Oil / Water Separators for Compressor Condensate

Virtual Summit Distributor School – November 2021

Rodney Rushing

SUMMIT®

Oil Water Separators

Reason for existence:

It is now illegal to put untreated compressor condensate down the drain or on the ground.

Oil Water Separators

Who are Potential Customers?

All Facilities that Operate an Air Compressor

- Manufacturing Facilities
- Refineries
- Paper Mills
- Steel Mills
- Utilities
- Food
- Ski-Resorts

Oil Water Separators

Q: Do Oil Water Separators save my customer money?

Yes

a. Untreated compressor condensate typically ranges from 300 to 800 ppm of hydrocarbon. Most sewage plants allow a maximum of 50 ppm, therefore this untreated condensate must be properly disposed.

b. Eliminates heavy fines from the EPA (Environmental Protection Agency) and unwanted monitoring from the local water authority!

Oil Water Separators

Example: Given conditions of 90º F (32ºC) and 90% humidity, a 50 hp compressor will produce 3.5 gal. of condensate/hr. At an average cost of $2.00/gal. for disposal, an 8 hr shift would cost $56.00 in disposal fees.

An oil/water separator will reduce this amount by 95% for an 8 hr cost of $2.80. This represents a total dollar savings of $53.20 per 8 hr shift.

Oil Water Separators

Two types of oil water separators:

1. Gravity / Filtration (Summit ConDePhase® Plus)

2. Vaporization (Electric) (Summit Thermaphase)

ConDePhase® Plus

Gravity Type – ConDePhase® Plus

Made from polypropylene with no moving parts

ConDePhase® Plus

Normally used water, but now can be used with polyglycols!

- PAO – 15 ppm
- Diester – 15 ppm
- Polyglycol – 50 ppm
- Silicone – 15 ppm
- Partials – 15 ppm
- Most petroleum compressor lubricants – 15 ppm

ConDePhase® Plus

Lubricants that will not readily separate from water:

- Polyglycols – now separable down to 50 ppm
- Motor Oils - due to detergents *
- ATF’s - due to detergents *
- Diesters in large recips (100 hp or larger)*

*Not yet tested

ConDePhase® Plus

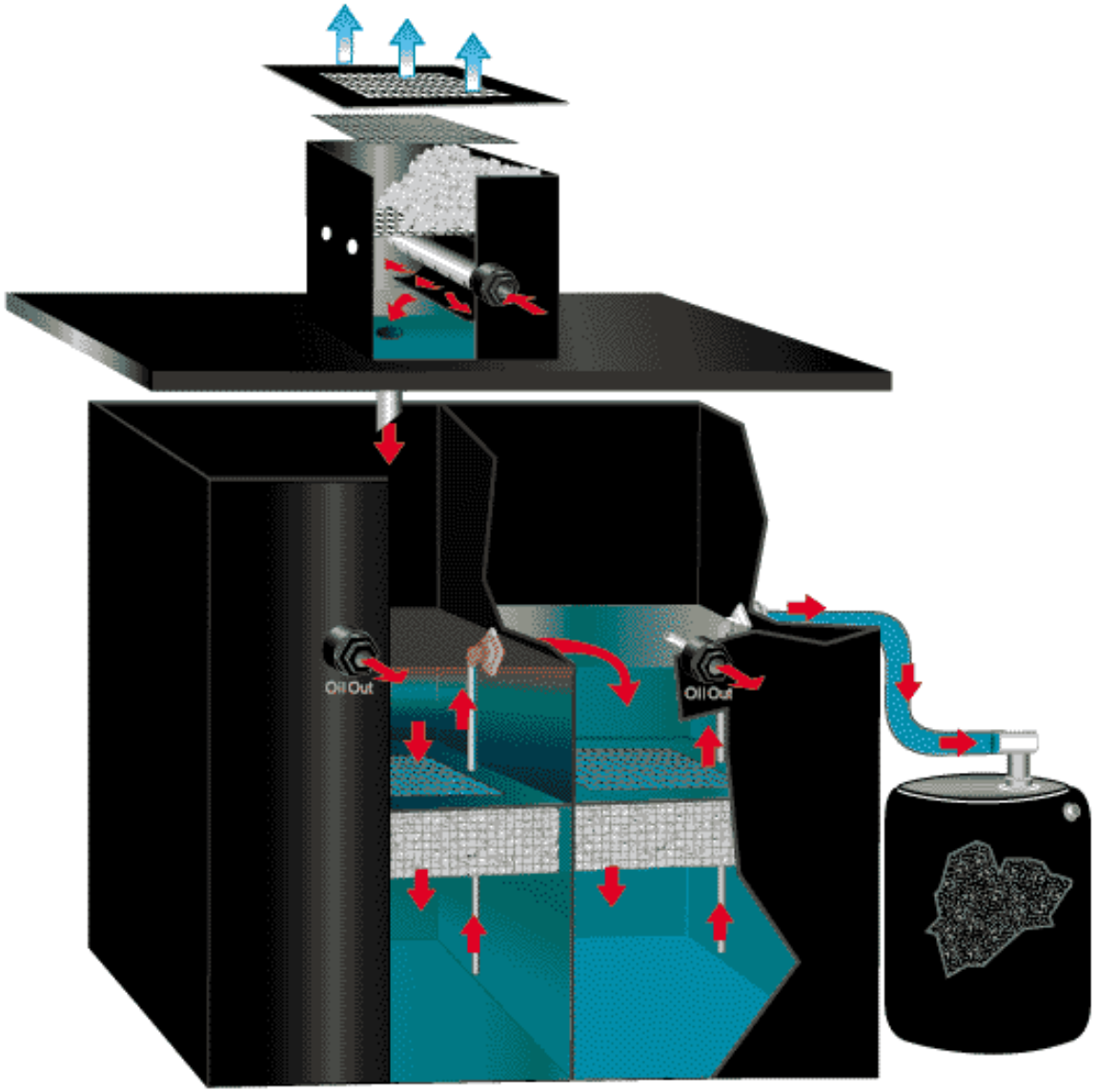
NOTE: Some lubricant manufacturers tell their customers their lubricant is biodegradable and can be put down the drain. **However, it takes time for an oil to biodegrade and the sewage plant measures what initially enters the system.**

HOW THE

ConDePhase® Plus WORKS

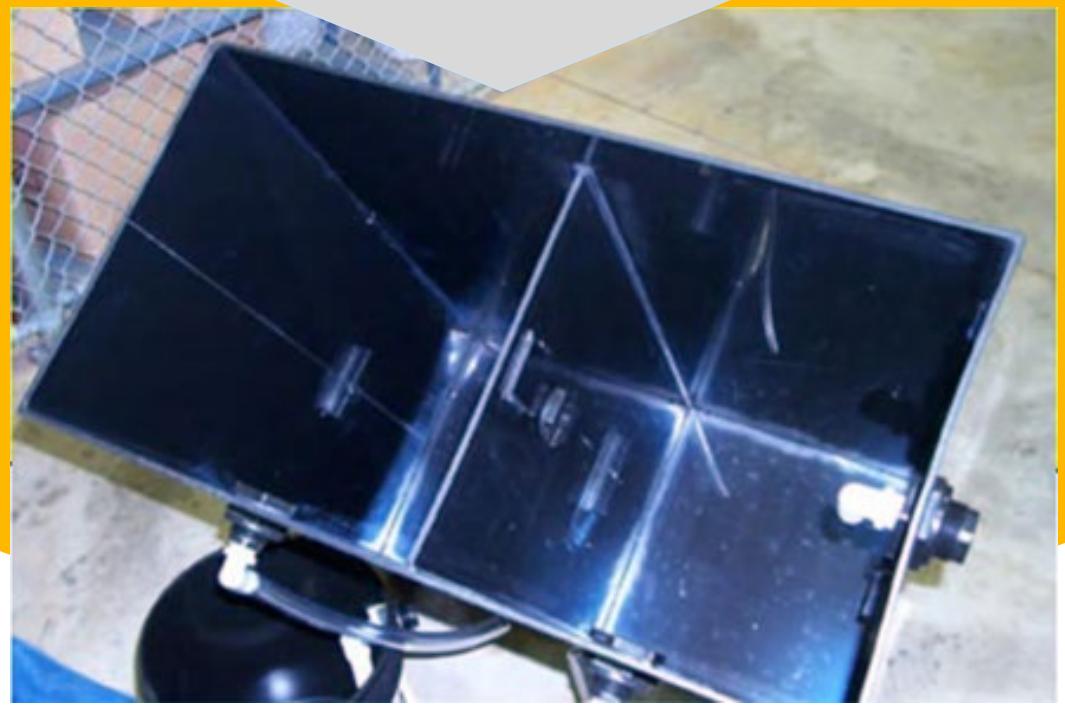
ConDePhase® Plus

- Condensate enters the expansion chamber where the air is separated from the condensate.
- Gravity flows to main tank's first chamber (which is pre-filled with clean water) for sufficient residence time
- Effluent must pass through the first poly pack filter for coalescing
- Oil floats to the top and clean water flows to the bottom
- Clean water flows from the first chamber to the second chamber which repeats the process
- Oil out coupling for automatic oil removal
- Effluent then flows to patented external carbon filter (which is pre-filled with clean water) for final absorption
- Should expect 15 ppm or less hydrocarbon for most lubes and 50 ppm or less for polyglycols
- Maintenance - Carbon filter change every 6-12 mos.



