

Questionnaire for Fish Oil

Distillation Systems

Completing this questionnaire will help us to evaluate your application and to provide an offer that is tailored to your requirements.

General information

Project description or title / keyword:

Company:

Contact person:

Department:

Address:

.....

Phone:

Email:

- All information submitted will be treated confidentially. -

Final product classification

- Animal food supplement
- Human food supplement
- Pharmaceutical product, pre-stage
- Pharmaceutical product, API

Others _____

Design qualification documents

Which documents are available?

- User requirement (URS)
- Functional design specification (FDS)
- Clients hygienic design philosophy (HDP)
- Cleaning procedure

Performance / product

System feed capacity _____ kg / h (= 100 %)
Range min. / max. _____ %
Operating hours _____ h / year
Operation continuous / batch _____

Feed composition

EPA _____ Area %
DHA _____ Area %
Water _____ wt - %
Inerts _____ wt - %
Others (Ethylester) _____ wt- %

Required quality

Concentration EPA / DHA _____ %
Others _____

Process design

The distillation steps in a fish oil production can be separated in a stripping and concentration stage.

Stripping stage

Depending on the final use of the fish oil product it may be necessary to strip off pesticides and other impurities prior to the concentration stage. If this process stage is needed, please get in contact with SMS to discuss the details about this production stage.

Please consider that a stripping process takes place at high temperatures and that the use of the same evaporator for stripping and concentration is only possible when the hygienic level of the installation is low. The limitation is given by the availability of a suitable equipment in hygienic design.

Concentration stage

Fish oil distillation is performed under deep vacuum so that the thermal treatment of the product is minimised. This is normally performed in a short path evaporator. Prior entering a short path evaporator the product needs to be pre-treated to remove water and inert compounds in the feed composition. To achieve the different final product concentrations several runs through a short path evaporator are needed. The most common used configuration is a 3-stage treatment consisting of a dewatering stage and two short path evaporators. Depending on the product requirement the two short path evaporators can be operated in a serial or a parallel mode.

Which process stages are required?.....

Do you already have a design in mind?.....

.....

.....

We recommend to discuss the design with us.

1) Dewatering stage

- Plate heat exchanger and flash box
- Falling film evaporator
- Alternative client requirements

The pros and cons for the solutions a) and b) can be discussed with SMS.

2) Concentration stage

- One short path evaporator
- Two short path evaporators
- Operation in serial
- Operation in parallel

Scope of Supply

Which equipment and services should be included?

<p>Equipment</p> <ul style="list-style-type: none"> <input type="checkbox"/> Short path evaporators <input type="checkbox"/> Heat exchangers <input type="checkbox"/> Receivers 	<p>Pumps</p> <ul style="list-style-type: none"> <input type="checkbox"/> Product pumps <input type="checkbox"/> Utility pumps <input type="checkbox"/> Vacuum pumps
<p>Measuring and Control</p> <ul style="list-style-type: none"> <input type="checkbox"/> Measuring & control field instruments <input type="checkbox"/> Control valves <input type="checkbox"/> Local indicators <input type="checkbox"/> Field switch boxes <input type="checkbox"/> Control Panel with PLC <input type="checkbox"/> Motor Control Center <input type="checkbox"/> Process Visualisation 	<p>Piping</p> <ul style="list-style-type: none"> <input type="checkbox"/> Manual valves <input type="checkbox"/> Actuated valves <input type="checkbox"/> Piping / fittings <input type="checkbox"/> Pipe supports
<p>Erection/Assembly</p> <ul style="list-style-type: none"> <input type="checkbox"/> Steel structure <input type="checkbox"/> Equipment and pump installation <input type="checkbox"/> Manufacturing and installation of piping <input type="checkbox"/> Painting <input type="checkbox"/> Wiring <input type="checkbox"/> Insulation 	<p>Engineering / services</p> <ul style="list-style-type: none"> <input type="checkbox"/> Basic engineering <input type="checkbox"/> Detail engineering <input type="checkbox"/> Erection supervision <input type="checkbox"/> Commissioning, start-up <input type="checkbox"/> Operator training <input type="checkbox"/> Spare parts
<p>Miscellaneous</p> <ul style="list-style-type: none"> <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ 	

Shall the stages be connected to an Inlet and/or outlet distribution matrix?

Yes No

Is the matrix in the scope of SMS?

Yes No

■ Qualification / validation

Which qualification approval is requested?

- Risk based approach
- Traditional (FAT/SAT/IQ/OQ)
- GAMP 5 (only if software is included in the SMS supply)
- PQ assistance by SMS required
- Validation assistance by SMS required

Available utilities:

	Pressure (bar a)	Temperature (°C)
Avail. heating medium 1:		
Avail. heating medium 2:		
Avail. heating medium 3:		
Avail. heating medium 4:		

	Pressure (bar a)	Temperature (°C)	Quantity (m ³ /h)
Cooling water:			
Chilled water / brine:			
Nitrogen gas:		-	
Nitrogen liquid:			
Instrument air:		-	

	Frequency (Hz)	Voltage (V)	Explos. prot.
Electricity:			

Material requirements:

- Product / vacuum: stainless steel Carbon steel
- Thermal oil: Stainless steel Carbon steel
- Steam / condensate: Stainless steel Carbon steel
- Cooling water: Stainless steel Carbon steel
- Chilled water / brine: Stainless steel Carbon steel
- Nitogen: Stainless steel Carbon steel
- CIP: Stainless steel Carbon steel
- Steel structure: Stainless steel Carbon steel galv

General information

Codes and standards for design and fabrication?

- AD 2000 ASME Others _____

Which GMP regulations are to be followed? _____

Which space is available for the system? _____

Plant installation Indoors Outdoors

Installation in hazardous area? _____

Installation in clean room? Yes No

Classification = _____

Environmental data:

		Maximum	Minimum
Av. year temperature	[°C]		
Relative humidity	%-rel		
Barometric pressure	[hPa]		
Dew point	[°C]		
Evaporation monthly	[mm]		
Wind load max.	[m/s]		
max. rainfall	[mm]		
Solar radiation	[MJ/m ²]		
Av. rainfall per year	[mm]		

Hardware requirements

The hardware requirements in respect to the cleaning capability have an influence on the price. Normally only product-wetted equipment will be specially designed. Material not in contact with product will be designed without any special requirements. If no company standard for the attached equipment is available, SMS can propose a technical solution. SMS can discuss the single components in detail if the design philosophy is not clear in the actual stage.

General

Inner surface requirement No Yes Ra = _____ μm
Outer surface requirement No Yes Ra = _____ μm

Heat exchanger

Are plate heat exchangers allowed? Yes No
Are shell and tube heat exchangers allowed? Yes No

Short path evaporator – condenser

SMS can offer a patented hygienic design condenser.

- This design is optimised of cleanability
- Standard tube condenser with surface requirements on product side

Short path evaporator – top part and bottom part

- Thorispherical head for better drainability
- Flat head with sloop

Instrumentation

- Instrument connections acc. to EN 11864
- Instrument connections not acc. to EN 11864

Valves

- Normal ball valves with dead legs are accepted
- Special hygienic shut of valves with high drainability (e.g. Type Varivent GEA Tuchenhagen)

Pumps

- Vertically installed gear pumps are acceptable
- Vertically installed lobe pumps with high drainability

CIP

- Manual CIP connections to be foreseen
- Automated CIP concept with distribution to be included

Date:

Signature: