YAKIMA REGIONAL CLEAN AIR AGENCY

186 Iron Horse Court, Suite 101. Yakima, WA. 98901
Phone: (509) 834-2050 Fax: (509) 834-2060
Website: http://www.yakimacleanair.org

RECEIVED
JUN 15 2026
By MARC T.

Filing Fee: $400.00*

***Pursuant to WAC 173-400-111(1) (e)-an application is not complete until the permit application filling fee required by YRCAA has been paid.**

OFFICAL USE ONLY

YRCAA NSR No: NSRP-09-AMI-26 Date Fee Paid: JUNE 15, 2026
CHK 111614

Received by: MARC THORNSBURY Filing Fee: **$400.00**

☐ YRCAA is the lead agency for the SEPA process. Processing Fee $400.00

Review of the application will not begin, until the application filling fee is paid. A surcharge fee for the time required for preparing and processing the application for approval will be invoiced after the permit to operate is issued.

New Source Review (NSR) Application General

Stationary/Permanent Source

INSTALLATION OR ESTABLISHMENT OF NEW AIR CONTAMINANT SOURCES

NSR Application is Required for Construction, Installation or Establishment of an Air Pollution Source
Or
Replacement or Substantial Alteration of Emission Control Technology on an Air Pollution Source or Equipment

I. General Information:

BUSINESS NAME Adventurer Manufacturing Inc.

NATURE OF BUSINESS Recreational Vehicle (RV) Manufacturing

MAILING ADDRESS 3303 W. Washington Ave, Yakima, WA 98903

FACILITY ADDRESS (if different): 1503 W Rose St, Union Gap, WA 98903

PHONE and FAX NUMBERS (509) 895-7064 Email: claus.s@amlrv.com

TYPE OF PROCESS, EQUIPMENT, OR APPARATUS Updating material usage for facility.

LIST OF AIR CONTAMINANT(S) WHICH WILL BE PRODUCED AND/OR CONTROLLED

Volatile Organic Compounds (VOCs), Particulate Matter (PM), Toxic Air Pollutants (TAPs)

ESTIMATED STARTING DATE: Facility already existing

ESTIMATED COMPLETION DATE: Facility already existing

Yakima Regional Clean Air Agency
INSTRUCTIONS FOR PERMIT APPLICATION

Use this sheet as a checklist to determine when your application is substantially complete.

☞ Each PERMIT APPLICATION for the construction, installation or establishment of a new air contaminant source, or modification of existing air pollution source or control equipment or permit, needs to be accompanied by the following information to be considered complete:

Included	N/A	
Attachment #1 ☒	☐	Process flow sheets and equipment layout diagrams.
Attachment #5 ☒	☐	Control equipment manufacturer, model number, size, serial numbers (for each piece of control equipment).
Attachment #2 ☒	☐	Quantify average and maximum hourly throughput values, average yearly totals, and maximum concentrations for each pollutant.
Attachment #2 ☒	☐	Applicant's calculation of the kinds and amounts of emissions for each emission point, materials handling operation or fugitive category (both controlled and uncontrolled).
Attachment #1 ☒	☐	Plot plan including identification of proposed emission points to the atmosphere, distance to property boundaries, height of buildings and stack height above ground level.
Attachment #6 ☒	☐	Identification of raw materials and/or product specifications (physical and chemical properties) and typical ranges of operating conditions as related to each emission point (toxic air contaminants require a separate summary); Material Safety Data Sheets (MSDS) should be included in the PERMIT APPLICATION for all compounds used.
Attachment #1 & #5 ☒	☐	Identification of the methods/equipment proposed for prevention/control of emissions to the atmosphere.
Attachment #3 ☒	☐	Information sufficient to demonstrate the ability of the emission controls proposed as being consistent with those provided in the applicable regulations (BACT/NSPS/RACT/NESHAPS/LAER analysis). See attached worksheet for typical layout of BACT analysis information.
☐	☒	The kinds and amounts of emission offset credits proposed for assignment when operations are within a non-attainment boundary (see WAC 173-400-120 and 131).
☐	☒	Estimates of the proposed project ambient impact under average and least favorable conditions where pertinent to PSD (WAC 173-400-720) or Toxic Air Pollutants (WAC 173-460) requirements.
☐	☒	Additional information, evidence, or documentation as required by the Board of Directors, or the Control Officer, to show that the proposed project will meet federal, state and local air pollution control regulations.
☐	☒	For applications that include equipment that has previously been approved, authorized or registered, a lapse is considered to have occurred if the registration fees are delinquent for more than one calendar year or the source has not operated within five years prior to the receipt of any required PERMIT APPLICATION (WAC 173-400-110).
☐	☒	Applications that include previously approved or authorized equipment require that additional information regarding previous owners or approvals be provided so that YRCAA records can be updated. Equipment registered and/or approved for a given company cannot be authorized without a legal name change, purchase of company or equipment, or a legal contract or subcontract to do business with or for the approved source. Responsibility for operation of authorized equipment rests with the registered source.
Attachment #4 ☒	☐	All applications need to be accompanied with a completed SEPA checklist or SEPA determination. YRCAA may process the SEPA determination, if no other agency has done it. In this case a SEPA checklist with the proper fees must be submitted with the NSR application.

☞ The application transmittal shall conform to YRCAA review requirements wherever possible as detailed in the General Regulations for Air Pollution Sources (WAC 173-400).

☞ Each drawing, document, or other form of transmittal considered by the applicant to be proprietary and confidential must be suitably identified as confidential in red ink, and signed and dated by the applicant or its agent. Be aware that YRCAA follows the requirements in 40 CFR 2 for determination of confidentiality. YRCAA may not process company sensitive information as confidential.

☞ Orders of Approval (to construct, modify, or install) are issued for specific equipment or processes described in the application. Changes to the processes or control equipment are not allowed without new source review (Permit Application and Permit) if these changes result in an emission of a different type or an increase in emissions (WAC 173-400-110). Process equipment changes that result in decreased emissions require notification to YRCAA.

☞ The SIC code is identified as the four digit major group classification in the 1987 Standard Industrial Code Classification Manual listing of SIC codes can be obtained for free from the internet.

☞ Mail or deliver in person the completed application package to:

Yakima Regional Clean Air Agency
186 Iron Horse Court, Suite 101
Yakima, WA 98901-2303

☞ **Application fees must accompany application for the application to be considered complete. An invoice will be sent out for the Engineering review after final decision on the application. Make checks payable to "Yakima Regional Clean Air Agency" or "YRCAA".**

☞ **The PERMIT APPLICATION package submitted must be complete. All applications are screened for completeness before processing. Applicants submitting incomplete application packages will be notified of their incomplete status and may result in a delay in processing the application.**

Compliance with SEPA (State Environmental Policy Act) - Check One of the Options Below:

☒ A DNS or EIS has been Issued by Another Agency for this Project and a Copy is Attached.

☐ If no DNS or EIS Exists for this Project, a Completed Checklist for this Project and the SEPA Processing Fee are Attached. *YRCAA SEPA checklist is available by phone, or by our website.*

☐ The city/county has established an exemption for this project.

☐ I certify that the SEPA has been satisfied or this project is exempt:

July 6, 2023 by *City of Union Gap, Washington*
Date *Government Agency*

Previous NSR/Air Permits Number issued by YRCAA for the Facility, if any NSRP-08-AMI-23

Describe Input to Output Process (Attach drawings, schematics, prints, or block diagrams) Adventurer performs wood working, hot adhesive application, and aluminum frame welding in the production of RVs. See Appendix A for a process flow diagram.

ESTIMATED COSTS: OF BASIC SOURCE EQUIPMENT $ SawStop table saw already purchased

OF CONTAMINANT CONTROL APPARATUS $ No new equipment

Process: Production Output per Year (tons, pounds, etc) 10,000 units per year (unit is a motor home or camper)

Maximum Output per Hour (tons, pounds, etc) 2.6 units per hour

Percentage of Production (%)

Dec - Feb 25% Mar – May 25%

Jun - Aug 25% Sep – Nov 25%

Operating Schedule: Hrs/Day 8 Days/Wk 5 Wks/Yr 50

II. Emissions Estimations and Calculations:

1. Criteria Pollutants (gr/dscf, tons/yr, lbs/hr., ppm, etc.)

Particulate (PM_{10},$PM_{2.5}$) 0.32 / 0.27 ton/yr

Volatile Organic Compounds 3.16 ton/yr

Nitrogen Oxides N/A

Sulfur Oxides N/A

Carbon Monoxide N/A

Lead N/A

2. Toxic Air Pollutants (Name) — Quantity (in gr/dscf, tons/yr, lbs/hr. ppm, etc.)

See Appendix B

3. Fugitive Pollutants (Source) | Quantity (in gr/dscf, tons/yr, lbs/hr. ppm, etc.)

None

4. Air Pollution Modeling

Results N/A. No SQER levels were exceeded and there is no NAAQS or ASIL for VOCs

Computer Printout Attached? ☐Yes ☒No

III. Emission Data:

1. Stack

Height (Feet)_____ Inside Diameter (feet)_____

Gas Exit Temp (degrees F) Ambient Gas Exit Velocity (ft/min)_____

Flow Rate (cfm) 9,200

Shared Stack? If a shared stack, identify process (es) or point(s) which share the stack.

Distance from Stack to Property Line 232 feet

2. Discharge Point or points (if no stack or other than stack)

Height (feet)_____ Inside Diameter (feet)_____

Gas Exit Temp (degrees F)_____ Gas Exit Velocity (ft/min)_____

Flow Rate (cfm) _____

Shared discharge point? If a shared discharge point, identify process (es) or point(s) which share the discharge point. _____

Distance from discharge point to Property Line _____

3. Fuel

Type N/A (electrical line power) % Sulfur_____

% Ash_____ Unit of Measure (gal./cu.ft./etc.)_____

BTU per Unit of Measure_____ Consumption Units per Year_____

Maximum Consumption Units per Hour _____

4. Building Dimensions

Height (feet) 24 Length (feet) 200 Width (feet) 180

IV. Air Pollution Control Equipment:

Baghouse

Type Donaldson Torit Model #, Serial # DFE 3-18

Efficiency 99.9% $PM_{2.5}$: 99.9% and PM_{10}: 99.9%

Bag Height (feet) _____ Bag Diameter (feet) _____

Filter Area (feet squared) 119.0 Blower Flow Rate (cfm) 9,200

Filter Media Triagonal Fibra-Web Cartridges Dimensions (feet) 14.7x8.4x5.8

Discharge Area Dimensions (feet) _____

Cleaning Mechanism (shake) (air psi) _____

Other Data _____

Scrubber

Type N/A Model #, Serial # _____

Efficiency _____

Gas Differential Pressure (psi) _____ Liquor Differential Pressure (psi) _____

Liquor Flow (gpm) _____ Discharge Area Dimensions ($feet^2$) _____

Gas Flow (cfm) _____ Other Data _____

Cyclone

Type N/A Model #, Serial # _____

Efficiency _____ $PM_{2.5}$: _____ and PM_{10}: _____

Gas Flow (cfm) _____ Discharge Area Dimensions ($feet^2$) _____

Other Data _____

Precipitator

Type N/A Model #, Serial # _____

Efficiency _____

Gas Flow (cfm) _____ Gas Velocity (ft/sec) _____

Residence Time _____ Gas Differential Pressure (psi) _____

Precipitation Rate (ft/sec) _____ Discharge Area Dimensions ($feet^2$) _____

Other Data _____

Ad/Absorp

Type N/A Model #, Serial # _____

Efficiency _____

Gas Flow _____ Gas Velocity (ft/sec) _____

Gas Temp (degree F) _____ Bed Volume (ft^3) _____

Bed Dimensions (feet) _____ Capacity (hours) _____

Contaminant (lb/day) _____ Regeneration time (hours) _____

Other Type _____ Model #, Serial #_____

Efficiency _____

Gas Flow (cfm)_____ Discharge Area Dimensions (feet)_____

Other Data _____

V. Additional Information:

1. Attach Related Information on Chemicals or Materials that will be emitted. (MSDS Sheets, Company Information, etc.)

   Note: Indicate how much quantity are used per MSDSs

   ☒ Yes ☐ No, if not why? _____

   _____

2. Fugitive Dust Control Plan (Attach if Necessary)
3. Attach Operation and Maintenance Manual of Pollution Control Equipment.

   ☒ Yes ☐ No, if not, why? _____

4. Attach Vendor Information or Manufacturer's Instructions on Pollution Control Equipment.

   ☒ Yes ☐ No, if not, why? _____

APPLICANT: I hereby certify that the information contained in this application, including supplemental forms and data, when required, is, to the best of my knowledge, complete and correct. I also agree to all fees for processing this permit and grant permission for YRCAA staff to enter the premises for inspection.

Signature _____ Date 6/5/26

Title VP Operations Date 6/5/26

Name and Title of Individual Filling out Form:

Name (print) Beth Fifield Hodgson, PE, F. NSPE, Spring Environmental, Inc.

