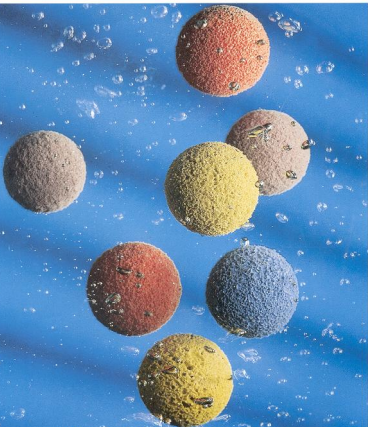


 **Schmitz**

CLEANING BALLS



A Subsidiary of GEA Energy System (India) Ltd.



SOFT DEPOSITS

In all cooling water applications, fouled layers, such as slime, mud or silt, form on the inner surfaces of condenser tubes even at velocities of 2m/s.

These deposits are typically soft and easily removed by SCHMITZ Cleaning Balls without an abrasive layer.



HARD DEPOSITS

In cooling towers and other open evaporative cooling water systems the water becomes highly concentrated with certain chemicals.

The solubility limit is thereby exceeded and hard crystalline deposits, such as calcium carbonate, form on the tube surface.



ARTIFICIAL PROTECTIVE FILMS

Copper base alloys have marginal corrosive resistance in seawater applications. Although artificial protective films can be formed by using ferrous sulphate, excessive sponge ball cleaning produces lacquer-like films which easily flake away on drying.

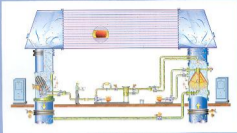


CORROSION RESISTANT MATERIALS

Although titanium and high performance stainless steels have excellent resistance to corrosion they are more susceptible to fouling than copper-base alloys.

This can be attributed to the absence of copper-ions, which are toxic and tend to hinder the formation of biofouled layers.





SCHMITZ normally recommends Type RS open pore structure sponge ball for continuous cleaning with 8 to 12 ball passes per tube per hour.



SCHMITZ ring coated Abrasive Balls Type RA are first used to clean the fouled tubes, typically for a period of a few weeks. Continuous cleaning with Schmitz Balls without an abrasive layer then hinders the growth of nuclei. In very hard waters, regular use of abrasive balls is recommended, i.e. 1 or more ball charges every 1 to 3 months.



SCHMITZ recommends the use of Cleaning Balls without an abrasive layer Type RS for 1 hour per day immediately before ferrous sulphate dosing. This produces compact, matt brown films, giving an optimum combination of heat transfer and corrosion resistance. Abrasive balls fully coated Type RAT is very effective for removing such films.



SCHMITZ recommends continuous cleaning, Type RB Scouring balls with 8 to 10 balls passes per tube per hour. Additionally, a basic charge of granulated balls Type RG should be circulated every few months to avoid a possible build-up of strongly adherent fouled layers.

APPLICATION AND RANGE

FOR SEA WATER AND FRESH WATER WITH TEMPERATURE UP TO 80°C(176°F)

RS 15



- Removal of Soft deposits
- For Copper and brass tubes

RS 10



Lower sinking velocity

RA 15



- Removal of Hard Scales - $CaCO_3$
- For Copper and brass tubes

RA 10



Lower sinking velocity

RAT 15



- Removal of Soft Scales $Mg(OH)_2$ & Fe_2O_3
- For welded copper and brass tubes

RB 20



- For stainless steel, titanium tubes
- RB scouring balls for removal of bio-fouled layers
- RG for removing highly adhesive bio-fouled layers

RG 15



APPLICATION AND RANGE

FOR SEA WATER AND BRINE FLUID WITH TEMPERATURE UPTO 140°C(284°F)
(Desalination Systems)



