SUPARATOR Gets more out of it

Selecting Suparator® systems

HOW TO SELECT AND SIZE A SYSTEM

CHARACTERISTICS

Selection and dimensioning of a Suparator® system is based on the following characteristics.

INSTALLATION CHARACTERISTICS

- how much aqueous medium (cleaner, coolant etc.) is to be treated
- how much oil is to be separated
- how fast should oil be separated
- how low must the oil concentration be
- shape and size of the installation

These characteristics tell us how big the job is.

PHYSICAL CHARACTERISTICS

- the type of oil
- the various components in the fluid
- the stability of any emulsions
- the presence of solids
- etc.

These characteristics give some information on how well oil separates from the aqueous medium.

OIL REMOVAL

To control oil you must remove as much oil as gets into the process.

The oil concentration in the process will rise to the point where the flow to the Suparator® system carries away the same amount of oil as gets into the process.

A higher flow rate to the Suparator® system therefore means a lower oil concentration.

OIL FILM REMOVAL

To keep a bath or tank oil film free, we need to remove oil faster than it separates.

Keeping the surface free from oil film requires flow. How much depends on the shape and dimensions of the bath. A wider and deeper bath requires a higher flow. This flow must match the capacity of the Suparator® system.

With an immersion cleaning bath, keeping the surface free from oil is essential. Otherwise oil will redeposit on the parts if they are withdrawn from the bath.

In many other applications it can be very valuable too, as accumulation, degradation and deposition of oil and dirt are inhibited.

SELECTION

To select a Suparator® unit for an application, the characteristics of that application must be considered.

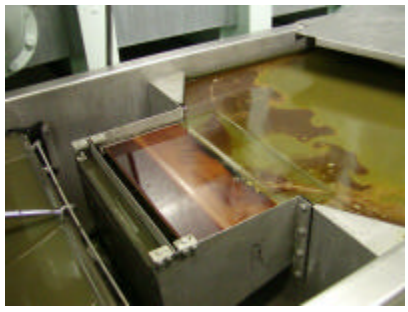
The selection is done in two steps. First the "installation" characteristics are considered and a first selection is made. Next the "physical" characteristics are considered to decide whether this selection needs correcting.

Before we can select a system, we must convert the installation characteristics to the following parameters:

VOL (Volume)
is the amount of aqueous medium in an installation, a washer or coolant systems, that needs to be treated. VOL is expressed in m3.

OR (Oil Removal)
determines how much oil the system must be able to remove in 24 hours. OR is calculated from the amount of oil that gets in the medium in 24 hour and the (maximum allowable) oil concentration.

OFR (Oil Film Removal)
determines what surface can be kept free from oil film. This is particularly relevant with immersion cleaning baths. OFR is calculated from the dimensions of the bath.



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PHYSICAL PROPERTIES

The physical properties or characteristics concern factors that influence the velocity at which the oil separates from the aqueous medium under gravity.

Stable emulsions, heavy oils and solids will have a negative effect on the separation velocity.

The table data is based on a separation rate of 95% in 1 hour. If the separation rate is much lower, it may be wise to select a bigger Suparator® system.

Skim & Treat solutions however normally perform better than indicated in the table.

USING THE TABLE

The calculated VOL, OR and OFR can be used to look up the most suitable system.

Each parameter (VOL, OR and OFR) is used separately. Look up the values for these parameters in the three bars at the top of the table .

There is not a scale, only ranges are indicated. You will find the suitable Suparator® series by going down.

Applicable flow rates and acceptable fluctuation in flow are indicated at the right side of the table.

The different parameters will give (totally) different outcomes. It depends on the application what takes priority.

For instance if the application is not an immersion cleaning bat, the OFR will be less relevant and a smaller system might be used.

If, depending on the physical properties, the oil takes longer than normal to separate, it may be necessary to select the next bigger system.

CAPACITY SUPARATOR® SYSTEMS

VOL	(0,1 - 0,5)	(0,25 - 1)	(0,75 - 5)	(5-25)	(10 - 50)	(25 - 125)	(75 - 350)
OR	(5 - 7)	(14 - 18)	(19 - 24)	(25 - 72)	(73 - 120)	(120 - 240)	(240 - 480)
OFR	(1)	(3 - 4)	(4 - 6)	(8 - 14)	(16 - 20)	(30 - 40)	(50 - 80)

	FLOW (m3/hour)		
	Nominal	Fluctuation	
		-	+
89	0,25-0,35	5%	5%
86	0,75 - 1	10%	10%
84	1 - 3	10%	10%
85	1 - 5	25%	25%
87	1 - 10	100%	50%
88	3 - 20	100%	50%

OIL REMOVAL

The required oil removal capacity (**OR**) for an application depends on amount of oil and maximum oil concentration and is calculated with:

$$OR = \frac{Oil\,amount\,(gr/day)}{c}$$

x = (free) oil concentration (mg/liter).

OIL FILM REMOVAL

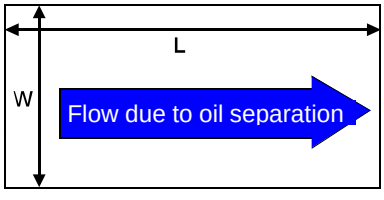
In keeping the surface of a bath or holding tank free from oil film, the dimensions of the bath and the conditions in it play a very significant role.

The required oil film removal capacity **(OFR)** for an application represents size and shape of the bath and is calculated with:

$$OFR = \frac{L * W * H}{\sqrt{L/W}}$$

H = liquid height, W = bath width L = bath length. Dimensions in meters.

The **OFR** does not take into account specific conditions like agitation.



The length of the bath is the dimension, measured in the direction of the flow, generated by the oil separation system (see sketch above).

Adverse flow conditions can present a serious problem. Always try to lay out the installation such that natural surface flow patterns, from agitation or product flow, have the same direction as the oil separation flow.

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