PRÁCTICA Nº 2

ANÁLISIS DE AGUAS DE CALDERAS

REALIZADA POR YOLANDA AMADO SÁNCHEZ

NALFLEET

Delivered by: Wilhelmsen Ships Service

Spectrapak 310

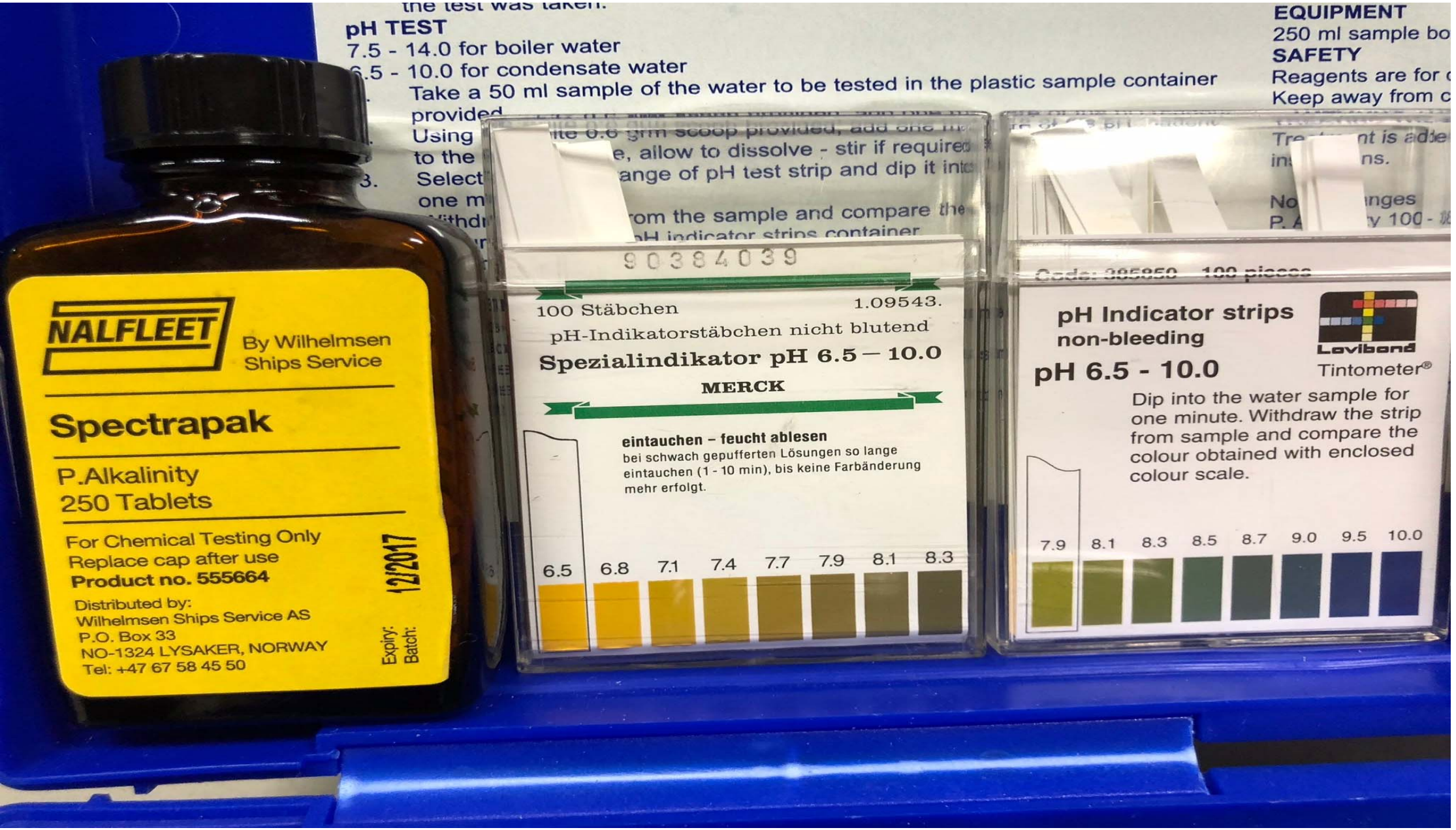
P.Alk. + Cl + pH Boiler Water Test Kit

Product no. 739474

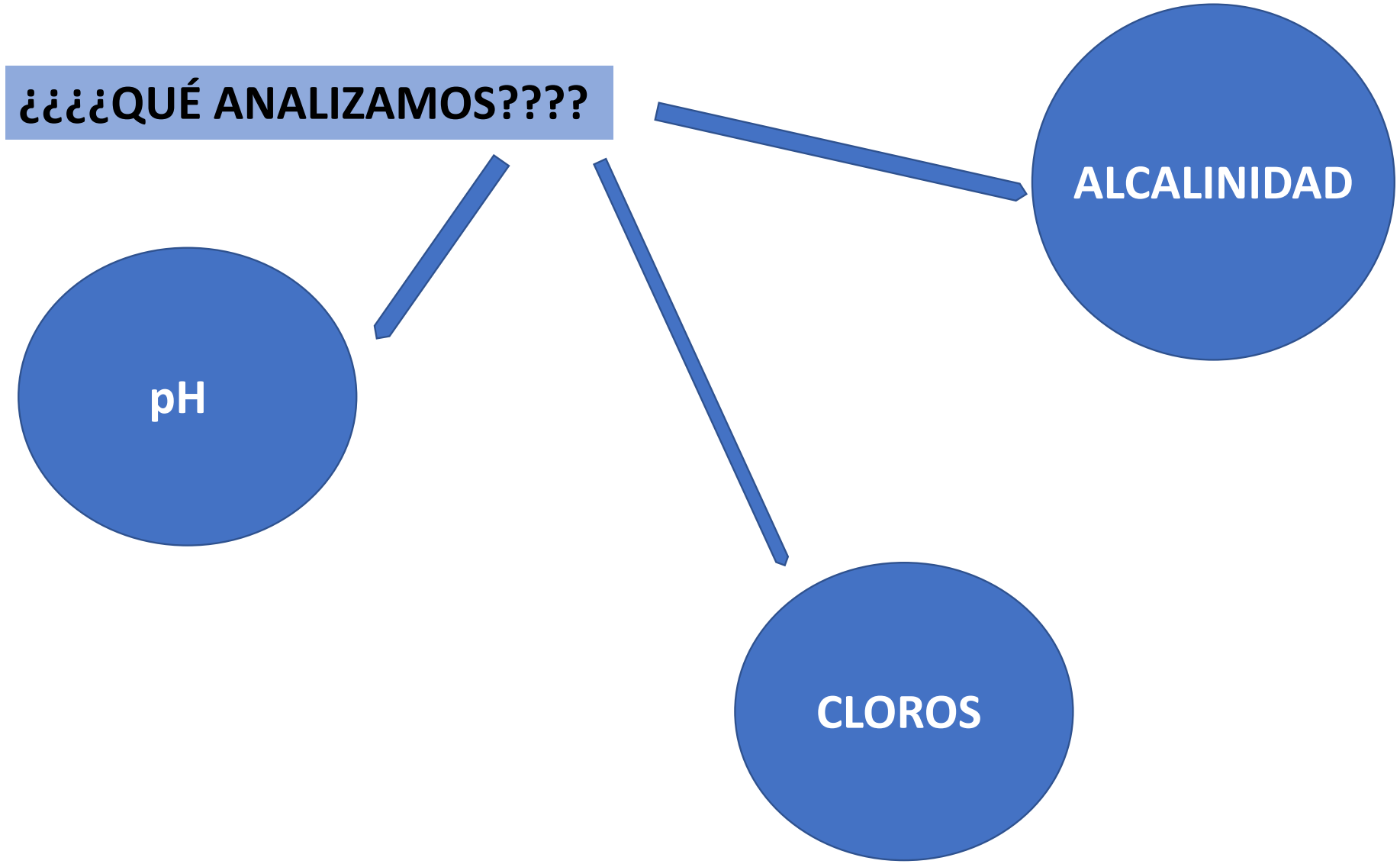
Country of origin: UK


MALETÍN PARA REALIZAR ANÁLISIS DE AGUAS DE CALDERA Y TK CISTERNA


NALFLEET
by Wilhelmsen
Spectrapak
P.Alkalinity
250 Tablets
For Chemical Testing Only
Replace cap after use
Product no. 555664
Distributed by:
Wilhelmsen Ships Service AS
P.O. Box 33
NO-1324 LYSAKER, NORWAY
TEL: +47 67 58 40 00
Expiry: 10/2020
Batch: 906D
Spectrapak®
555706
Each
pH Reagent
4 Jan 2021
Wilhelmsen Ships Service AS
PO Box33
NO 1324 LYSAKER Norway
T +47 67 58 45 50
NALFLEET
by Wilhelmsen
Spectrapak
Chloride
250 Tablets
For Chemical Testing Only
Replace cap after use
Product no. 739458
Distributed by:
Wilhelmsen Ships Service AS
P.O. Box 33
NO-1324 LYSAKER, NORWAY
TEL: +47 67 58 40 00
Expiry: 01/2021
Batch: 512A
NALFLEET
by Wilhelmsen
Spectrapak
P.Alkalinity
250 Tablets
For Chemical Testing Only
Replace cap after use
Product no. 555664