ConDePhase® Plus

Two Equal Chambers



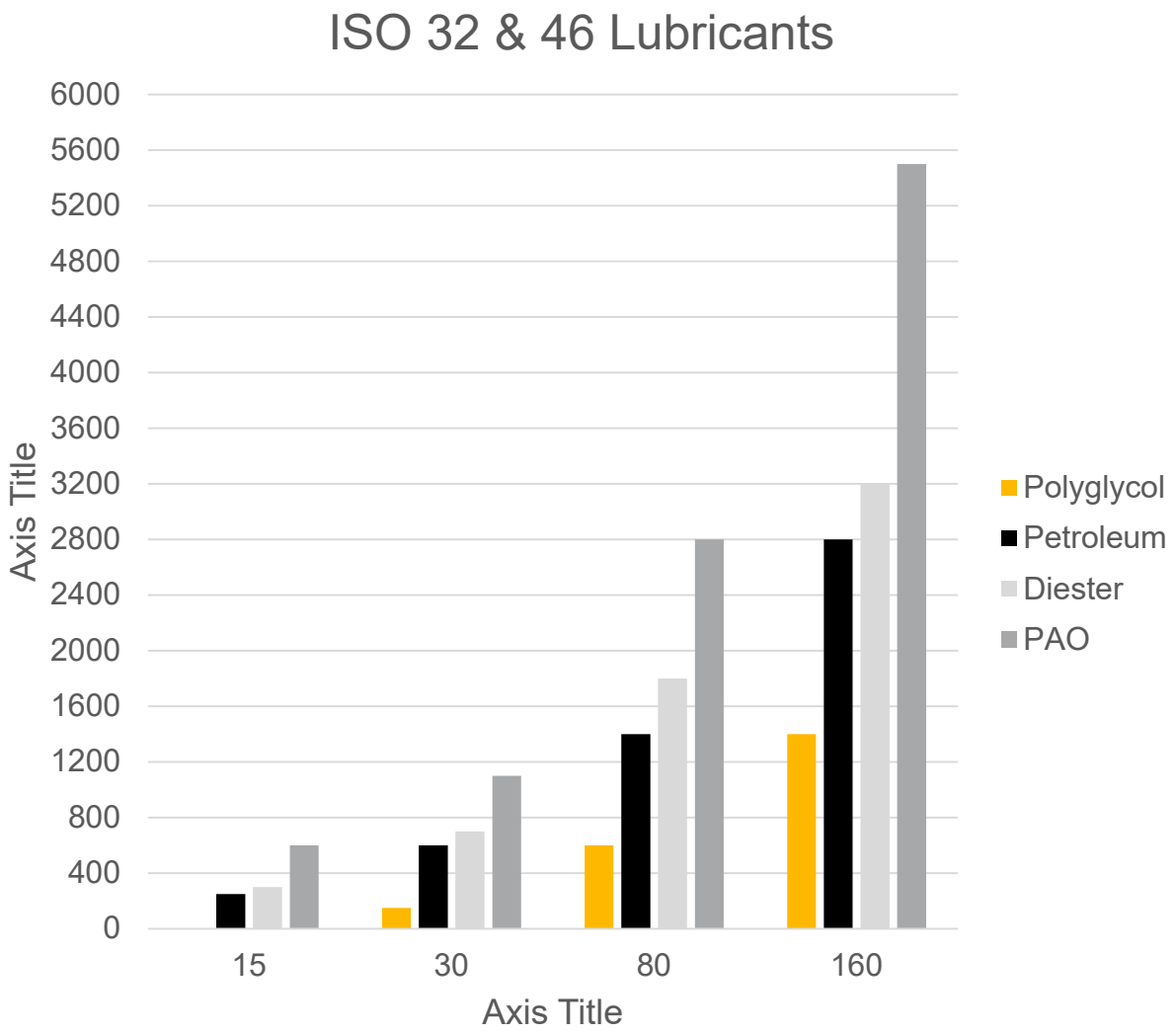
ConDePhase® Plus

Two Coalescing Packs

ConDePhase® Plus

SIZING OF ConDePhase® Plus:

- Total CFM of Compressor
- ISO Grade of Lubricant
- Base Stock



ConDePhase® Plus

ConDePhase® Plus® vs COMPETITION

- Separate expansion chamber
- Patented external carbon filter
- 3 phase separation vs 2 phase
- Sized according to differences in base stocks and ISO grades
- Competitively priced
- POLYGLYCOLS!

ThermaPhase®

Separation through electrical vaporization

Internal vaporization chamber is made of Stainless Steel.

