

SUBLIME®

GENERAL APPLICATION GUIDE

INTRODUCTION

Summit SUBLIME* is a water-based solvent containing wetting agents, corrosion inhibitors and degreasing compounds. SUBLIME is designed to penetrate and remove encrusted lime scale, rust, corrosion products and dirt from water-wetted surfaces in process equipment. The solution can also be used to remove lime scale in commercial and industrial applications. SUBLIME is non-toxic, non-corrosive and non-flammable and can be safely handled when used as directed in the technical literature.

TECHNICAL SPECIFICATIONS:

SUBLIME has a pleasant sassafras odor and does not generate obnoxious odors when dissolving water scale or lime.

SUBLIME contains a pale yellow colored dye which changes to a purple color when the solution is spent.

SUBLIME has the ability to remove approximately 1.5 pounds of lime, and water scale per gallon of solution. Carbon dioxide (CO₂) gas is generated by the action of SUBLIME solution on lime or water scale.

SUBLIME is non-corrosive and will not adversely affect the following materials when used as directed: stainless steel, carbon steel, brass, admiralty metal, copper, iron, lead, PVC plastic, polyethylene, rubber, leather, or most metals or materials normally found in water-wetted equipment.

SUBLIME is a water-based solvent containing wetting agents, corrosion inhibitors and degreasing agents to penetrate and remove encrusted lime scale, rust and dirt from water-wetted surfaces in process equipment.

SUBLIME is especially designed to safely remove lime deposits or water scale from:

- Power plant boilers and piping systems and from evaporating equipment
- 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
- Any equipment that is water contacted in any manner

SUBLIME is non-toxic, non-corrosive and non-flammable when used as directed within the temperature and operating described in the technical literature.

SUBLIME is not recommended for use in aluminum, aluminum alloys, zinc (hot dipped galvanized sheet), and all alloys of magnesium. It is recommended that test samples of these metals be evaluated in the laboratory before using SUBLIME to treat water scale deposits on these metals.

Concentrated SUBLIME solution may discolor some chromed and stainless steel surfaces. It is recommended that SUBLIME solution be diluted 1:1 with water before using on chrome surfaces.

SUBLIME solution may be shipped on private or commercial carriers.

SUBLIME does not separate, phase out or degrade in storage. The solution is free rinsing and does not require neutralization.

*SUBLIME® is a registered trademark of Summit Industrial Products, Inc.



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PHYSICAL PROPERTIES

Summit SUBLIME has the following properties:

Specific Gravity @ 60° F	1.051
Freezing Point	-22°F
Boiling Point	214°F
Flash	None
Temperature of Reaction	Negligible

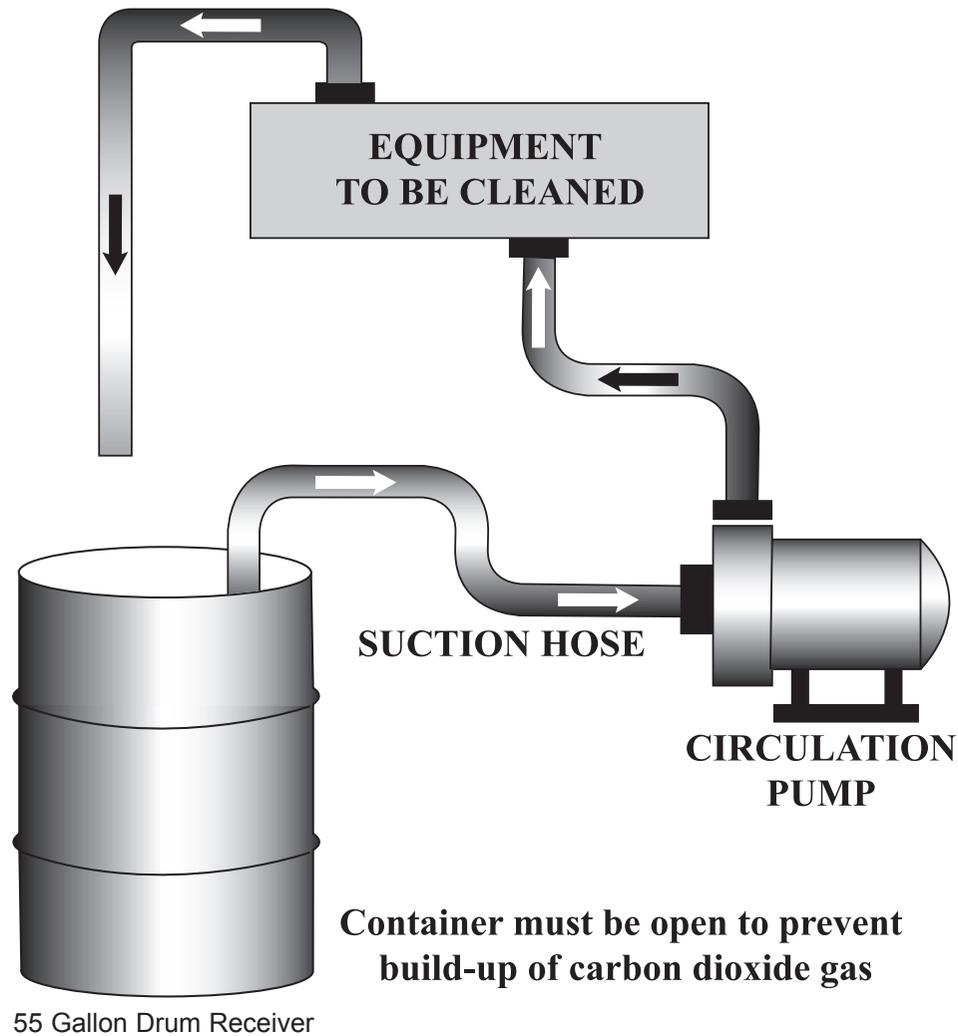
Recommended operating pressure is atmospheric and recommended operating temperature range is:

Minimum	40°F
Optimum	80°F
Maximum	120°F

METHOD OF APPLICATION:

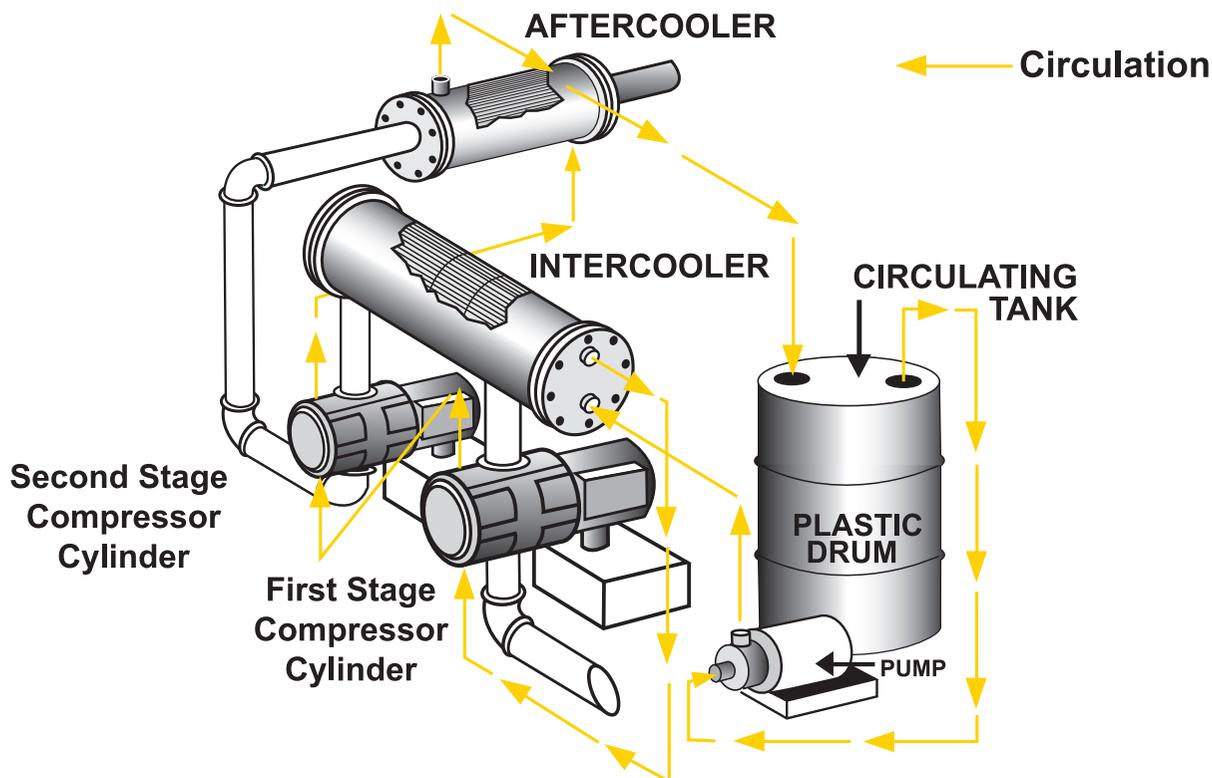
Summit SUBLIME solution is most effectively used by circulating it through the equipment to be cleaned. When possible circulation should be up flow. The equipment should be vented at all times since carbon dioxide (CO₂) gas is liberated from the disassociation of the lime scale.