Distributed by:
Wilhelmsen Ships Service AS
P.O. Box 33
NO-1324 LYSAKER, NORWAY
TEL: +47 67 58 40 00
Expiry: 10/2020
Batch: 906D


pH TEST
7.5 - 14.0 for boiler water
6.5 - 10.0 for condensate water
Take a 50 ml sample of the water to be tested in the plastic sample container
provided
EQUIPMENT
250 ml sample bo
SAFETY
Reagents are for
Keep away from c
NALFLEET
By Wilhelmsen Ships Service
Spectrapak
P.Alkalinity
250 Tablets
For Chemical Testing Only
Replace cap after use
Product no. 555664
Distributed by:
Wilhelmsen Ships Service AS
P.O. Box 33
NO-1324 LYSAKER, NORWAY
Tel: +47 67 58 45 50
Expiry: 12/2017
Batch:
90384039
100 Stäbchen
1.09543.
pH-Indikatorstäbchen nicht blutend
Spezialindikator pH 6.5 — 10.0
MERCK
eintauchen – feucht ablesen
bei schwach gepufferten Lösungen so lange eintauchen (1 - 10 min), bis keine Farbänderung mehr erfolgt.
6.5 6.8 7.1 7.4 7.7 7.9 8.1 8.3
pH Indicator strips
non-bleeding
pH 6.5 - 10.0
Lovibond
Tintometer®
Dip into the water sample for one minute. Withdraw the strip from sample and compare the colour obtained with enclosed colour scale.
7.9 8.1 8.3 8.5 8.7 9.0 9.5 10.0

