECOMMENDED MINIMUM "ADD-ON" IS TWO (2) WET MILS.
DRYING TIMES ARE AFFECTED BY WEATHER CONDITIONS AND AIR MOVEMENT. GENERALLY YOU CAN EXPECT:
DRY TIME (TO TOUCH): 45 - 120 MINUTES COMPLETE CURE TIME: 24 HOURS MINIMUM

OTHER INFORMATION

THE VOLATILE ORGANIC CONTENT OF THIS PRODUCT IS 0.0%. IT CONTAINS NO HEAVY METALS.
THIS PRODUCT MEETS CALIFORNIA RULE 1107 AIR EMISSION STANDARD.
MEETS DEPT. OF HUD REGULATION 24 CFR 3280 FOR THE PROTECTIVE PAINT OF MOBILE HOME CONSTRUCTION.
FOR INFORMATION ON SAFETY AND HANDLING, REFER TO THE MATERIAL SAFETY DATA SHEET. PROTECT FROM FREEZING.

MATERIALS TO AVOID
OXIDIZING AGENTS; BORON COMPOUNDS

HAZARDOUS DECOMPOSITION
OXIDES OF CARBON AND SMOKE

HAZARDOUS POLYMERIZATION
WILL NOT OCCUR

PRECAUTIONS
AVOID EXTREME COLD

SECTION 6 - HEALTH HAZARD DATA

ROUTES OF ENTRY:	INGESTION?	INHALATION?	SKIN?
	YES	YES	YES

HEALTH HAZARDS
THE VOLATILE ORGANIC CONTENT (VOC) OF THIS PRODUCT IS ZERO. (0.0%)

THIS PRODUCT MEETS CALIFORNIA RULE 1107 AIR EMISSION STANDARDS.

CARCINOGENITY?
NO

OSHA REGULATED ?
NO

SIGNS AND SYMPTOMS OF EXPOSURE
SKIN: RASH OR IRRITATION. EYES: IRRITATION OR REDNESS. INHALATION: DIZZINESS OR NAUSEA.

EMERGENCY FIRST AID PROCEDURES
SKIN: WASH WITH SOAP AND WATER. EYES: FLUSH WITH WATER. INGESTION: INDUCE VOMITING. INHALATION: GET SOME FRESH AIR. SEE A DOCTOR IF SYMPTOMS PERSIST.

SECTION 7 - PRECAUTIONS IN SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
SWEEP UP AND PLACE IN CONTAINER FOR RECYCLE OR DISPOSAL.

WASTE DISPOSAL METHOD
CONSULT EXPERT TO COMPLY WITH LOCAL, STATE AND FEDERAL REGULATIONS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
STORE AND USE AT AMBIENT TEMPERATURE. PROTECT FROM FREEZING. FREE ACRYLIC ESTER MONOMER CONTENT IS AT A MAXIMUM CONCENTRATION OF 0.0%.

SECTION 8 - CONTROL MEASURES

RESPIRATORY PROTECTION
GENERALLY NOT NEEDED.

PROTECTIVE COVERING
RUBBER GLOVES; ALSO SAFETY GOGGLES WHEN SPLASH POTENTIAL EXISTS.

MATERIAL SAFETY DATA SHEET

IDENTITY
1858

CODE
MSDS #4

FOR CHEMICAL EMERGENCY
SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT
CALL CHEMTREC - DAY OR NIGHT
800-424-9300

HMIS RATING
1 HEALTH
0 FLAMMABILITY
0 REACTIVITY
B PERSONAL PROTECTION

SECTION 1

MANUFACTURER'S NAME
THE REYNOLDS COMPANY

ADDRESS
P.O. BOX 1925
10 GATES STREET
GREENVILLE, S.C.
29611

INFORMATION TELEPHONE #
(864) 232-6791

DATE PREPARED
5/12/2000

LAST REVISION DATE
9/7/99

SECTION 2 - HAZARDOUS INGREDIENTS/ IDENTITY INFORMATION

NONHAZARDOUS ACCORDING TO 29 CFR 1910.1200.
PRODUCT CONTAINS ONE OR MORE OF THE FOLLOWING AS MAJOR INGREDIENTS:
ACRYLIC EMULSION, INORGANIC PIGMENT

THE TOXIC CHEMICALS LISTED UNDER SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372 WHICH HAVE A CONCENTRATION LEVEL GREATER THAN THE "DE MINIMIS" LEVEL ARE:

NONE.