Signature Beth Fifield Hodgson

Name and Title of Contact Person, if Different than Above:

Name Claus Schroder

Title Director of Operations, Adventurer Manufacturing, Inc.

Name and Title of the Responsible Official for the permit, if Different than Above:

Name _____

Title _____

Attachment 1

Project Description

Adventurer Manufacturing, Inc.
APOC Materials Usage Update - Project Description

Background:
Adventurer Manufacturing, Inc. (Adventurer) manufactures/assembles recreational vehicles, such as truck campers and motor homes. The manufacturing process involves wood working and cutting, gluing and frame welding. Raw Luan, plywood, paneling, and styrofoam are cut with saws. Aluminum tubing is cut and welded to shape. Hot melt adhesive is used to attach the foam to cut panels and aluminum frames. Once pieces are formed and shaped in the CNC machines, the vehicles are assembled using a variety of adhesives, sealants, linoleum, and glue.

Adventurer operates a panel operation center (APOC) at 1501 W Rose St in Union Gap. The APOC facility is permitted under NSRP-08-AMI-23 which permits woodcutting, framing welding, and gluing of panels. These panels are finished and transported to Adventurer's facility at the Washington Ave facility in Yakima where the RVs are assembled. Particulate emissions from the CNC machines, panel saw, tiger saw, and table saw, are controlled by a Donaldson Torit DFE 3-18 baghouse at 99.9% efficiency. Fumes from welding operations are vented through ducting to the baghouse. The facility layout is included on page A-2, and a process flow diagram is included on page A-3.

Project Description:
Adventurer is applying for an NOC modification to update the material usage at the APOC facility. Adventurer is proposing product usage limits be a limit on the amount of product per category (e.g. adhesive, cleaners, paints, lubricants) instead of for each individual product.

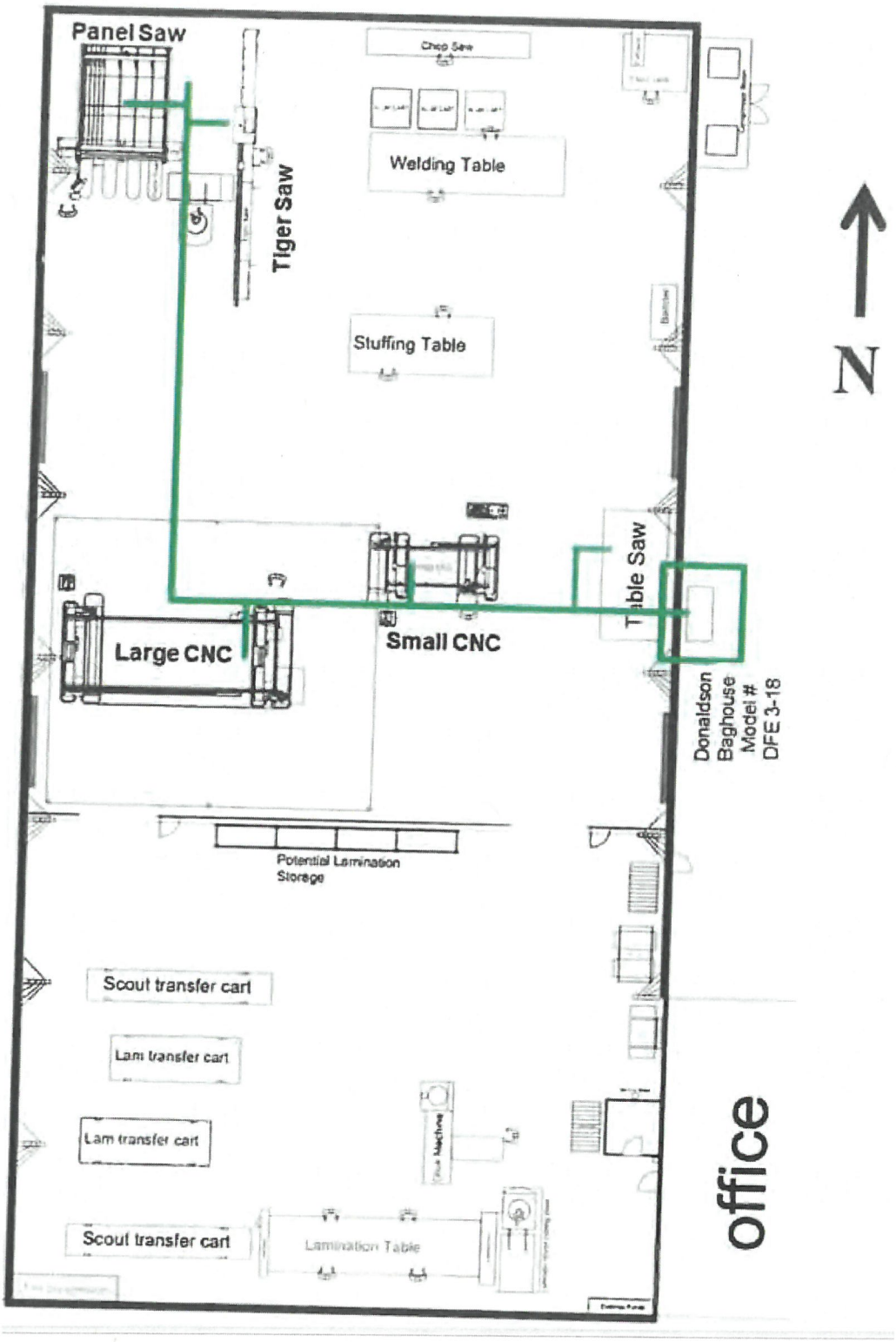
Operations Schedule:
Adventurer conducts typical manufacturing operations 8 hours per day, 5 days per week, 50 weeks per year.

Equipment List:
A SawStop Model ICS51230 table saw replaces the Rockwell table saw previously permitted. Otherwise, all equipment remains the same as currently permitted.

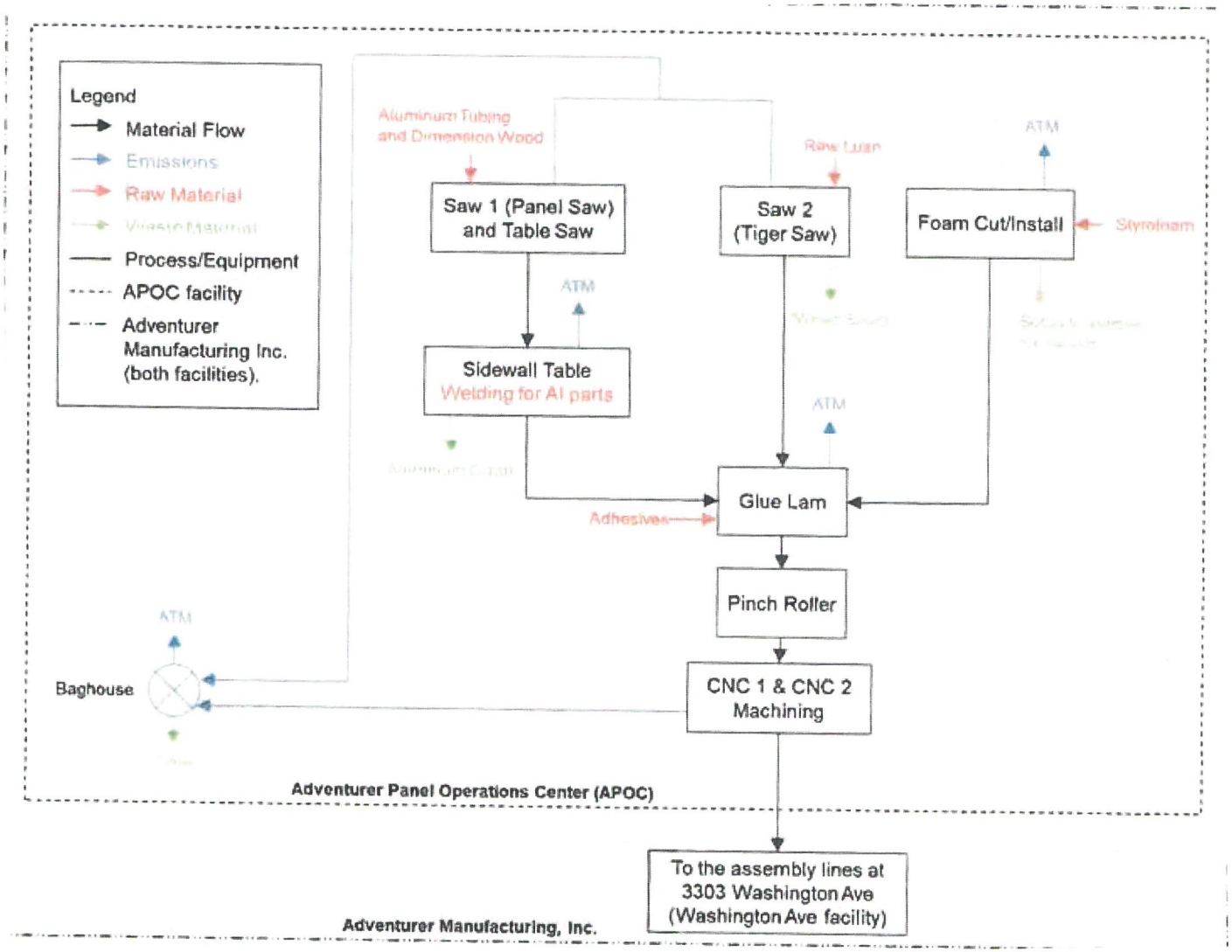
Emissions Calculations:
Air Emissions from the wood working, gluing, and welding operations include Particulate Matter (PM), Volatile Organic Compounds (VOCs), some of which are known as Hazardous Air Pollutants (HAPs) and/or Toxic Air Pollutants (TAPs). Emissions of HAPs, TAPs, and VOCs are calculated using worst case concentrations for each group of products. Detailed emissions calculations are included in **Attachment #2**.

BACT:
Potential emissions of three criteria pollutants and six toxic air pollutants triggered permitting, and are subject to BACT/t-BACT. A BACT/t-BACT analysis is included in **Attachment #5**.

APOC Facility Layout



Process Flow Diagram



Vicinity Map



Facility Diagram



Attachment 2

Emissions Inventory

Emissions Summary

Criteria Pollutants

Pollutant[1]	NSRP-08-AMI-23 Uncontrolled lb/yr	NSRP-08-AMI-23 Uncontrolled tpy	NSRP-08-AMI-23 Controlled lb/yr	NSRP-08-AMI-23 Controlled tpy	NOC Mod Uncontrolled lb/yr	NOC Mod Uncontrolled tpy	NOC Mod Controlled lb/yr	NOC Mod Controlled tpy	Exemption Level (tpy)[2]	Permitting Required?	Modeling Required?
PM10	152,937	76.47	765	0.38	152,804	76.40	633	0.32	0.75	YES	NO
PM2.5	76,750	38.38	665	0.33	76,630	38.32	544	0.27	0.5	YES	NO
VOCs	6,470	3.37	6,740	3.37	6,321	3.16	6,321	3.16	2.0	YES	NA

1. PM speciation from EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills (2014)
2. Per WAC 173-400-110(5)

Greenhouse Gases

CAS	Pollutant	Potential Emissions lb/yr	Potential Emissions metric tpy	Global Warming Potential[3]	CO2e (metric tpy)	Exceeds WA Threshold?	Exceeds Federal Threshold?
75-37-6	1,1-Difluoroethane (HFC-152A)	451	2.04E-01	138	28	NO	NO

