

DOSING CHART

BOILER WATER TREATMENT

Oxytreat

The objective is to maintain a hydrazine hydrate residual between 0.05-0.2 ppm depending on operating pressure and boiler design. Actual consumption is determined under operating conditions. **A normal dosage is approximately 1 ltr. per day**, depending of system layout.

Hydrazine hydrate test result in PPM

Pressure	0-0.05	0.05-0.10	0.10-0.15	0.15-0.20	0.2 +	Range
0-40 Bar 0-588 PSI	Increase dose 25%	Increase dose 25%	Satisfactory Maintain dose	Satisfactory Maintain dose	Decrease dose 25%	0.1-0.2
41-60 Bar 589-896 PSI	Increase dose 25%	Increase dose 25%	Satisfactory Maintain dose	Decrease dose 25%	Decrease dose 25%	0.1-0.15
> 60 Bar >897 PSI	Increase dose 25%	Satisfactory Maintain dose	Decrease dose 25%	Decrease dose 25%	Decrease dose 25%	0.05-0.1

Oxygen Scavenger

A maintain the DEHA residual in the condensate is between 0.08-0.30 ppm. The consumption will depend on feed water temperature and the amount of water fed into the boiler. **A normal dosage is approximately 750 Ml. per day**, depending of system layout.

Condensanol Amine

The condensate is tested for pH to determine the dosage level. The pH limits are 8.3-9.0. For an average system e.g. **10 m3, the dosage is approximately 0.65 Ltr/day**

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Alkalinity Control

A proper level of treatment is maintained by testing for p-Alkalinity. The level is determined by the pressure and type of boiler. Refer to the dosage table below for correct dose rates. The normal method of raising the alkalinity level is by adding the required quantity of Alkalinity Control after testing for **p-Alkalinity. 235 ml/ton** will raise the p-Alkalinity by 100 ppm.

USING THE TABLE:- Select the section corresponding to the pressure of the boiler to be treated and read across the table to obtain the level of treatment required.

P-Alkalinity Test Result PPM CaCO ₃							Standard range P-Alkalinity	Initial dose ml/tonne
Pressure Range	0-60	60-90	90-100	100-110	110-120	120-150		
0-30 Bar (0-441PSI)	225ml	110ml	70ml	Satisfactory No Dose			Blow Down	100-150
31-40 Bar (442-588 PSI)	190ml	80ml	60ml	Satisfactory No Dose		Blow Down		100-130
41-60 Bar (589-882 PSI)	170ml	80ml	60ml	Satisfactory No Dose		Blow Down		100-120

Proper treatment should normally give a pH between 9.5 and 11. These are recommended values based on experience and are in no way intended to replace the boiler manufacturer's specifications or company regulations.

Cata Sulphite Liquid

The quantity of CSL required depends on the operation of the boiler system. As a guide 10 ppm sulphite is required to react with 1 ppm oxygen. A reserve of 20 to 50 ppm sulphite is to be maintained in the boiler water, determined by regular testing. A normal dosage is approximately **750 MI per day**, depending on system layout

Boiler Cogulant

For optimum results dose Boiler Coagulant directly to the boiler via the bypass pot-feeder. The initial **dosage is 20 ml of treatment daily for every ton of boiler capacity.** Daily bottom blow down is required when using Boiler Coagulant

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BWT One Shot

The BWT dose is as below –

P-Alkalinity*	0	50	100	150	200	250	300	350 +
Dose/ton**	2.4	1.8	1.2	0.6	0	0	0	Blow Down

As ppm CaCO₃

Liter BWT one Shot per ton boiler volume to achieve 200 ppm P-Alkalinity. Minimum dosage to reach 100 ppm P-Alkalinity for untreated water is **1 Ltrs/ton boiler water volume.**

COOLING WATER TREATMENT

Engine Water Treatment

The Engine Water treatment **dose is 3.00 Ltrs for 1000 Nitrite PPM.** For Better Performance maintain the Nitrite level 1250 to 1500 Nitrite PPM. For find the correct Nitrite PPM use the Rxsol Nitrite Test Kit and the EWT accordingly in water.

Rocor NB Liquid

Add 0.15 -1.5 % of Rxsol -C W T - 4001 in system or recommended Nitrite level 1400 – 2500 ppm can be measured and controlled by any standard RXSOL test kit. For 1000 Ltrs Fresh Water (without treated with coolant) recommended CWT 4001 is 13 Ltrs.

Nitrite (as PPM NO ₂)	0	100-200	300-600	700-900	1100-1300	1440-2400
RXSOL CWT NB 4001	13.0	11.3	8-10	5-7	1.5-3.5	0

Remarks – After using this Product no need to use EWT.

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Brine Inhibitor	Recommend dosage is <u>10.5 liters per ton of brine in the fresh Water (Without Treated) in system</u> . It may be added directly to the system either neat or in a water dilution. Dilutions should be made with evaporated water. When a chemical dosing pump is used, then pump and lines should be mild steel. Stainless steel, Teflon, polyethylene, PVC or rubber. It is monitored and controlled by measuring Boron concentration, in which it should be maintained in the range of 70 – 85 ppm
Bioguard	<u>Dose 0.6 litre of Bioguard for every 100 tons of sea water</u> flowing through the system per hour. The system throughput is either to be determined from the rating of the pump(s) or from the system specifications. Treatment is necessary in coastal waters and should commence three days before entering these waters and continue for three days after leaving coastal waters. The calculated dose should be dosed over a one hour period and repeated every 48 hours.

EVOPORATOR TREATMENT

Portable Water Treatment	The product can be injected into the discharge line of the fresh water generator or directly into the fresh water pumps' suction manifold. If a high percentage of shore water is used the solution must be "slug" dosed into the tanks prior to taking water. <u>Inject rate of 0.12 litres per m3 of water to obtain a 6 mg/ltr concentration.</u> Example:- For 20 m3 per day : Dose 0.1 ltr/hour = 2.4 ltr/day For 100 m3 per day : Dose 0.5 ltr/hour = 12 ltr/day
Vaptreat	The standard dosage, applicable to the majority of systems, is 10-15 ml of Vaptreat per ton of distillate produced. This is based on the rated production capacity of the evaporator. Example:- In a 25 ton/day evaporator. <u>Treatment used = 25 x 20 ml = 500 ml of Vaptreat per day.</u>

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FUEL OIL TREATMENT

Fuel Oil Treatment

Fuel Oil Treatment is completely oil-soluble and should be added via a metering pump into the suction side of the booster pump. Alternatively, it can be added into the settling tank. If so, the dose rate should be increased by 10%. As a general guide, the average dosage should be 1:4000. Alterations can then be made according to operating experience and results obtained. Where fuel analysis for Micro Carbon Residue, (MCR) is available, dose according to the table below: -

MCR%	10	12	14	16	18
Dosage Rate	1:4000	1:3000	1:2500	1:2000	1:1000

Soot Remover Liquid

Soot Remover Liquid should be introduced to the boiler through a suitable port, preferably with an injector, ensuring that the liquid is spread through the flame path toward the back of the combustion chamber.

For Diesel engines, inject Soot Remover Liquid directly into the exhaust system upstream of the area to be treated. Soot Remover Liquid should be injected as below

Dose For Boiler:-

Steam Raised (tons/hr)	Boiler fuel (tons/day)	Dose rate (kg/day)
3	5,5	1,0
6	11	2,0
9	16	3,0
12	21	3,5
15	27	4,0
23	41	4,5
31	55	5,0
46	82	5,5
62	110	6,5

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Diesel Engines

Fuel Consumption (Tons/Day)	Dose Rate (Kg/Day)
10	1,5
20	3,0
30	3,5
40	4,0
50	4,5

Disilite

For best results, Dieselite should be dosed automatically using a metering pump to dose into the fuel feed line as near to the injector or burner pump as possible. Where Micro Carbon Residue (MCR) or vanadium/sodium analysis is available, use the following table:-

Vanadium		50	100	150	200	300	400
ppm							
Tons of fuel							
	25	3	3,5	2,5	2	1	1
	35	2	3,5	2,5	2	1	1
Sodium	50	2	3	2,5	2	1	1
ppm	65	1,5	2	2	2	1	1
	75	1,5	2	1,5	2	1	1
	85	1	2	1	2	1	1
	100	1	2	1	2	1	1
MCR %	10	12	14	16	18		
Dose	1:4000	1:3000	1:2500	1:2000	1:1000		

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Example: A fuel contains 65 ppm Sodium and 150 ppm Vanadium. The dose rate should therefore be: 1 ltr Dieselite per 2 tons of fuel (1:2000) If no analysis is available, use an initial dose rate of 1:4000 and adjust according to the results obtained

Dual Purpose Plus

Rxsol DPP is completely oil-soluble and should be added via a metering pump into the suction side of the booster pump. Alternatively, it can be added into the settling tank. If so, the dose rate should be increased by 10%. As a general guide, the average dosage should be 1:4000. Alterations can then be made according to operating experience and results obtained. Where fuel analysis for Micro Carbon Residue, (MCR) is available, dose according to the table below:-

MCR%	10	12	14	16	18
Dosage Rate	1:4000	1:3000	1:2500	1:2000	1:1000

Fuel Care

Fuel Care should be dosed directly into the bunker tank prior to bunkering. However, it can be introduced to the settling tank or during transfer from storage. Dosage rates are best determined from the results of fuel analysis, i.e. sediment content or compatibility test which is easily performed on board using the Compatibility Test Kit.

ASTM SPOT	1	2	3	4	5
SEDIMENT%	0,05 OR LESS	0,05	0,1	0,2*	0,5 OR OVER*
DOSE RATE	**1:8000	1:4000	1:2000	1:500	1:200

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Soot Remover Powder

Soot Remover should be introduced to the boiler through a suitable port, preferably with a blower, ensuring that the powder is spread through the flame path towards the back of the combustion chamber. For Diesel engines, inject Soot Remover directly into the exhaust system upstream of the area to be treated.

Boiler

Steam Raised (tons/hr)	Boiler fuel (tons/day)	Dose rate (kg/day)
3	5,5	1,0
6	11	2,0
9	16	3,0
12	21	3,5
15	27	4,0
23	41	4,5
31	55	5,0
46	82	5,5
62	110	6,5

Diesel Engines

Fuel Consumption (Tons/Day)	Dose Rate (Kg/Day)
10	1,5
20	3,0
30	3,5
40	4,0
50	4,5

Valvecare

Valvecare should be dosed either directly into the service tank or by automatic metering into the suction side of the booster pumps. **Typical dose rates vary between 1:1000 and 1:5000** depending on the nature and severity of the problem. Use the table below for optimum dosage.

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Vanadium ppm	50	100	150	200	300	400	500
Tons of fuel							
5	4	5	3,5	2,5	1,5	1	1
35	2,5	5	3,5	2,5	1,5	1	1
Sodium ppm	50	2,5	4	3	2,5	1,5	1
65	2	2,5	2,5	2,5	1,5	1	1
75	2	2,5	2	2,5	1,5	1	1
85	1,5	2,5	1,5	2,5	1,5	1	1
100	1,5	2,5	1,5	2,5	1,5	1	1

Example: A fuel contains 50 ppm Sodium and 150 ppm Vanadium. The dose rate should therefore be: 1 Ltr Valvecare per 3 tons of fuel (1:3000)