SUBLIME PUMP & HOSE HOOK-UP



SUBLIME®

CLEANING INTERCOOLER, AFTERCOOLER, AND CYLINDER JACKETS ON A TWO STAGE COMPRESSOR



PROCEDURE

1. Shut down the compressor and lock out the power source.
2. Continue water circulation until the compressor and all water cooled surfaces have cooled to 140°F or less.
3. Shut off, disconnect and drain all cooling water from the unit. Backwash the exchangers and the cylinder heads individually to remove as much loose dirt and debris as possible.
4. The unit should be piped and valved so that SUBLIME® solution can be circulated upflow in series through all of the waterwetted equipment. SUBLIME® solution should enter at the lowest point and exit from the highest point. The SUBLIME® pump and circulation tank should be attached as shown in Figure 1.
5. The circulation tank should be vented to atmosphere at all times while the SUBLIME® solution is being used. This allows the carbon dioxide formed during the cleaning process to escape to the atmosphere.
6. Sufficient SUBLIME® should be added to the circulation tank to provide for flooded circulation and approximately 12 inches of SUBLIME® solution in the tank.
7. A yellow dye has been added to SUBLIME® which turns to a purple color when the SUBLIME® solution's ability to remove lime scale has been exhausted. If the solution changes to a purple color or if carbon dioxide (CO₂) gas no longer evolves when there is lime scale present, the solution is spent.
8. It will normally take two (2) to six (6) hours of circulation to clean, depending on the size of the equipment and the quantity of scale and rust to be removed. One gallon of SUBLIME® will remove approximately 1.5 pounds of scale, depending on the composition of the scale.
9. Upon completion of the cleaning operation, drain the SUBLIME® solution from all equipment. Thoroughly flush the water cooling system with fresh water for 10 to 15 minutes and rinse all surfaces before returning the equipment to service.
10. Check the SUBLIME® solution to see if it is spent. If it is still active, retain for future use. If it is spent, properly dispose of.



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CYLINDER CLEANING WITH SUBLIME®

The water-wetted cooling cavities of compressor cylinders inevitably become fouled with scale and rust deposits. The efficiency of the compressor is impaired by this condition. SUBLIME® can effectively clean up this condition without removing the cylinder head. To insure proper removal of all scale, rust and water born debris, it is important that these instructions be followed.

SUBLIME® CLEANING INSTRUCTIONS

1. Shut the compressor down and lock out the power source. When the temperature has reached ambient condition, valve off the cooling water and drain water from the cylinder water jacket.
2. Remove all of the inspection plates and clean out as much scale and debris as possible. Replace the inspection plates and backflush the cylinder jacket downflow to remove any loose material remaining.
3. Disconnect the backflush lines and connect the SUBLIME® circulation system as shown in Figure 2. Make sure the circulation is upflow.
4. Determine quantity of SUBLIME® needed based on the requirements in Table 1.
5. Add the required quantity of SUBLIME® to the system and begin circulation. It will normally take two (2) to six (6) hours of circulation to clean relative to the size of the equipment and the quantity of scale and rust to be removed. One gallon of SUBLIME® will remove approximately 1.5 pounds of scale, depending on the composition of the scale.
6. A special yellow dye has been added to SUBLIME® which turns to a purple color when the SUBLIME® solution is spent. If the solution changes to a purple color or if carbon dioxide (CO₂) gas no longer evolves when there is lime scale present, the solution is spent.
7. Discontinue pumping and allow sufficient SUBLIME® to drain so that the inspection plate can be removed for a visual inspection. If there is still scale present in the water jacket, replace the inspection plate and continue circulation. Be sure to check the condition of the circulating SUBLIME® solution.
8. When visual inspection shows the water jacket is clean, disconnect the pump and hoses.
9. Thoroughly backflush to remove any remaining loose material and replace inspection plates.
10. Reconnect water piping to cylinder jacket as shown in operating manual.
11. Unit is now ready to be returned to service.
12. Check the SUBLIME® solution to see if it is spent. If it is still active, retain for future use. If it is spent, properly dispose of.