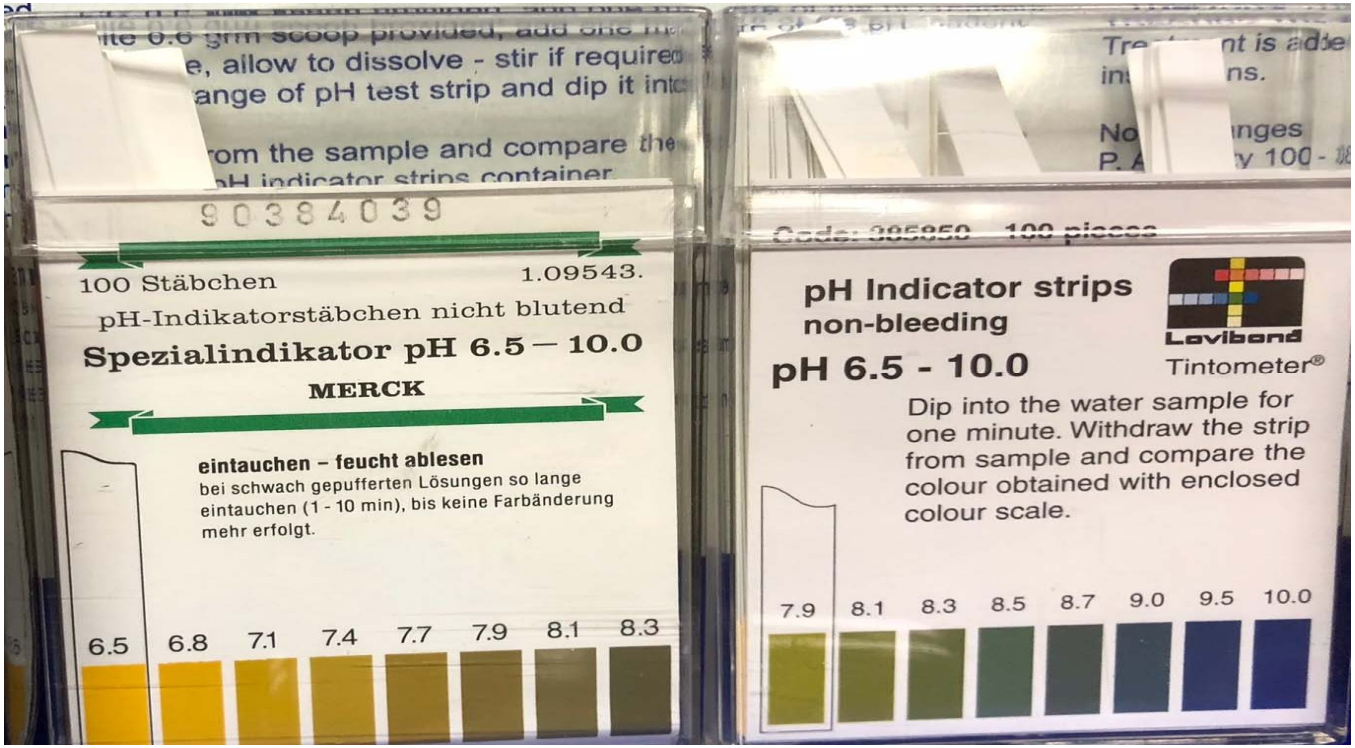
¿¿¿¿CÓMO REALIZAMOS LOS ANÁLISIS????

