1120 WESTCHESTER AVENUE

NYSDEC SITE No. 203083

1120 WESTCHESTER AVENUE BRONX, NEW YORK 10459
Block 2750 Lot 11

Soil Vapor Extraction Operation and Maintenance Plan

Prepared for:
West Levy,
LLC 2140 East
7th Street
Brooklyn, New York 11230

Prepared By:

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SYSTEM OPERATION AND MAINTENANCE

SVE Start-Up Procedures

Following installation of the system, the following items will be inspected and tested to ensure proper operation:

1) Check all exposed/visible SVE piping for evidence of damage, cracks, or leaks.
2) Turn system on and off to ensure the start box is functioning properly;
3) Record vacuum reading at blower;
4) Record vacuum readings at surrounding vapor monitoring points;
5) Take PID readings before, in-between and after carbon vessels.

The results of the initial start-up test, or any subsequent pressure test will be provided to the DEC and DOH for review and approval, and to determine whether a second extraction pit would be needed at the back of the building.

The system testing described above will be conducted if, in the course of the SVE system lifetime, the system goes down or significant changes are made to the system and the system must be restarted.

A visual inspection of the complete system will be conducted during each monitoring event. SVE system components to be monitored include, but are not limited to, the following:

- Vacuum blower; and,
- General system piping.
- Vacuum gauges at blower.
- Control switches.
- PID Readings from influent line, between carbon drums and at the discharge stack.

Observations and PID readings will recorded on the inspection form (**Attachment 1**). The SVE system is not adjustable and the regenerative blower shall not be serviced or repaired at the Site.

Monitoring and Sampling

Confirmation Testing

Confirmation indoor air testing will be completed after the SVE system has been in continuous operation for a minimum of 30 days. Testing will be performed during the heating season (November1 -March 1) and will include one indoor air sample from the cellar, one indoor air sample from the first floor and one indoor air sample from the second floor. Samples will be colelcted in 6-liter summa cannisters over an 8 hr period and submitted to a NYSDOH Certified laboratory for the analysis of VOCs by TO15.

Performance Monitoring

The system will be monitored intitally on an alternate week basis for the first month of operation, going to monthly for next three months of opertion and then quarterly after that. Air samples will be collected at start up and then on a quarterly basis to evaluate the performance of the system. PID readings will be taken during each monitoring event from three locations: system influent (before carbon), between the carbon canisters and from the system discharge (after carbon). Air samples will be collected from the system effluent only and submitted to a NYSDOH certified environmental laboratory for analysis of VOCs by USEPA method TO15.

Initial effluent concentrations will be high as accumulated vapors are removed resulting in accelerated carbon depletion rates. However carbon usage will rapidly diminish over time (1-2 weeks) as the accumulated vapors are removed and effluent concentration is dictacted by the transfer of VOCs from the sorbed phase to the vapor phase from residually impacted soils. Carbon drums will be set up in series with the between vessel PID readings utilized to determine when break through occurs at the first drum. When this occurs the drum will be changed out and shipped back to the supplier for regeneration. If nuisance odors are observed from the discharge at any time, operation of the system will be temporarily halted until the situation is remedied by changing out the carbon or through other necessary repairs / actions (loose valve / fitting, broken pipe, etc.).

QA/QC

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The accuracy, precision and completeness requirements will be addressed by the laboratory for all data generated.

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site. Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
- Sample Tracking and Custody;
- Calibration Procedures:
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;

- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel.

Reporting

Sample analysis will be provided by a New York State ELAP certified environmental laboratory. Laboratory reports will include Analytical Systems Protocol July 2005 (ASP) category B data deliverables for use in the preparation of a data usability summary report (DUSR). All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format. All monitoring results will be reported to NYSDEC on a periodic basis in the Periodic Review Report. A letter report will also be prepared subsequent to each quarterly air sampling event. The report (or letter) will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (o be submitted electronically in the NYSDEC-identified format);
- Calculations of contaminant mass recovered, treated, or destroyed by the system during the period of operation;
- Description of system performance in terms of contaminant data and comparison to the design performance standards;
- Any observations, conclusions, or recommendations; and
- A determination as to whether conditions have changed since the last reporting event.

Reporting of Performance Data in CCR
Chemical labs used for all performance monitoring and sampling analysis will be NYSDOH ELAP laboratory certified in the appropriate categories. The CCR will provide a tabular and map summary of all performance monitoring and post-remedial sample results.

Permits / Authorization

Air discharge under the NYS Class 2 Hazardous Waste Site program will not require a permit from the NYSDEC, however sites undergoing remediation in NYSDEC's DER program are not exempt from air permitting requirements. An industrial process equipment application will be filed with the NYC Department of Environmental Protection, Bureau of Environmental Compliance, if required.

Attachment 1

SVE System Inspection Checklist

SOIL VAPOR EXTRACTION SYSTEM INSPECTION FORM

Date:_____

Time:_____

Weather: _____

Inspector: _____

Extraction Point	Vacuum (iwc)	PID Reading(ppb)
VE-1		
Blower inlet		
Before Carbon		
After Carbon		

Inspection:	Yes / No	Comments
Blower Operating?		
Spare Carbon Drums?		
System Integrity?		

CARBON MONITORING

Carbon filter installation date:_____

Date/Time	Location	PID reading	PID units(ppm or ppb)
	Pre-Carbon		
	Post -Carbon		

Comments/Actions taken:

Attachment 2

Manufacturers Specification Sheets

Environmental / Chemical Processing Blowers

EN 454 & CP 454

ROTRON®

1.5 HP Sealed Regenerative w/Explosion-Proof Motor

FEATURES

- Manufactured in the USA - ISO 9001 and NAFTA compliant
- Maximum flow: 120 SCFM
- Maximum pressure: 65 IWG
- Maximum vacuum: 59 IWG
- Standard motor: 1.5 HP, explosion-proof
- Cast aluminum blower housing, impeller , cover & manifold; cast iron flanges (threaded); teflon® lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

MOTOR OPTIONS

- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

BLOWER OPTIONS

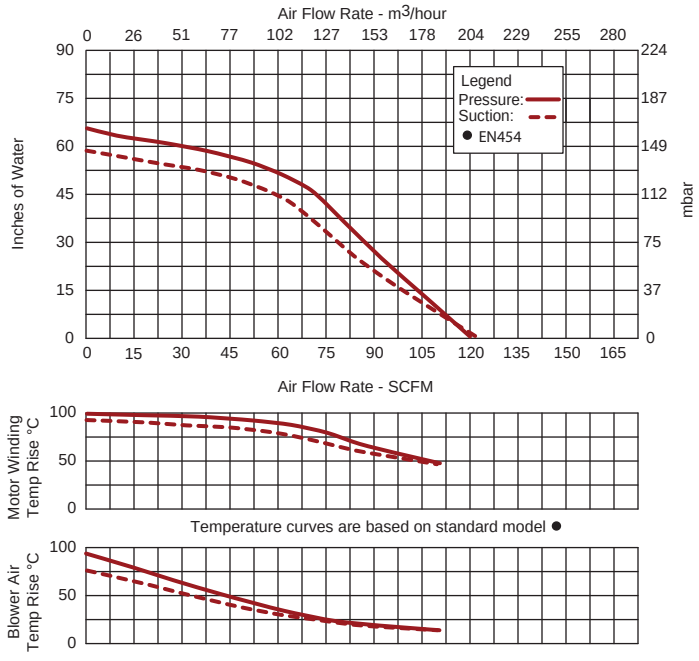
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