3. Per 40 CFR 98 Table A-1

Toxic Air Pollutants

CAS	Pollutant	NSRP-08-AMI-23 lb/yr	NSRP-08-AMI-23 lb/avg period	NOC Mod lb/yr	NOC Mod lb/avg period	Avg Period	De Minimis[4]	Permitting Required?	SQER[4]	Modeling Required?
75-37-6	1,1-Difluoroethane (HFC-152A)	--	--	4.5E+02	1.8E+00	24-hr	1.5E+02	NO	3.0E+03	NA
--	Beryllium & Compounds	6.7E-04	6.7E-04	3.3E-04	3.3E-04	Year	3.4E-03	NO	6.8E-02	NA
71-43-2	Benzene	4.1E-04	4.1E-04	2.0E+00	2.0E+00	Year	1.0E+00	YES	2.1E+01	NO
108-90-7	Chlorobenzene	--	--	3.7E+00	1.5E-02	24-hr	3.7E+00	NO	7.4E+01	NA
--	Copper & Compounds	2.5E-01	2.9E-05	1.2E-01	6.2E-05	1-hr	9.3E-03	NO	1.9E-01	NA
98-82-8	Cumene	4.1E-04	1.1E-06	2.3E-03	9.0E-06	24-hr	1.5E+00	NO	3.0E+01	NA
110-82-7	Cyclohexane	--	--	2.0E+03	8.2E+00	24-hr	2.2E+01	NO	4.4E+02	NA
100-41-4	Ethylbenzene	1.8E+01	1.8E+01	5.0E+01	5.0E+01	Year	3.2E+00	YES	6.5E+01	NO
67-63-0	Isopropyl alcohol	9.7E+01	1.1E-02	1.1E+03	5.5E-01	1-hr	3.0E-01	YES	5.9E+00	NO
108-31-6	Maleic anhydride	--	--	4.8E-01	1.9E-03	24-hr	2.6E-03	NO	5.2E-02	NA
--	Manganese & Compounds	4.2E-02	1.2E-04	2.1E-02	8.3E-05	24-hr	1.1E-03	NO	2.2E-02	NA
67-56-1	Methanol	--	--	2.3E+02	9.3E-01	24-hr	7.4E+01	NO	2.2E+02	NA
108-10-1	Methyl isobutyl ketone	--	--	6.0E+00	2.4E-02	24-hr	1.1E+01	NO	2.2E+02	NA
101-68-8	MDI	2.0E-01	5.5E-04	2.0E-01	8.0E-04	24-hr	3.0E-04	YES	5.9E-03	NO
91-20-3	Naphthalene	4.1E-04	4.1E-04	3.4E+00	3.4E+00	Year	2.4E-01	YES	4.8E+00	NO
108-88-3	Toluene	3.7E+01	1.0E-01	2.8E+01	1.1E-01	24-hr	1.9E+01	NO	3.7E+02	NA
1330-20-7	Xylenes	8.1E+01	2.2E-01	5.4E+02	2.2E+00	24-hr	8.2E-01	YES	1.6E+01	NO

4. Per WAC 173-460-150

2024 Usage - APOC[1]

Campers Produced @ Wash 1000 Units

	YEARLY QTY	U/M DESCRIPTION
Acetone	4,732	Ounces
Denatured Alcohol	5	Gallons
PTOUCH 2X +SSPR 6PK Flat Black	2,568	Ounces
Technomelt Cleaner 785A	21,096	Ounces
Welding Wire	172	Pounds
Quick Orange Gel Remover	1,512	Ounces
Iso Guard Select	768	Ounces
Isopropyl Alcohol	210	Ounces
Rohper LSPR 6PK Gloss Safety Yellow	624	Ounces
Platen Gel Lubricant	624	Ounces
Technomelt PUR 834A	567,792	Ounces
Technomelt PUR 608C	48,520	Ounces
Food Grade Silicone	410	Ounces
VMAXOL Sealant	14,200	Ounces
2001M High Strength Fast Tack Adhesive	4,800	Ounces
3M Primer 94	640	Ounces
Coolube 2210AL	27,392	Ounces
Air Tool Oil	3,210	Ounces
Petro-Therm	123,555	Ounces
Chevron Rando HDZ 32	230	Fl. Ounces

	Linear Feet Cut	U/M DESCRIPTION
CNC 1	526,595	Lin. Feet
CNC 2	175,532	Lin. Feet
Saw 1	1,290,713	Lin. Feet
Saw 2	28,949	Lin. Feet

1. 2024 usage provided by C. Schroder

Proposed Maximum Usage - APOC[1]

Campers Produced 10,000 Units

	YEARLY QTY	U/M DESCRIPTION
Acetone	47,320	Ounces
Denatured Alcohol	50	Gallons
PTOUCH 2X +SSPR 6PK Flat Black	25,680	Ounces
Technomelt Cleaner 785A	210,960	Ounces
Welding Wire	1,720	Pounds
Quick Orange Gel Remover	15,120	Ounces
Iso Guard Select	7,680	Ounces
Isopropyl Alcohol	2,100	Ounces
Rohper LSPR 6PK Gloss Safety Yellow	6,240	Ounces
Platen Gel Lubricant	6,240	Ounces
Technomelt PUR 834A	5,677,920	Ounces
Technomelt PUR 608C	485,200	Ounces
Food Grade Silicone	4,100	Ounces
VMAXOL Sealant	142,000	Ounces
2001M High Strength Fast Tack Adhesive	48,000	Ounces
3M Primer 94	6,400	Ounces
Coolube 2210AL	273,920	Ounces
Air Tool Oil	32,100	Ounces
Petro-Therm	1,235,550	Ounces
Chevron Rando HDZ 32	2,300	Fl. Ounces

	Linear Feet Cut	U/M DESCRIPTION
CNC 1	5,265,950	Lin. Feet
CNC 2	1,755,320	Lin. Feet
Saw 1	12,907,130	Lin. Feet
Saw 2	289,490	Lin. Feet

1. Proposed maximum usage is based on 2024 usage and scaled to 10,000 units

VOC/HAP/TAP Emissions

	Material Usage (lb/yr)	Solids	VOCs	Weight Percent[1]													
				1,1-Difluoroethane	Benzene	Chlorobenzene	Cumene	Cyclohexane	Ethylbenzene	Isopropyl alcohol	Maleic anhydride	Methanol	Methylenebis(phenylisocyanate) (MDI)	Methyl isobutyl ketone	Naphthalene	Toluene	Xylene, mixed isomers
				75-37-6	71-43-2	108-90-7	98-82-8	110-82-7	100-41-4	67-63-0	108-31-6	67-56-1	101-68-8	108-10-1	91-20-3	108-88-3	1330-20-7
											Solid		Solid		Solid		
				TAP	HAP/TAP	HAP/TAP	HAP/TAP	TAP	HAP/TAP	TAP	HAP/TAP	HAP/TAP	HAP/TAP	HAP/TAP	HAP/TAP	HAP/TAP	HAP/TAP
Adhesives with no toxics or VOCs																	
Adhesives w/ max 5% MDI and no other toxics[2]	385,195	[3]	0%										See MDI Sheet				
Subtotals	385,195		0%														
Adhesives																	
2001M High Strength Fast Tack Adhesive	3,000	[3]	44%												0.1%		
3M Primer 94	400	[3]	97%			0.11%		60%		1%	0.014%	1%		0.08%		0.22%	10%
Subtotals	3,400		97%			0.11%		60%		1%	0.014%	1%		0.08%	0.1%	0.22%	10%
Cleaners with no HAPs/TAPs/VOCs																	
Acetone	2,958	0%	0%														
Technomelt Cleaner 785A	13,185	0%	0%														
Subtotals	16,143	0%	0%														
Cleaners																	
Isopropyl Alcohol	131	0%	99%							99%							
Quick Orange Gel Remover	945	0%	69%														
Subtotals	1,076	0%	99%							99%							
Denatured Alcohol																	
Denatured Alcohol	332	0%	98%									60%		1%			
Subtotals	332	0%	98%									60%		1%			
Lubricants with no HAPs/TAPs/VOCs																	
Coolube AL2210	17,120	0%	0%														
Air Tool Oil	2,006	0%	0%														
Petro-Therm	77,222	0%	0%														
Chevron Rando HDZ 32	129	0%	0%														
Subtotals	96,477	0%	0%														
Lubricants																	
Iso Guard Select	480	0%	1%														
Platen Gel Lubricant[4]	390	0%	51.04%		0.0002%		0.0002%		0.0002%						0.0002%	0.021%	
Food Grade Silicone	256	0%	78.5%	40%													
Subtotals	1,126	0%	78.5%	40%	0.0002%		0.0002%		0.0002%						0.0002%	0.021%	
Paints																	
PTOUCH 2X +SSPR 6PK Flat Black[5]	1,605	22%	28.0%		0.1%				2.5%							1%	10%
Rohper LSPR 6PK Gloss Safety Yellow[5]	390	13%	37.5%						2.5%								10%
Subtotals	1,995	22%	37.5%		0.1%				2.5%							1%	10%
Other																	
VMAXOL Sealant	8,875	0%	0%														
Subtotals	8,875	0%	0%														
Emissions (lb/yr)		439	6,321	4.51E+02	2.00E+00	3.74E+00	2.25E-03	2.04E+03	4.99E+01	1.10E+03	4.76E-01	2.33E+02	1.99E-01	6.04E+00	3.40E+00	2.77E+01	5.40E+02

1. Composition per SDSs sheets
2. Technomelt PUR 834A and 608C both contain a maximum of 5% MDI and no other substances listed on WAC 173-460-150 or on EPA's HAP list
3. Adhesives have solid components, but are not in a physical state that would emit particulate matter
4. SDS section 15.2 indicates naphthalene is present at a concentration of 0.0% but other chemicals in the section are listed at 0.0002%. Naphthalene is assumed 0.0002% for a conservative estimate
5. Spray paint VOC composition calculated by subtracting solids and acetone from 100%

Methylene Diphenyl Diisocyanate (MDI) Emissions

MDI will migrate from all exposed surfaces and all losses will be the result of evaporation. The evaporation losses are a function of the temperature, the airflow speed in the vicinity of the process, the tack-free time, and the exposed surface area.

Reference: MDI Emissions Reporting Guidelines for the Polyurethane Industry, May 2012, AX186, American Chemistry Council

Evaporation Losses (p. 5-2):

$W = 25.4 * VP_{MDI} * (M_W/T_{proc}) * (u)^{0.78} * S_A * t_{TF}$

Where:

W:	Evaporation losses from the open process (grams/day)
25.4:	Conversion factor = (298 K) / (1 atm) * (0.0224 m^3/mol)
VP_{MDI}:	Vapor pressure of MDI at process temperature (atm)
M_W:	Molecular weight of MDI (250 grams/mol)
T_{proc}:	Process temperature (K)
u:	Airflow speed (m/s)
S_A:	Exposed surface area (m^2)
t_{TF}:	Tack-free time (s)

Assumptions:

1. MDI used in melting application at a minimum temperature of 170°F (350K) — T_{proc}: 170 °F

2. Airflow speed is 2000 acfm and roller contact surface area is 2.25 ft^2
   Therefore (2000 ft^3/min)/(2.25 ft^2)*(1 min/60 sec)*(1 m/3.281 ft)= — u: 4.52 m/s

3. Surface area exposure
   Based on equipment specifications (Model A Double Coater Roll Configuration) rollers adding glue to both sides of the panel
   Roller with 54" and production feed rate 250 linear ft/hr, both sides; therefore maximum surface exposure = — S_A: 2250 ft^2/hr

4. Tack-free time of 5 seconds — t_{TF}: 5 sec

Inputs:

5%	Worst-case scenario concentration for MDI
24	Maximum operating hours per day

Calculations:

$VP_{MDI(5\%)}$	1.68E-07	atm	(2.55E-3 mmHg)*(1 atm/760 mmHg)*5%
M_W	250	g/mol	
T_{proc}	349.82	K	
u	4.52	m/s	
S_A	5016	m^2/day	
t_{TF}	5	sec	

W=	2.48E-01	g/day
	5.46E-04	lb/day
	1.99E-01	lb/yr

Saws and CNC Emissions

Sawdust density: 0.155 BDT/yd^3
Conversion factor: 27 ft^3/yd^3

Accounting for 50% moisture in the wood chips per AP-42 Chapter 10.6.2 (June 2002)

	Linear Feet Cut (ft)	Thickness (in)	Kerf (in)	Sawdust Generated (ft^3)
CNC 1	5,265,950	1	0.5	18,285
CNC 2	1,755,320	1	0.5	6,095
Saw 1	12,907,130	0.125	0.125	1,401
Saw 2	289,490	3	0.125	754
			Total	983 yd^3

Saw Emissions[1]	Uncontrolled (BDT/yr)	Controlled (BDT/yr)[2]
PM	152.32	1.52E-01
PM10	76.16	7.62E-02
PM2.5	38.08	3.81E-02

1. PM speciation from EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills (2014)
2. Donaldson Torit DFE 3-18 Baghouse has an efficiency of 99.9%

Welding Emissions 4043 Aluminum Silicon Welding Wire

Welding wire used: 1,720 lb/yr

Particulate	Emission Factor (lb/1000 lb)[3,4]	Uncontrolled Emissions (lb/yr)
PM	42.0	72
PM10	24.1	41
PM2.5	17.1	29

3. PM10 emission factors from AP-42 Table 12-19-1 for GMAW welding using ER5154, January 1995
4. PM speciation for welding SCC codes from California Air Resources Board is 57.4% PM10 and 40.7% PM2.5, so PM2.5 assumed equal to 7.9% of PM10

Pollutant	Composition[5]	HAP/TAP	Emissions (lb/yr)
Beryllium	0.0008%	HAP/TAP	3.32E-04
Copper	0.30%	TAP	1.24E-01
Iron	1%	NA	3.32E-01
Magnesium	0.05%	NA	2.07E-02
Manganese	0.05%	HAP/TAP	2.07E-02
Silicon	6%	NA	2.49E+00
Titanium	0.20%	NA	8.29E-02
Zinc	0.10%	NA	4.15E-02

5. Based on 4043 Aluminum welding wire SDS

Total PM Saw, CNC, and Welding Emissions

Particulate	Uncontrolled Emissions (lb/yr)	Controlled Emissions (lb/yr)
PM	304,720	377
PM10	152,365	194
PM2.5	76,191	106

Attachment 3

BACT Analysis

BACT/t-BACT Analysis

Adventurer Manufacturing – Union Gap, Washington

Introduction

Adventurer intends to update the material usage at the APOC facility located at 1501 West Rose Street in Union Gap, Washington. One criteria pollutant and two toxic air pollutants emitted during operations at the facility trigger BACT/t-BACT.