- Eliminates rust and corrosion
- Longer life

ThermaPhase®

Two separate thermostats

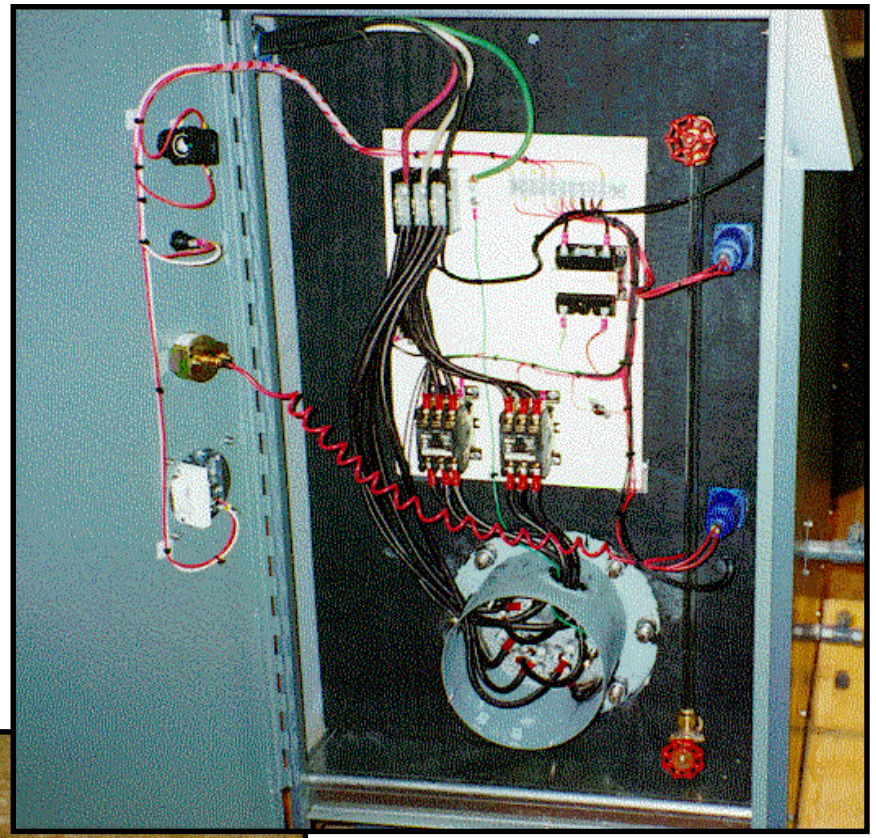
- Safety

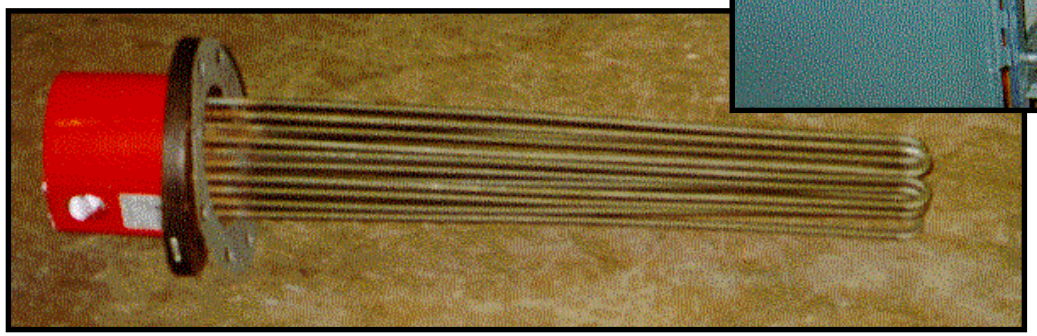
Sight Glass

- Visual monitoring

Low Density Heater

- Eliminates hot spots





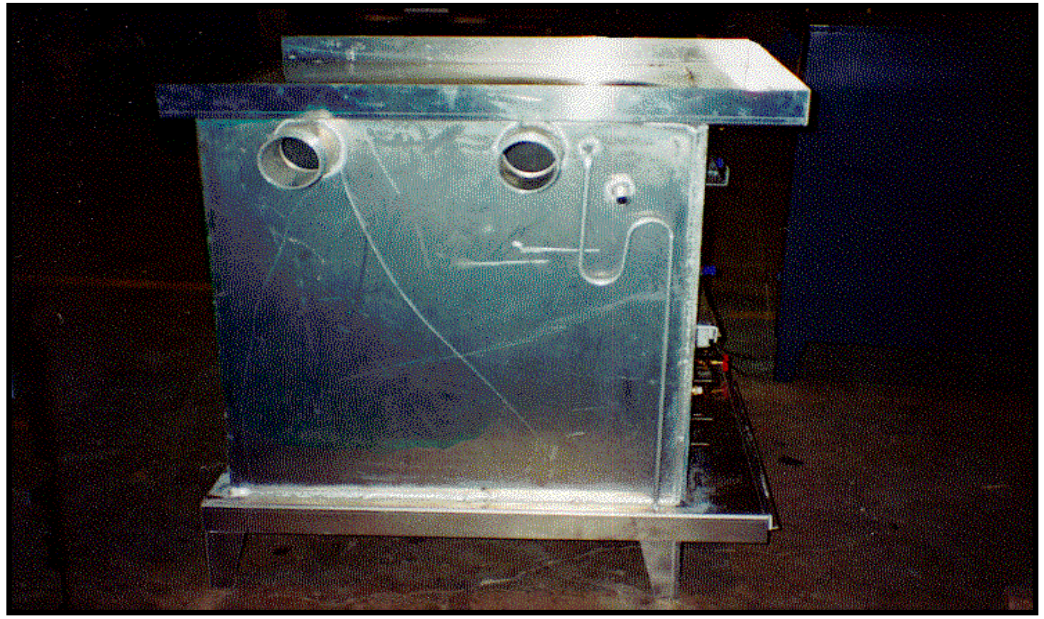
ThermaPhase®

Large Vessel - Reduced Maintenance

- 68 Gallon - TP-6 & TP-12
- 96 Gallon - TP-18, TP-24, TP-36
- 192 Gallon - TP-54 & TP-72

Dip Tube Safety Device

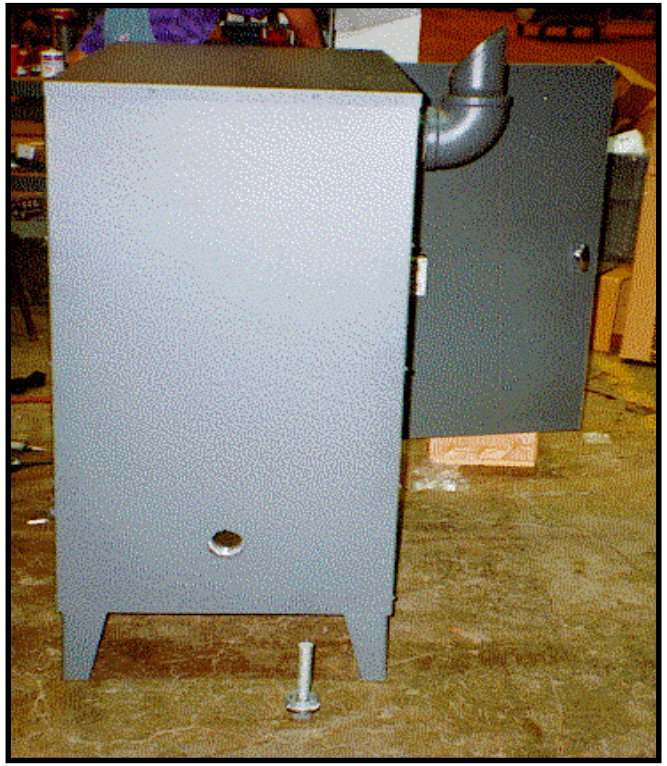
- Internal Pressure Relief



ThermaPhase®

Clean out plug

- Periodic cleaning every six months
- eliminates thick, gummy oil build up on tank bottom and on heater elements.



ThermaPhase®

When to use ThermaPhase?

- Lubricants that form a stable emulsion
  - Motor Oils
  - Automatic Transmission Fluids

- Lubricants that have a high affinity for water.
  - Polyglycols

Ultra Coolant	Supra Coolant®
Sullube 32	Supra 32

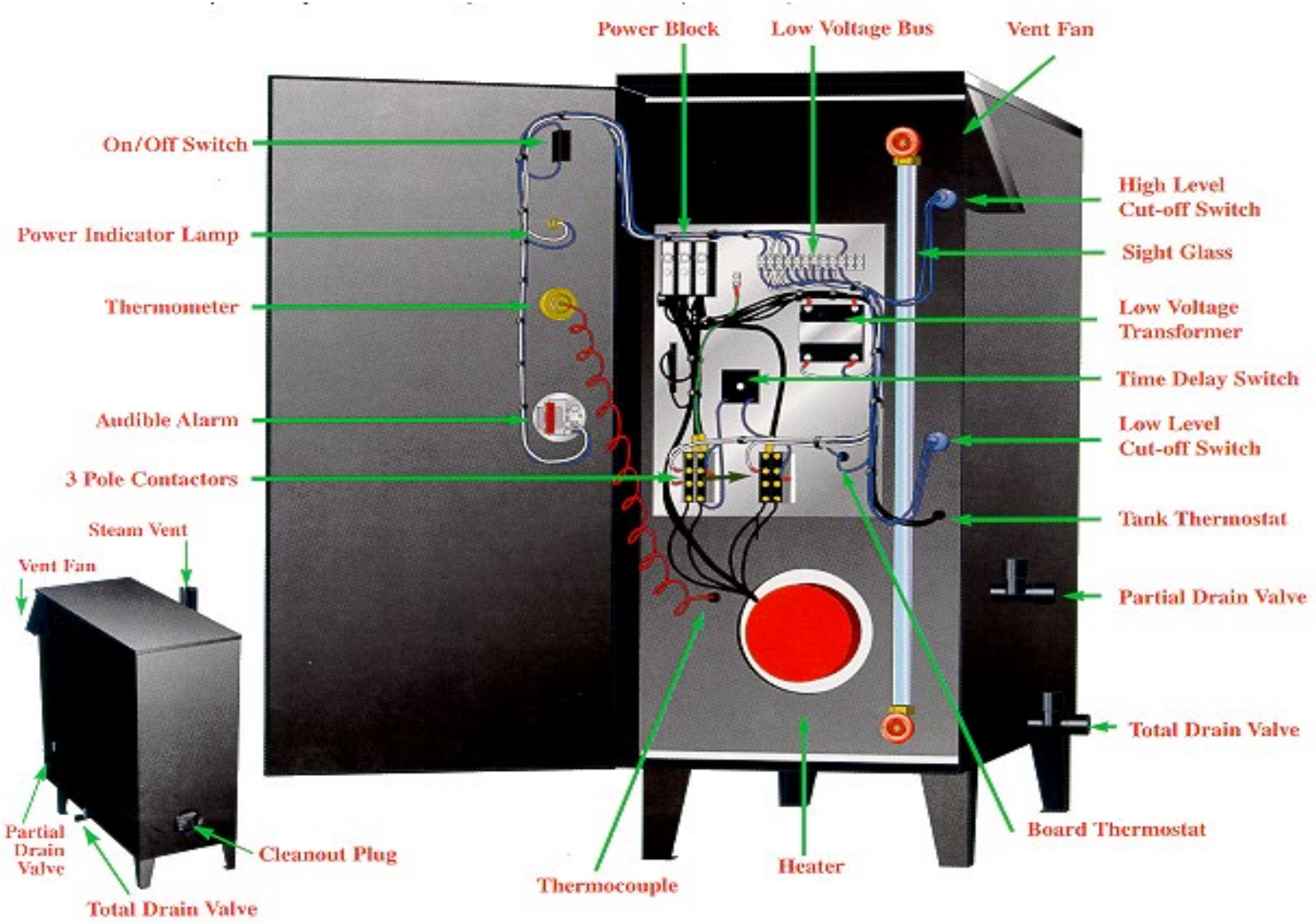
- Companies that prefer not to put any condensate down the drain or on the ground.

ThermaPhase®

HOW does the ThermaPhase work?

- Condensate enters the inner vaporization chamber slowly filling the unit.
- Once the collected condensate level rises above the heating elements, the low level float switch turns the heater on.
- The water leaves the unit through the external vent as steam.
- The heating elements heat the unit to approx. 230 ºF (110ºC).

ThermaPhase®



ThermaPhase®

HOW does the ThermaPhase work?

- The lubricant stays inside the unit until drained for disposal.
- When the unit is full, the high level float switch turns the unit off and sounds an alarm.
- Drain the unit from one of two drain valves.

ThermaPhase®

Sizing the ThermaPhase Unit?

(What you need)

- Total CFM of Compressor
- Average temperature and humidity in summer months
- Sizing Chart

* Note: HP x 4.5 = CFM

Table 1

SCF/M AIR PER GALLON OF WATER PER HOUR

Relative Humidity	40°F	50°F	60°F	70°F	80°F	90°F	100°F
40%	923.5	628.9	436.5	307.3	219.1	158.1	115.5
50%	737.3	502.8	348.9	245.1	174.6	125.9	91.8
60%	613.5	418.8	290.0	203.8	145.0	104.4	76.0
70%	525.4	358.1	248.2	174.3	123.8	89.1	64.7
80%	459.4	313.3	216.6	152.1	108.0	77.5	56.2
90%	408.1	278.1	192.2	134.8	90.8	68.6	49.6
100%	367.1	250.0	172.7	121.0	85.8	61.4	44.4

SCF/ M of air required to produce one gallon of water per hour assuming 95% water removed.

