RYDLYME MARINE®

Dissolve the toughest water scale deposits in heat exchangers, chillers, condensers & much more on offshore rigs.

Offshore Rig Descaling

Titanium Heat Exchanger Descaling

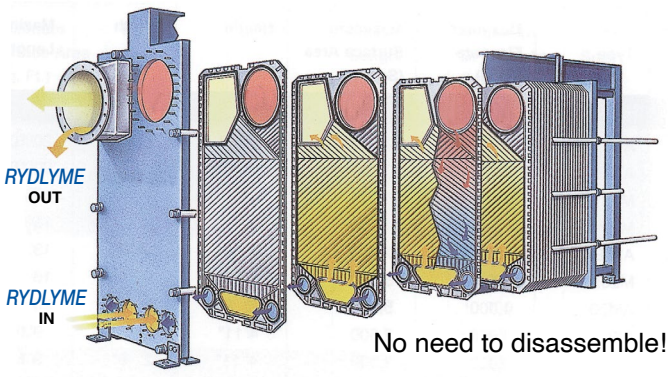
To obtain the quantity of ***RYDLYME*** marine needed to clean your heat exchanger, you will need to know the diameter and length first. Once you have that information, please refer to the chart for the quantity and circulation time (fig 1.1). The volume given in the reference chart depicts a 50% concentration, therefore the same amount of water will be required to flood the unit and circulate the solution. If you're cleaning a plate and frame, please consult the formula for figuring your volumes in the two boxes below (see fig 2.1 & fig 2.2). When isolating the water-side of the unit for cleaning, additional ***RYDLYME*** marine may be necessary if the isolation valves are located further than one foot from the actual supply and return ports of the exchanger. To account for this added volume, add in the piping volume from the exchanger to the valves to ensure the adequate amount of solution.

1. Isolate and drain the water-side of the exchanger to be cleaned.
2. Place a 1" ball valve between the isolation valves and the heat exchanger on both the supply and return.
3. Attach the ***RYDLYME*** marine pump and hoses so the ***RYDLYME*** marine will be pumped in the bottom or supply, and back out the top or return (see fig 3.1).
4. Begin pumping all the required ***RYDLYME*** marine into the exchanger. Once that is accomplished, begin to add water to complete the circulation. ***Please note: The calcium deposit will take up volume within the heat exchanger, so you will not be able to add the same amount of water in the beginning.***
5. Continue circulating the solution for the recommended amount of time. As the circulation progresses and the product dissolves the deposits inside the unit, the volume will increase. To account for the increase in volume, please add water to the circulation vessel, as needed. If you begin adding a lot of water, please be aware, it is possible there is a leak in the system.
6. It is a good idea to periodically check the effectiveness of the solution while circulation is in progress. This can be accomplished by utilizing a pH meter and as long as the solution retains a low pH, the product is active. Should the circulating solution reach a pH of 5.5 to 7.0 before the recommended time is up, you will need to add more ***RYDLYME*** marine and possibly extend the circulation time.
7. Upon completion of the recommended circulation time, the solution may be purged to a normal sewer and flushed with water. This process is completed by placing the return hose in the drain and adding water to the circulation container until the discharge line runs clear.
8. The unit is ready to be returned to service.
9. The same instructions may be used for plate and frame type heat exchangers. For volumes, please follow noted formula.

Please note: If your situation dictates that you cannot take your heat exchanger off-line, please contact the manufacturer for on-line cleaning instructions.

SYSTEM VOLUME	CIRCULATING TIME
0 - 25 gallons	1 hour
25 - 50 gallons	2 hours
50 - 150 gallons	3 hours
150 - 300 gallons	4 hours
300 - 500 gallons	6 hours
500 - 800 gallons	8 hours

fig 2.1



No need to disassemble!

Formulation for Determining Volume to Plate & Frame Heat Exchangers

1. Multiply the W x H x the thickness of the plate pack and that number is the total cubic inches.
2. Take the cubic inches and divide by 1728, and it is now converted to cubic feet.
3. Multiply the cubic feet by 7.5 and you now have the total gallons.
4. Divide the total gallons by 2 and you now have the volume inside the plates.
5. Divide the volume inside the plates by 2 and you now have the quantity of ***RYDLYME marine*** you will need to clean the exchanger.

Please note: Depending on the severity of the build-up, the application may require more RYDLYME marine or an extended circulation time.