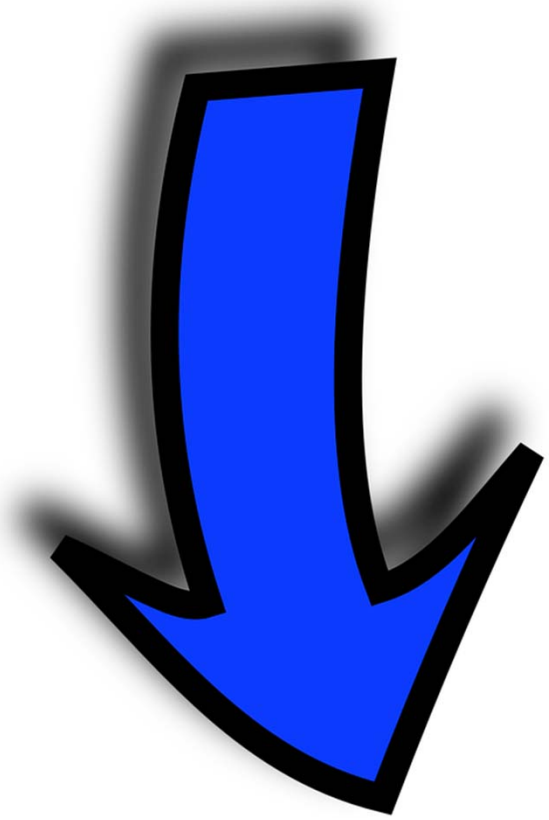

¿¿¿¿QUÉ ANALIZAMOS????
ALCALINIDAD
pH
CLOROS

ANALIZAMOS LA ALCALINIDAD, PARA ELLO UTILIZAMOS ESTAS PASTILLAS

ANALIZAMOS EL CONTENIDO DE CLORO, PARA ELLO UTILIZAMOS ESTAS PASTILLAS

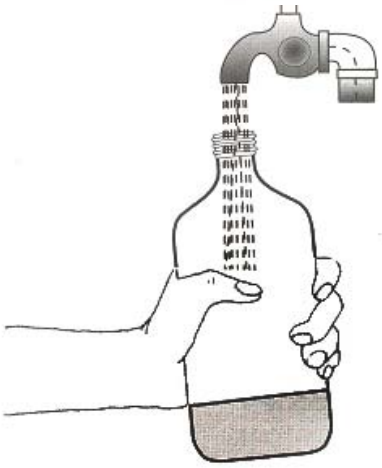
ANALIZAMOS EL pH, PARA ELLO UTILIZAMOS ESTAS TIRAS DE REACTIVO



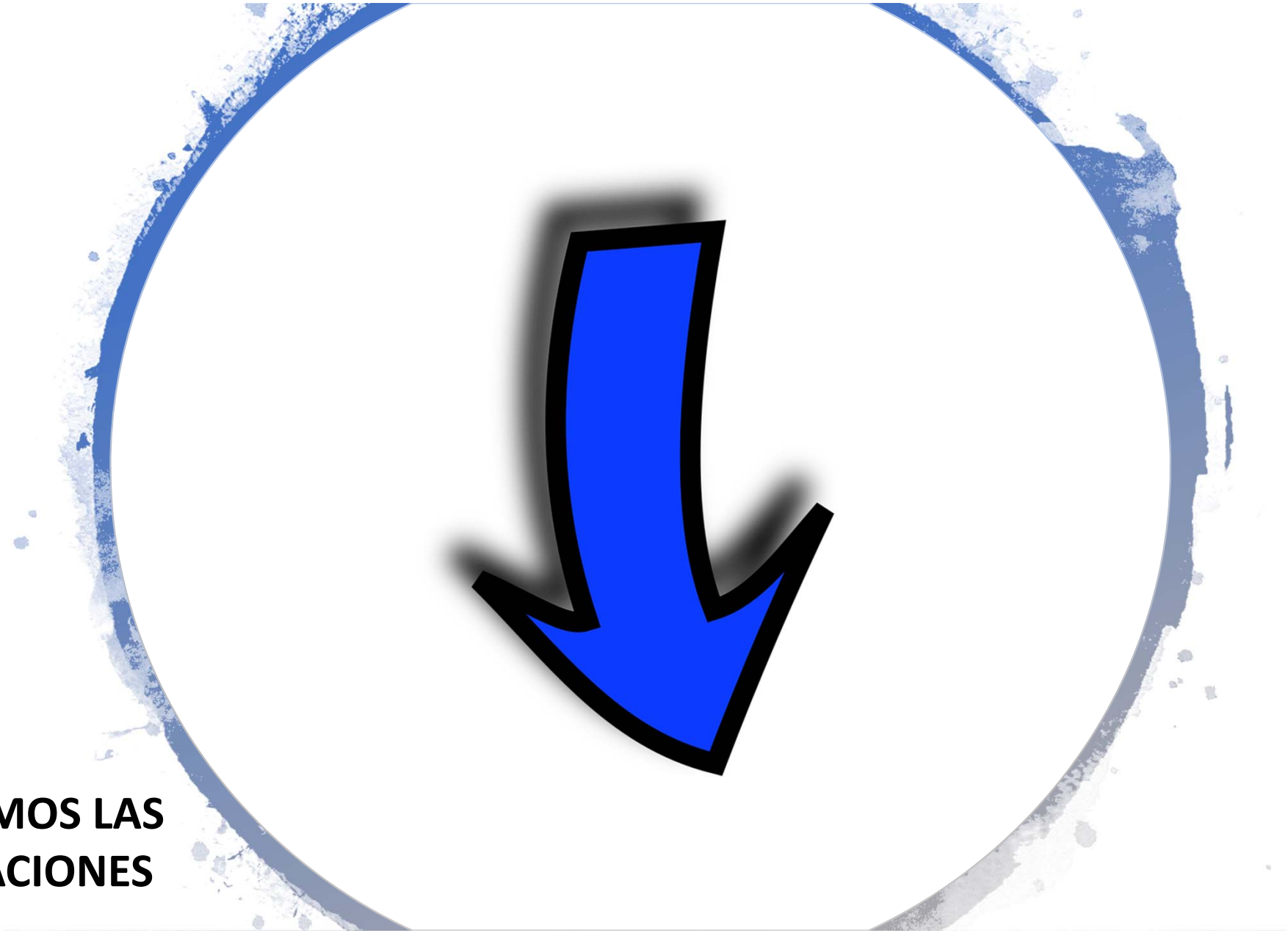


NOS HACE FALTA TOMAR UNA MUESTRA DE AGUA

NOS VAMOS A LA VÁLVULA DE TOMA DE MUESTRAS



UNA VEZ QUE TENGAMOS LA MUESTRA, COMENZAMOS EL ANÁLISIS



SEGUIMOS LAS INDICACIONES

NALFLEET

Boiler Water Treatment Test Kit P Alkalinity, pH & Chloride

Spectrapak 310

SAMPLING

A representative water sample is required. Always take water sample from the same place. Allow the water to flow from the sample cock before taking the sample for testing to ensure the line is clear of sediment.
Cool water samples to 20 - 25°C in separate container before using test equipment.