ACCESSORIES

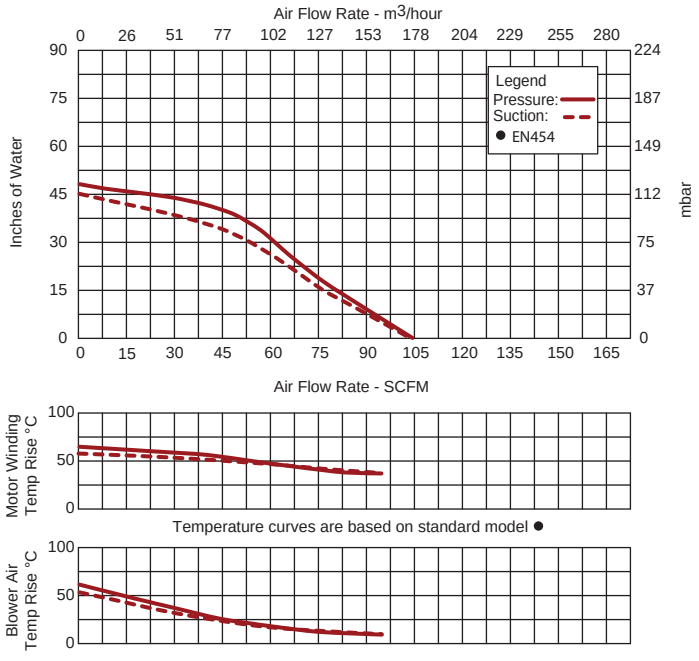
- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges, & relief valves
- Switches - air flow, pressure, vacuum, or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

Blower Performance at Standard Conditions

60 Hz



50 Hz



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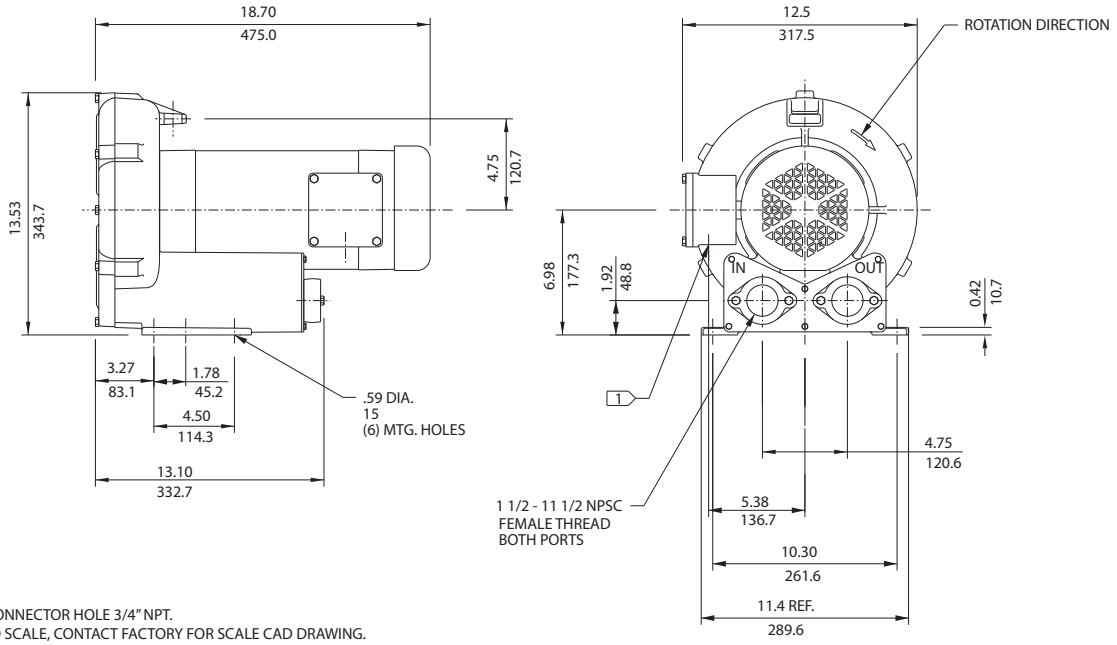
ROTRON®

EN 454 & CP 454

1.5 HP Sealed Regenerative w/Explosion-Proof Motor



IN
MM

NOTES
1. TERMINAL BOX CONNECTOR HOLE 3/4" NPT.
2. DRAWING NOT TO SCALE, CONTACT FACTORY FOR SCALE CAD DRAWING.
3. CONTACT FACTORY FOR BLOWER MODEL LENGTHS NOT SHOWN.

		Part/ Model Number			
		EN454W58ML	EN454W72ML	CP454W72MLR	CP454FR72MLR
Specification	Units	080487	080488	080490	080494
Motor Enclosure - Shaft Mtl.	-	Explosion-proof-CS	Explosion-proof-CS	Chem XP-CS	Chem XP-SS
Horsepower	-	1.5	1.5	1.5	1.5
Phase - Frequency	-	Single-60 hz	Three-60 hz	Three-60 hz	Three-60 hz
Voltage	AC	115/208-230	230/460	230/460	230/460
Motor Nameplate Amps	Amps (A)	15/7.9-7.5	4.6/2.3	4.5/2.3	4.6/2.3
Max. Blower Amps	Amps (A)	19/10.9-9.5	5.6/2.8	5.6/2.8	5.6/2.8
Inrush Amps	Amps (A)	96-48	32/16	32/16	32/16
Service Factor	-	1.0	1.0	1.0	1.0
Starter Size	-	1/0	00/00	00/00	00/00
Thermal Protection	-	Class B - Pilot Duty	Class B - Pilot Duty	Class B - Pilot Duty	Class B - Pilot Duty
XP Motor Class - Group	-	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G
Shipping Weight	Lbs	90	84	84	84
	Kg	40.8	38.1	38.1	38.1

Voltage - ROTRON motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

Operating Temperatures - Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

Maximum Blower Amps - Corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

XP Motor Class - Group - See Explosive Atmosphere Classification Chart in Section I

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AMETEK® TECHNICAL & INDUSTRIAL PRODUCTS

ROTRON®

Motor Options

ROTRON strives to provide the most complete variety of desired options on our products including on our motors. By using motor vendors of high quality and versatility, we can provide motor features from multiple released designs to meet your needs (i.e., a Chem Processing Inverter Duty Explosion-proof motor with space heaters and drains wound for 380 V-50 Hz service).

Design Consistency

ROTRON motors are engineered for us to integrally mount with our blower and maximize blower performance. Our vendors are qualified by ROTRON (per motor part number) to ensure the blowers' mechanical and electrical needs merge with your required features. The basic motor requirements on our DR/EN/CP/HiE products include:

- NEMA approved
- CE conformity (non-XP models)
- UL & CSA approved with symbol and file on nameplate
- C-face mount
- Permanently sealed bearings
- Shaft end play, run out and perpendicularity requirements above NEMA standards
- Dual voltage and dual frequency (some models not feasible) to maximize use worldwide
- Single Shafted Totally Enclosed Fan Cooled (TEFC) and Explosion-proof (XP) models
- Double Shafted Open Drip Proof (ODP) models with dual internal fans for circulation
- Class I Group D minimum on explosion-proof motors; many are Class I Group D, Class II F & G
- Commercial Spa (SPA-ODP) motors with automatic thermal overload protection and industry specified terminal strip

Standard Motor Variations

Chemical Processing (CP) features are added to TEFC, XP or HiE designs for corrosive gas service, Marine Duty service and sanitary (food/pharmaceutical) service.

- 303 stainless steel shaft
- Cast iron and steel frame epoxy painted or zinc plated
- Zinc plated hardware
- Stainless steel nameplate
- Non-hygroscopic insulation; double dipped and baked stator
- Epoxy coating on rotor
- Gaskets and joint sealers on all metal-to-metal surfaces
- Oversized conduit box

High Efficiency (HiE) features are added to TEFC, ODP, XP or CP motors for maximum motor efficiency and life. ROTRON HiE motors carry extra phase-to-phase protection for use with inverters between a 1750-3500 RPM range.

Inverter Duty features are added to TEFC, ODP, XP or CP for use with Inverters/Variable Speed Drive Controllers. A wide range of RPM can be handled and should be specified at time of quote. For best compatibility, an inverter should be matched to the motor manufacturers design.