ThermaPhase®

Table 2	
Evaporation Rate	
Gallons Per Hour	
TP-6	1.9
TP-12	4.1
TP-18	6.2
TP-24	8.3
TP-36	12.5
TP-54	18.8
TP-72	25.1

Descalers and Degreasers

Virtual Summit Distributor School – November 2021

Rodney Rushing

SUMMIT®

Descalers

- Sublime®
- Alimex
- Sum-Kool®
- GalVan-Plus

Descalers

Sublime®

HCL Based Descaler

Descalers

Sublime®

Sublime® is a descaler designed to remove scale and rust from water wetted equipment.

Descalers

Sublime®

Product Description

- Acid based - 10% HCL
- Corrosion Inhibitor
- Wetting Agents
- Degreasing Compounds
- One (1) gallon consumes 1.5 lbs. of calcium carbonate ($CaCO_3$)

$$2\ HCl + CaCO_3 \rightarrow CaCl_2 + CO_2 + H_2O$$

Descalers

Sublime®

The formation of scale in process equipment decreases efficiency by:

- Increasing pressure drop
- Requiring more pumping horsepower to maintain volumetric throughput
- Gradually fouling heat transfer surfaces causing thermal efficiencies to decrease
- Attaching to rotating equipment, i.e., pumps and mixers causing bearing failure

Descalers

Sublime®

Why Use Sublime®?

- **Sublime** provides an excellent method to clean equipment without expensive disassembly
- In some cases the system can remain operational while cleaning is taking place
- **Sublime** can remove scale in small, inaccessible places that cannot otherwise be cleaned

Descalers

Sublime®

Proper Use

- No dilution necessary
- Maximum recommended circulation time:

  8 hours; average time 2 - 4 hours

- System being cleaned must be vented

  CO_2 gas is evolved

- Use product at ambient temperature

Minimum	40 ºF	(4 ºC)
Optimum	80 ºF	(27 ºC)
Maximum	120 ºF	(49 ºC)

Changes color from yellow to purple when it is spent

Descalers

Sublime®

Sublime® comes in a pale yellow color that changes to a deep bluish-purple color when it is spent. There are four important advantages to this color change:

1. You know when the solution is spent and should be discarded or re-activated.

2. You do not spend time circulating a spent solution.

3. The color change occurs at a pH of 5.8 to 6.0, which is well within the safe disposal range of most of the current governmental waste water regulations.

4. If the equipment is clean and Sublime® has not changed color, you can save it and use it again.

Descalers

Sublime®

Compatible Materials

Stainless Steel*	Carbon Steel
Brass	Admiralty Metal
Copper	Iron
Lead	PVC Plastic
Polyethylene	Rubber
Leather	Viton
Tygon	Tubing

* Concentrated Sublime® may discolor stainless steel and chromed surfaces. It is suggested that Sublime® be diluted 1:1 with water for use on these surfaces.

Descalers

Sublime®

Incompatible Materials

Aluminum	Aluminum Alloys
Zinc	Galvanized Surfaces
Magnesium Alloys	

It is recommended that test samples of materials in question should be evaluated in the lab to verify compatibility.

Descalers

Sublime®

Regulations and Restrictions

- Sublime® is considered by OSHA & DOT to be a non-hazardous chemical. 40 CRF-261 & DOT 173.240(a)

  Non-Toxic
  Non-Corrosive
  Non-Flammable

- Biodegradable - BOD < 6 ppm
- NSF Registered A3
- Availability

  5 gallon pail
  30 gallon drum
  55 gallon drum
  330 gallon tote

Descalers

Sublime®

Applications

REFINERY DE-SCALING APPLICATIONS:

- Heat Exchangers
- All type crackers
- Converters
- Air & Gas Compressors
- Pumps
- Piping

PAPER MILL DE-SCALING APPLICATIONS:

- Liquid-Ring Vacuum Pumps & Filters
- Calendar Rolls
- Mill Rolls
- Liquor Tanks
- Pulverizers

Descalers

Sublime®

How do you determine the amount of Sublime® needed for a cleaning?

- Consult with maintenance supervisor to determine equipment specifications
- Consult OEM drawings
- Estimate pipe capacity
- Estimate approximately 30% of body or cylinder size
- Make sure you have spare quantities available

Descalers

Sublime®

PIPE CAPACITY

PIPE DIAMETER	FEET/GAL
1/8”	338
1/4”	185
3/8”	100
1/2”	63
3/4”	36
1 “	22
1 1/4”	12.8
1 1/2”	9.45
2”	5.73
2 1/2”	4.02

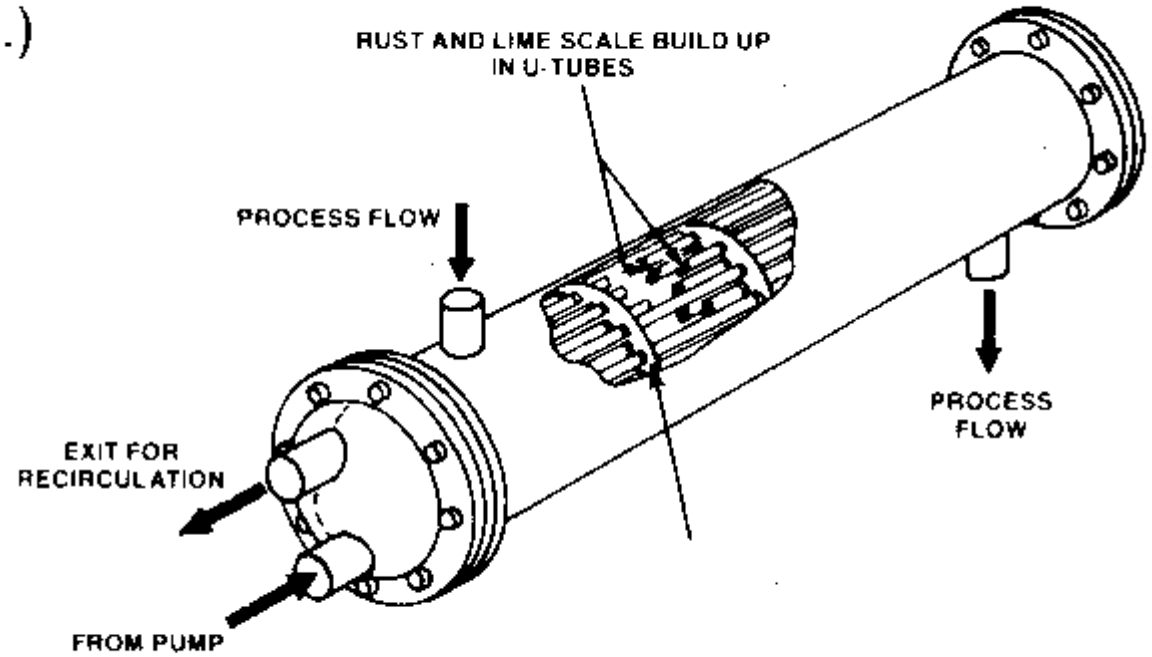
PIPE DIAMETER	FEET/GAL
3”	2.60
3 1/2”	1.95
4 “	1.57
5”	.96
6”	.66
7”	.49
8”	.40
10”	.24
12”	.17
14”	.12

GALLONS REQUIRED = TOTAL LENGTH OF PIPE / FEET PER GALLON

Descalers

Sublime®

(Figure 3.)