TESTING

P. ALKALINITY TEST

1. Take a 200 ml water sample in the stoppered bottle provided.
2. Add one P. Alkalinity tablet and shake to disintegrate. If P. Alkalinity is present the sample will turn blue.
3. Repeat tablet addition until the blue colour changes to permanent yellow.

CALCULATION.

P. Alkalinity ppm ($CaCO_3$) = (Number of tablets used x 20) - 10
For example: If 8 tablets are used then P. Alkalinity = (8 x 20) - 10 = 150 ppm.

4. Mark the result obtained on the log sheet provided, against the date on which the test was taken.

pH TEST

7.5 - 14.0 for boiler water
6.5 - 10.0 for condensate water

1. Take a 50 ml sample of the water to be tested in the plastic sample container provided.
2. Using the white 0.6 grm scoop provided, add one measure of the pH reagent to the water sample, allow to dissolve - stir if required.
3. Select the correct range of pH test strip and dip it into the water sample for one minute.
4. Withdraw the strip from the sample and compare the colour obtained with the colour scale on the pH indicator strips container.
5. Record the pH value obtained on the log sheet provided, against the date on which the test was taken.

CHLORIDE TEST

1. For boilers under 30 bar (Kg/cm^2) take a 50 ml sample in the stoppered bottle provided.
2. Add one Chloride tablet and shake to disintegrate, sample should turn yellow if Chlorides are present.
3. Repeat tablet addition until yellow colour changes to orange/brown.

N.B. For higher expected Chloride levels, reduce the water sample size e.g. 25 ml sample will give steps of 40 ppm per tablet used.
For lower expected Chloride levels, increase the water sample size e.g. 100 ml sample will give steps of 10 ppm per tablet used.

CALCULATION (50 ml sample)

Chloride ppm = (number of tablets used x 20) - 20
For example:
If 4 tablets are used then Chloride ppm = (4 x 20) - 20 = 60 ppm

4. Mark this result on the log sheet provided, against the date on which the test was taken.

SPARES

Standard replacement reagents are available from your Unitor representative.

REAGENTS	**PRODUCT NO:**
P. Alkalinity	555664
Chloride Tablets	739458
pH Paper Replacement Pack 7.5 - 14 and 6.5 - 10	555706
EQUIPMENT	
250 ml sample bottle	555557

SAFETY

Reagents are for chemical testing only. Not to be taken internally.
Keep away from children. Wash hands after use.

TREATING THE SYSTEM

Treatment is added to the system in the normal way, as per the product data sheet instructions.

Normal ranges
P. Alkalinity 100 - 300 ppm
Chlorides 200 ppm maximum
pH Boiler 9.5 - 11
pH Condensate 8.3 - 9.0

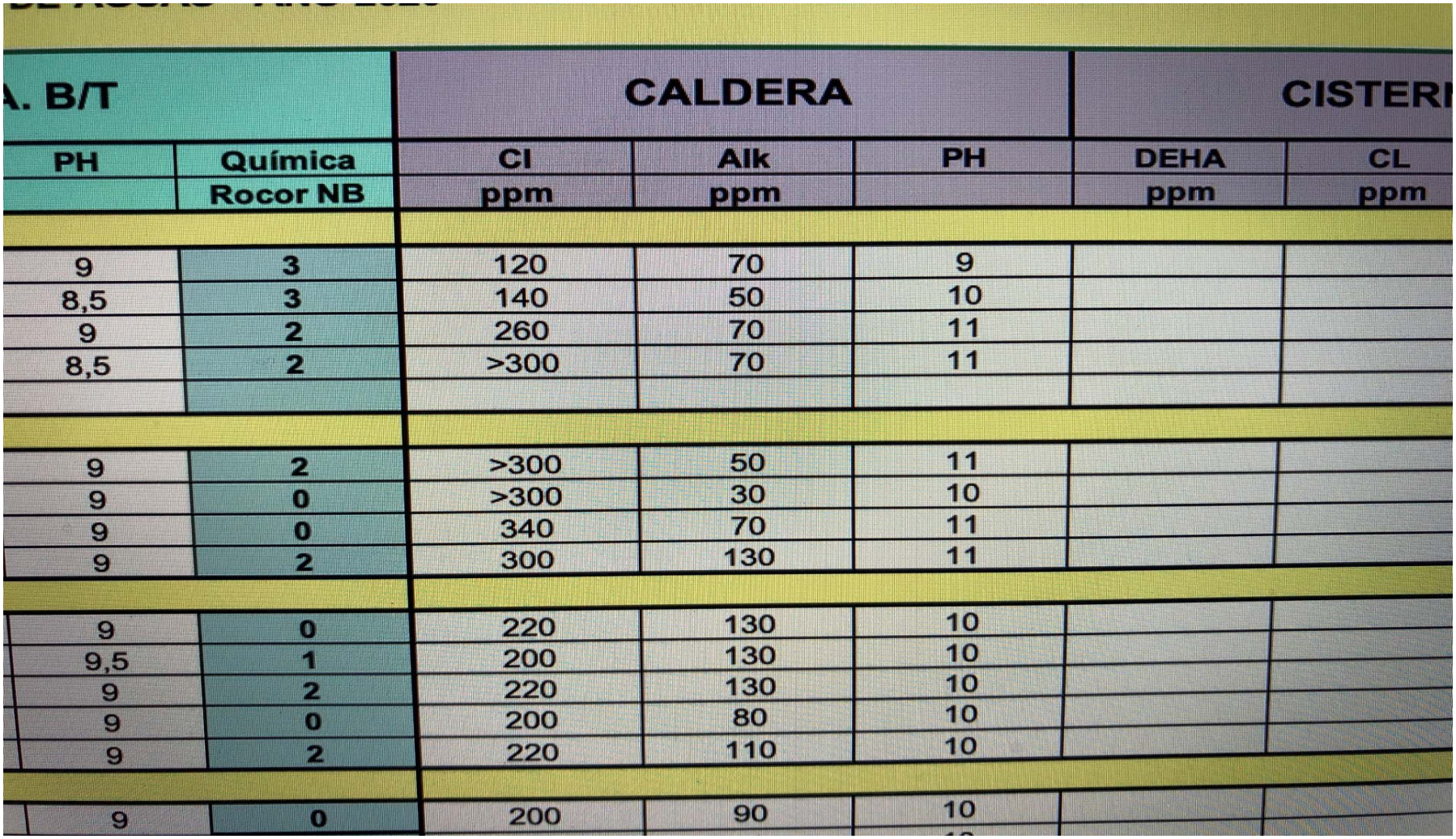
COMBITREAT initial dosage: 400 grammes/tonne of water.
100 grammes/tonne of water will raise P. Alkalinity by 50 ppm
LIQUITREAT initial dosage: 2.4 grammes/tonne of water.