Regulated Emissions

Estimated emissions of no criteria pollutants are greater than the exemption level of WAC 173-400-110, Table 110(5) and will be the subject of this BACT analysis:

- Particulate matter less than 10 microns (PM_{10})
- Particulate matter less than 2.5 microns ($PM_{2.5}$)
- Volatile organic compounds (VOCs)

Estimated emissions of the following toxic pollutants are greater than the exemption level of WAC 173-460-150 and will be the subject of this t-BACT analysis:

- Benzene
- Ethylbenzene
- Isopropyl alcohol
- MDI
- Naphthalene
- Xylenes

Selected Acronyms Used Throughout This Report

- BACT – Best Available Control Technology
- DFTO – Direct Fired Thermal Oxidizer
- Ecology – Washington State Department of Ecology
- ESP – Electrostatic Precipitator
- NOC – Notice of Construction
- NSR – New Source Review
- O&M – Operation and Maintenance
- PM_{10} – Particulate matter >10 micron
- $PM_{2.5}$ – Particulate matter >2.5 micron
- RTO – Regenerative Thermal Oxidizer
- TPY – Tons Per Year, unit of measure for emission rate
- VOCs – Volatile Organic Compounds
- WAC – Washington Administrative Code

Step 1: Identify Technologies

Under the State of Washington's NSR rules, which are promulgated and enforced by Ecology and local air quality districts, best available control technologies (BACT) are required for construction and modification of specified stationary sources.

BACT is defined as

> *an emission limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Clean Air Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.*[1]

The purpose of this investigation was to identify potential control technologies for controlling emissions.

Control techniques for criteria pollutants may be classified into two broad categories – **(1) inherently lower emitting processes/practices** and **(2) emission controls**[2].

The control techniques potentially available for control of PM emissions from the CNC machines and saws, and paints include:

- Emission controls
  - Baghouse/Dust Collector
  - ESP
  - Wet Scrubber
  - Cyclone
- Inherently lower emitting process/practices
  - Good Operating and Maintenance Practices

The control techniques potentially available for control of VOCs from adhesives, paints, lubricants, and cleaners, benzene emissions from lubricants and paints, ethylbenzene emissions from lubricants and paints, isopropyl alcohol from cleaners, MDI from adhesives, naphthalene from adhesives and lubricants, and xylenes from adhesives and paints:

- Emission controls
  - Carbon Adsorption
  - Regenerative Thermal Oxidizer (RTO)
  - Direct Fired Thermal Oxidizer (DFTO)
- Inherently lower emitting process/practices
  - Minimize paint overspray

[1] "New Source Review Workshop Manual", DRAFT October 1990, Section I.

[2] "New Source Review Workshop Manual", DRAFT October 1990, Section IV.A.

Particulate Emissions

Based on the proposed operations, the facility has the potential to emit 76.2 tons per year of PM_{10}, and 38.1 tons per year of $PM_{2.5}$ from saw operations. Particulate matter emissions from paints are 0.22 tons per year for PM_{10} and $PM_{2.5}$. Particulate matter from welding are considered insignificant compared to emissions from the CNCs and saws, and paints.

Step 2: Infeasible Technologies

All of the technologies are feasible for sawdust control.

Baghouse, ESP, Scrubber, and Cyclone control of emissions from spray paints are infeasible because an enclosure is required to collect emissions, and the operations are distributed throughout the facility.

Step 3: Effectiveness Ranking

According to the 1990 Draft New Source Review Manual, feasible technologies are next ranked by the degree of reduction (i.e. "% reduction").

Sawdust Control

Type of Control	% Reduction	Potential PM10 Emissions (tpy)	Potential PM2.5 Emissions (tpy)
Baghouse/Dust Collector	99.9%	0.0761	0.038
ESP	99%	0.76	0.38
Wet Scrubber	95%	3.81	1.91
Cyclone	90%	7.62	3.81
Uncontrolled	0%	76.2	38.1

Step 4: Evaluate Controls

Adventurer already has a baghouse/dust collector at their facility that controls particulate matter emissions from the CNCs and saws. Furthermore, welding fumes are vented through the baghouse duct work.

Step 5: BACT Recommendation

Spring Environmental recommends a baghouse/dust collector is BACT for control of sawdust from the facility. Emissions of particulate matter would be a maximum of 0.32 tpy and 0.27 tpy for PM_{10} and $PM_{2.5}$, respectively.

Toxics and VOC Emissions

Based on the proposed operations, the facility has the potential to emit 2.0 pounds per year of benzene, 50 pounds per year of ethylbenzene, 1,100 pounds of isopropyl alcohol, 0.2 pounds of MDI, 3.4 pounds of naphthalene, 540 pounds of xylenes, and 6,300 pounds of VOCs.

Step 2: Infeasible Technologies

Carbon adsorption is infeasible for adhesive, spray painting, and cleaning application operations due to the amount of carbon that would be required.

Emissions from lubricant applications were deemed insignificant in comparison to other applications.

Step 3: Effectiveness Ranking

According to the 1990 Draft New Source Review Manual, feasible technologies are next ranked by the degree of reduction (i.e. "% reduction).

The control efficiencies are as follows:

Type of Control	% Reduction	Potential Emissions Benzene (lb/yr)	Potential Emissions Ethyl benzene (lb/yr)	Potential Emissions Isopropyl alcohol (lb/yr)	Potential Emissions MDI (lb/yr)	Potential Emissions Naphthalene (lb/yr)	Potential Emissions Xylenes (lb/yr)	Potential Emissions VOCs (lb/yr)
RTO	98%	4.0E-2	1.0E+1	2.2E+1	4.0E-3	6.8E-2	1.1E+1	1.3E+2
DFTO	98%	4.0E-2	1.0E+1	2.2E+1	4.0E-3	6.8E-2	1.1E+1	1.3E+2
None	0%	2.0	50	1,100	0.2	3.4	540	6,300

Step 4: Evaluate Controls

Spring Environmental obtained a cost estimate from Ship & Shore Environmental for an RTO for this process and a DFTO for Adventurer's foam densifier. The estimate is included in pages E-13 and E-14 of this report. Capital costs were determined by adding all equipment, installation, start-up, commissioning, delivery, concrete pad, ductwork, and crane rental costs for the DFTO. Annual capital costs were defined assuming an equipment life of 10 years and an interest rate of 7.25%. Annual operation and maintenance costs were estimated using the Environmental Protection Agency's Air Pollution Control Cost Manual and wages from the U.S. Bureau of Labor Statistics. Annual utility costs were estimated using natural gas usage rates from Ship & Shore Environmental and industrial natural gas pricing for Yakima, Washington. The detailed cost analysis is included in page E-16 of this report. The control costs are as follows:

Control Technology	Capital Cost	Annual Capital Cost	Annual O&M Costs	Annual Utility Cost	Annualized Cost	Cost per Ton per Year Benzene Removed	Cost per Ton per Year Ethyl Benzene Removed	Cost per Ton per Year Isopropyl Alcohol Removed	Cost per Ton per Year MDI Removed	Cost per Ton per Year Naphthalene Removed	Cost per Ton per Year Xylenes Removed	Cost per Ton per Year VOCs Removed
RTO	$357,000	$53,400	$23,600	$14,900	$71,413	$154,000,000	$6,170,000	$280,000	$1,550,000,000	$90,500,000	$571,000	$48,700
DFTO	$321,000	$46,200	$23,600	$363,000	$247,427	$248,000,000	$9,950,000	$451,000	$2,490,000,000	$146,000,000	$920,000	$78,500

Spring Environmental recommends that an RTO or DFTO are not cost-effective options. Therefore, Spring Environmental recommends that Good Operation and Maintenance Practices for adhesives, cleaners, spray paints, and lubricants, which include selecting materials with low toxic levels and minimizing overspray, are BACT.

Step 5: BACT Recommendation

Spring Environmental recommends that oxidizers are not cost effective, and that Good Operation and Maintenance Practices are BACT/t-BACT for benzene, ethylbenzene, and VOC emissions from adhesives, cleaning, lubricants, and painting. Emissions would be a maximum of 2.0 pounds per year of benzene, 50 pounds per year of ethylbenzene, 1,100 pounds of isopropyl alcohol, 0.2 pounds of MDI, 3.4 pounds of naphthalene, 540 pounds of xylenes, and 6,300 pounds of VOCs.

Summary

Spring Environmental recommends that BACT/t-BACT be defined as a baghouse/dust collector for particulate matter emissions and good operation and maintenance for VOCs and toxics. Emissions of particulate matter would be a maximum of 0.32 tpy and 0.27 tpy for PM_{10} and $PM_{2.5}$, respectively. Emissions from adhesives, cleaners, lubricants, and spray paints would be a maximum of 2.0 pounds per year of benzene, 50 pounds per year of ethylbenzene, 1,100 pounds of isopropyl alcohol, 0.2 pounds of MDI, 3.4 pounds of naphthalene, 540 pounds of xylenes, and 6,300 pounds of VOCs.

Contact Information

If you have any questions on the enclosed information, contact Beth Fifield Hodgson at (509) 328-7500.

Sincerely,

Beth Fifield Hodgson, PE, F. NSPE
Principal Engineer

4.0 PRICING

10,500 SCFM RTO

• **10,500 SCFM S&SE RTO**	**$ 497,000.00**
• **Ultra Low Nox Burner (30 ppmv % O2 dry basis)**	**$ 29,500.00**
• **New VFD (Variable Frequency Drive) for RTO Main Blower**	**$ 19,000.00**
• **Start-up of RTO & Operator Training**	**$ 27,500.00**

VALUE ADDED SERVICES – For Either Options Included at No Charge

- ✓ Air Quality Permit Assistance
- ✓ Assistance with Customized Incentive Application
- ✓ Design Drawing for Concrete Pad
- ✓ Provision for Future Addition of Stack Heat Exchanger

OPTIONS – (and pricing) Available Upon Request

- Engineering Design of VOC Collection System
- Supply & Installation of VOC Collection System
- Integrated VPN for Remote Assessment of RTO ($7,500.00)
- Pre-Wired Unit for Minimal Electrical Field Work ($27,500.00)

***NOTE:** Due to ongoing economic uncertainty affecting tariffs and component sourcing, we're currently only able to guarantee pricing for two weeks. However, thanks to our existing sourcing channels and strong long-term partnerships, we can confidently confirm and honor our current proposed pricing within this timeframe ** Due to 90-day hold on lower tariffs, prices are adjusted*

PLEASE NOTE:

1) All prices are given in US Dollars net, f.o.b. Signal Hill, California.
2) This proposal is valid for a period of 2 weeks. Purchase orders received after 2 weeks are subject to acceptance after evaluation of any material price changes, etc. Due to the rapidly changing cost of raw steel, materials, components, and transportation costs, the seller reserves the right to amend pricing at time of order. All major components are subject to price increase unless order is secured.
3) Upon receipt of order, S&SE Environmental shall finalize and confirm the selected Scope of Supply and Pricing by written Order Acknowledgement.
4) S&SE responsibility shall not extend beyond the defined scope of this proposal. If it becomes necessary to perform work outside the scope of supply, S&SE shall first notify the customer of additional costs to get approval before proceeding. For Saturday, Sunday, or Holiday works extra charges apply.
5) S&SE Environmental team shall assist customer with coordination of shipment by common carrier. A transportation handling fee for labor and expenses incurred by S&SE to assist with coordination of shipment and delivery will be invoiced according to the attached "customer billing rates" and "warranty, terms and conditions of sale."
6) All S&SE units must be annually serviced by authorized S&SE personnel only. The use of 3rd party service companies will result in a void of warranty*.

Please note that service of RTO by unauthorized personnel will void warranty

David Finley

From: James Kuzara <JKuzara@shipandshore.com>
Sent: Friday, June 19, 2020 10:39 AM
To: david@springenvironmental.com
Cc: Sarah Bumacod; Anu Vij; Niloofar Hajibeiklou
Subject: RE: Densifying equipment abatement project.
Attachments: Aftermarket Services.pdf; Company Profile.pdf; Regenerative Thermal Oxidizer.pdf; M02-3.5K.pdf

Hi David,

Please review the following BALLPARK budgetary pricing information for polystyrene and Styrofoam VOC abatement. Systems are designed for 98% destruction efficiency. Pricing is for regenerative thermal oxidizer and direct fired thermal oxidizer technology. If any of these options are of interest to the end customer, please let us know and we can develop a more formal / detailed proposal.