Descalers

Sublime®

HEAT EXCHANGER CAPACITIES

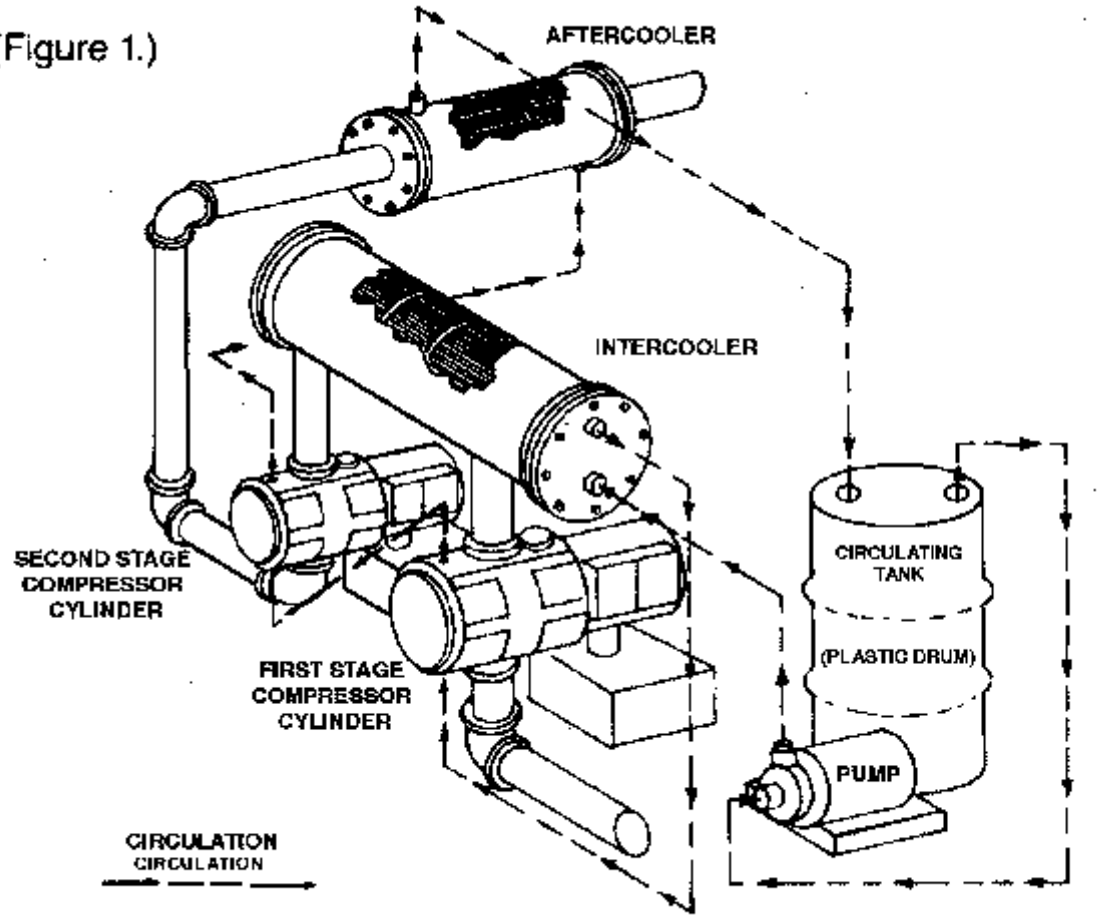
	LENGTH IN FEET									
DIA.	1	2	5	10	12	15	20	25	30	40
6”	1	2	4	8	9	11	15	19	22	30
12”	3	6	15	30	35	44	59	74	88	118
18”	7	13	33	66	80	99	133	166	199	265
24”	12	24	59	118	141	177	236	295	353	471
30”	19	37	92	184	221	276	368	460	552	736
36”	27	53	133	265	318	398	530	663	795	1060
42”	36	72	180	361	433	541	722	902	1082	1443
48”	47	94	236	471	566	707	943	1178	1414	1885
54”	60	119	298	596	716	895	1193	1491	1789	2386
60”	74	147	368	736	884	1105	1473	1841	2209	2945
66”	89	178	445	891	1069	1336	1782	2227	2673	3564
72”	106	212	530	1060	1272	1590	2121	2651	3181	4241
78”	125	249	622	1244	1493	1867	2489	3111	3733	4978

NUMBERS REPRESENT A 50% SOLUTION

Descalers

Sublime®

(Figure 1.)



Descalers

Sublime®

Descalers

Sublime®

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Sublime®

Descalers

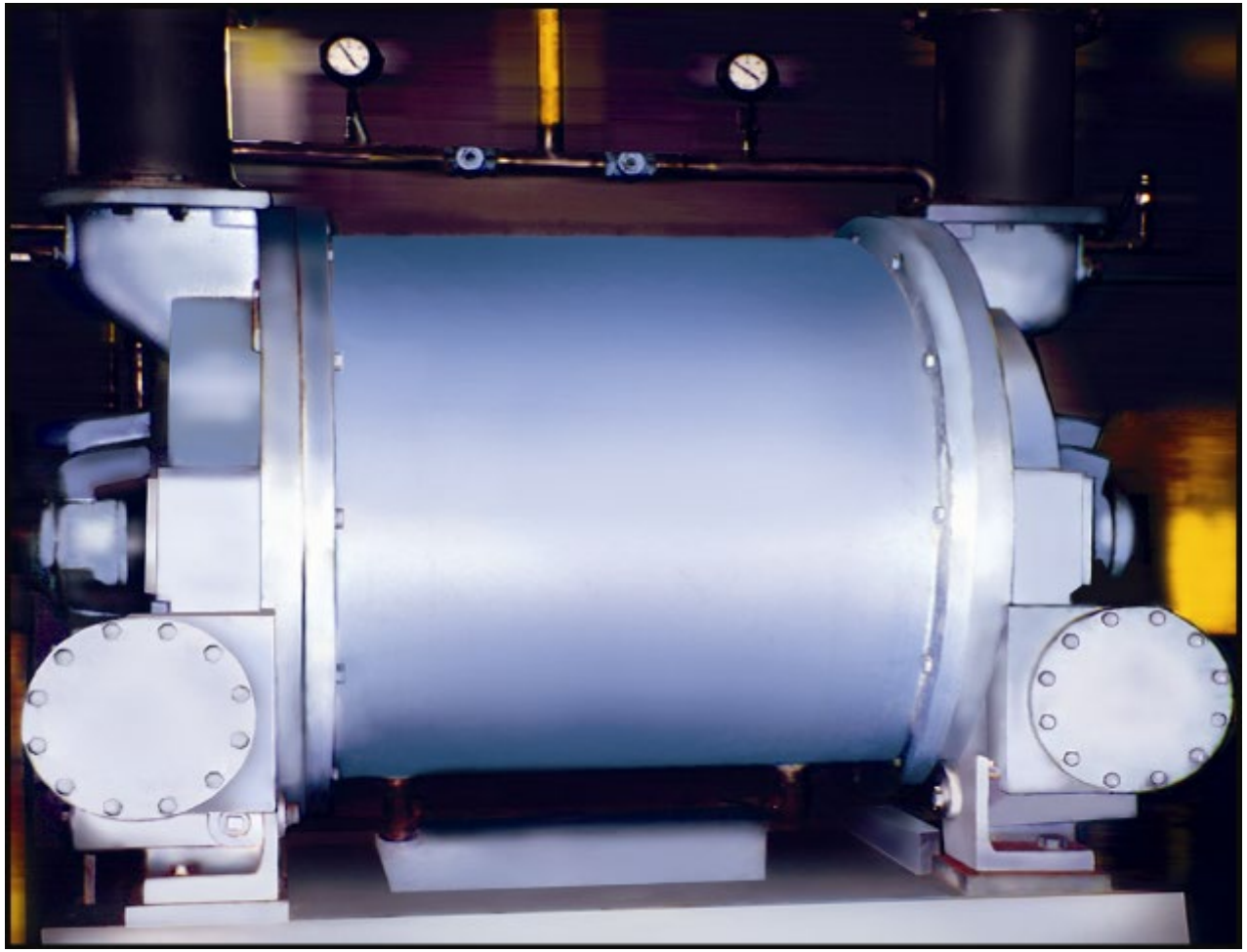
Sublime®

Where possible, Sublime® should be circulated through the system being cleaned.