Product No: 739474

V5_01/13

SE ANOTAN LOS RESULTADOS EN UN HISTÓRICO DE DATOS

EJEMPLO DE ANÁLISIS REALIZADOS A BORDO



A. B/T		CALDERA			CISTERI	
PH	Química Rocor NB	Cl ppm	Alk ppm	PH	DEHA ppm	CL ppm
9	3	120	70	9		
8,5	3	140	50	10		
9	2	260	70	11		
8,5	2	>300	70	11		
9	2	>300	50	11		
9	0	>300	30	10		
9	0	340	70	11		
9	2	300	130	11		
9	0	220	130	10		
9,5	1	200	130	10		
9	2	220	130	10		
9	0	200	80	10		
9	2	220	110	10		
9	0	200	90	10		

SE ANALIZAN DICHOS RESULTADOS

VALORES NORMALES PARA AGUAS DE LA CALDERA COMMANDER

ALCALINIDAD

MÍNIMO	MÁXIMO
100	300

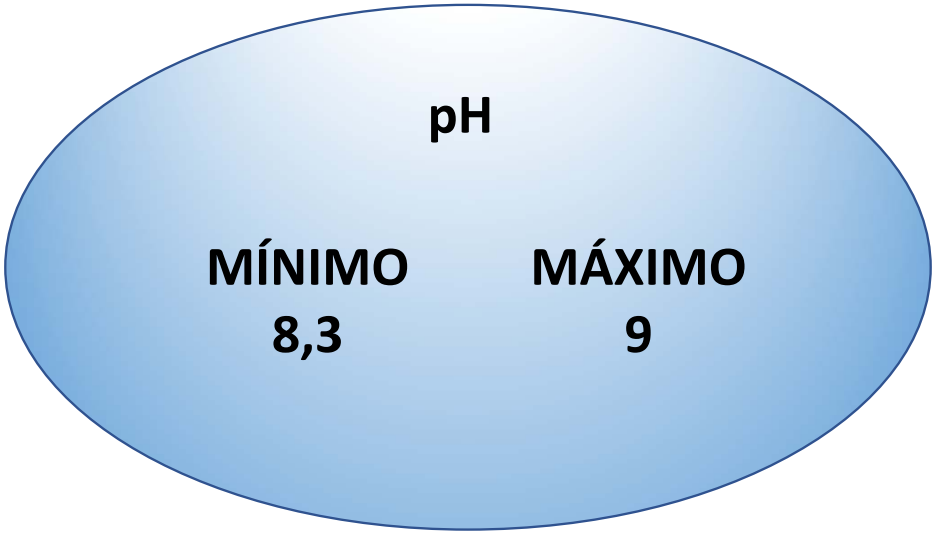
pH

MÍNIMO	MÁXIMO
9,5	11

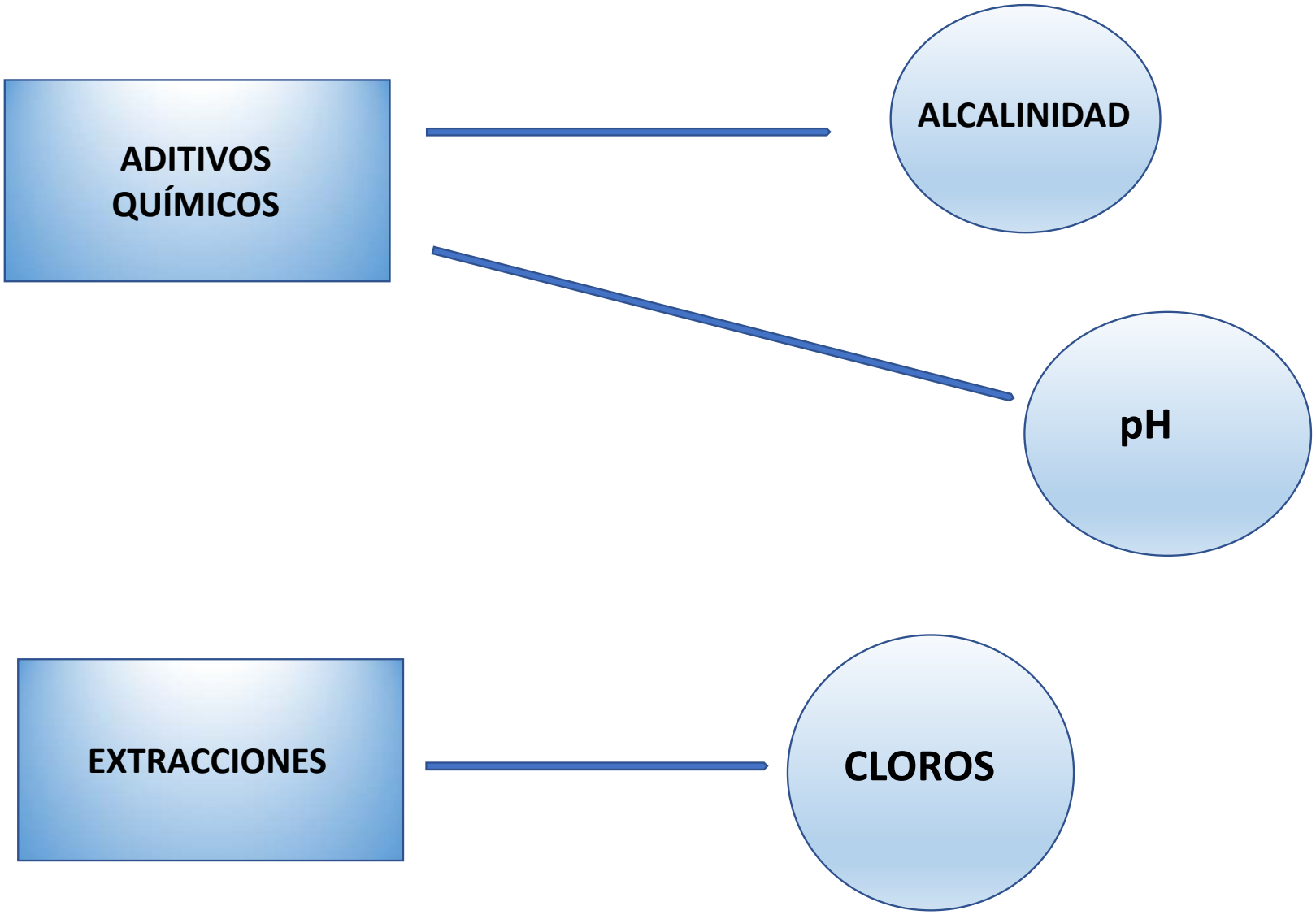
CLORO

MÁXIMO
200

VALORES NORMALES AGUA TK CISTERNA DE ESTE BUQUE

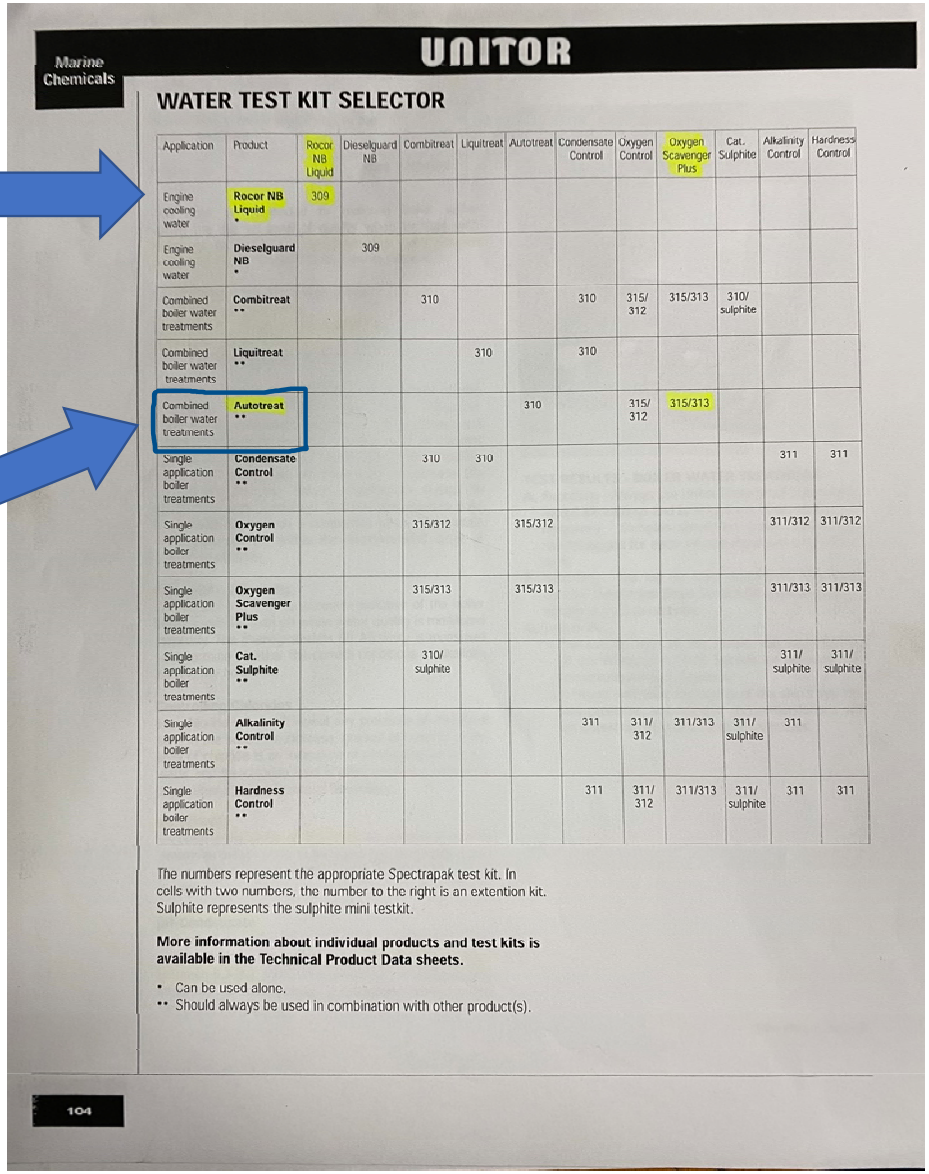


SE TIENEN QUE MANTENER LOS NIVELES ÓPTIMOS DE CONCENTRACIONES, PARA ESTO JUGAMOS CON LAS EXTRACCIONES Y CON LA CANTIDAD DE ADITIVO QUÍMICO


ADITIVOS QUÍMICOS
ALCALINIDAD
pH
EXTRACCIONES
CLOROS

ADITIVO QUÍMICO PARA AGUA DE MOTORES

ADITIVO QUÍMICO PARA AGUA DE CALDERA



Marine Chemicals

UNITOR

WATER TEST KIT SELECTOR

Application	Product	Rocor NB Liquid	Dieselguard NB	Combitreat	Liquitreat	Autotreat	Condensate Control	Oxygen Control	Oxygen Scavenger Plus	Cat. Sulphite	Alkalinity Control	Hardness Control
Engine cooling water	**Rocor NB Liquid** *	309										
Engine cooling water	**Dieselguard NB** *		309									
Combined boiler water treatments	**Combitreat** **			310			310	315/ 312	315/313	310/ sulphite		
Combined boiler water treatments	**Liquitreat** **				310		310					
Combined boiler water treatments	**Autotreat** **					310		315/ 312	315/313			
Single application boiler treatments	**Condensate Control** **			310	310						311	311
Single application boiler treatments	**Oxygen Control** **			315/312		315/312					311/312	311/312