Project Specific Motor Variations

There are no limits to the options you can select or request for your product. Routine motor options include:

- International voltage & frequency (Hz)
- Different shaft material
- Oversized and/or Nema 4 intent T-box
- Space heaters
- Drains
- Regreasable bearings
- Tropicalized windings

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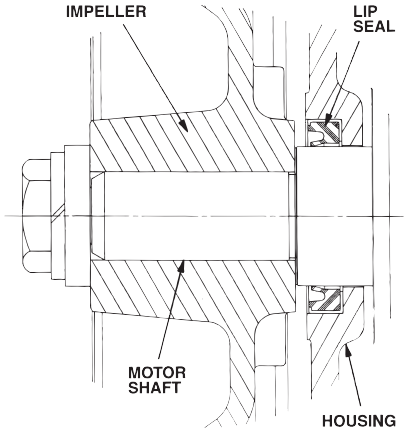
Typical Sealing Options

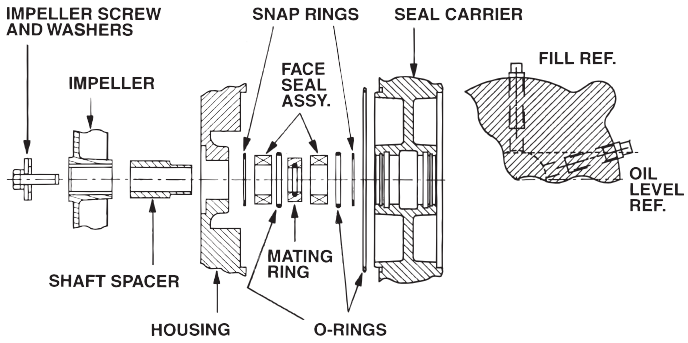
Lo-Leak™ LIP SEAL Option

The Lo-Leak™Lip Seal option is available to control gas leakage for all DR models and is standard on all EN and CP models. Features include: Lip seals to prevent leakage at the motor shaft. RTV sealing compound is used to cut off all leakage paths at the blower's metal-to-metal surfaces. Castings are vacuum impregnated to prevent leakage through castings. Estimate leakage rate = 25 cc/min or less



Double Face Carbon Seal Option

For further minimization of gas leakage on all DR, EN and CP models, a pair of face seals work against each other on opposite sides of a common mating ring to effectively reduce gas leakage at the motor shaft. The face shields are continually lubricated from a reservoir to prolong seal life. The seal is completed by installing the blower to motor bolts with O-rings and sealing the covers to the housing with an RTV sealing compound.
O-rings are also placed between the pipe flanges and the manifold.
All castings are vacuum impregnated.
Estimate leakage rate = 0.5 cc/min or less



Hermetically Sealed Spiral Containment Option

The containment option utilizes a series of O-rings to control gas leakage in Spiral blower models. The O-rings are placed at critical locations on the blower's housing and covers to contain gas leakage.

Hermetically Sealed Mag Drive Option

On DR, EN and CP 101 units, a magnet drive option has been an alternative for complete gas containment.
O-rings are used throughout the product, and magnets attached to the motor shaft spin magnets inside the blower without shaft penetration. Estimated leakage rate = 0.001 cc/mi

Nitrogen Purge / Blanket Option

The nitrogen purge option is a carrier designed to accept a nitrogen line which will purge the space outside the shaft hole. Purges can be designed to bleed the nitrogen into the process called a blanket, or the carrier can have a second tap to carry away the leaking contaminants.

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Chem-Tough™ Chemical Resistance

To stand up in corrosive and hazardous environments, chemical processing blowers have to be tough. That's why Ametek ROTRON routinely applies Chem-Tough™, ROTRON'S own engineered and proprietary process, whenever it builds blowers for handling chemical (vapor) streams. Chem-Tough™ combines the advantages of aluminum oxide ceramic and selected fluorocarbons to give ROTRON blowers unheard-of levels of chemical resistance, hardness, abrasion resistance, permanent lubricity and more.

Chem-Tough™ Brings You the Rotron Advantage

Through this unique proprietary process, Chem-Tough™ gives ROTRON blowers these advantages:

- **Outstanding Chemical Resistance**
  Time after time, Chem-Tough™ finishing shows extremely high resistance to most common chemicals, as well as dramatically improved corrosion resistance over regular hard anodizing. Chem-Tough™ allows aluminum to achieve equivalent corrosion resistance as teflon®. 90-day immersion in acid or alkaline solution (pH 4.0-8.5) has no effect; neither does prolonged exposure to salt water. Far exceeds military specification requirements for salt spray.

- **Abrasion Resistance Equivalent to Steel**
  Excellent for smooth surfaces, Chem-Tough™ surface conversion provides higher wear resistance than either case-hardened steel or hard-chrome plate. Rub any other metal against the Chem-Tough™ finish, and the metal will show nothing but the slightest wear. Chem-Tough™ provides a perfect bond to the parent metal.

- **Increased Hardness**
  With an equivalent hardness of Rc 40-60, Chem-Tough™ is approximately file-hard – the hardness of nitrated steel. Because the Chem-Tough™ surface becomes an integral part of the metal, it simply cannot peel or chip – neither can it be scratched, flaked or nicked under ordinary conditions.

- **Permanent Dry Lubricity**
  By infusing polymers into aluminum, Chem-Tough™ gives the resulting surface a high degree of permanent lubricity and resistance to moisture. The polymers also level off surface asperities, significantly reducing surface tension. The result: blowers converted with Chem-Tough™ have a longer life, operate more efficiently and call for less maintenance.

- **Other Proprietary Processes**
  Food-Tough™ uses the same unique process as Chem-Tough™, and is designed for the food processing, medical and pharmaceutical markets. Food-Tough™ has USDA approval and meets FDA guidelines.

Chem-Tough™ at Work

Chem-Tough™ employs the advantages of anodizing, hardcoat plating, low-friction polymers and dry lubricants to become an integral part of the blower's molecular structure.

Specifically, Chem-Tough™ first converts the aluminum surface to aluminum oxide, forming a new ceramic-like surface. The water in the ceramic is replaced with Teflon®, adding a multi-functional dimension to the surface; in the process, the aluminum crystals expand and form anchor crystals that remain hygroscopic for a short time. Then, under controlled conditions, particles of the specified polymer are infused to interlock with these anchor crystals. The new surface extends .5 mil above and below the original aluminum surface – and forms a permanent molecular bond with the metal.

The result: a plastic/ceramic surface that's harder than steel, is continuously lubricating, and resists damage from chemicals like no other. The kind of protection you need for your chemical processing blowers.

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Chemical Resistance Chart

Chemical Effect Ratings
A – No effect – acceptable
B – Minor effect – acceptable
C – Moderate effect – questionable
D – Severe effect – not recommended
* – Not tested