Process Summary:
Single polystyrene and Styrofoam densifier.
Capacity 300lbs material per hour.
5lbs per hour VOC batch operation.
2hours per month operation (120 lbs VOC per YEAR).
Process is fan exhausted to atmosphere at ambient temperature – 3500 scfm.

3500 scfm RTO price	$200,000.00	
Variable Frequency Drive	$8,500.00	
Installation Estimate	$40,000.00	(Pending site review)
Start-up + Commissioning	$20,000.00	

Estimated natural gas usage once at temperature approximately 0.3 mmBTU/hr (95% system energy recovery)
Due to the extremely high thermal efficiency of the RTO unit, incentive rebates from the natural gas provider might be possible.

3500 scfm Direct Fired Thermal Oxidizer	$185,000.00	
Installation Estimate	$35,000.00	(Pending site review)
Start-up and Commissioning	$20,000.00	

Estimated natural gas usage once at temperature approximately 7.3 mmBTU/hr (no system energy recovery)

Please keep in mind other project costs indicated below:

- Ductwork collection system
- Gas, electric, compressed air needs by abatement equipment from plant to equipment
- Concrete Foundation Pad for Abatement Equipment
- Construction / Environmental Permitting Costs

I've attached a general arrangement drawing for the RTO. A direct fired unit would be a more simple burner and combustion chamber design that would fit easily within the footprint of the RTO.

Again, please consider these directional costs. If you have any questions, please do not hesitate to give me a call.

BACT Calculations

Benzene	Ethylbenzene	Isopropyl alcohol	MDI	Naphthalene	Xylenes	VOCs
2.00E+00 lb/yr	4.99E+01 lb/yr	1.10E+03 lb/yr	1.99E-01 lb/yr	3.40E+00 lb/yr	5.40E+02 lb/yr	6.32E+03 lb/yr

		Benzene		Ethylbenzene		Isopropyl alcohol		MDI		Naphthalene		Xylenes		VOCs	
Control Technology	**Destruction Efficiency (%)**	**Emissions (lb/yr)**	**Reduction (lb/yr)**	**Emissions (lb/yr)**	**Reduction (lb/yr)**	**Emissions (lb/yr)**	**Reduction (lb/yr)**	**Emissions (lb/yr)**	**Reduction (lb/yr)**	**Emissions (lb/yr)**	**Reduction (lb/yr)**	**Emissions (lb/yr)**	**Reduction (lb/yr)**	**Emissions (lb/yr)**	**Reduction (lb/yr)**
Regenerative Thermal Oxidizer (RTO)	98%	4.0E-02	1.96E+00	1.0E+00	4.89E+01	2.2E+01	1.08E+03	4.0E-03	1.95E-01	6.8E-02	3.33E+00	1.1E+01	5.29E+02	1.3E+02	6.19E+03
Direct Fired Thermal Oxidizer (DFTO)	98%	4.0E-02	1.96E+00	1.0E+00	4.89E+01	2.2E+01	1.08E+03	4.0E-03	1.95E-01	6.8E-02	3.33E+00	1.1E+01	5.29E+02	1.3E+02	6.19E+03
Carbon Adsorption	95%	1.0E-01	1.90E+00	2.49E+00	4.74E+01	5.5E+01	1.04E+03	1.0E-02	1.89E-01	1.7E-01	3.23E+00	2.7E+01	5.13E+02	3.2E+02	6.00E+03
None	0%	2.0E+00	0.00	4.99E+01	0.00	1.1E+03	0.00E+00	2.0E-01	0.00E+00	3.40E+00	0.00	5.40E+02	0.00	6.3E+03	0.00

Financial Analysis

Operating Information:	8	operating hours per day (hrs/day)	
	5	operating days per week (days/wk)	
	50	operating weeks per year (wks/yr)	
	2000	operating hours per year (hrs/yr)	
	250	operating days per year (days/yr)	
	1	shifts per day	
Conversions:	1 mmBTU =	1000 ft^3 natural gas	
Financial Assumptions:	10	years at	
	7.25%	prime interest rate as of October 21, 2025 - https://www.commercebank.com/about-us/prime-rate-update	
	8.30%	sales tax in Yakima County, Washington	
Labor:	$ 27.50	per hour[1]	
	19.8%	employer's wage burden[2]	
Operations[3]:	Operator	0.5	hr/shift
	Operator	0.5	hr/day
	Supervisor	15%	of Operator costs
Maintenance[3]:	Labor	0.5	hr/shift
	Labor	0.5	hr/day
	Materials	100%	of Labor costs
Utilities:	Natural Gas[4] (NG)	$ 12.94	per 1000 ft^3
	NG Usage[5] (RTO)	1.9	mmBTU/hr
	NG Usage (RTO)	1.9	1000 ft^3/hr
	NG Usage[6] (DFTO)	7.3	mmBTU/hr
	NG Usage (DFTO)	7.3	1000 ft^3/hr

Control Technology	**Capital Cost**	**Annual Capital Cost[8]**	**Annual O&M Costs**	**Annual Utility Costs**	**Annualized Cost**	**Benzene Removal Cost (per year per ton)**	**Ethylbenzene Removal Cost (per year per ton)**	**Isopropyl alcohol Removal Cost (per year per ton)**	**MDI Removal Cost (per year per ton)**	**Naphthalene Removal Cost (per year per ton)**	**Xylenes Removal Cost (per year per ton)**	**VOC Removal Cost (per year per ton)**
Regenerative Thermal Oxidizer (RTO)[5]	$ 620,559	$ 89,377	$ 12,294	$ 49,172	$ 150,843	$ 154,133,291	$ 6,172,014	$ 279,988	$ 1,545,214,034	$ 90,482,144	$ 570,608	$ 48,704
Direct Fired Thermal Oxidizer (DFTO)[6,7]	$ 291,016	$ 41,914	$ 12,294	$ 188,924	$ 243,132	$ 248,435,099	$ 9,948,175	$ 451,290	$ 2,490,606,670	$ 145,840,916	$ 919,718	$ 78,502

Notes:

1) Mean hourly wage for occupation code 49-0000 in Washington state, per May 2019 National Occupational Employment and Wage Estimates by the U.S. Bureau of Labor Statistics.
2) Based on a net tax rate of 0.6% from the Federal Unemployment Tax Act, a 15.3% tax rate from the Federal Insurance Contribution Act, and an average tax rate of 3.93% from the State Unemployment Tax Act.
3) Based on guidance from EPA Air Pollution Control Cost Manual, Section 3, Chapter 2, Table 2.12.
4) Industrial price for natural gas in Union Gap, Washington in April 2025 per Natural Gas Local website.
5) Per 2025 cost estimate by Ship & Shore Environmental for RTO.
6) Per 2020 cost estimate by Ship & Shore Environmental for DFTO.
7) Includes cost estimate for control equipment, installation, startup, commissioning, equipment delivery, concrete pad, ductwork, and crane rental. Adjusted to 2025 dollar using COLA of 5% (5.3 is average of past 3 years)
8) Annual Capital Cost = Total Installed Cost*interest*(1+interest)^years / ((1+interest)^years-1)

Attachment 4

SEPA Determination

WASHINGTON STATE ENVIRONMENTAL POLICY ACT
MITIGATED DETERMINATION OF NONSIGNIFICANCE
CITY OF UNION GAP, WASHINGTON
JULY 6, 2023

STATE ENVIRONMENTAL POLICY ACT

Mitigated Determination of Non-Significance

Lead agency: City of Union Gap

Agency Contact: Dennis Henne, Director of Public Works & Community Development

Agency File Number: 2023.0122.SE0007

PROJECT DESCRIPTION: The City of Union Gap has received a Building Permit Application and Environmental Checklist from Adventurer Manufacturing in order to install equipment that requires a new source review by the Clean Air Authority. While environmental review had occurred previously on the parcel, the installation of new equipment with the potential for discharge of emissions requires a new environmental review that considers the emissions from the project. Emissions will be reduced or controlled by use of a cyclone and a baghouse to control particulate matter emissions.

LOCATION: 1501 W. Rose St. Union Gap, WA 98903

PROPONENT: Adventurer Manufacturing 3303 W. Washington Ave. Yakima, WA 98903

The City of Union Gap has determined that this proposal will not have a probable significant adverse impact on the environment. Pursuant to WAC 197-11-350(3), the proposal has been clarified, changed, and conditioned to include necessary mitigation measures to avoid, minimize or compensate for probable significant impacts. An environmental impact statement (EIS) is not required under RCW 43.21C.030. The necessary mitigation measures are listed below, the Environmental Checklist is attached and is available to the public upon request from the City of Union Gap.

This determination is based on the following findings and conclusions:

Findings:

A. **Access:** Access to the site is from W. Rose St. to the south of the property.
B. **Comprehensive Plan:** The Comprehensive Plan designation of the site as Industrial.
C. **Zoning:** The sites are currently zoned Wholesale Warehouse (W/W).
D. **Critical Areas:** A portion of the parcel is within the 100 year flood plain, but the proposal is over 200 feet from the nearest portion of the flood plain.
E. **Air Quality:** A New Source Review application must be submitted, and an order of approval permit must be issued prior to any installation or work.

F. **Comments:**

1. Yakima Regional Clean Air Agency:

"...A New Source Review (NSR) application must be submitted to YRCAA and an order of approval permit must be issued prior to the start of any installation or work;"

2. Department of Ecology:

"...Hazardous Waste and Toxics Reduction

The applicant must ensure that all waste generated from operations at this site are designated and managed in accordance with the Dangerous Waste Regulations, Chapter 173-303 Washington Administrative Code (WAC). For compliance assistance, please contact Erik Rollin, Hazardous Waste Compliance Inspector, at (509) 490-5621 or erik.rollin@ecy.wa.gov."

Conclusions:

The requirements outlined in Findings F.1 and F.2 shall be met by the applicant. Mitigation will involve the following conditions:

A. A New Source Review application shall be submitted to the YRCAA, and an order of approval permit shall be required prior to the start of any installation or work.

B. All waste generated from operations at this site shall be managed in accordance with the Dangerous Waste Regulations chapter of the Washington Administrative Code (WAC 173-303).

This MDNS is issued under WAC 197-11-350 and has already undergone a comment period.

There will be no additional comment period.

SEPA Responsible official: Dennis Henne
Director of Public Works & Community Development, City of Union Gap

Phone: (509) 575-3638
Address: 102 W. Ahtanum Rd. Union Gap, WA 98903

Date: July 6, 2023 Signature: Dennis Henne

You may appeal this determination to the City of Union Gap, at 102 W. Ahtanum Rd. Union Gap, WA 98903, no later than 5:00 pm on July 20, 2023 (14 days) by completing an appeal application form and payment of the appeal fee. You should be prepared to make specific factual objections. Contact the City of Union Gap to read or ask about the procedures for SEPA appeals.

Attachment 5

Baghouse Specifications

Donaldson
Torit®

DOWNFLO® EVOLUTION DUST COLLECTORS



EVOLUTIONARY DESIGN

THE ORIGINATORS OF THE CARTRIDGE COLLECTOR

The breakthrough performance of the Downflo® Evolution (DFE) family of cartridge dust collectors is the result of Donaldson Torit's relentless drive to improve its products and exceed customer expectations. Donaldson Torit put decades of industry experience to work to produce a new, best-in-class dust collector capable of reducing equipment size and number of required filters by up to 40% compared to a typical cartridge collector. A smaller collector helps lower the initial purchase price, reduces filter replacement costs, and opens up valuable manufacturing floor space.

This state of the art collector, coupled with Donaldson's industry-leading Ultra-Web® fine fiber filtration technology, is truly an intelligent design.