THIS PRODUCT CONTAINS NO HEAVY METALS.

SECTION 3 - PHYSICAL / CHEMICAL CHARACTERISTICS

VAPOR PRESSURE (WATER = 1)
1

DENSITY (LBS./GAL.)
8.9 LBS./GAL.

BOILING PT.
212 °F

EVAPORATION RATE (WATER = 1)
1

SOLUBILITY IN WATER
DISPERSIBLE IN ALL PROPORTIONS

FLAMMABLE LIMITS
N/A

APPEARANCE AND ODOR
BLACK EMULSION WITH VERY SLIGHT AMMONIA ODOR

LEL N/A
UEL N/A

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH PT. (METHOD USED)
NON-FLAMMABLE

SPECIAL FIRE FIGHTING PROCESSES
NONE.

FIRE AND EXPLOSION HAZARDS
WET PRODUCT WILL NOT BURN. DRIED FILMS WILL BURN, GIVING OFF OXIDES OF CARBON, WATER AND SMOKE.

EXTINGUISHING MEDIA
FOR DRY POLYMER USE WATER OR CARBON DIOXIDE

SECTION 5 - REACTIVITY DATA

STABILITY
STABLE

CONDITIONS TO AVOID
FREEZING OR BURNING MAY COAGULATE THE PRODUCT.

08/21

/00 -

11:32

:59

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

200072 - Redman Home Builders - Frame Shop

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	.126000
STACK HEIGHT (M)	=	10.6680
STK INSIDE DIAM (M)	=	1.0668
STK EXIT VELOCITY (M/S)	=	3.2694
STK GAS EXIT TEMP (K)	=	294.2611
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	.0000
MIN HORIZ BLDG DIM (M)	=	.0000
MAX HORIZ BLDG DIM (M)	=	.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .034 M**4/S**3; MOM. FLUX = 3.030 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
10.	.4951E-10	1	3.0	3.0	960.0	13.25	3.40	1.67	NO
100.	34.74	1	1.0	1.0	320.0	21.08	27.02	14.26	

NO								
200.	39.69	3	1.0	1.0	320.0	21.06	23.81	14.34
NO								
300.	34.03	4	1.5	1.5	480.0	17.58	22.70	12.25
NO								
400.	34.58	4	1.0	1.0	320.0	21.03	29.60	15.55
NO								
500.	33.28	5	1.0	1.0	10000.0	20.27	27.15	13.09
NO								
600.	32.65	5	1.0	1.0	10000.0	20.27	32.05	14.95
NO								
700.	35.23	6	1.0	1.0	10000.0	18.60	24.56	11.16
NO								
800.	35.75	6	1.0	1.0	10000.0	18.60	27.73	12.19
NO								
900.	35.15	6	1.0	1.0	10000.0	18.60	30.86	13.18
NO								
1000.	33.93	6	1.0	1.0	10000.0	18.60	33.96	14.14
NO								

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

207.	39.76	3	1.0	1.0	320.0	21.06	24.67	14.84
NO								

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** INVERSION BREAK-UP FUMIGATION CALC. ***
CONC (UG/M**3) = .0000
DIST TO MAX (M) = 100.00

DIST TO MAX IS < 2000. M. CONC SET = 0.0

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	39.76	207.	0.

APPENDIX C

Mill Baghouse Emission Estimates

Redman Home Builders
Weiser, Idaho

T200072
September 2000

T20007b – Redman Home Builders

Mill Emission Estimates: PM-10 Only

— RDS Dust System —

- Net amount of sawdust collected = 1,200 lb/wk.
- RDS Baghouse capture efficiency = 99.8% (PM-10)

$(1200\ lb/wk)(1\ wk/5\ day)(1\ day/24\text{-}hr) = 10\ lb/hr.$ ⇒ to baghouse

conservative

$(10\ lb/hr)(1 - 0.998) = 0.02\ lb\ PM\text{-}10/hr.$ ⇒ from baghouse to atm.

$(0.2\ lb/hr)(8760\ hr/yr)(1\ T/2000\ lb) = 0.09\ T/yr$ ⇒ Annual PM-10

Ambient Analysis: PM-10

SCREEN3 Max 1-hr conc = 49 $\mu g/m^3$ @ 1 lb/hr.