Single application boiler treatments	**Oxygen Scavenger Plus** **			315/313		315/313					311/313	311/313
Single application boiler treatments	**Cat. Sulphite** **			310/ sulphite							311/ sulphite	311/ sulphite
Single application boiler treatments	**Alkalinity Control** **						311	311/ 312	311/313	311/ sulphite	311	
Single application boiler treatments	**Hardness Control** **						311	311/ 312	311/313	311/ sulphite	311	311

The numbers represent the appropriate Spectrapak test kit. In cells with two numbers, the number to the right is an extention kit. Sulphite represents the sulphite mini testkit.

More information about individual products and test kits is available in the Technical Product Data sheets.

* Can be used alone.
** Should always be used in combination with other product(s).

SPECTRAPAK 315

Boiler Water Treatment Programme
Water Test Kits

Product no. **661 739490**

The tests recommended to maintain boiler water within the desired level of quality when treating with Autotreat or Combitreat in conjunction with Oxygen Scavenger Plus or Oxygen Control are as follows:

A. P-alkalinity - Recommended Limits:
100-300 ppm as $CaCO_3$
B. Chlorides - 200 ppm maximum as Cl^-.
C. Condensate pH - 8.3-9.0
D. Hotwell temperature - 70-90°C

Dosage level of Autotreat/Combitreat is based on the P-alkalinity value of the boiler water. However, chlorides and condensate pH must also be controlled and maintained as recommended. Knowledge of all relevant parameters is desirable to enable better interpretation and correct application of treatment. To increase the condensate pH, use Unitor's Condensate Control in conjunction with Combitreat. It is recommended to dose Condensate Control on a continuous basis, to maintain the condensate pH within the recommended range of 8.3-9.0 at all times.