REVOLUTIONARY AIRFLOW MANAGEMENT

Directs incoming air to an intelligent dropout zone for reduced filter loading

BREAKTHROUGH FILTER CLEANING

MaxPulse™ Cleaning System delivers 27% more cleaning energy to filtration media

INDUSTRY-LEADING FILTRATION DESIGN

Positions more filtration media in beneficial locations and ensures easy, leak-free installation with Ultra-Web MERV15 media as standard

RESULTS

A smaller cartridge collector with fewer filters and the lowest cost of ownership

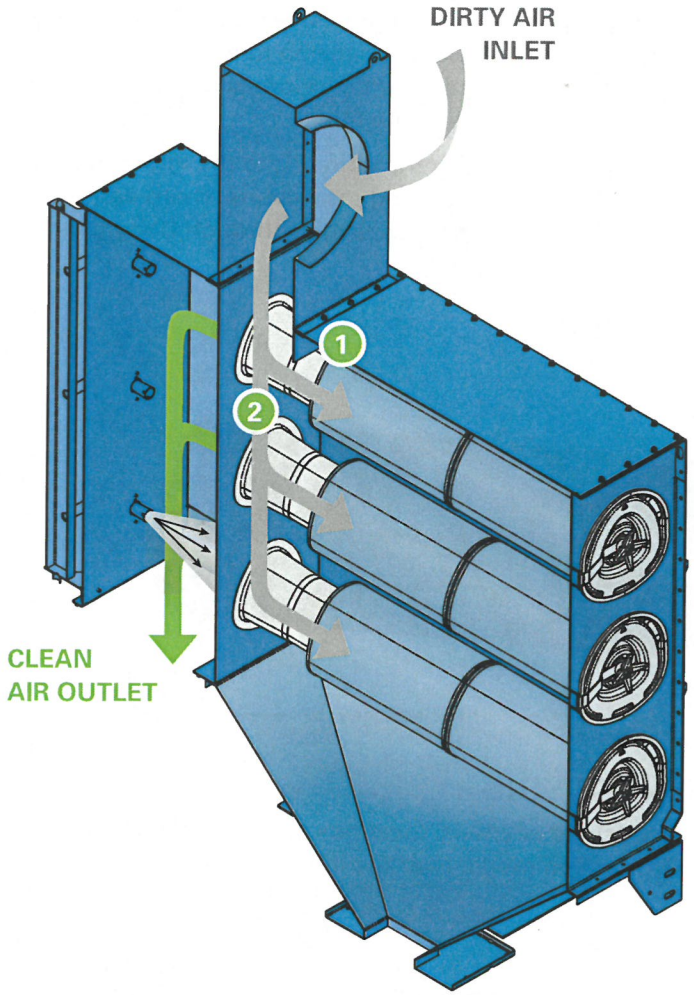
iCUE™ CONNECTED FILTRATION SERVICE

Now available with the option of Donaldson's iCue connected filtration service, an IoT enabled service designed to prompt timely maintenance, helping improve production uptime and reduce operating costs.



ENGINEERED AIRFLOW MANAGEMENT

The DFE's game-changing dust collection performance is achieved through a combination of design features that result in significant customer benefits.



INTELLIGENT DROPOUT ZONE

1. **Metal venturis**
2. **Dropout zone ensures**
   - Pre-separation of heavy dust particles
   - Lower pressure loss than baffle design used by competitors
   - Minimal filter element abrasion

DOWNFLO EVOLUTION
INTELLIGENT DESIGN

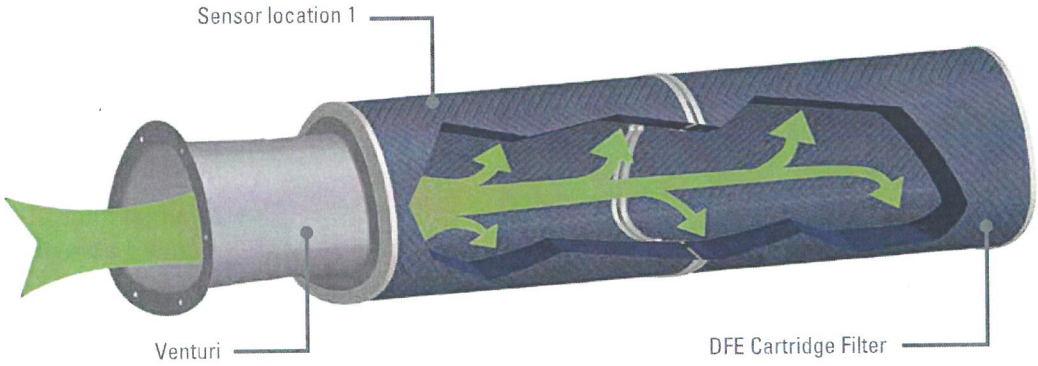
MAXPULSE™ CLEANING SYSTEM

SUPERIOR CLEANING PERFORMANCE

The DFE provides breakthrough cleaning performance resulting in improved filtration capacity without sacrificing filter life or taxing compressed air consumption. Typical pulse-jet cleaned dust collectors deliver only a fraction of the compressed air energy to clean the filtration media. The DFE's proprietary, MaxPulse Cleaning System minimizes energy losses by focusing on the cleaning air's exact path and delivers uniform cleaning energy to all effective filtration media.

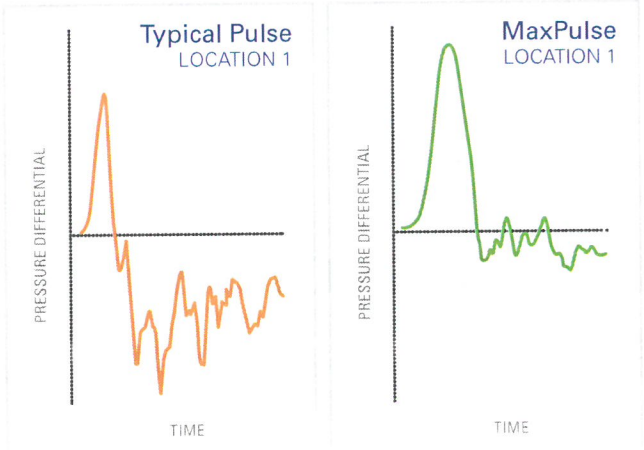
The cleaning action starts with the release of compressed air from the diaphragm valve through a unique, double-diverging pulse nozzle. The nozzle precisely controls the initial pulse expansion to minimize energy losses associated with uncontrolled compressed air expansion. Donaldson Torit's proprietary, pulse-shaping design distributes the cleaning energy evenly to match the unique shape of the filter.

After exiting the pulse nozzle, the cleaning air flows through smooth, easy transitions into the filter interior ensuring the compressed air expands naturally without abrupt, energy-wasting restrictions, sharp edges, or volume changes. More effective filtration media results in increased airflow capacities through Donaldson Torit dust collection equipment.



PROVEN IN PULSE TEST BENCH ANALYSIS

Significantly higher pulse pressures are recorded and sustained at critical locations along the filtration media profile. More uniform cleaning results in more effective filtration media over the life of the filter.

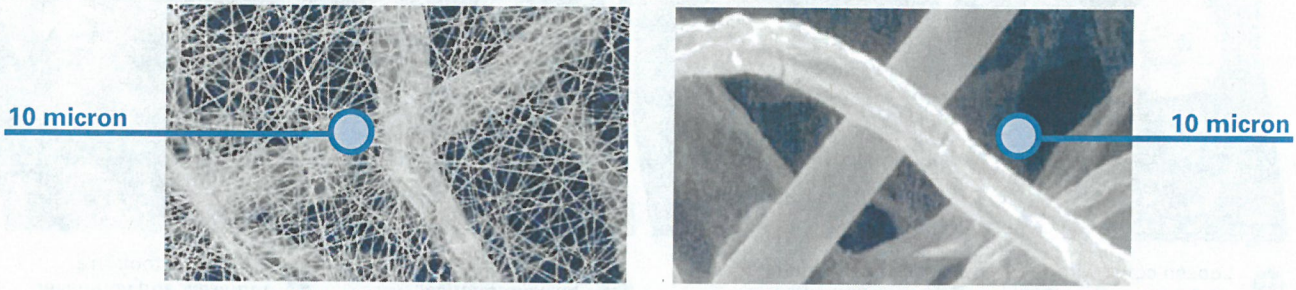


27% HIGHER
IMPULSE CLEANING ENERGY DELIVERED

CARTRIDGE FILTER TECHNOLOGY

HIGH PERFORMANCE FILTERS

The DFE filter design is another indication of Donaldson Torit's commitment to technical research and development. The distinguishing factor in our filters is Ultra-Web filtration technology. Ultra-Web fine fiber media uses a layer of fibers 0.2 to 0.3 microns in diameter to capture contaminants on the surface of the media less than one micron in size. The resulting dust cake is easily cleaned off during the automated collector cleaning cycles providing cleaner air longer, with a minimum MERV* 15 efficiency rating based on ASHRAE 52.2 - 2007 test standards.

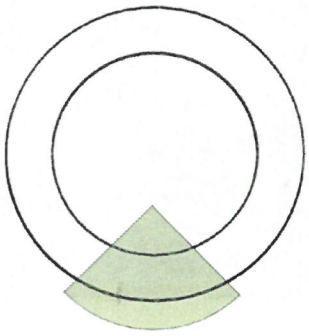


Fine Fiber Media
(600x)
Fine fiber surface loading technology is available in all Ultra-Web and Fibra-Web filter cartridges.

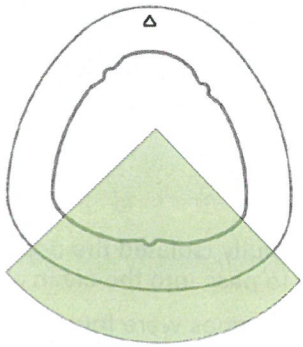
Commodity Filter Media
(600x)
Conventional media has spaces of up to 60 µm between fibers, allowing dust to become deeply embedded.

TRIAGONAL FILTER SHAPE

The ultimate goal of any pulse-cleaned dust collector is to remove the contaminant from the airstream and get the contaminant into a containment vessel under the equipment's hopper. The DFE's unique shape positions more filter media at the bottom of the cartridge element so pulse-cleaning energy directs the ejected dust toward its ultimate destination – the containment vessel!



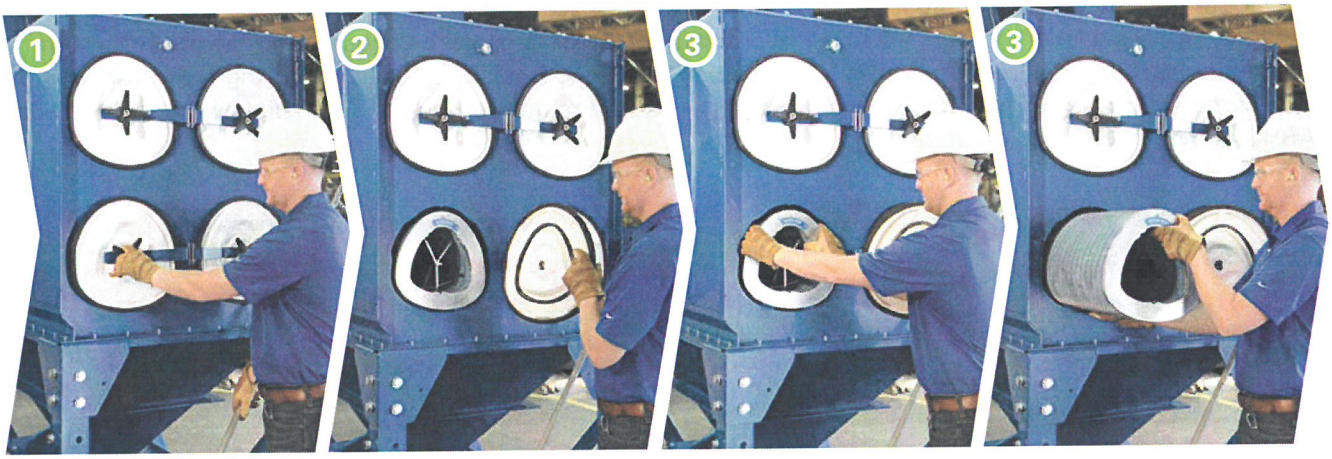
25%
ROUND FILTER



27%
DFE TRIAGONAL FILTER
The DFE triagonal filter features more filter media at the bottom of the cartridge element than any other cartridge on the market.

QUICK FILTER CHANGEOUT

The interior of the metal filter element endcaps features a specific profile that engages with the collection equipment's support yoke. The asymmetrical yoke design ensures proper filter installation, seal, and cleaning alignment.



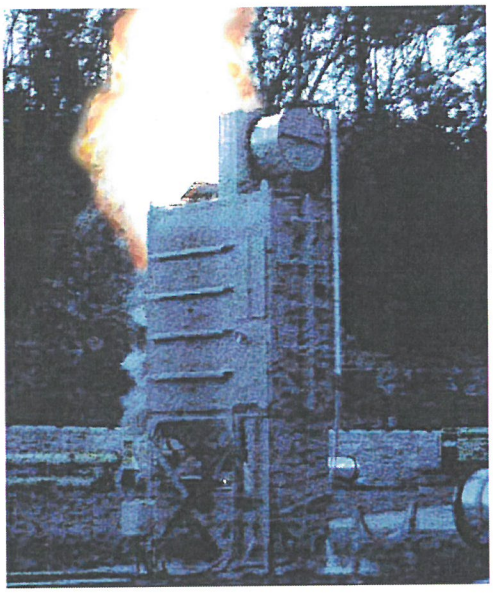
1. Loosen cover with 4-lobe knob. Knob has center lug enabling power tool operation.
2. Open hinged filter access cover.
3. Filter supported by asymmetrical suspension yoke ensure proper installation for worry-free operation.

✱ No special tools are required, and you never have to enter a confined space or dirty air plenum to do the job.