Chemical	Aluminum	Cast Iron	Carbon Steel	Chem-Tough (Teflon®)	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Hastelloy C
Acetaldehyde	B	*	C	A	A	A	A	*	A
Acetate Solv.	B	B	A	A	A	B	A	B	*
Acetic Acid	B	D	C	A	*	B	A	B	A
Acetic Anhydride	B	B	D	A	B	A	A	B	A
Acetone	A	A	A	A	A	A	A	B	A
Acetylene	A	A	A	*	A	A	A	A	*
Acrylonitrile	B	C	*	*	A	A	C	*	B
Alcohols									
Amyl	C	C	C	A	A	A	A	*	A
BENZYL	B	*	*	*	*	A	A	*	A
Butyl	B	C	C	A	A	A	A	*	A
Diacetone	A	*	A	*	*	A	A	*	A
Ethyl	B	A	A	*	*	A	A	A	A
Hexyl	A	*	A	*	*	A	A	*	A
Isobutyl	B	*	A	*	*	A	A	*	A
Isopropyl	B	C	A	*	*	A	A	*	A
Methyl	B	A	A	A	*	A	A	A	A
Octyl	A	*	A	*	*	A	A	*	A
Propyl	A	*	A	A	*	A	A	*	A
Aluminum Chloride 20%	B	D	A	*	*	D	C	D	A
Aluminum Chloride	D	D	B	A	C	D	C	*	A
Aluminum Hydroxide	A	D	A	A	*	A	A	A	*
Alum Potassium Sulfate (Alum), 10%	A	D	A	A	*	A	*	*	B
Alum Potassium Sulfate (Alum), 100%	B	*	A	A	*	D	A	B	B
Aluminum Sulfate	A	D	A	A	*	C	C	A	A
Amines	A	A	B	A	A	A	A	*	A
Ammonia 10%	*	*	*	A	*	*	A	*	A
Ammonia, Anhydrous	B	D	B	A	A	B	A	A	A
Ammonia, Liquids	D	A	A	A	*	A	A	A	B
Ammonia, Nitrate	C	*	A	*	*	A	A	A	*
Ammonium Bifluoride	D	*	*	*	*	C	A	*	B
Ammonium Carbonate	C	C	B	A	B	A	A	A	B
Ammonium Chloride	C	D	D	A	C	A	C	A	A
Ammonium Hydroxide	C	A	C	A	A	A	A	A	A
Ammonium Nitrate	B	A	D	A	A	A	A	A	A
Ammonium Persulfate	C	D	A	A	*	A	A	A	A
Ammonium Phosphate, Dibasic	B	*	D	A	B	A	A	A	A
Ammonium Phosphate, Monobasic	B	*	A	A	*	A	A	A	A
Ammonium Phosphate, Tribasic	B	C	D	A	B	A	A	A	A
Ammonium Sulfate	B	C	C	A	C	A	B	A	A
Amyl-Acetate	B	*	C	A	B	A	A	C	A
Amyl Alcohol	B	*	A	A	*	A	A	*	A
Amyl Chloride	D	*	A	A	*	C	B	*	A
Aniline	C	*	C	A	B	A	A	A	B
Anti-Freeze	A	B	C	A	*	A	A	*	A
Antimony Trichloride	D	*	*	A	*	D	D	*	A
Aromatic Hydrocarbons	A	A	A	*	*	*	A	*	*
Arsenic Acid	D	D	D	A	B	A	A	*	*

Chemical	Aluminum	Cast Iron	Carbon Steel	Chem-Tough (Teflon®)	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Hastelloy C
Barium Carbonate	B	B	B	A	B	A	A	A	A
Barium Chloride	D	D	C	A	C	A	A	A	A
Barium Hydroxide	D	C	C	A	B	C	A	A	B
Barium Sulfate	D	C	C	A	B	A	A	A	A
Barium Sulfide	D	C	C	A	B	A	A	*	*
Benzaldehyde	B	B	A	A	A	A	A	*	A
Benzene	B	B	C	A	B	A	A	A	B
Benzoic Acid	B	D	*	A	B	A	A	A	A
Benzol	B	*	*	A	*	A	A	*	A
Borax (Sodium Borate)	C	A	C	A	*	A	A	A	A
Boric Acid	B	D	*	A	B	A	A	A	A
Bromine (Wet)	D	D	D	A	D	D	D	D	A
Butadiene	A	C	C	A	A	A	A	*	*
Butane	A	C	C	A	A	A	A	*	*
Butanol	A	*	*	A	*	A	A	*	A
Butylene	A	A	A	A	A	*	A	*	*
Butyl Acetate	A	*	A	A	*	*	C	*	A
Butyric Acid	B	D	*	A	B	B	A	A	A
Calcium Bisulfate	D	D	*	A	C	D	A	*	*
Calcium Bisulfide	C	*	*	A	*	*	B	*	A
Calcium Bisulfite	C	*	*	A	*	D	A	*	A
Calcium Carbonate	C	D	*	A	B	A	A	A	A
Calcium Chloride	C	C	*	A	C	A	D	C	A
Calcium Hydroxide	C	*	*	A	B	A	A	*	A
Calcium Hypochlorite	C	D	*	A	D	A	C	C	B
Calcium Sulfate	B	*	*	A	B	A	A	A	B
Carbon Bisulfide	A	B	*	*	B	A	A	A	*
Carbon Dioxide (Wet)	C	C	*	A	*	A	A	*	A
Carbon Disulfide	C	B	C	A	*	B	A	*	*
Carbon Monoxide	A	*	*	*	*	A	A	*	*
Carbon Tetrachloride	C	C	D	A	B	C	B	A	A
Carbonated Water	A	D	*	*	B	A	A	A	*
Carbonic Acid	A	D	*	A	B	A	B	A	A
Chloracetic Acid	C	D	*	A	D	D	D	D	A
Chlorinated Glue	D	D	*	*	*	A	A	*	*
Chlorine, Anhydrous Liquid	D	C	*	A	*	D	D	D	A
Chlorine (Dry)	D	A	*	A	B	A	A	*	A
Chlorine Water	D	D	*	A	D	*	D	*	B
Chlorobenzene (Mono)	B	B	C	A	A	A	A	*	A
Chloroform	D	D	C	A	A	A	A	A	A
Chlorosulfonic Acid	D	*	D	A	D	D	*	D	B
Chlorox (Bleach)	C	D	C	A	*	A	A	*	A
Chromic Acid 5%	C	D	*	*	*	A	A	B	A
Chromic Acid 50%	C	D	*	A	C	B	B	*	A
Citric Acid	C	D	*	A	*	A	A	A	A
Citric Oils	C	*	*	*	*	A	A	*	*
Copper Chloride	D	D	*	A	C	D	D	B	A
Copper Cyanide	D	D	*	A	*	A	A	A	A
Copper Floborate	D	D	*	A	*	D	D	*	B
Copper Nitrate	D	*	*	A	B	A	A	B	A

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Chemical Resistance Chart (Cont'd)

Chemical Effect Ratings
A – No effect – acceptable
B – Minor effect – acceptable
C – Moderate effect – questionable
D – Severe effect – not recommended
* – Not tested

Chemical	Aluminum	Cast Iron	Carbon Steel	Chem-Tough (Teflon®)	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Hastelloy C
Copper Sulfate (5% Solution)	D	D	*	A	*	A	A	A	A
Cresols	B	*	*	*	*	A	A	*	*
Cresylic Acid	C	*	*	A	B	A	A	*	B
Cyclohexane	A	*	A	*	*	A	*	*	*
Detergents	A	*	A	*	*	A	A	*	*
Diesel Fuel	A	A	A	*	A	A	A	*	*
Diethylamine	A	*	*	A	A	A	*	*	*
Dyes	B	*	*	*	*	A	A	*	*
Epsom Salts (Magnesium Sulfate)	A	*	*	*	B	A	A	A	B
Ethane	A	*	*	*	A	A	*	*	*
Ether	A	*	B	*	A	A	A	A	B
Ethyl Acetate	B	*	C	A	*	A	A	*	B
Ethyl Chloride	B	C	D	A	*	A	A	A	B
Ethylene Chloride	C	C	C	A	*	A	A	*	B
Ethylene Dichloride	D	*	C	A	*	A	A	*	B
Ethylene Glycol	A	B	C	A	*	A	A	*	A
Ethylene Oxide	A	*	*	A	*	*	A	*	*
Fatty Acids	B	D	*	A	*	A	A	*	A
Ferric Chloride	D	D	*	A	*	D	D	D	B
Ferric Nitrate	D	*	*	A	*	A	A	A	A
Ferric Sulfate	D	D	*	A	*	A	C	A	A
Ferrous Chloride	D	D	*	A	*	D	D	*	B
Ferrous Sulfate	D	D	D	A	B	A	C	*	B
Fluorine	D	D	D	C	D	D	D	*	A
Fluosilicic Acid	D	D	*	A	*	*	B	*	B
Formaldehyde	A	D	A	A	A	A	A	*	B
Formic Acid	D	D	D	A	C	A	B	B	A
Freon 11	B	C	B	A	A	*	A	*	*
Freon 12 (Wet)	B	*	*	A	*	*	D	*	*
Freon 22	B	*	*	*	*	*	A	*	*
Freon 113	B	*	*	*	*	*	A	*	*
Freon T.F.	B	*	*	*	*	*	A	*	*
Fuel Oils	A	C	B	A	A	A	A	*	A
Furan Resin	A	A	A	A	*	A	A	*	*
Furfural	A	*	A	A	A	A	A	*	B
Gallic Acid	A	D	D	A	B	A	A	*	A
Gasoline	A	A	A	A	A	A	A	A	A
Glycerine	A	B	B	A	A	A	A	A	A
Heptane	A	*	B	A	A	*	A	*	A
Hexane	A	*	B	A	A	A	A	*	A
Hydraulic Oils (Petroleum)	A	A	A	A	A	A	A	*	*
Hydraulic Oils (Synthetic)	A	A	*	*	*	A	A	*	*
Hydrobromic Acid	D	D	D	A	D	D	D	D	A
Hydrochloric Acid (Dry Gas)	D	*	D	A	D	C	A	*	A
Hydrochloric Acid (20%)	D	D	*	A	*	D	D	D	B
Hydrochloric Acid (37%)	D	D	*	A	*	D	D	D	B
Hydrochloric Acid 100%	D	D	*	A	*	D	D	*	C
Hydrocyanic Acid	A	*	C	A	A	A	A	C	A
Hydrofluoric Acid (20%)	D	D	*	A	*	D	D	D	B
Hydrofluoric Acid (75%)	D	D	*	A	*	C	D	*	C