**Diagram for SUBLIME®
Cleaning of Cylinder**

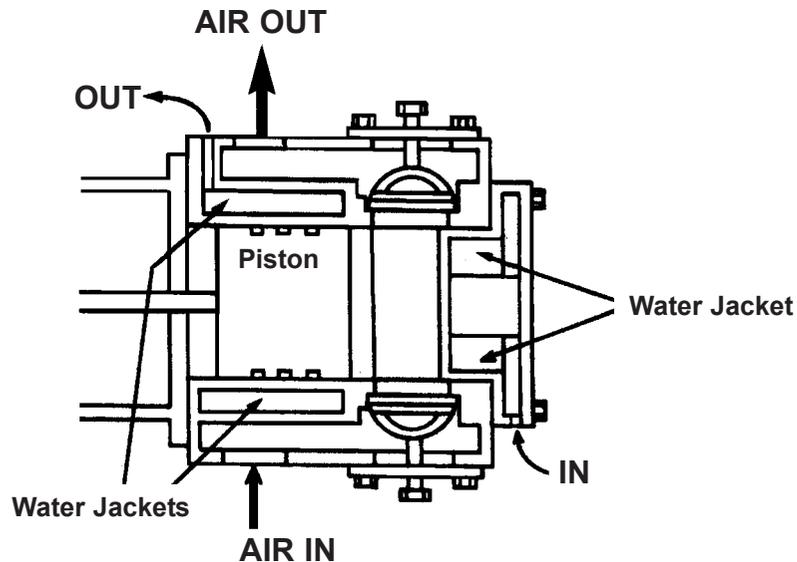


TABLE 1.

The following table provides an estimate of the quantity of SUBLIME® required for cleaning cylinder water jackets. These are approximate numbers based on average conditions. The actual fluid requirement may be more or less depending on the quantity and composition of scale or rust to be removed.

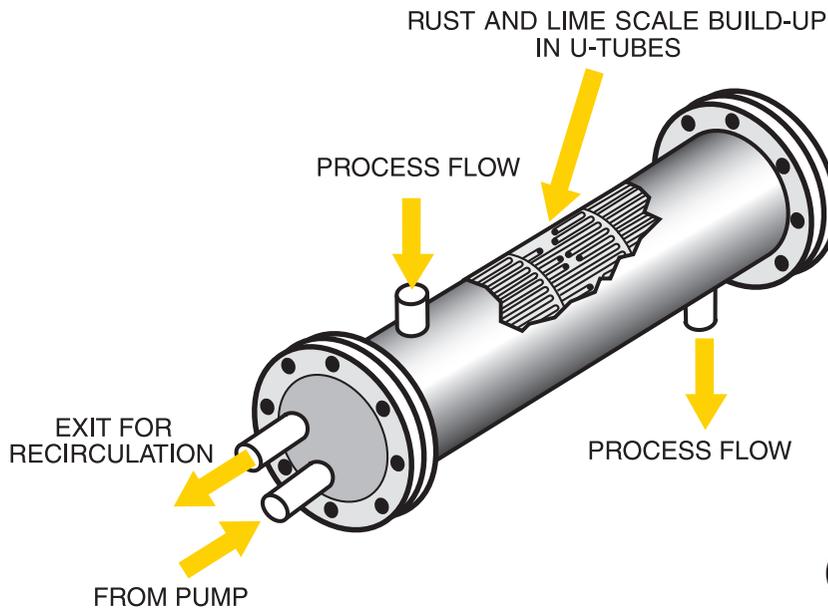
HORSE POWER OF COMPRESSOR	GALLONS SUBLIME®	HORSE POWER OF COMPRESSOR	GALLONS SUBLIME®
30	8-10	200	24-30
50	10-12	250	26-34
100	14-16	300	30-40
150	20-24	350	34-44

SUBLIME®

EXCHANGER (INTERCOOLER) CLEANING

EXCHANGER (INTERCOOLER) CLEANING WITH SUBLIME®

SUBLIME® CLEANING OF TUBE SIDE WATER EXCHANGER



(FIGURE 3.)

This diagram shows the correct hook-up for SUBLIME® cleaning of tube side water exchanger.