24-hr

$(0.02\ lb/hr)(49\ \mu g/m^3/lb.hr)(0.4) = 0.39\ \mu g/m^3$ 24-hr Ave.

Statewide 24-hr background = 86 $\mu g/m^3$

Total Impact = $(0.39 + 86)\ \mu g/m^3 = 86.39\ \mu g/m^3$

NAAQS = 150 $\mu g/m^3$

Annual

$(0.02\ lb/hr)(49\ \mu g/m^3/lb.hr)(0.08) = 0.08\ \mu g/m^3$ Annual Ave.

Statewide annual background = 32.7 $\mu g/m^3$

Total Impact = 32.15 $\mu g/m^3$

NAAQS = 50 $\mu g/m^3$

TOPS

-SCAMPER-N-GO SCALE

CERTIFIED CARDINAL SCALES

447 RIVERDOCK RD. WEISER, ID. 83672

PHONE: (208) 549-2615

Cash

DATE: 3-27-2002 P.O./TRIP# _____ ___CHG X CASH

WEIGHTS:	1st	2nd	FINAL	___INCOMING ___OUTGOING
LIGHT	7580			COMPANY Champion TRK#
STEERING				BILL TO Sawdust
TRACTOR				ADDRESS
DRIVERS				CITY STATE ZIP
GROSS	8,280			AMOUNT $
TRAILER				PAYMENT $
NET	700	Per Week 300 LB Approximate		BALANCE DUE $

DRIVER X ON OFF FOR Nearly Weeks -

MISC.

WEIGHED BY: T Bradley

DRIVER

ENCLOSURE # 1

7/26/00 1

1:07:03

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Redman Home Bld's., RDS Dust Collector

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	.126000
STACK HEIGHT (M)	=	8.8392
STK INSIDE DIAM (M)	=	.9144
STK EXIT VELOCITY (M/S)	=	4.6714
STK GAS EXIT TEMP (K)	=	293.1500
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	.0000
MIN HORIZ BLDG DIM (M)	=	.0000
MAX HORIZ BLDG DIM (M)	=	.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = 4.561 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
10.	.7113E-08	6	1.0	1.0	10000.0	16.50	2.24	2.21	NO

100.	35.33	2	1.5	1.5	480.0	17.38	19.42	10.8
8 NO								
200.	37.94	3	1.0	1.0	320.0	21.65	23.90	14.5
0 NO								
300.	41.89	5	1.0	1.0	10000.0	17.25	17.06	9.0
2 NO								
400.	48.63	5	1.0	1.0	10000.0	17.25	22.14	11.0
8 NO								
500.	47.23	5	1.0	1.0	10000.0	17.25	27.12	13.0
3 NO								
600.	47.56	6	1.0	1.0	10000.0	16.50	21.35	9.9
3 NO								
700.	48.98	6	1.0	1.0	10000.0	16.50	24.55	11.1
5 NO								
800.	47.43	6	1.0	1.0	10000.0	16.50	27.72	12.1
7 NO								
900.	45.01	6	1.0	1.0	10000.0	16.50	30.85	13.1
7 NO								
1000.	42.26	6	1.0	1.0	10000.0	16.50	33.95	14.1
2 NO								

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

697.	48.99	6	1.0	1.0	10000.0	16.50	24.49	11.1
2 NO								

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	48.99	697.	0.

RDS
...al Fabricators
...kwall Dust Systems

...Dust Systems dba RDS Metal Fabricators
...0 N. First Street
...rland, TX 75040
(972) 272-7310 972-272-7310
Fax (972) 272-6341 Fed ID# 75-2323134

ATTACHMENT A

Quotation

Quote Number: [illegible]