Chemical	Aluminum	Cast Iron	Carbon Steel	Chem-Tough (Teflon®)	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Hastelloy C
Hydrofluoric Acid 100%	D	D	D	A	D	D	D	*	B
Hydrofluosilicic Acid (20%)	D	D	*	A	*	D	D	*	B
Hydrofluosilicic Acid	C	*	*	A	*	D	D	*	C
Hydrogen Gas	A	B	B	A	A	A	A	*	*
Hydrogen Peroxide 10%	A	D	*	A	*	C	C	*	A
Hydrogen Peroxide	A	D	D	A	*	A	B	A	A
Hydrogen Sulfide, Aqueous Solution	C	D	*	A	*	A	A	C	A
Hydrogen Sulfide (Dry)	D	B	B	A	A	C	A	*	A
Hydroxyacetic Acid (70%)	D	*	*	*	*	*	*	*	*
Ink	C	D	D	*	A	A	A	*	*
Iodine	D	D	*	A	*	D	D	D	B
Iodoform	A	C	B	A	B	D	A	*	*
Isotane	A	*	*	*	*	*	*	*	*
Isopropyl Acetate	C	*	*	*	*	*	B	*	*
Isopropyl Ether	A	*	A	A	A	*	A	*	*
Jet Fuel (JP3, JP4, JP5)	A	A	A	A	A	A	A	*	*
Kerosene	A	A	B	A	A	A	A	A	A
Ketones	B	A	A	A	A	A	A	*	A
Lacquers	A	C	C	*	A	A	A	*	*
Lactic Acid	C	D	D	A	A	A	B	C	A
Lead Acetate	D	*	D	A	B	A	A	*	A
Lubricants	A	*	*	A	*	A	A	*	A
Magnesium Chloride	D	D	C	A	B	B	B	A	A
Magnesium Hydroxide	D	B	B	A	A	A	A	*	A
Magnesium Sulfate	B	C	B	A	B	B	A	*	B
Maleic Acid	B	*	B	A	C	A	A	A	A
Malic Acid	C	*	D	A	B	A	A	*	A
Mercuric Chloride (Dilute Solution)	D	D	D	A	D	D	D	D	B
Mercuric Cyanide	D	*	D	A	A	A	A	*	*
Mercury	C	A	A	A	A	A	A	A	A
Methane	A	A	A	A	A	A	A	A	A
Methyl Acetate	A	*	B	A	A	*	A	*	A
Methyl Acetone	A	A	A	A	A	*	A	*	*
Methyl Alcohol 10%	C	*	B	A	A	*	A	*	A
Methyl Butyl Ketone	A	*	*	*	*	*	A	*	*
Methyl Cellosolve	A	*	*	*	*	*	*	*	*
Methyl Chloride	D	*	*	A	*	C	A	*	A
Methyl Ethyl Ketone	A	*	*	A	*	A	A	*	A
Methylamine	A	B	B	*	A	*	A	*	*
Methylene Chloride	A	*	B	A	A	A	A	*	A
Naptha	A	B	B	A	A	A	A	A	A
Napthalene	B	B	A	A	B	A	B	*	A
Nickel Chloride	D	D	*	A	*	A	B	*	A
Nickel Sulfate	D	D	D	A	B	A	B	*	B
Nitric Acid (10% Solution)	D	D	D	A	A	A	A	A	A
Nitric Acid (20% Solution)	D	D	*	A	*	A	A	A	A
Nitric Acid (50% Solution)	D	D	*	A	*	A	A	A	A
Nitric Acid (Concentrated Solution)	B	D	*	A	*	D	B	A	B

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Chemical Resistance Chart (Cont'd)

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A – No effect – acceptable
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Chemical	Aluminum	Cast Iron	Carbon Steel	Chem-Tough (Teflon®)	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Hastelloy C
Nitrobenzene	C	B	B	A	B	A	B	*	B
Oleum	B	*	B	A	B	*	A	*	*
Oxalic Acid (cold)	C	D	D	A	C	A	B	A	B
Pentane	A	B	B	A	A	C	C	*	B
Perchloroethylene	A	B	B	A	B	A	A	*	*
Petrolatum	B	C	C	A	A	*	A	*	*
Phenol 10%	A	B	D	A	B	A	A	*	B
Phenol (Carbolic Acid)	B	D	D	A	B	A	A	A	A
Phosphoric Acid (to 40% Solution)	D	D	*	A	*	B	A	A	A
Phosphoric Acid (40%-100% Solution)	D	D	*	A	*	C	B	B	A
Phosphoric Acid (Crude)	D	D	D	A	*	D	C	C	A
Phosphoric Anhydride (Molten)	D	*	*	A	*	A	A	*	*
Photographic (Developer)	C	D	*	*	*	C	A	C	A
Phthalic Anhydride	B	C	C	A	B	A	B	*	A
Picric Acid	C	D	D	A	B	A	A	*	A
Potash	C	B	*	*	*	A	*	A	A
Potasium Bicarbonate	C	D	*	A	*	A	*	B	B
Potassium Bromide	C	D	D	A	A	A	*	B	B
Potassium Carbonate	C	B	B	A	B	A	*	A	A
Potassium Chlorate	B	B	B	A	B	A	A	A	B
Potassium Chloride	B	B	B	A	C	A	A	B	A
Potassium Chromate	A	A	*	*	*	*	B	B	B
Potassium Cyanide Solutions	D	B	B	A	B	A	B	A	A
Potassium Dichromate	A	B	C	A	B	A	A	A	B
Potassium Ferrocyanide	C	*	C	A	B	A	*	A	B
Potassium Hydroxide (50%)	D	C	A	A	A	B	B	B	A
Potassium Nitrate	B	*	B	A	B	A	B	A	B
Potassium Permanganate	B	B	B	A	B	A	B	B	B
Potassium Sulfate	A	B	B	A	B	A	B	B	A
Potassium Sulfide	B	B	B	A	A	A	*	A	B
Propane (Liquified)	A	*	B	A	A	A	*	A	*
Propylene Glycol	A	B	B	A	B	B	*	A	*
Pyridine	B	B	A	A	*	C	*	B	*
Pyrogallic Acid	B	B	B	A	B	A	A	A	A
Silver Bromide	D	*	*	*	*	C	C	B	*
Silver Nitrate	D	D	D	A	B	A	B	A	A
Sodium Acetate	B	C	C	A	B	A	A	B	A
Sodium Aluminate	C	*	C	A	B	*	*	A	B
Sodium Bicarbonate	A	C	C	A	B	A	A	A	*
Sodium Bisulfate	D	D	D	A	A	A	*	A	B
Sodium Bisulfite	A	D	*	A	*	A	*	A	B
Sodium Borate	C	C	C	A	B	A	*	A	A
Sodium Carbonate	C	B	B	A	B	A	B	B	A
Sodium Chlorate	B	*	C	A	B	A	*	A	B
Sodium Chloride	C	B	C	A	B	A	C	B	A
Sodium Chromate	D	B	B	A	A	A	A	*	B
Sodium Cyanide	D	B	B	A	B	A	*	A	*
Sodium Fluoride	C	D	D	A	B	C	*	C	A