CHEMICAL CART

Descalers

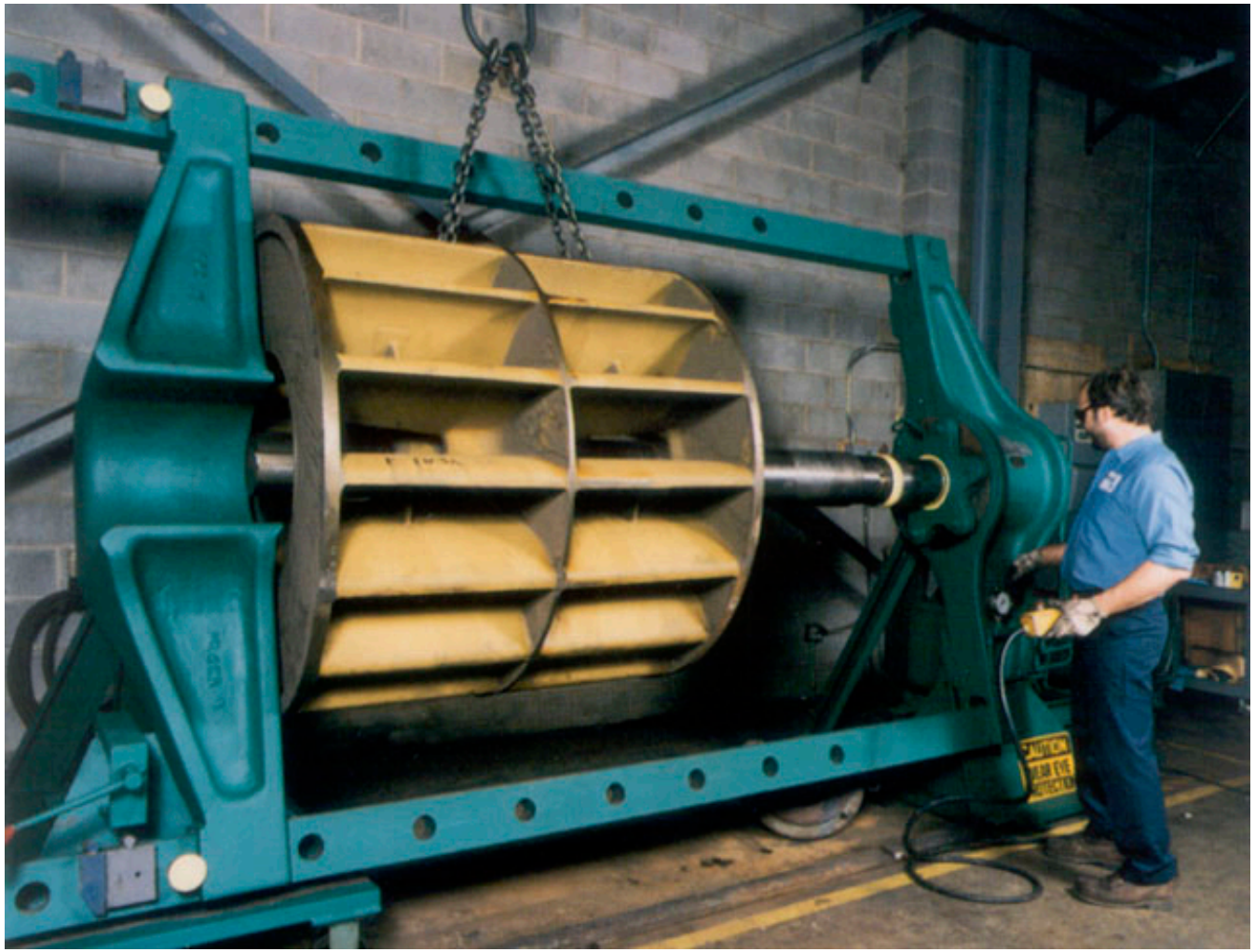
Sublime®



Vacuum Pump

Descalers

Sublime®



Descalers

Sublime®

Descalers

Sublime®

Descalers

Sublime®

Marine Applications

Ships, Submarines and Commercial Watercraft

- Pumps
- Radiators
- Fire Mains
- Diesel Engines
- Hulls
- Buoys
- Coolers
- Sea Strainers
- Condensers
- Feed Water Heaters
- Air Compressors
- Propulsion Units
- Boilers
- Engine Cooling Systems
- Generators
- Water Pumps
- Impellers
- A/C Units
- Cylinder Jackets
- Dissolves Marine Invasive Species (Zebra Mussles)

Descalers

Sublime®

DEPARTMENT OF THE NAVY
NAVAL SURFACE WARFARE CENTER
CARDEROCK DIVISION

NAVAL SHIP SYSTEMS
ENGINEERING STATION
1661 S. BROAD STREET
PHILADELPHIA, PA 19112-1403

IN REPLY REFER TO
9220
Ser 61/10-371
01 DEC 10

From: Commander, Naval Surface Warfare Center, Carderock Division, Philadelphia, PA
To: Commander, Naval Sea Systems Command (05Z41)

Subj: **AUTHORIZATION TO CLEAN SEAWATER SYSTEMS USING SUBLIME-WATER SCALE SOLVENT®**

Ref: (a) Technical Manual for Repair of Heat Exchangers, Coolers, And Distilling Plants, NAVSEA S9531-BB-MMI-010 Heat Exchanger
(b) Uniform Industrial Process Instruction 5050-90IC, Cleaning Marine Growth from a Component or System Using Safe-D-Scale or Rydlyme
(c) Commercial Item Description, Heat Exchanger Cleaning Compound A-A-59782 of 27 Sept 2005
(d) Summit Industrial Products ltr of February 15, 2010
(e) Naval Research Laboratory Report 3900, Ser 6130/1025 of 18 Aug 2010

Encl: (1) Summary of SUBLIME® Results

1. Reference (a) approved the use of specific commercial descaling solutions to remove hard fouling from the seawater side of heat exchangers on non-nuclear, surface ships. The commercial products are acid solutions, typically containing hydrochloric or phosphoric acid, which are used at room temperature to dissolve sea scale (calcium carbonate and magnesium hydroxide) and to dissolve or loosen sea life (sea grass, mussels, and barnacles). These commercial descaling solutions are significantly more effective at removing hard fouling than the mechanical cleaning methods or the previous acid procedures. Shipyards, contractors, and Regional Maintenance Center personnel experienced in acid cleaning, are authorized to use the approved descaling solutions to clean heat exchangers on non-nuclear surface ships. The procedures for on site cleaning by shipyards and contractors were developed by Puget Sound Naval Shipyard and are given in reference (b).

2. A commercial item description (CID) for Heat Exchanger Cleaning Compound, reference (c), was developed to screen the candidate descaling solutions. The proposed CID requires testing to confirm that the descaling agent is effective at dissolving scale, does not affect the system non-metal materials, is not corrosive to the system metals, and does not interfere with the formation of a protective oxide layer on copper alloys after the cleaning. Products that meet the requirements in the proposed CID are authorized for use in cleaning non-nuclear surface ship heat exchangers.

3. Summit Industrial Products of Tyler TX submitted test results by reference (d) showing that

Subj: **AUTHORIZATION TO CLEAN SEAWATER SYSTEMS USING SUBLIME-WATER SCALE SOLVENT®**

their product, Sublime- Water Scale Solvent, meets the corrosion requirements and does not affect the non-metallic parts found in the seawater systems. Reference (e), are the results of Naval Research Laboratory test showing that cleaning with Sublime does not interfere with the reformation of the protective oxide layer. A summary of the results is tabulated in enclosure (1).

4. Based on the requirements stated in reference (c), Sublime-Water Scale Solvent manufactured by Summit Industrial Products is approved for use by Naval Shipyards, contractors, and Regional Maintenance Center personnel experienced in acid cleaning seawater system components on non-nuclear surface ships.

5. NSWCCD-SSES technical point of contact for acid cleaning is Melissa Harris, Code 615, Commercial (215) 897-1233, DSN 443-1233, email: Melissa.A.Harris@navy.mil.

D. SIMUNOV
Head, Coatings, Corrosion Control and Functional Materials Branch
By direction

Copy to:
PEO AIRCRAFT CARRIERS (PMS 312)
PEO SHIPS (PMS 470)
PEO TSC (PMS 400F)
NRL Key West
SOUTHEAST RMC MAYPORT FL
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NAVSHIPYD Portsmouth NH (Code 260)
NAVSHIPYD Puget Sound WA (Code 260)
NAVSHIPYD AND IMF Pearl Harbor HI (Code 260)
NAVSHIPREPFAC Yokosuka JA (Code 242)

61, 615, 923, 924

2

Descalers

Sublime®

Other Applications

Automotive
Extruders
Radiators

Bottling
Sterilizers
Booster Heaters

Chemicals
Reactors
Scrubbers

Food
Ice Machines
Process Equipment

Glass
Piping
Fan & Furnace bearings

Manufacturing
Quenchers
Chillers

Metals
Cooling Fans
Table Top Sprays

Paper
Mill Rolls
Vacuum Pumps & Filters

Pharmaceuticals
Stills
Reactor Vessel Jackets

Refineries
All Type Crackers
Air & Gas Compressors

Rubber/Plastics
Injection Molders
Molds

Steel
Transformer Coolers
Arc Furnaces

Textile
Condensers
Air Washers

Utilities
Soot Blowers
Transformers

Descalers

ALIMEX

Aluminum Safe Descaler

Descalers

ALIMEX

Product Description

- Sulfamic acid based
- Designed for equipment with aluminum components ie. heat exchangers, fin fans, etc.
- Atlas Copco Recommended
- Corrosion Inhibitor
- Wetting Agents
- Degreasing Compounds
- Color change from yellow to blue when spent (pH ≈ 6)
- One (1) gallon consumes 0.5 pounds $CaCO_3$

Descalers

ALIMEX

Proper Use

- No dilution necessary
- Maximum recommended circulation time:

  8 hours; average time 5 - 6 hours

- System being cleaned must be vented

  CO_2 gas is evolved

- Use product at ambient temperature

  Minimum 40 ºF (4 ºC)

  Optimum 80 ºF (27 ºC)

  Maximum 140 ºF (60 ºC)

Descalers

ALIMEX

Compatible Materials

- Aluminum
- Carbon Steel
- Admiralty Metal
- Iron
- PVC Plastic
- Rubber
- Titanium
- Stainless Steel
- Brass
- Copper
- Lead
- Polyethylene
- Leather

Incompatible Materials

- Zinc
- Magnesium Alloys
- Galvanized Surfaces

Descalers

ALIMEX

Regulations and Restrictions

- ***Alimex*** is considered by OSHA & DOT to be a non-hazardous chemical*.
  - Non-Toxic
  - Non-Corrosive
  - Non-Flammable
- Biodegradable - BOD < 6 ppm
- NSF Registered A3

* 40 CRF-261 & DOT 173.240(a)

Descalers

SUM-KOOL®

pH Neutral Descaler

Descalers

SUM-KOOL

Product Description

- Neutral compound - does not contain any acid
- Based upon chelating agents
- Designed for closed loop systems (venting not required) and systems containing aluminum
- Can be disposed of in municipal water handling operations

Descalers

SUM-KOOL

Why Use Sum-Kool®?