SUBLIME® CLEANING INSTRUCTIONS:

1. Shut down the equipment and lock out power source. When the temperature has reached ambient condition, turn off the water supply and drain all water from the exchanger.
2. Flush the exchanger, flow top to bottom, to remove loose dirt and scale.
3. Attach SUBLIME® pump, hose and circulating tank making sure circulation is bottom to top in exchanger. (See Figure 3.)
4. Add SUBLIME® to the circulation tank and begin pumping the solution through the exchanger. It will normally take two (2) to six (6) hours of circulation to clean, depending on the size of the exchanger and the quantity of scale and rust to be removed.
5. When the cleaning is complete, drain the SUBLIME® solution back into the circulation tank.
6. Disconnect pump and hoses and flush the exchanger with water to remove any remaining insoluble material.
7. The exchanger is now ready to be put back into service.
8. Check SUBLIME® solution to see if it is spent. If it is still active, retain for future use. If it is spent, discard it.



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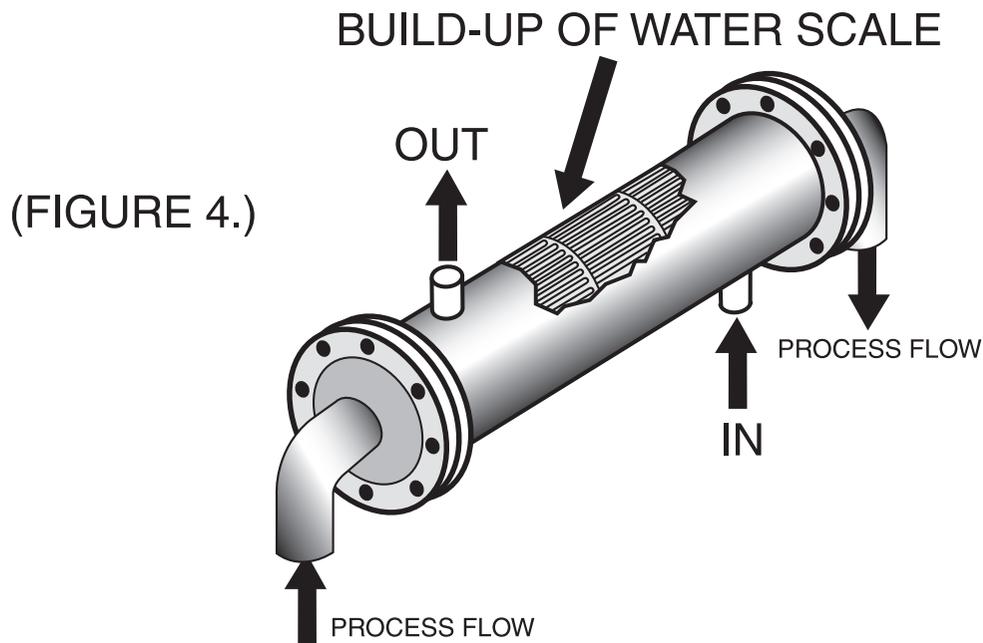
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EXCHANGER (INTERCOOLER) CLEANING WITH SUBLIME®

SUBLIME® CLEANING OF SHELL SIDE WATER EXCHANGER



This diagram shows the correct hook-up for SUBLIME® cleaning of shell side water exchanger. SUBLIME® cleaning of shell and tube exchangers with water on the tube side can be accomplished without disassembling or removing the tube bundle from the shell. These instructions should be followed to insure proper removal of scale, rust and dirt from the exchanger or cooler.

SUBLIME® CLEANING INSTRUCTIONS:

1. Shut down the equipment and lock out power source. When the temperature has reached ambient condition, turn off the water supply and drain all water from the exchanger.
2. Flush the exchanger, flow top to bottom, to remove loose dirt and scale.
3. Attach SUBLIME® pump, hose and circulating tank making sure circulation is bottom to top in exchanger. (See Figure 3.)
4. Add SUBLIME® to the circulation tank and begin pumping the solution through the exchanger. It will normally take two (2) to six (6) hours of circulation to clean, depending on the size of the exchanger and the quantity of scale and rust to be removed.
5. When the cleaning is complete, drain the SUBLIME® solution back into the circulation tank.
6. Disconnect pump and hoses and flush the exchanger with water to remove any remaining insoluble material.
7. The exchanger is now ready to be put back into service.
8. Check SUBLIME® solution to see if it is spent. If it is still active, retain for future use. If it is spent, discard it.