COMBUSTIBLE DUST MANAGEMENT

DEFLAGRATION ISOLATION

Donaldson Torit's DFE assists operators' combustible dust management. A DFE collector was tested to determine if the collector could isolate a deflagration and stop flames or sparks from passing into the clean air plenum. When applied in conjunction with effective explosion protection strategies including inlet isolation and explosion venting, the performance results support conformance to Chapter 5 Performance-Based Design Option requirements of both NFPA 654 - to prevent the "extension of the flame front outside the compartment or equipment of origin except where intentionally vented to a safe location" [5.2.5 (2)] and NFPA 69 - to "limit the risk of flame spread from vessel to vessel via interconnecting ducts." [5.2.3.4]



TEST RESULTS[1]

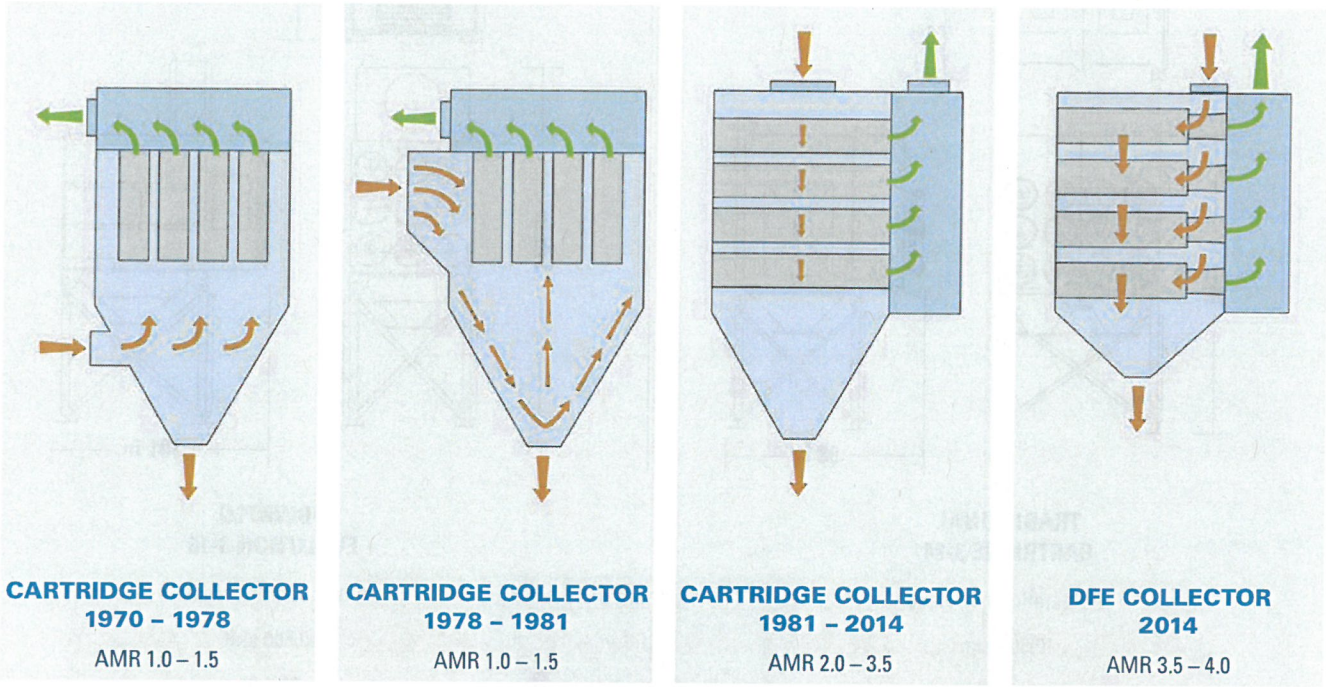
- In all tests, the filters successfully isolated the deflagration and allowed no flame or sparks to pass into the clean air plenum.
- The filter media and support frames were found to be free from any plastic deformation due to deflagration loads at dirty air plenum pressures up to and including 8.3 psig.

[1] Tests conducted on a Downflo Evolution (DFE) cartridge collector with standard FR Cartridge filter elements, top-mounted explosion vents, and without secondary filtration. Tests performed with airflow through the collector at typical air volumes. Tests repeated with no airflow through the unit. Tests used clean filters and were repeated with 'dirty' filters loaded with enough dust (cornstarch) to generate a 4-inch differential pressure across the filters and tubesheet. (Cornstarch dried to less than 2% moisture by weight was used as the dust / fuel for all tests.) Optical detectors sensitive in the IR band were mounted in multiple locations within the clean air plenum to determine flame transmission through the filter media.

THE CONTINUING EVOLUTION OF CARTRIDGE COLLECTION

Donaldson Torit has been at the forefront of cartridge collection for over 40 years, and has developed game-changing solutions others can only attempt to imitate. Now, the game is changing again! With the DFE's airflow design, MaxPulse cleaning system, triangonal filter shape, and industry-leading Ultra-Web filtration media, customers benefit from a smaller collector containing fewer filters.

AIR-TO-MEDIA (AMR) RATIO EVOLUTION – WELD FUME

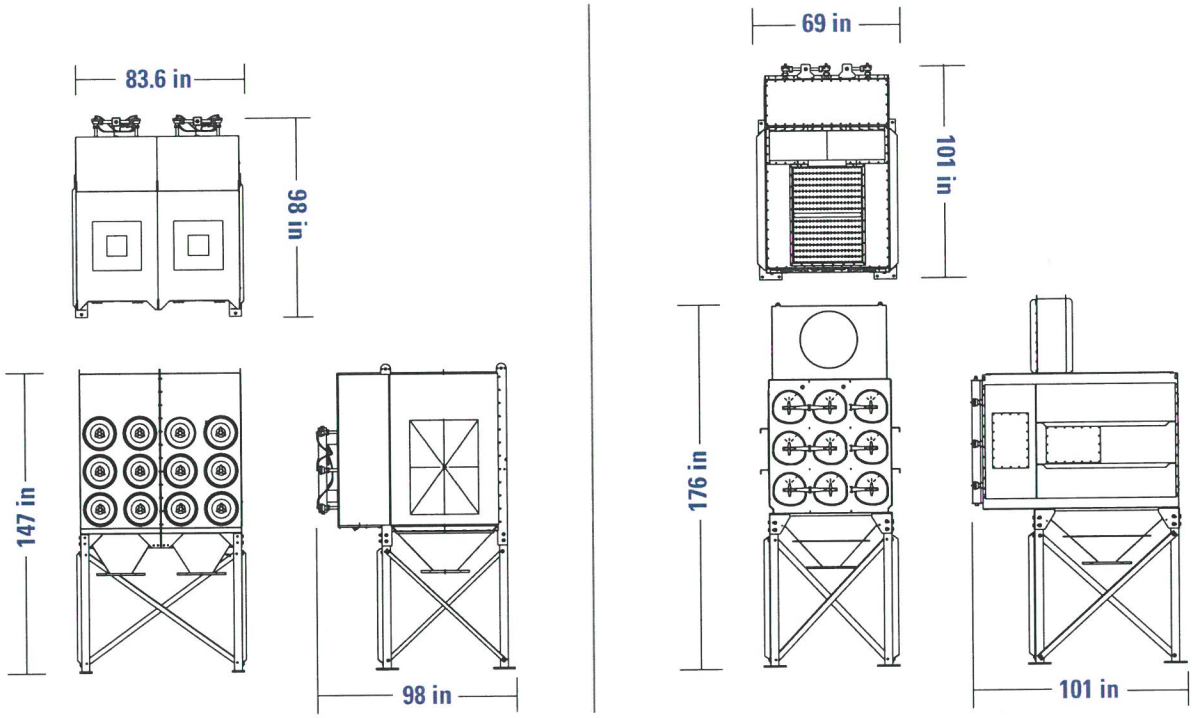


The graphic above shows an example of the Air-to-Media ratios for a typical weld fume application. The DFE features higher AMRs, smaller footprint, fewer filters, superior performance, and lowest cost of ownership!

UP TO 40% FEWER FILTERS & SMALLER FOOTPRINT

EQUIPMENT COMPARISON

The DFE dust collector has increased filtration capacity compared to traditional cartridge collectors. This advantage reduces required collector footprint, with fewer filters, and lowers the total cost of ownership.



TRADITIONAL CARTRIDGE 3-24		DOWNFLO EVOLUTION 3-18
Automatic Shot Blast	Application	Automatic Shot Blast
10,500 cfm	Airflow	10,500 cfm
56.9 ft²	Footprint	50.3 ft²
147 in	Height	176 in
24	Filter Count	18
2	Hopper Outlets	1
13 scfm	Compressed Air	10 scfm

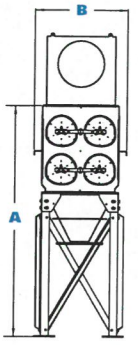
OPERATING CONDITIONS FOR DFE COLLECTORS

Seismic Spectral Acceleration	S_s = 1.5 g S_1 = 0.6 g per IBC 2009 FIG 1613.5
Basic Wind Speed and Exposure (mph/kph)	90/145 Exposure C per IBC 2009
Housing Rating (inches of H_2O/millimeters of H_2O)	-25 – +10 / -635 – +254
Compressed Air Required (psi/bar)	90-100/6.2-6.9
Operating Temperature	150°F/66°C
Housing Construction	3/16" (4.8mm) - 10-gauge steel
Control Voltage	120 VAC -or- 24 VDC

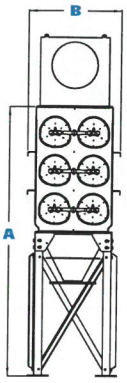
Adventurer Manufacturing, Inc. - APOC
NOC Modification - Materials Usage Update

June 4, 2026
Attachment 5-8

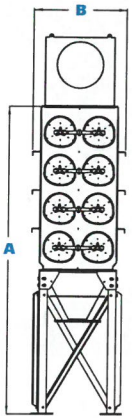
DIMENSIONS & SPECIFICATIONS



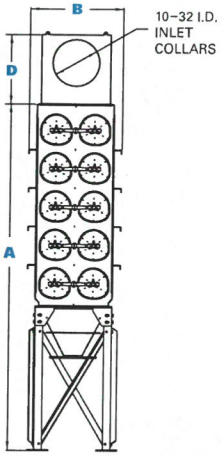
DFE 2-8



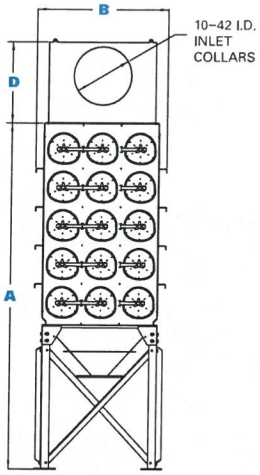
DFE 3-12



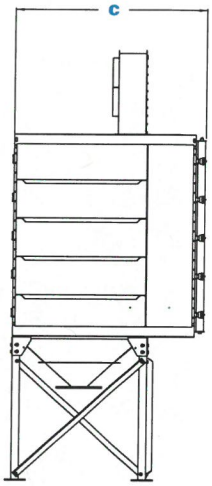
DFE 4-16



DFE 5-20



DFE 5-30



SIDE VIEW

DFE Model*	No. of Filters	Ultra-Web Filter Area		No. of Valves	Approx. Shipping Weight*		Dimensions					
							A		B		C	
		ft²	m²		lb	kg	in	mm	in	mm	in	mm
DFE 2-4	4	1,016	94.4	4	1,890	857	110	2,794	48	1,219	75	1,905
DFE 3-6	6	1,524	141.6	6	2,300	1,043	130	3,302	48	1,219	75	1,905
DFE 2-8	8	2,032	188.8	4	2,300	1,043	120	3,048	48	1,219	101	2,565
DFE 2-12	12	3,048	283.2	6	2,900	1,316	120	3,048	68	1,727	101	2,565
DFE 3-12	12	3,048	283.2	6	2,800	1,270	140	3,556	48	1,219	101	2,565
DFE 4-16	16	4,064	377.6	8	3,300	1,497	160	4,064	48	1,219	101	2,565
DFE 3-18	18	4,572	424.8	9	3,500	1,588	140	3,556	68	1,727	101	2,565
DFE 5-20	20	5,080	471.9	10	3,850	1,746	180	4,572	48	1,219	101	2,565
DFE 3-24	24	6,096	566.3	12	4,500	2,041	140	3,556	88	2,235	101	2,565
DFE 4-24	24	6,096	566.3	12	4,090	1,855	160	4,064	68	1,727	101	2,565
DFE 5-30	30	7,620	707.9	15	4,800	2,177	180	4,572	68	1,727	101	2,565
DFE 4-32	32	8,128	755.1	16	5,200	2,359	160	4,064	88	2,235	101	2,565
DFE 3-36	36	9,144	849.5	18	5,700	2,585	140	3,556	128	3,251	101	2,565
DFE 5-40	40	10,160	943.9	20	6,200	2,812	180	4,572	88	2,235	101	2,565
DFE 3-48	48	12,192	1,132.7	24	8,200	3,719	140	3,556	168	4,267	101	2,565
DFE 4-48	48	12,192	1,132.7	24	6,700	3,039	160	4,064	128	3,251	101	2,565
DFE 3-60	60	15,240	1,415.8	30	9,900	4,490	140	3,556	208	5,283	101	2,565
DFE 5-60	60	15,240	1,415.8	30	7,700	3,493	180	4,572	128	3,251	101	2,565
DFE 4-64	64	16,256	1,510.2	32	9,500	4,309	160	4,064	168	4,267	101	2,565
DFE 3-72	72	18,288	1,699.0	36	11,600	5,262	140	3,556	248	6,299	101	2,565
DFE 4-80	80	20,320	1,887.8	40	11,500	5,216	160	4,064	208	5,283	101	2,565
DFE 5-80	80	20,320	1,887.8	40	11,000	4,990	180	4,572	168	4,267	101	2,565

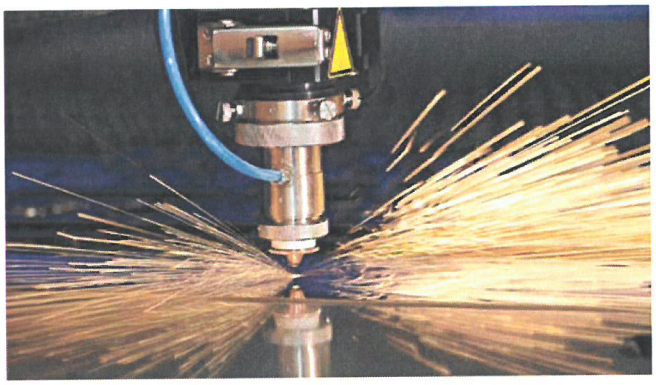
Inlet Size	D	
	in	mm
10 – 16	24.0	610
17 – 24	36.0	915
26, 28, 30, 32	42.0	1,067
34, 36, 38, 40, 42	48.0	1,219

* Without accessories or optional equipment.