Controlling Alkalinity
The alkalinity is a more accurate indicator of the boiler water condition than pH when water quality is monitored manually. The phenolphthalein (P) Alkalinity is measured to determine whether the correct conditions of alkalinity exist in the boiler.

Controlling Chlorides
The chloride value will reveal any presence of dissolved salts in the boiler. An increase, gradual or sudden, in the level of chloride is an indication of contamination by sea water and the chloride level is often used as a reference point when controlling rate of blowdown.

pH BOILER
Recommended limits of 9.5-11.0. An additional test to determine the pH of the boiler water can be carried out to give a better overall understanding of the boiler water quality.

pH-Condensate
To control corrosion in a boiler, condensate and feed water section, the condensate pH should be kept between 8.3-9.0. Monitoring the pH of this water is very important in maintaining a complete Boiler Water Treatment Programme.

TEST RESULTS - BOILER WATER TREATMENT

A. Recording - Always use Unitor Waterproof Software to record all readings and to keep track of all results.
Frequency - Samples should be drawn, tested and results logged for each system minimum every three days.

B. Reporting - The log file from Waterproof should be sent to Wilhelmsen Ships Service for evaluation a minimum of once per month.

C. Evaluation
1. The log file with all the results will be reviewed at the Wilhelmsen Ships Service for adherence to recommended specifications.
2. A report indicating the status of the ship's system, any problems and relevant recommendations will be issued to the desired e-mail addresses.

See also next page


Inser
Suppr
Fin