Quote Date: Jul 20, 1998

Page: 1

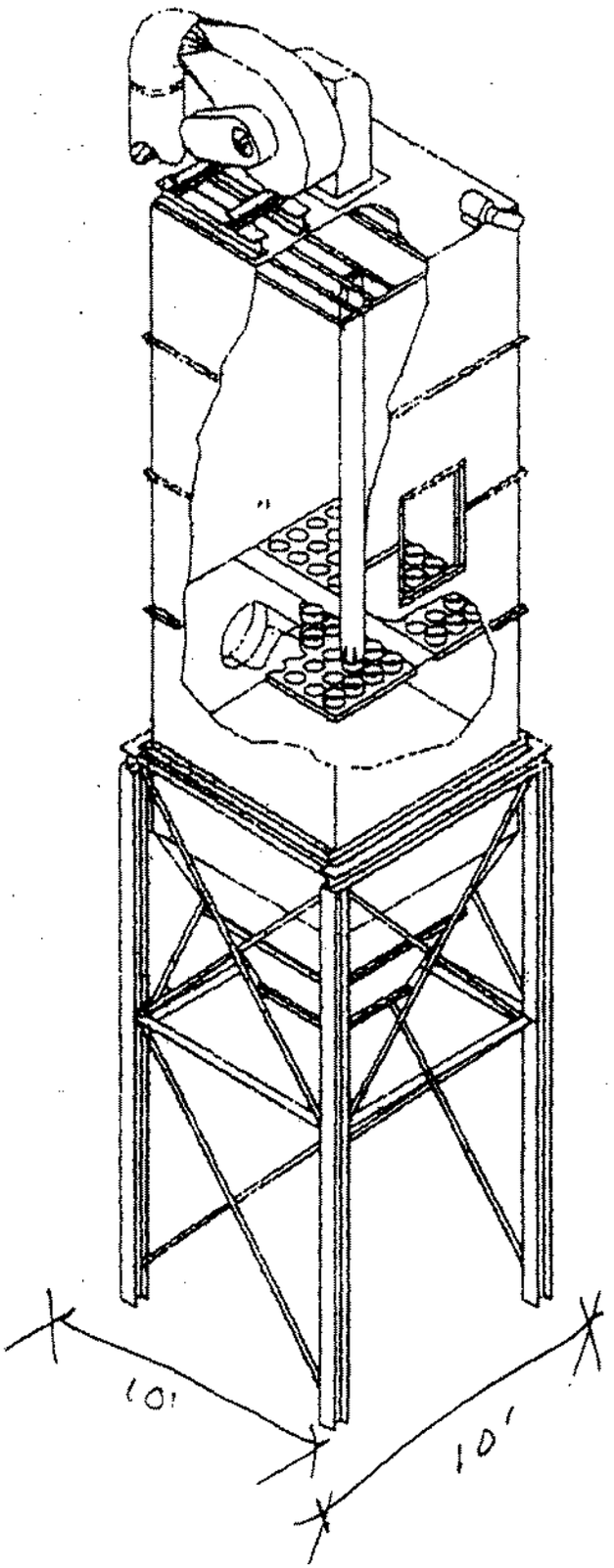
Quoted to: Champion Homes
P.O. Box
Weiser, ID 83672