- Does not require venting
- Safe for use on aluminum
- Holds the scale removed in suspension
- Does not produce carbon dioxide gas
- Ideal for closed loop systems

Descalers

SUM-KOOL

Proper Use

- Use at 20% strength for cleaning
- Use at 2% concentration for preventative maintenance
- Should be heated to between 120ºF - 200 ºF
- Should be circulated through system
- Circulation time 6 - 8 hours
- Effective in systems with a pH range of 6.0 to 8.5

Descalers

SUM-KOOL

Compatible Materials

- Aluminum
- Carbon Steel
- Admiralty Metal
- Iron
- PVC Plastic
- Rubber
- Stainless Steel
- Brass
- Copper
- Lead
- Polyethylene
- Leather

Incompatible Materials

- Zinc
- Magnesium Alloys
- Galvanized Surfaces

Descalers

SUM-KOOL

Applications

- Power plant boilers and piping systems including nuclear power plants
- Equipment in refineries, utility companies, paper mills, chemical plants, foundries, and other industries
- Sewage disposal plants, water treating facilities and other municipal water handling operations
- Compressor stations and radiator systems including closed loop systems
- Equipment that is water cooled in any manner or that requires the removal of multivalent metal ions
- Applications in office buildings, hospitals, and electronics facilities where accidental spills or leaks of acid based cleaners could result in adverse effects
- Cleaning applications requiring a solution with an extremely low metal ion content

Descalers

SUM-KOOL

Regulations and Restrictions

- ***Sum-Kool®*** is considered by OSHA & DOT to be a non-hazardous chemical*.

  Non-Toxic

  Non-Corrosive

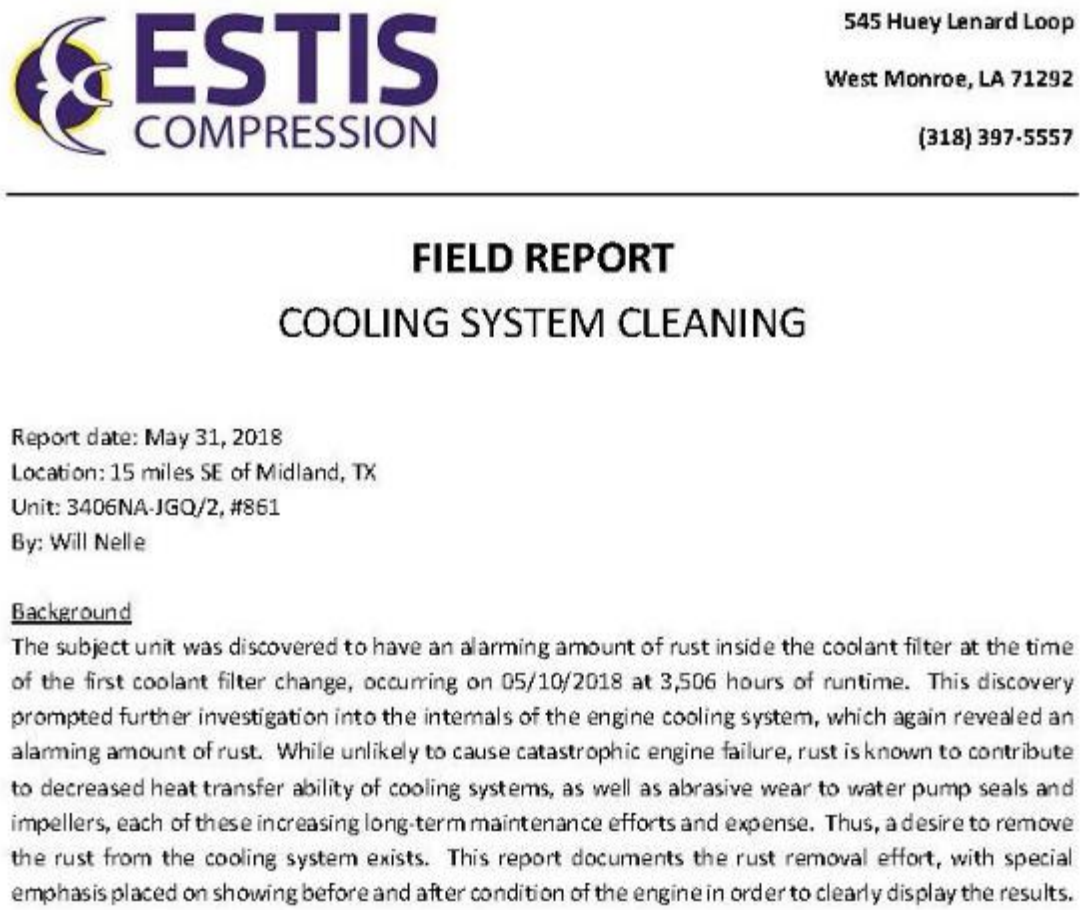
  Non-Flammable

  *40 CRF-261 & DOT 173.240(a)

- NSF Registered A1

Descalers

SUM-KOOL



ESTIS COMPRESSION

545 Huey Lenard Loop

West Monroe, LA 71292

(318) 397-5557

FIELD REPORT

COOLING SYSTEM CLEANING

Report date: May 31, 2018
Location: 15 miles SE of Midland, TX
Unit: 3406NA-JGQ/2, #861
By: Will Nelle

Background

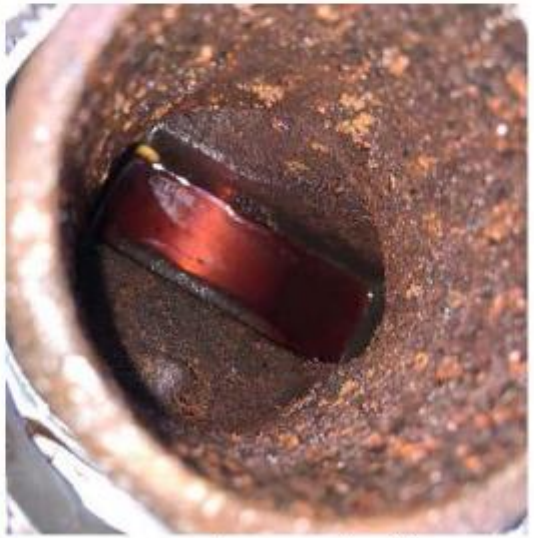
The subject unit was discovered to have an alarming amount of rust inside the coolant filter at the time of the first coolant filter change, occurring on 05/10/2018 at 3,506 hours of runtime. This discovery prompted further investigation into the internals of the engine cooling system, which again revealed an alarming amount of rust. While unlikely to cause catastrophic engine failure, rust is known to contribute to decreased heat transfer ability of cooling systems, as well as abrasive wear to water pump seals and impellers, each of these increasing long-term maintenance efforts and expense. Thus, a desire to remove the rust from the cooling system exists. This report documents the rust removal effort, with special emphasis placed on showing before and after condition of the engine in order to clearly display the results.

Before Pictures

Inside of coolant filter housing

Coolant drained from coolant filter housing

Cooling port plug from center of head



Engine coolant outlet "neck"

Descalers

SUM-KOOL

Cleaning Process

Summit manufactures a cooling system descaler by the name Sum-Kool that is said to remove lime scale, rust and corrosion from inside cooling systems in a safe and simple manner. Sum-Kool was used, following these steps:

- Begin on 05/24/2018 at 3,836 hours of runtime
- Partially drain cooling system
- Add 15 gallons of Sum-Kool, yielding approximately 30% concentration
- Top off engine cooling system with coolant

Before/After Pictures

Cooling port plug from center of head

Cooling port plug from rear of head

Descalers

SUM-KOOL

Cleaning Process *(continued)*

- Restart engine and run under normal conditions for approximately one week
- Completely drain and dispose of coolant/descaler mixture, making sure to drain as many low
- points in cooler and engine as reasonably possible.
- Refill engine with fresh coolant
- Replace coolant filter
- End on 05/31/2018 at 3,985 hours of runtime

Descalers

SUM-KOOL

Engine coolant outlet “neck”

Descalers

SUM-KOOL

Observations

Following the cleaning process (7 days, 149 hours of runtime):

- All visible internal surfaces of the engine in contact with the coolant/descaler solution were free of visible rust.
- Drained coolant color was as tan/light brown (started as deep red) and free of particulate matter (presumably from use of a coolant filter).
- The coolant filter housing contained roughly one tablespoon of sediment.

Discussion

The cleaning process was simple, trouble-free and yielded no negative surprises. Results are plainly evidenced in the pictures and can safely be described as remarkable. The cleaning process as described earlier, was simply the approach used in this specific instance and should not be considered the only effective approach. Specifically, a lower concentration of Sum-Kool and a decreased cleaning time may be still prove to be effective. Overall, the process accomplished the desired result and is recommended as a practical option for removing rust and scale from the internal surfaces of an engine’s cooling system.

Descalers

GalVan-Plus

Acidic Descaler for Galvanized Metal

Descalers

GalVan-Plus

Product Benefits

- GalVan-Plus is a non-acid cleaner that works as a replacement for traditional mineral and organic acids.
- Will not harm Zinc coatings of galvanized metals
- Works on Calcium Sulfate scale
- GalVan-Plus 4 to 10 times more effective than Citric and Glycolic acids and 2 to 3 times more effective than phosphoric acid.
- Contains no VOCs (volatile organic compounds)
- Has a low pH and is non-corrosive to skin and mild steel

Descalers

GalVan-Plus

Applications

- safely remove lime deposits or water scale from cooling towers (basin), water lines and galvanized pipe fittings where stronger, acid-based descalers would degrade the metal.
- used by circulating through the equipment that needs cleaning, providing that there is adequate venting for the carbon dioxide created in the cleaning process.