- Removal of Soft deposits
- For Cupronickel and SS tubes



Lower sinking velocity



- Removal of hard Scales Ca Co₃
- For Cupronickel and SS tubes

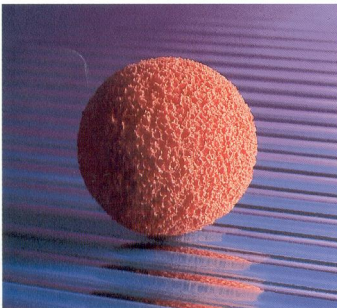


Lower sinking velocity



- Removal of Soft Scales Mg (OH)₂
- For Cupronickel and SS tubes





ORDERING DATA (EXAMPLE)



Nominal ball diameter (mm) = 25
 Ball Type RS = Standard
 Mixture Colour 15 = Red
 Ball texture M = Medium
 Ball diameter tolerance range 0 = Dia + 1 mm
 - 0

NOMINAL DIA : Ball size is from 15 to 45 mm dia in 1 mm steps. For Ring Coated balls, coating of 1 - 2 mm will be additional to nominal dia

BALL TYPE	MIXTURE (Colour)	BALL TEXTURE	TOLERANCE RANGE
Temperature upto 80° C Copper & Brass Tubes RS - Standard Ball RA - Ring Coated Abrasive RAT - Fully Coated Abrasive Titanium & SS Tubes RB - Scouring Ball RG - Ring Coated with fine granulated plastic	15 - Red 10* - Yellow 20 - Blue 15 - Red	S - Soft MS - Medium Soft M - Medium MH -Medium Hard H - Hard SH - Super Hard	0 + 1.0 (std) - 0 1' +0.5 - 0 2' + 1.0 + 0.5
High Temp. upto 140° C RT - Standard Ball RTA- Ring Coated Abrasive RTAT - Fully Coated Abrasive	35 - Dark Blue 30* - Fleider		



BASIC CHARGE

Basic charge or the number of balls per system is calculated from the number of tubes per pass and the estimated time interval taken by a ball between two passes of a tube. It is recommended that each tube is cleaned by a Sponge ball at an interval of 5 minutes. For general guidelines, the number of balls to be charged per system is usually around 10 % of the total number of condenser tubes per pass. For batch cleaning system as applicable to Multi Stage Flash distillers, the basic charge is normally between 30 to 50% of the number of tubes per evaporator.

SELECTION OF BALL SIZE

The nominal diameter of the Cleaning Ball selected is usually 1 to 3 mm oversize in diameter to the inner diameter of the tube. However, the oversize of the ball selected depends on the available pressure drop across the condenser tube.

BALL DISTRIBUTION

Distribution of balls in the condenser/heat exchanger is influenced by factors such as ball injection in the c.w. inlet, the c.w. flow conditions in the waterbox and the type of Schmitz cleaning balls chosen. For further optimising the ball distribution mixing ball types of different sinking velocities may be adopted.

BALL TEXTURE

The choice of optimum ball hardness is dictated by the need to be able to catch the balls on the screens, recirculate them and good ball life (the softer the balls, the greater the permitted ball oversize for a given pressure drop, and thus the longer the ball life).

The most commonly used cleaning balls is the 'medium' grade.

BALL LIFE

Ball life is strongly dependent on the cleaning frequency and the surface condition of the tubes to be cleaned. It is typically about 4 weeks, but can be much longer depending on local conditions and frequency of cleaning. Scaled and corroded surfaces have a particularly detrimental effect on ball life. The use of other types of ball e.g. abrasive balls, to polish roughened surfaces should be considered in case of excessive ball wear.

STORAGE

It is important that cleaning balls be stored in a cool, dry place, away from direct sunlight. With proper storage Schmitz Cleaning balls have practically an indefinite shelf life.

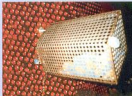
ADVISORY SERVICE

Our specialists will gladly answer your queries regarding the selection and use of Schmitz Cleaning Balls. Contact us directly or via your local agent.

The SCHMITZ Research and Development R&D department is part of the GEA INDIA R&D facility which is reputed for its technical excellence. Our personnel have over 20 years' field experience in the manufacture and usage of cleaning balls. SCHMITZ Cleaning Balls are compatible with all ball type tube cleaning systems.



Examining of condenser tubes in our Laboratory



Ball distribution test in a Condenser



Complete range of deering balls



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