Chemical	Aluminum	Cast Iron	Carbon Steel	Chem-Tough (Teflon®)	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Hastelloy C
Sodium Hydrosulfite	A	*	*	A	*	*	*	*	A
Sodium Hydroxide (20%)	D	A	*	A	*	A	A	A	A
Sodium Hydroxide (50% Solution)	D	B	*	A	*	A	B	*	A
Sodium Hydroxide (80% Solution)	D	C	*	A	*	A	D	*	B
Sodium Hypochlorite (to 20%)	D	C	*	A	*	A	D	*	B
Sodium Hypochlorite	D	D	D	A	D	*	A	*	A
Sodium Hyposulfate	D	*	*	A	*	A	A	*	*
Sodium Metaphosphate	A	B	B	A	A	*	A	*	*
Sodium Metasilicate	B	C	C	A	A	*	A	*	*
Sodium Nitrate	A	A	B	A	B	A	A	A	B
Sodium Perborate	B	B	B	A	B	*	C	*	*
Sodium Peroxide	C	D	C	A	B	A	A	*	B
Sodium Polyphosphate (Mono, Di, Tribasic)	D	*	*	A	*	A	A	*	A
Sodium Silicate	C	*	B	A	B	A	B	A	B
Sodium Sulfate	B	A	B	A	B	A	A	C	B
Sodium Sulfide	D	A	B	A	B	A	B	*	B
Sodium Sulfite	C	A	*	A	*	C	C	*	A
Sodium Thiosulphate ("Hypo")	B	C	B	A	A	A	A	*	*
Stannic Chloride	D	D	D	A	D	D	D	*	B
Stannous Chloride	D	D	D	A	D	D	C	*	A
Stearic Acid	B	C	C	A	B	A	A	A	A
Stoddard Solvent	A	B	B	A	A	A	A	A	A
Styrene	A	*	A	A	A	A	A	*	*
Sulfate Liquors	B	*	*	*	*	C	C	*	A
Sulfur Chloride	D	*	*	A	*	D	D	D	*
Sulfur Dioxide	A	*	*	A	*	A	A	C	B
Sulfur Dioxide (Dry)	A	A	B	A	A	A	A	*	A
Sulfur Trioxide (Dry)	A	B	B	A	A	A	C	*	*
Sulfuric Acid (to 10%)	C	D	*	A	*	D	C	C	A
Sulfuric Acid (10%-75%)	D	D	*	A	*	D	D	D	B
Sulfurous Acid	C	D	D	A	C	C	B	C	B
Tannic Acid	C	C	C	A	B	A	A	A	B
Tanning Liquors	C	*	*	A	*	A	A	*	A
Tartaric Acid	C	D	D	A	B	A	B	B	B
Tetrahydrofuran	D	D	A	A	*	A	A	*	*
Toluene, Toluol	A	A	A	A	A	A	A	*	A
Trichlorethane	C	C	*	A	*	C	A	*	A
Trichlorethylene	B	C	B	A	B	A	A	*	A
Water, Acid, Mine	C	C	*	*	*	A	A	*	*
Water, Distilled, Lab Grade 7	B	D	*	A	*	A	A	*	*
Water, Fresh	A	B	D	A	A	A	A	*	*
Water, Salt	B	D	*	*	*	A	A	*	*
Weed Killers	C	*	*	*	*	A	A	*	*
Whiskey and Wines	D	D	D	A	A	A	A	A	*
Xylene	A	A	B	A	A	A	A	*	A
Zinc Chloride	D	D	D	A	D	A	B	B	B
Zinc Hydrosulphite	D	D	*	*	*	*	A	*	*
Zinc Sulfate	D	C	D	A	B	A	A	A	B

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Filtration - Inline Filter (Dual Connection)

ROTRON®

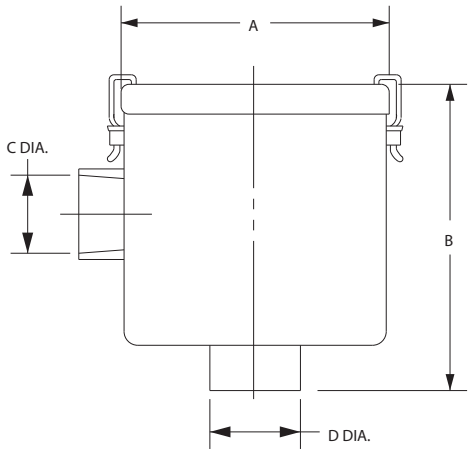
Inline Filters protect the blower from harmful dust and other particles that may be drawn into the blower through the air distribution system. Normally used in vacuum systems.

SPECIFICATIONS:

HOUSING – Steel
MEDIA – Polyester
EFFICIENCY – 97-98% (8 to 10 micron particle size)
FILTER ELEMENT – Replaceable (see filter elements)
NOTE: "Z" MEDIA (1 to 3 micron particle size) available

* Feature 1/4" threaded tap for gauge connection on inlet and outlet

Inline filter PN 271200 is a straight through design
Inlet is directly opposite of outlet



		Part/Model Number							
Specification	**Units**	**271200**	**516461**	**515254**	**515255**	**515256**	**516463***	**516465***	**517611***
Filter Element	-	271078	516434	516434	516435	516435	515135	515135	516515
Ref Blower Model	-	A	B	C, D	E	F	G	H	H
Inlet Connection	-	1.75 SO	1.00 NPSC-F	1.50 NPSC-F	2.00 NPSC-F	2.50 NPSC-F	3.00 NPT-M	4.00 NPT-M	6.00 NPT-M
Outlet Connection	-	2.00 SO	1.00 NPSC-F	1.50 NPSC-F	2.00 NPSC-F	2.50 NPSC-F	3.00 NPT-M	4.00 NPT-M	6.00 NPT-M
Dimension A	Inches	5.25	7.25	7.00	8.00	8.00	14.00	14.00	18.00
	mm	133.4	184.2	177.8	203.2	203.2	355.6	355.6	457.2
Dimension B	Inches	8.31	6.50	6.50	10.25	10.25	26.50	27.00	28.00
	mm	211.1	165.1	165.1	260.4	260.4	673.1	685.8	711.2
Dimension C	Inches	2.00	1.00	1.50	2.00	2.50	3.00	4.00	6.00
	mm	50.8	25.4	38.1	50.8	63.5	76.2	101.6	152.4
Dimension D	Inches	1.75	1.00	1.50	2.00	2.50	3.00	4.00	6.00
	mm	44.5	25.4	38.1	50.8	63.5	76.2	101.6	152.4
Z Media Filter PN	-		517886	517887	517888	517889	517890	517891	517892

Blower Model Reference Key	
A = SPIRAL	E = DR/EN/CP 656, 6, 633, S7
B = DR/EN/CP 068, 083, 101, 202	F = DR/EN/CP 757, 808, 858, S9, P9 (Inlet Only)
C = DR/EN/CP 303, 312, 313, 353	G = DR/EN/CP 833, S13, P13 (Inlet Only)
D = DR/EN/CP 404, 454, 513, 505, 555, 523	H = DR/EN/CP 909, 979, 1233, 14, S15, P15 (Inlet Only)

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AMETEK® TECHNICAL & INDUSTRIAL PRODUCTS

NIXTOX Steel Drum Adsorbers

Modular Activated Carbon Vapor Phase Adsorbers

Solutions for Vapor Phase Remediation & Industrial Emission Control

These economical deep bed activated carbon adsorption units may be used as refillable or disposable adsorbers.