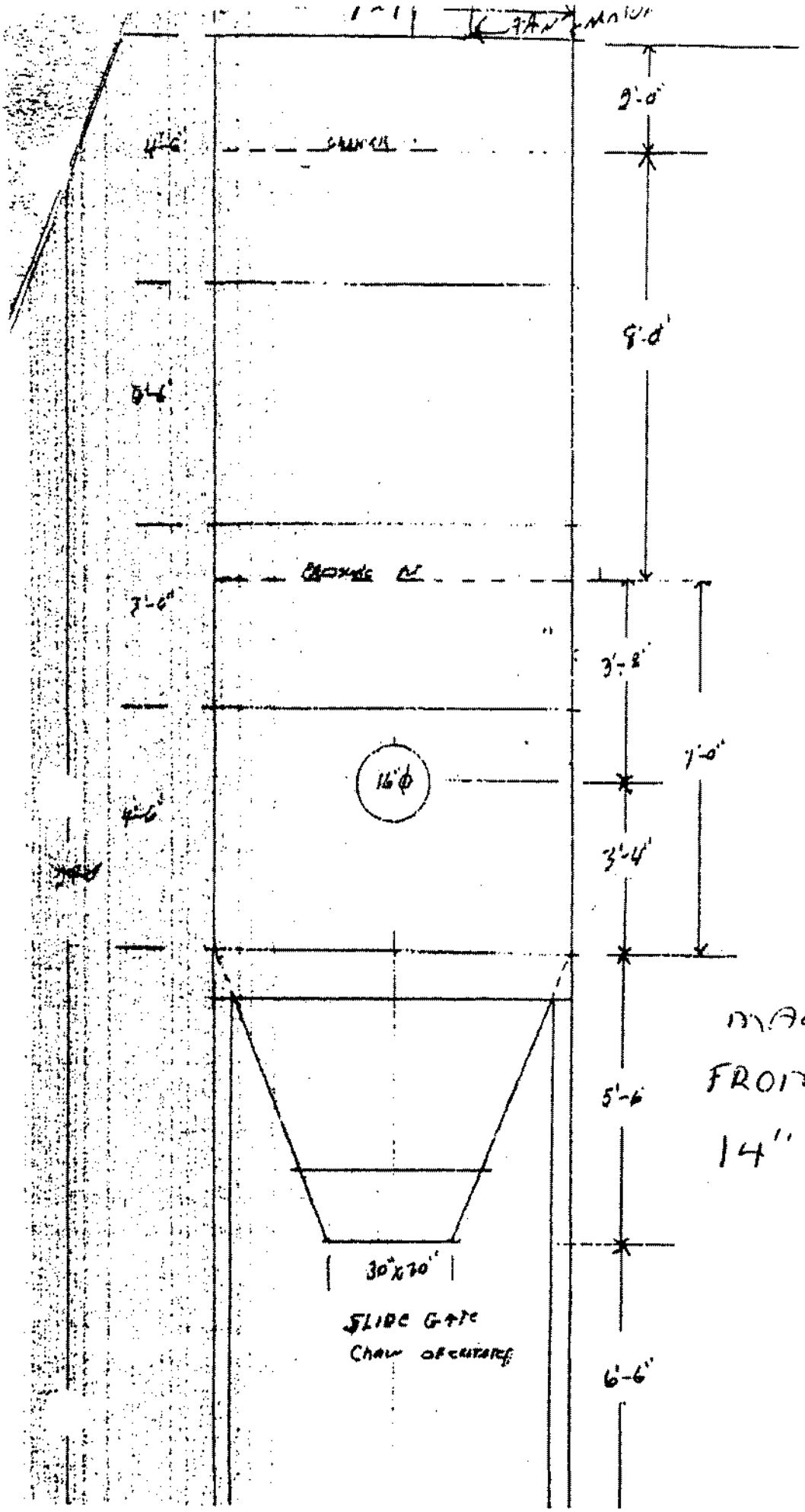
Phone: 208-549-1410
Fax: 208-549-0060

Dear Sylvester Koronka:

We are pleased to quote the following for your approval. We have included the items and work as you requested. Based on our understanding of your planned requirements, we believe RDS can provide what you need at a considerable savings. We will follow-up in the near future to answer any questions. Thank you.

Quantity	Description	Unit Price	Extension
	Re: Dust Collector		
	25 HP Dust Collector 6500 CFM 1080 Sq Ft, 10 Cubic Yard Hopper, Cloth Gate, and Explosion Doors.		18,000.00
	Installation		14,500.00
	Total:		32,500.00
	Price does not include: Electrical or Starter.		
	Price does not include sales tax if applicable.		
	Sincerely.		
	Bill Willard		


10'
10'



CHAMPION HEIGHTS

REACH APROX. 15'6"
FROM BUILDING
14" INLET PIPE

APPENDIX D

Cabinet Shop Baghouse Emission Estimates

Redman Home Builders
Weiser, Idaho

T200072
September 2000

T20072 – Redman Home Builders

Cut-out Shop Emission Estimates: PM-10 only

— Dustex dust system — Model 750

- Max amount of sawdust collected = 720 lb/mo.
- 1 mo = 480 hr (5 days/wk)(4 wk/mo)(24 hr/day)
  ⇐ conservative
- Dust system collection η = 98%

$(720\ lb/mo)(1\ mo/480\ hr) = 1.5\ lb/hr$ ⇒ to dust collector

$(1.5\ lb/hr)(1-0.98) = 0.03\ lb/hr$ ⇒ from dust collector to atm.

$(0.03\ lb/hr)(8760\ hr/yr)(1\ T/2000\ lb) = 0.13\ T/yr$ Annual PM-10

Emissions are vented into the interior of the Manufacturing Plant. The SCREEN3 max 1-hr conc from the Manufacturing Plant is 26.68 µg/m³ @ 1 lb/hr. Assuming all the emissions are vented to the atmosphere, the predicted impacts are:

$(0.03\ lb/hr)(26.68\ \mu g/m^3)(0.4) = 0.32\ \mu g/m^3$ 24-hr Ave

$(0.03\ lb/hr)(26.68\ \mu g/m^3)(0.08) = 0.06\ \mu g/m^3$ Annual Ave.