Quantities of ***RYDLYME*** to Clean Water Side of Shell & Tube Heat Exchangers

Length in Feet

Diameter in Inches	4’	5’	6’	8’	10’	12’	16’	18’	20’	24’	30’	36’	40’
4”	1	1	1	2	2	2	3	3	3	4	5	6	6
5”	1	1	2	2	3	3	4	5	5	6	8	10	10
6”	2	2	3	3	4	5	6	7	7	9	12	15	16
8”	3	3	4	5	7	8	10	12	13	16	20	25	30
10”	4	5	6	8	10	12	16	18	20	25	30	40	45
12”	6	7	9	12	15	18	24	27	30	35	45	55	60
16”	10	13	16	21	25	30	42	50	55	60	80	95	110
20”	16	20	25	32	40	50	65	75	80	100	120	150	160
24”	25	30	35	50	60	70	95	110	120	140	180	220	240
30”	35	45	55	75	90	110	150	165	180	220	280	330	360
36”	55	65	80	110	130	160	220	250	275	330	400	495	550
40”	65	80	100	130	160	200	260	300	330	400	500	600	660
44”	80	100	120	160	200	240	320	360	400	475	600	720	800
48”	100	120	140	190	240	280	380	425	480	560	710	850	950
50”	105	130	160	210	260	315	415	470	520	625	780	935	1040
54”	120	150	180	240	300	360	480	540	600	715	895	1075	1195
60”	150	185	220	295	370	445	590	665	740	885	1105	1325	1475

Gallons of RYDLYME Marine

fig 1.1

= 1 Hour
= 2 Hours
= 3 Hours
= 4 Hours
= 5 Hours
= 6 Hours
= 7 Hours
= 8 Hours

Chiller Descaling

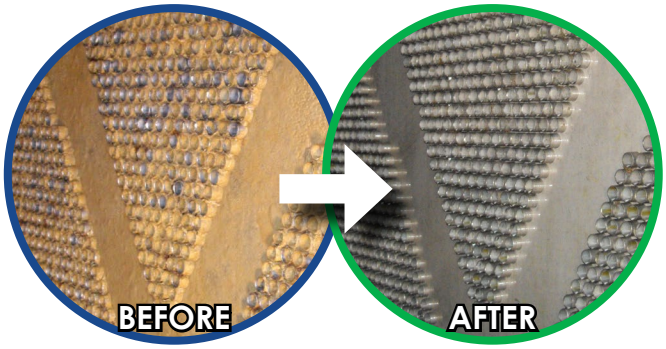
When isolating and cleaning just the barrel on a chiller, this chart will assist the technician in ascertaining the correct amount of ***RYDLYME*** marine required. ***RYDLYME*** marine, when circulated through the tubes, will completely clean the tubes, including the enhancements.

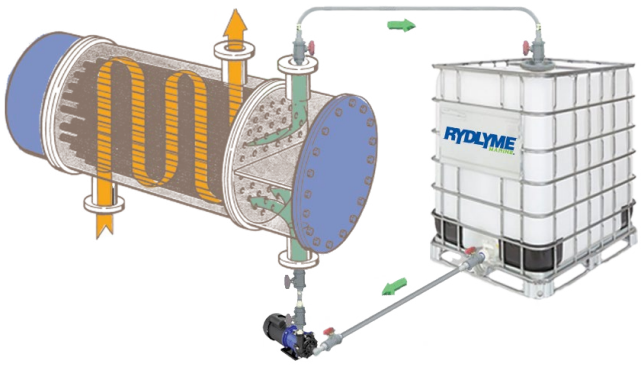
A ***RYDLYME*** marine cleaning will insure optimal efficiency is restored, bringing approach temperatures down to “as designed” specifications. When cleaning a chiller barrel, add the recommended amount of ***RYDLYME*** marine per the chart, then flood the remainder of the bundle with water to obtain circulation.

Circulate the ***RYDLYME*** marine and water solution through the lowest point of the bundle and return out a high point. If the return point you are planning to use is below the top tubes of the barrel, make sure your return hose is elevated above the highest point of the bundle.

This step will insure all the high side tubes are flooded and cleaned and avoid the potential of them becoming air bound. After circulating ***RYDLYME*** marine for the prescribed time and determining the tube bundle is clean, always perform a thorough water flush of the bundle.

Chiller Tubes





*Periodic **RYDLYME** marine cleanings will allow your centrifugal chiller to operate at peak efficiency during high demand cycles.*

Tube Bundle Descaling

1. Combine 50% ***RYDLYME*** Marine and 50% water in a large container. (**Note**: The length, width and depth of the container should be large enough to completely submerge the tube bundle).
2. Remove tube bundle from box cooler or sea chest and prepare bundle for submersion into ***RYDLYME*** Marine solution.
3. Once tube bundle is submerged into ***RYDLYME*** Marine solution, let tube bundle sit for recommended time agitating solution every 30 minutes. (**Note**: The duration of time the tube bundle is to be submerged will be anywhere from 2-6 hours. Please contact Apex Engineering Products Corp to assess the amount of soak time).
4. If the solution stops bubbling but there is still scale remaining, this means the ***RYDLYME*** Marine solution is no longer active. Add more ***RYDLYME*** Marine to continue the descaling process to completion.
5. Once the tube bundle has been successfully descaled, remove tube bundle from container and thoroughly rinse with fresh water prior to returning tube bundle to box cooler or sea chest.

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