Rain shields are available and condensate drains are standard. The activated carbon units are constructed of carbon steel and provided with a double epoxy / phenolic lining. All adsorption units feature specially constructed vapor distributors to permit full adsorbent utilization and peak removal efficiency.

Custom distributors for high temperature applications are available upon request.

NOTES:

- Nominal design flow may be conservative.
- Desired contact time may allow higher or lower flow rates.
- Dry virgin activated or reactivated carbon provided as standard adsorbent.
- Adsorbent fill is based on a bed density of 27 lb/ft3.
- Adsorbent fill can differ based on variable bed density and alternate adsorbents.
- Pressure drops are based on a dense packed bed of activated carbon.

Modular Activated Carbon Vapor Adsorber Drums

Model #	Design Flow (CFM)	Max Temp	Max Pressure (PSIG)	Diameter/ Height (IN)	Standard Fill (LBS)	Shipping Weight
N-100	100	200	6	24.5/37.75	200	260
N-250	250	130	1	32/47	400	530

Call a TIGG Representative Today at 800-925-0011

TIGG

http://www.tigg.com/NIXTOX-steel-drum.html

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TIGG, LLC
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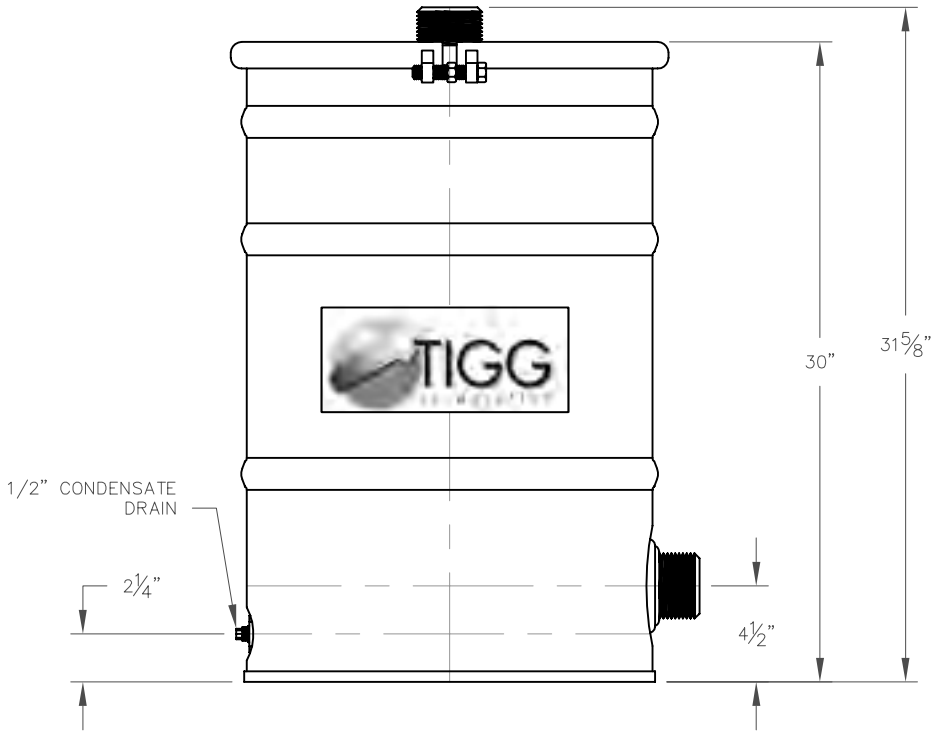
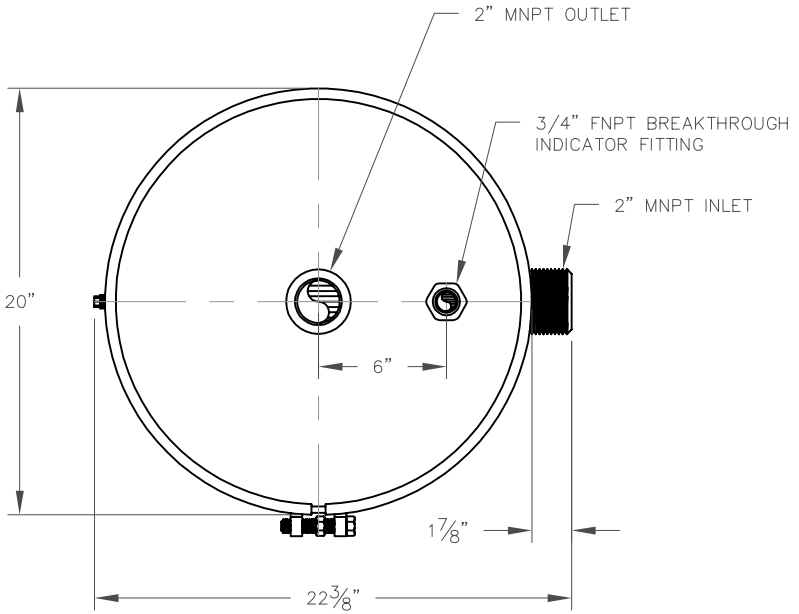
Oakdale, PA 15071

Purifying Air & Water



ELEVATION



PLAN

VESSEL STANDARDS

VESSEL MATERIALS : CARBON STEEL	APPROXIMATE VOLUME OF VESSEL : 4 FT^3
LINING : EPOXY PHENOLIC	STANDARD CARBON FILL : 110 LBS
EXTERIOR PAINT : ACRYLIC ALKYD ENAMEL	SHIP WEIGHT : 145 LBS
INTERNALS : STAINLESS STEEL SCREEN	CARBON TYPE : TIGG 5C 0410 VAPOR PHASE
ADSORBENT OUTLET ASSEMBLY : REMOVABLE COVER	MAXIMUME OPERATING PRESSURE : 6 PSIG
CONDENSATE DRAIN ASSEMBLY : 1/2" PLUG	MAXIMUME OPERATING TEMPERATURE : 200°F

NO.	REVISION	BY	DATE
2	REVISE PRESSURE RATING	JB	1/2/07
1	GENERAL	JB	6/11/03

PROJECT

PROJ. NO. SALES

P.O. NO.