TOPS

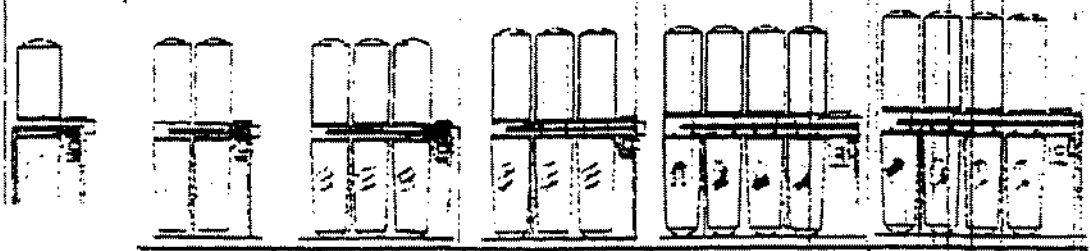
ATTACHMENT B

DUSTEK

Dustek is a Division of
Boshco, Inc.

42 Manning Road • Billerica, MA 01821
Tel (508) 667-1911 • Fax (508) 671-0011
978 978

To provide greatest flexibility and versatility, DUSTEK Internal Return Dust Collection Systems are available in SIX Models. Please see specifications below:



		500	750	1000	1500	2000
Horsepower		5	7.5	10	15	20
Phase		1 & 3	3	3	3	3
Inlet Diameter	7"	10"	12"	12"	14"	14"
Storage Cubic Ft.	15	30	45	45	80	60
Filter Area Sq. Ft.	25	50	75	100	132	180
Width/Height/ Depth	24"/112"/46"	24"/114"/72¼"	24"/118"/96¾"	24"/133"/96¾"	32"/137"/130"	32"/168"/130"
Distance of Inlet to Floor	69½"	71½"	73¼"	73¼"	81"	87"
Filtration & Collection Bag	1	2	3	3	4	4
Weight	190 lb.	450 lb.	530 lb.	800 lb.	750 lb.	1,000 lb.
Approximate Air Volume CFM	1,000	2,000	3,000	4,000	5,500	7,000

DUSTEK is a trademark of Boshco, Inc.

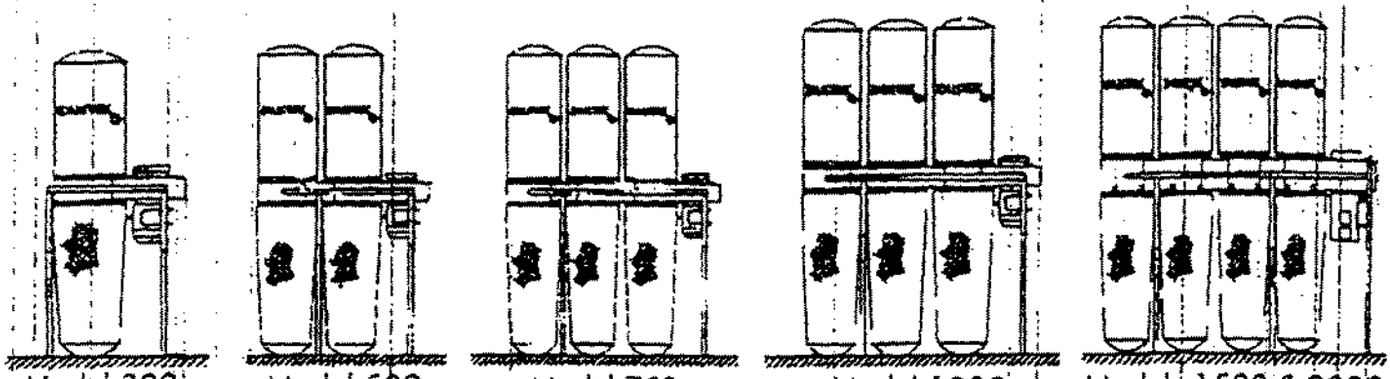
a division of
OSHCO, INC.
72 Manning Road
Billerica, MA 01821