Descalers

GalVan-Plus

Compatibility

- One gallon of GalVan-Plus will consume 1.1 pounds of Calcium Carbonate (CaCO3)
- Not recommended for Aluminum
- Is non-hazardous to ship by ground but is hazardous to ship by sea and air
- Ventilate equipment at all times when cleaning as carbon dioxide gas is created during the cleaning process.
- Do not store above 230°F

Degreasers

- Xtra-Clean
- EnviroTech Green Cleaner

Degreasers

XTRA-CLEAN

Super Industrial Cleaner and Degreaser

Degreasers

XTRA-CLEAN

Product Description

- Butyl based degreaser
- Biodegradable
- pH ≈ 11.2
- Rust Inhibited
- Safe to use on most painted surfaces
- Does not contain: Chlorinated Solvents, Benzene, or Naphtha
- Cleaning time & efficiency enhanced by moderate heating

Degreasers

XTRA-CLEAN

Applications

- Dilution (1) - Institutional - For painted walls, glass fixtures, skylights, windows, ceramic and wood. Never stronger than Dilution 1 and rinse immediately.
- Dilution (2) - Commercial - For floors of concrete, ceramic, tile, terrazzo, magnesite, vinyl, rubber and plastic.
- Dilution (3) - General surface cleaning - For airplanes, buses, trucks, trailers, boats, canopies, plastic, air-conditioning units, electric fans and motors, cooling coils, and filters, white side wall tires.
- Dilution (4) - Industrial - For cleaning dirt and grease from equipment, lift trucks, engines, pipes, motor shells, electric motors, and machinery. Printers - For cleaning ink from presses, wall, and floors.
- Dilution (5) - Maintenance - For conveyors, engines, exhaust stains, machines, metal stock and welding equipment. Kitchens - for ovens deep fat fryers, flues, ducts, and canopies over ovens, greasy floors.
- Dilution (6) - Vats - For cleaning greasy and carboned parts

DILUTION NO.	PARTS OF CLEANER	PARTS OF WATER
1	1	40
2	1	25
3	1	10
4	1	5
5	1	2
6	2	1

Degreasers

XTRA-CLEAN

Degreasers

XTRA-CLEAN

Regulations and Restrictions

- No known regulations
  - Non-Flammable
  - Non-Abrasive
  - Non-Corrosive
  - Non-Toxic
- NSF Registered A8, C1

Degreasers

EnviroTech® Green Cleaner

Environmentally Friendly Cleaner and Degreaser

Degreasers

EnviroTech Green Cleaner

Product Description

- Propylene based Glycol Ether solvent with environmentally safe chelating agent and surfactant.
- U.S. EPA DfE – Recognized “Safest Products”
- NSF Food Grade Registered
- No VOCs or phosphates
- Readily biodegradable
- Self-splitting: oils rapidly break from used solution
- Superior penetration and removal of oily, greasy particulate soils

Degreasers

XTRA-CLEAN

Formulated for Design for the Environment (DfE) Approval

- Program created by a Partnership with the EPA
- Distinguishes safer chemical product
- Uses criteria and testing to ensure ingredients and products are safe and best in class

Degreasers

EnviroTech Green Cleaner

Safer for the environment

- No Volatile Organic Chemicals (VOCs)
- No hazardous air pollutants
- No ozone depleting substances
- Biodegradable
- Not toxic to aquatic organisms
- Does not persist in environment or remain in aquatic life (bioaccumulate)
- Recycled content in packaging

Degreasers

EnviroTech Green Cleaner

Safer for humans

- No hazardous ingredients in plastic packaging
  - No phthalates or BPA (reproductive toxins)
- pH between 2 and 10 (diluted)
- No dangerous ingredient interactions
  - Some cleaners contain chemicals which react and produce harmful gases or carcinogens
- No carcinogens or reproductive toxins
- No sensitizers
  - Sensitizer: Causes allergic reaction even to small amount once exposed

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Degreasers

EnviroTech Green Cleaner

Applications

- EnviroTech® Green Cleaner removes oil residue and hydrocarbon buildup such as grease, motor oil, tar, fuel, fats, heavy soil, and much more.
- Replaces widely used chemistry in cleaners
  - EDTA – degrades into a persistent pollutant
  - NTA – suspected carcinogen
  - NPEs & OPEs – extremely toxic to aquatic life, reproductive toxin & has been detected in human blood & urine
  - Ethylene based Glycol Ethers – moderate toxicity & possible severe respiratory, liver & kidney damage with long term exposure

Degreasers

EnviroTech Green Cleaner

Degreasers

EnviroTech Green Cleaner

Data and Directions

Directions

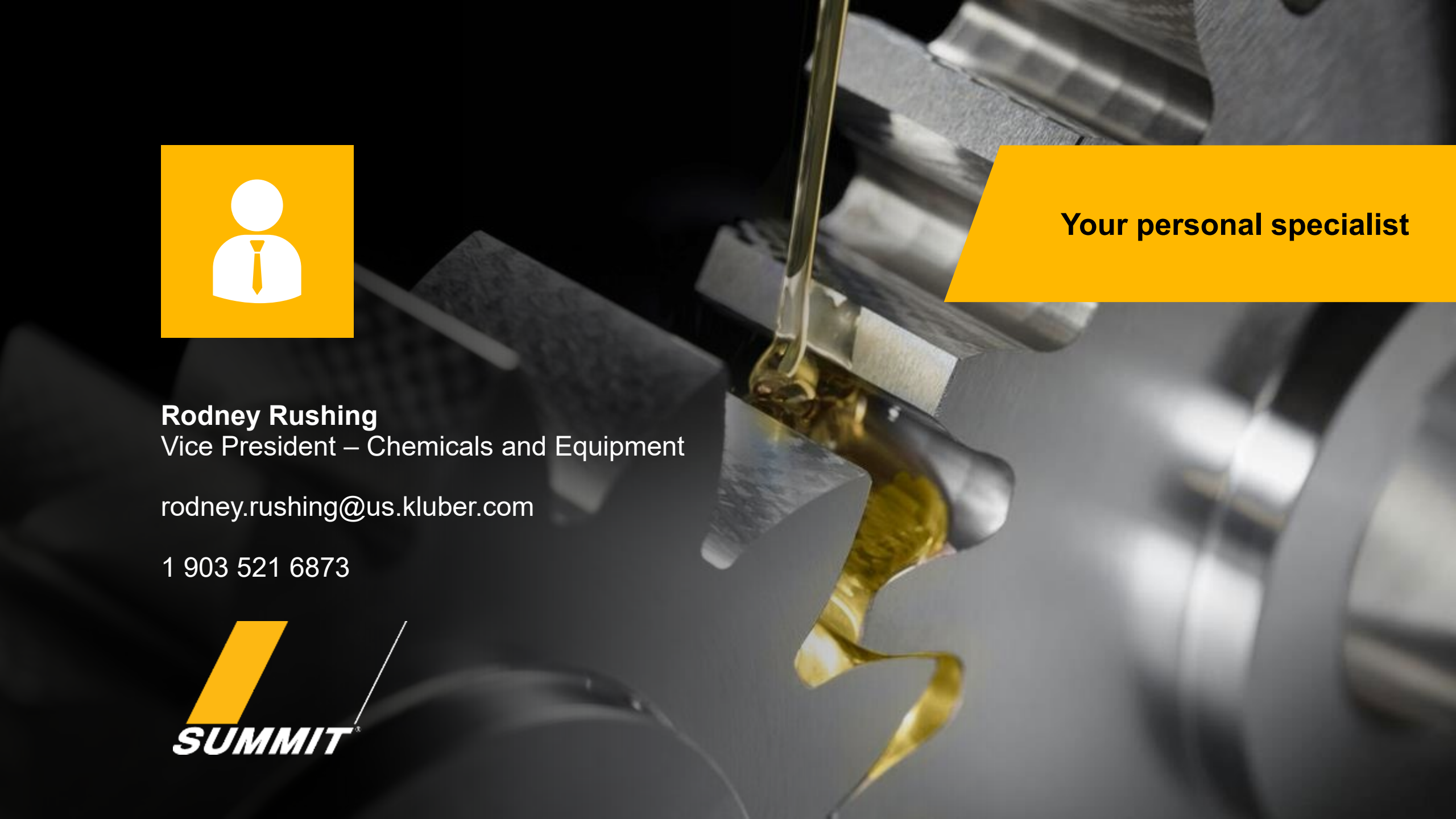
Allow to penetrate soil and contamination then agitate with a sponge, cloth or brush and rinse.

Dilution

1. Light Duty: (1:10) (product:water)
2. Heavy Duty: (1:2) (product:water)

Product Data

- Clear to slightly yellow liquid
- pH < 11.5
- Requires 1:10 dilution for DfE (product:water)
- Sold as concentrate



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