DRAWN BY	ZS
DESIGN BY	BL
CHKD. BY	BL
DATE	2/22/00
SCALE	NTS

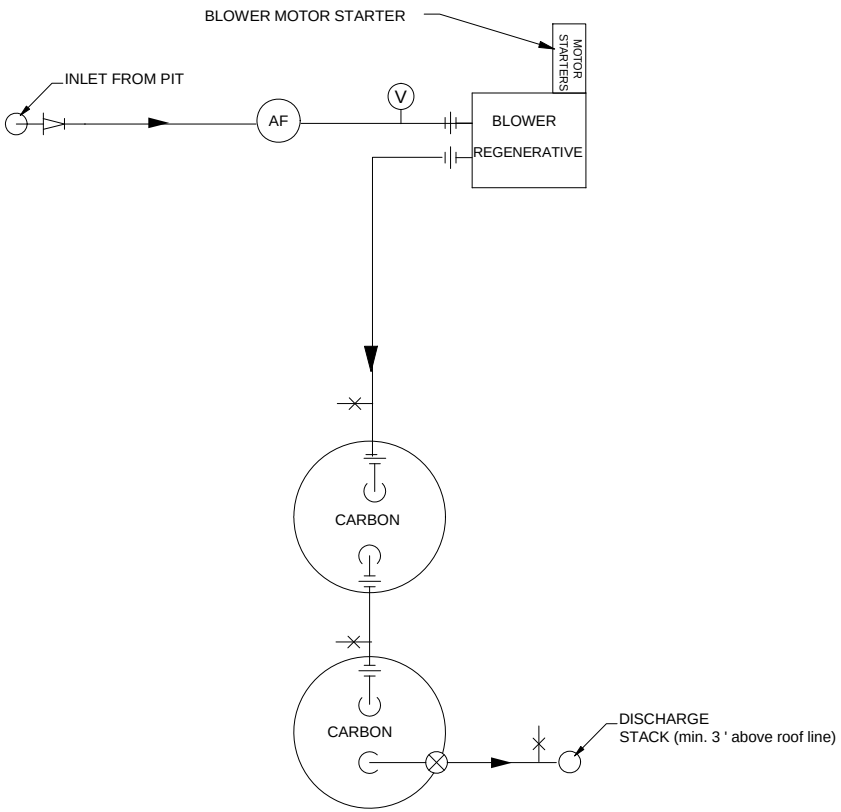
TIGG corporation

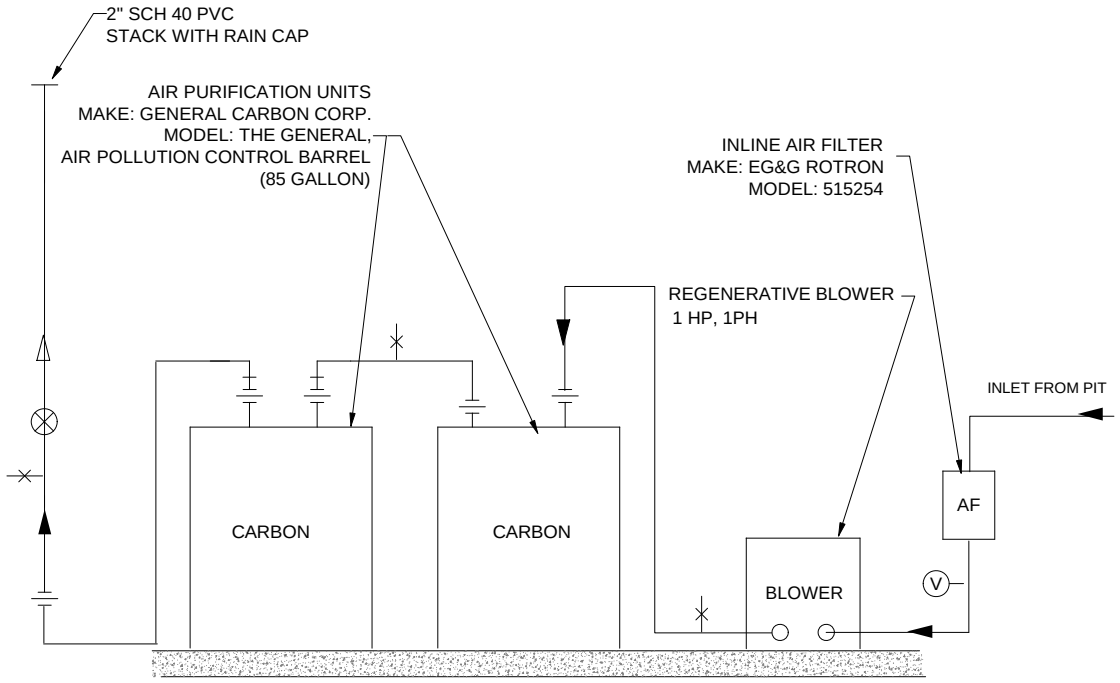
N-50 DRUM

DWG. NO. N-50-1001

REV. 2

Attachment 3
SVE System Design Details





LEGEND

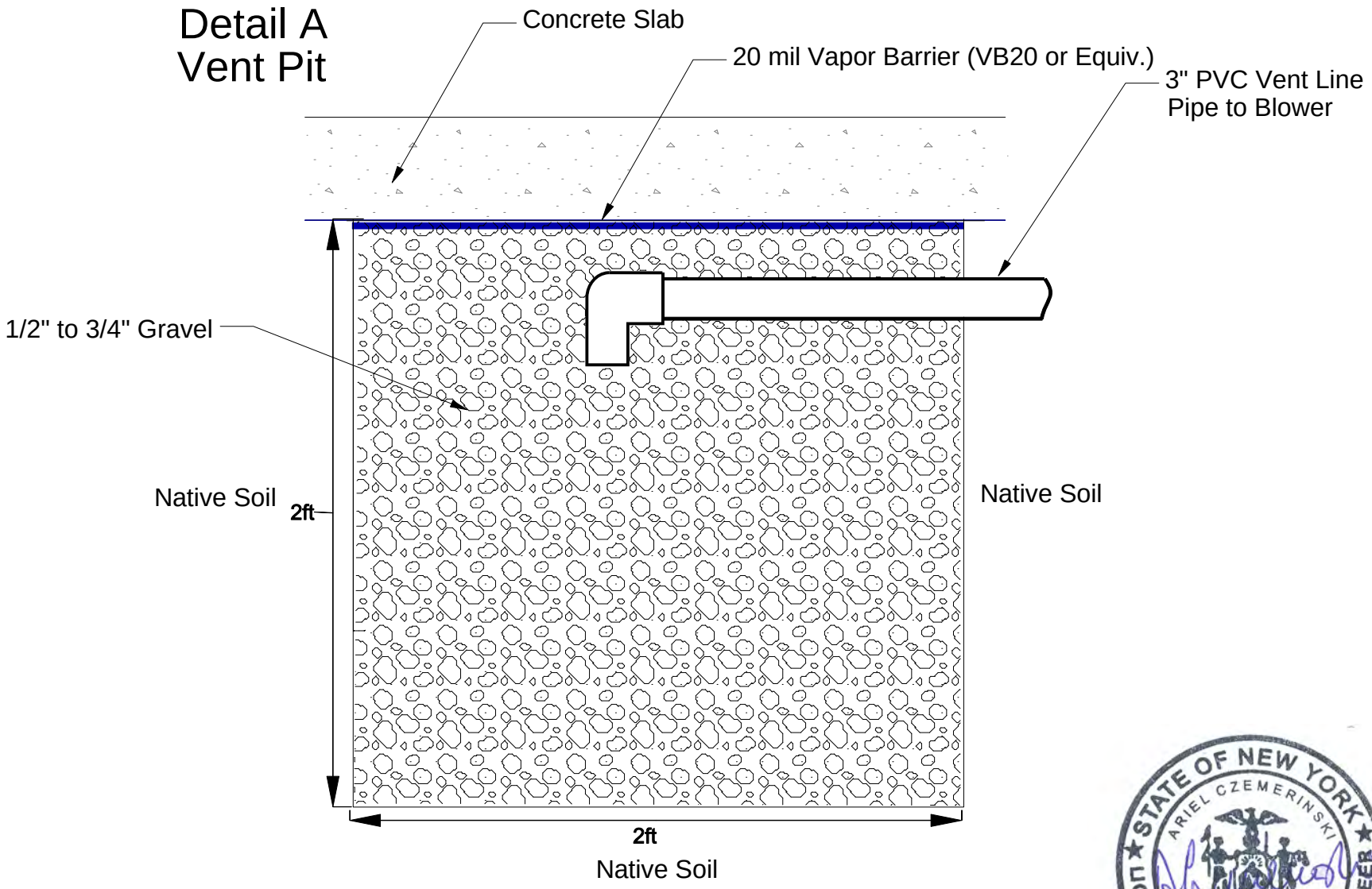
- SCH 40 PVC REDUCER
- VACUUM GAUGE
- SCH 40 PVC BALL VALVE
- SAMPLE TAP
- AF — AIR FILTER
- UNION OR QUICK CONNECT
- FLOW DIRECTION

AMC Engineeting, PLLC
18-36 42nd Street
Astoria, NY 11105

Figure No.
SVE01

Site Name: MIXED-USE BUILDING
Site Address: 1120 WESTCHESTER AVENUE, BRONX, NY
Drawing Title: SVE SYSTEM DETAIL

Detail A
Vent Pit



VAPOR EXTRACTION PIT

CONSTRUCTION DETAIL

N.T.S.

STATE OF NEW YORK
ARIEL CZEMERINSKI
076508
LICENSED PROFESSIONAL ENGINEER

AMC Engineeting, PLLC
18-36 42nd Street
Astoria, NY 11105

Figure No.
SVE02

Site Name: Mixed-use Building
Site Address: 1120 Westchester Avenue, Bronx, NY
Drawing Title: SVE System Extraction Pit Detail