DFE SERIES APPLICATIONS

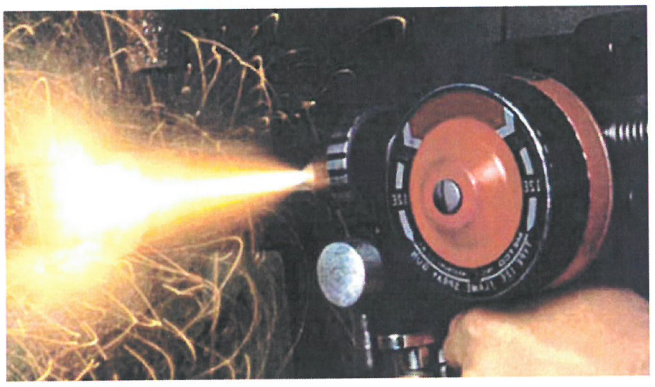












METAL GRINDING

PLASMA CUTTING

DRY BULK

PHARMACEUTICAL

THERMAL SPRAY

WELDING

METAL MANUFACTURING

GLASS

FOOD PROCESSING

Adventurer Manufacturing, Inc. - APOC
NOC Modification - Materials Usage Update

June 4, 2026
Attachment 5-10

STANDARD FEATURES & AVAILABLE OPTIONS

DFE 2-4 TO 5-80

Collector Design †	Std	Opt
Mild Steel Construction	X	
MaxPulse™ Filter Cleaning System	X	
Quick-Removal Access Covers	X	
Inlets	X	
Ledge-Free Hopper	X	
Sprinkler Taps	X	
Stainless Steel Construction		X
High Temperature Construction		X
Explosion Protected Models		X
Direct Drive Fans		X
Chamber and Exhaust Silencers		X
High-Flow Inlet		X
Air Management Modules		X
Extended Dirty Air Plenum		X
Steep-Sided Hopper		X
2-Mod Hopper		X
Sprinkler Heads		X
Service Platform (OSHA compliant)		X
Damper Pack		X
Drum Sentry™ Drum-Full Indicator		X
Lined Clean Air Plenum		X
Bag-Out Kit (Filter & Discharge)		X
Bag-In/Bag-Out Kit (Filter & Discharge)		X
Cartridge Filters		
Ultra-Web® (MERV* 15)	X	
Ultra-Web® FR (MERV* 15); Ultra-Web® SB (MERV* 15); Ultra-Web® AS (MERV* 15); Fibra-Web® (MERV 14); Thermo-Web™ (MERV 14); Torit-Tex™ (MERV 16); High Temp (MERV 13)		X
HEPA/ASHRAE Afterfilters		X

Paint System	Std	Opt
Prime Coated Interior	X	
Textured Multi-Coat Paint Finish with 2,000-Hour Salt Spray Performance	X	
Custom Color		X
Premium Duty Finish		X
Epoxy Coating		X
Hopper Discharge		
Drum Cover and Hose		X
Slide Gates		X
Rotary Valves and Transitions		X
Screw Conveyors		X
Electrical Controls, Gauges & Enclosures		
Control Box w/Timer in NEMA 4 Enclosure	X	
Magnehelic®** Gauge Controls	X	
Delta P Control, Delta P Plus Control		X
Dustronix™ Control Assembly		X
Custom Panels		X
Photohelic®** Gauge Standard and Weatherproof		X
Basic Cold Climate Kit		X
Heavy-Duty Cold Climate Kit		X
Solenoid Enclosure (NEMA 7 & 9)		X
iCue™ Connected Filtration Service		X
Warranty		
10-Year Warranty	X	

† Donaldson Torit equipment is designed to IBC guidelines for specific wind speed exposure and seismic spectral acceleration at grade level. Contact your Donaldson Torit representative for detailed information available on the equipment's Spec Control drawings. Equipment may be customized to meet unique, customer-specified site requirements.

Industry-Leading Technology

- Advanced filtration technology for optimal performance
- Reduced energy consumption and cost of ownership
- Advanced design and testing capabilities

The Most Filters and Parts

- For every brand and style of collector
- Wide range of filtration media for any application
- 90,000 filters and parts in stock and ready to ship

Unparalleled Support

- Live technical specialists
- Comprehensive pre- and post-sale support
- 40 manufacturing plants and 14 distribution centers worldwide

Significantly improve the performance of your collector with genuine Donaldson Torit replacement filters and parts. **Call Donaldson Torit at 800-365-1331.**

Important Notice
Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, product specifications, availability and data are subject to change without notice, and may vary by region or country.

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F118005 ENG (12/22) Downflo Evolution Dust Collector Brochure ©2014-2022 Donaldson Company, Inc. Donaldson, Torit, Downflo, iCue, Ultra-Web, Fibra-Web, Ultra-Tek, Thermo-Web, Torit-Tex and the color blue are marks of Donaldson Company, Inc. All other marks belong to their respective owners.

Donaldson
Torit®

FIBRA-WEB® CARTRIDGE

ENGINEERED FOR DUST COLLECTION

- Fine fiber technology ensures longer filter life at a significantly lower pressure drop
- Wide pleat spacing provides thorough pulse cleaning of fibrous and agglomerative particles
- MERV* 14 filtration efficiency rating per ASHRAE 52.2-2007
- Superior particle release due to surface filtration
- Lightweight and easy to install
- Flame retardant media available
- Stainless steel construction available



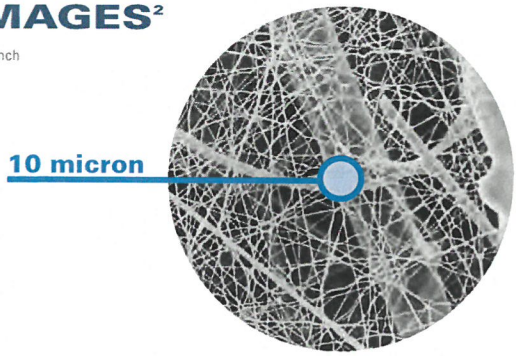
Fibra-Web Cartridge

APPLICATIONS

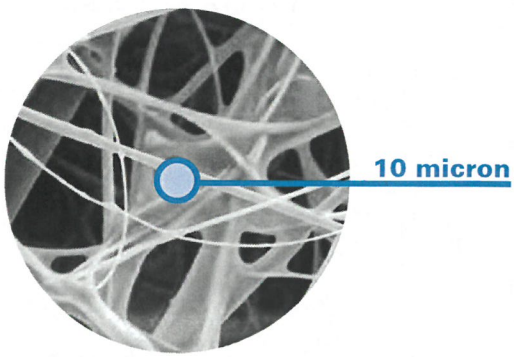
- Excellent on applications with a combination of fibrous and non-fibrous dust including ceramics, cotton, fiberglass, grains, and many more
- Proven solution for agglomerative dust

SEM IMAGES†

1 micron = 1/25,400 of an inch
(1/1000 of a millimeter)



Fibra-Web (600x)
Fine Fiber Media



Synthetic Media (600x)

† Scanning Electron Microscope
* Refer to Minimum Efficiency Reporting Value on page 2.

SPECIFICATIONS

MEDIA COMPATIBILITY DATA

Temperature Resistance	180°F / 82°C	
Moisture Absorption**	Maximum 14% @ 70°F (21°C) and 65% RH	
Chemical Tolerance***	Acids→Poor Bases→Fair	Oxidants→Fair Solvents→Good
Abrasion Resistance	Good per TAPPI 476 (Taber Method)	

MEDIA COMPOSITION

Fine Fiber Technology	Proprietary synthetic fibers with an average diameter of 0.2 µm
Substrate	Proprietary blend of synthetic fibers with an average diameter of 12 µm Flame retardant version per UL®† Standard 558 TAPPI Standard T 461 om-94, and DIN 53438 Part 3

CARTRIDGE CONSTRUCTION

Standard Construction	Galvanized metal end caps Galvanized expanded metal inner liner 60% open area Urethane gasket No outer liner
Options	Stainless steel liner and end caps Flame retardant media EPDM gasket

MEDIA EFFICIENCY

U.S. Efficiency Rating	MERV* 14 per ASHRAE 52.2-2007

CONFIGURATIONS

Collector Models	Filter Area		Pleat Height		Dimensions		Fibra-Web		
	ft²	m²	in	mm	in	mm	Standard	FR	SS
Bin Vent (TBV)	111.0	10.3	2.0	50.8	12.74 x 26.0	323.6 x 660.4	•	•	•
CX Series	119.0	11.1	2.0	50.8	13.84 x 26.0	351.5 x 660.4	•	•	
Downdraft Bench (DB)	119.0	11.1	2.0	50.8	13.84 x 26.0	351.5 x 660.4	•	•	
Downflo® (DF)	111.0	10.3	2.0	50.8	12.74 x 26.0	323.6 x 660.4	•	•	•
Downflo® II (DFT)	119.0	11.1	2.0	50.8	13.84 x 26.0	351.5 x 660.4	•	•	•
Downflo® Containment System (DCS)	89.0	8.3	1.5	38.1	11.4 x 14.4 x 26.0	288.5 x 364.7 x 660.4	•	•	•
Downflo® Oval (DFO)	89.0	8.3	1.5	38.1	11.4 x 14.4 x 26.0	288.5 x 364.7 x 660.4	•	•	•
Downflo® Evolution (DFE)	119.0	11.1	2.0	50.8	13.74 x 13.74 x 26.0	349.1 x 349.1 x 660.4	•	•	•
Downflo® WorkStation (DWS)	89.0	8.3	1.5	38.1	11.4 x 14.4 x 26.0	288.5 x 364.7 x 660.4	•	•	•
Downflo® (SDF)	55.0	5.1	1.5	38.1	9.2 x 22.3	233.9 x 566.1	•	•	
Environmental Control Booth (ECB)	111.0	10.3	2.0	50.8	12.74 x 26.0	323.6 x 660.4	•	•	•
MTD	111.0	10.3	2.0	50.8	12.74 x 26.0	323.6 x 660.4	•	•	•
ProBooth™	111.0	10.3	2.0	50.8	12.74 x 26.0	323.6 x 660.4	•	•	•
TD Large	111.0	10.3	2.0	50.8	12.74 x 26.0	323.6 x 660.4	•	•	•
TD Small	43.0	4.0	2.0	50.8	7.9 x 16.0	201.4 x 406.4	•		

† UL is a registered trademark of Underwriters Laboratories, Inc.

* The Minimum Efficiency Reporting Value (MERV) of this filter cartridge has been determined through independent laboratory testing using ASHRAE 52.2 (2007) test standards. The MERV rating was determined at a face velocity of 118 feet per minute (36.0 meters per minute) and loading up to four inches (101.6 millimeters) water gauge. Actual efficiency of any filter cartridge will vary according to the specific application parameters. Dust concentration, airflow, particle characteristics, and pulse cleaning methods all affect filtration efficiency.

** Environmental conditions involving combinations of high temperature, corrosive material, and moisture can reduce media strength. Reduction in media strength may compromise cartridge integrity and performance.

*** A combination of chemicals may alter fiber resistance to the specified performance level. Chemical attack may compromise cartridge integrity and performance.

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Important Notice
Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, product specifications, availability and data are subject to change without notice, and may vary by region or country.

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