DUSTEK

Dust Collection Systems

1998 Price Sheet

(978) 667-1911/TEL
(978) 671-0011/FAX
(800) 442-4430



Model 300 | Model 500 | Model 750 | Model 1000 | Models 1500 & 2000

3 Phase Motor

Model	300	500	750	1000	1500	2000
Horse Power	3	5	7.5	10	15	20
Price	1,650.00	2,400.00	2,300.00	3,300.00	4,500.00	5,900.00

Optional 1 Phase Motor

Price	1,950.00	2,700.00	3,100.00

2 @ 2700.00 = 5400.00
1 @ 2520.00 = STARTER AND BAGS

Ordered 8/25/98

BEN STUART

TOTAL $ 5020.00

Replacement Parts List

Straps:

Quick Release	$36.00 ea.
Clamp Type	$30.00 ea.

Bags:

Plastic collection bags - 6 mil (roll of 50)	$100.00
Polyester collection bag - reusable	$140.00 ea.
Filter bags 48" - Models 300/500	$ 80.00 ea.
Filter bags 60" - Models 750/1000/1500	$ 99.00 ea.
Filter bags 96" - Model 2000	$125.00 ea.

Impellers:

Models 300/500	$350.00
Models 750/1000	$450.00
Models 1500/2000	$550.00

Miscellaneous:

T-bolts and nuts	$ 6.00 per set
Rubber barrel gaskets	$10.00 ea
Shaft gaskets (donuts)	$ 8.00 ea
Magnetic Clips	$ 2.50 ea
Replacement Rods	$60.00 per set

Magnetic Controls with Push Button - 230/460 Volts

Models 300/500/750	$250.00
Model 1000	$350.00
Model 1500/2000	$450.00

Dustek Ultra-Flo Poly Spun Filter Cartridge

(Very Fine Dust Only)

26"	$350.00 -for models 300 & 500
36"	$450.00 -for models 750 & 1000

Each Dustek self-contained dust collection system is supplied with the appropriate number of :

- Cloth Filter Bags
- Clear Plastic Collection Bags
- Quick release straps for collection bags
- Clamp type straps for filter bags
- Operation Manual
- All Models Connected For 3 phase, 230/460 volt TEFC motors (1 phase special order for Models 300/500/750)

All prices and specifications subject to change without notice.

TOTAL P.05

8/21/00 1

1:37:18
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

200072 - Redman Home Builders - Manufacturing Plant

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	.126000
STACK HEIGHT (M)	=	10.6680
STK INSIDE DIAM (M)	=	1.0668
STK EXIT VELOCITY (M/S)	=	6.5388
STK GAS EXIT TEMP (K)	=	294.2611
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	.0000
MIN HORIZ BLDG DIM (M)	=	.0000
MAX HORIZ BLDG DIM (M)	=	.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .069 M**4/S**3; MOM. FLUX = 12.119 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
10.	.9746E-07	5	1.0	1.0	10000.0	22.76	3.30	3.26	NO

100.	17.37	1	2.0	2.0	640.0	21.08	27.02	14.2
6 NO								
200.	19.84	3	2.0	2.0	640.0	21.06	23.81	14.3
4 NO								
300.	18.43	3	1.5	1.5	480.0	24.53	34.52	20.7
1 NO								
400.	20.76	5	1.0	1.0	10000.0	22.76	22.28	11.3
5 NO								
500.	24.88	5	1.0	1.0	10000.0	22.76	27.24	13.2
6 NO								
600.	25.95	5	1.0	1.0	10000.0	22.76	32.12	15.1
0 NO								
700.	25.32	5	1.0	1.0	10000.0	22.76	36.93	16.8
7 NO								
800.	25.98	6	1.0	1.0	10000.0	21.16	27.80	12.3
5 NO								
900.	26.63	6	1.0	1.0	10000.0	21.16	30.92	13.3
2 NO								
1000.	26.57	6	1.0	1.0	10000.0	21.16	34.02	14.2
7 NO								

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

938.	26.68	6	1.0	1.0	10000.0	21.16	32.13	13.7
0 NO								

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** INVERSION BREAK-UP FUMIGATION CALC. ***
CONC (UG/M**3) = .0000
DIST TO MAX (M) = 97.21

DIST TO MAX IS < 2000. M. CONC SET = 0.0

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	26.68	938.	0.