Klaren International BV

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Confidential

Design Questionnaire Self-Cleaning Heat Exchanger

To obtain a quotation for your application, give as much data as possible and mail the completed questionnaire to Klaren International or to:

R.C. COSTELLO & ASSOC., INC

1611 S. Pacific Coast Highway, Suite 210
Redondo Beach, CA 90277, United States
Phone: +1 310 792 5870
E-mail: rcca@rccostello.com

Date: 31-Aug-2023

Your ref.:

Date quotation required:

Type of quotation required: ☐ Budget
☐ Firm

Approx. Installation date:

Company:

Address:

Contact:

Position:

Phone:

Fax:

E-mail:

Please, mark type of installation required.

☐ **1. Retrofit of certain existing conventional shell and tube exchangers** into a configuration which can apply the self-cleaning KLAREN® BV principle with: ☐ **continuous** or ☐ **intermittent** cleaning action.
☐ **2. New optimally designed self-cleaning shell and tube exchanger** according to the KLAREN® BV principle.
☐ **3. New conventional shell and tube exchanger** where the self-cleaning KLAREN® BV principle can be added at **a later stage**, if fouling should prove to be more severe than originally envisioned.

	Tube-side fluid	**Shell-side fluid**
Description and chemical composition		
Rate of flow		
a) Liquid	[kg/h]	[kg/h]
b) Vapour	[kg/h]	[kg/h]
c) Non condensable gas	[kg/h]	[kg/h]
d) Fluid vaporised or condensed	[kg/h]	[kg/h]
Inlet temperature	[°C]	[°C]
Outlet temperature	[°C]	[°C]
Inlet pressure	[bar]	[bar]
Maximum permissible pressure drop	[bar]	[bar]
Maximum working pressure	[bar]	[bar]
Molecular weight		
e) Vapour	[g/mol]	[g/mol]
f) Non condensables	[g/mol]	[g/mol]
Density (liquids).....	[kg/m³]	[kg/m³]
Specific heat at mean temperature	[J/kg/K]	[J/kg/K]
Thermal conductivity at mean temperature	[W/m/K]	[W/m/K]
pH at mean temperature	[-]	[-]
Viscosity at several temperatures	cP @ [°C]	cP @ [°C]
In operating range.	cP @ [°C]	cP @ [°C]
	cP @ [°C]	cP @ [°C]
Percentage of dissolved solids	[wt. %]	[wt. %]
Percentage of suspended solids	[wt. %]	[wt. %]
Nature of suspended solids		
(i.e. fibrous, powder, size)		
Nature of fouling		
(sludge, scale, suspended matter, biological)		

	Tube-side fluid	Shell-side fluid
Flow fluctuations, if any	[kg/h]	[kg/h]
Code requirements or design standard		
Materials	☐ Carbon steel ☐ 304 stainless ☐ 316 stainless ☐ Monel ☐ Incoloy 825 ☐ Titanium ☐ Other alloy, (specify)	☐ Carbon steel ☐ 304 stainless ☐ 316 stainless ☐ Monel ☐ Incoloy 825 ☐ Titanium ☐ Other alloy, (specify)

In case of installation type nr. 1:

Total number of tubes ..... [-]
Total number of passes at the tube-side ..... [-]
Tube length ..... [mm]
Outer-diameter of tubes ..... [mm]
Wall thickness of tubes ..... [mm]
Inner-diameter of inlet channel ..... [mm]

Shell-side fouling factor ..... [m²K/W]

Please, send relevant drawings of the exchanger!

In case of installation type nr. 2:

Shell-side fouling factor ..... [m²K/W]

In case of installation type nr. 3:

Tube side fouling factor ..... [m²K/W]
Shell-side fouling factor ..... [m²K/W]

Sketch

Remarks,