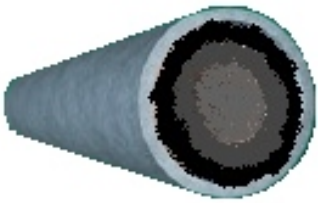
Thermic Fluid System
Cleaning Additive & Life Enhancer

sigma THERM® - FF 101

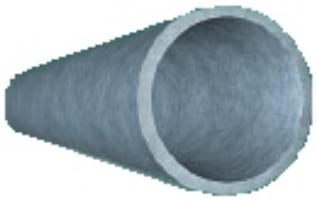
Improves Flow Rate

& Heat Transfer



Removes Deposited

Carbon & Sludge



Dissolves Carbon

Particles of Oil

www.sigma-therm.com

TÜV SÜD
ISO 9001

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Description :

sigma THERM® FF - 101 Additive exhibits exceptional solvency for the hydrocarbon structures found in most petroleum heat transfer oils and synthetic organic heat transfer fluids. Its very low viscosity and pour point, relatively high boiling point, and superior thermal stability make **sigma THERM® FF – 101** Additive ideal for use with heat transfer oils and fluids, particularly when they are thermally or oxidatively degraded. Its amazing Powerful Action provides a dramatic reduction in the viscosity of fresh and used heat transfer media while solubilizing any hydrocarbon oligomeric sludges and deposits in heat transfer systems.

Dosage :

Use of **sigma THERM® FF – 101** Additive at levels as low as 10-20% for 50 hours circulation can provide Powerful Action for problem solving:

Application :

- **System pre-cleaning** while operating before change out - reduces downtime and post discharge cleaning
- **Flushing fluids not needed** and in most cases, mechanical cleaning - less downtime and disposal cost
- **Reduces viscosity** - improves heat transfer efficiency while operating and thoroughness of change out discharge

sigma THERM® FF – 101 Additive can be used in many industrial indirect heating and cooling processes where low viscosity and high solvency are important for heat transfer system pre-cleaning before change out or extending the useful life of the charge. It is particularly beneficial as a solution additive to systems where thermally or oxidatively degraded hydrocarbon oligomeric sludges and deposits exist.

All these applications for Powerful Action lead to lower cost in problem solving.

Changing to the suitable **sigma THERM®** Heat Transfer Fluid for the application once the immediate Powerful Action task is completed can minimize future degradation problems. Operating Considerations At low addition levels to a problem change, **sigma THERM® FF - 101** Additive has little effect on the heat transfer system's vapor pressure

Cleaning pump filter screens and by-pass filters is usually required to catch particles already in the heat transfer system as well as any new materials that are slow to solubilize during the initial period of Powerful Action.

sigma THERM® FF – 101 Additive does not form any viscous or solid deposits that lead to fouling on heat exchanger surfaces or clogging of the heat transfer circuit. It is used to correct these types of problems.

Specification :

Property	Value
Kin Vis @ 40 ^{0}C, cSt	2-5
Specific Gravity @ 15 ^{0}C	1 ± 0.05
Flash Point ^{0}C	Above 110
Pour Point, ^{0}C	Below (-30)
IBP, ^{0}C	Above 250
Max oil temp. ^{0}C	250
Auto Ignition Temp ^{0}C	Above 350

Other features and benefits include:

- **Good heat transport and transfer properties**
  - *Improves heat transfer efficiency*
- **Non-corrosive to materials of construction**
  - *Applicable for many systems*
- **Generally stable with user side products**
  - *Applicable for many systems*
- **High autoignition temperatures**
  - *Does not readily ignite*
- **Works while the system operates**
  - *Economical problem solver*

sigma THERM® - FF 101

1.0 When sigma THERM® FF - 101 should be used?

It should be used at any of one below given conditions.

- If Kin. Vis. of thermic fluid has gone above 40 cSt@ 40° C. sigma THERM® FF - 101 will improve co efficient of heat transfer and extend usability of existing thermic fluid.
- If Carbon (Benzene / Hexane / Acetone insoluble) in the thermic fluid is above 1 %.
- If one is replacing existing thermic fluid with new one.
- If one concludes that there is a carbon deposition in the heat transfer area – oil side.
- If at the time of replacing existing thermic fluid- kin. Vis. of thermic fluid is so high that it is difficult to remove thermic fluid from the system.

2.0 How much sigma THERM® FF – 101 should be used?

Basically it will depend on what and how much benefits that one is looking for from above mentioned benefits. Practically and economically it should be used 10-20% of thermic fluid in the system.

3.0 What sigma THERM® FF - 101 will do?

It gives below given benefits.

- It will reduce Kin. Viscosity of Thermic Fluid. One time dosing can extend life of thermic fluid by 1 to 2 years.
- It reduces load on circulation pump.
- It will reduce / dissolve carbon/ sludge content in thermic fluid.
- It also removes carbon deposition from the piping. Which otherwise works as insulator in heat transfer.

4.0 How to use sigma THERM® FF - 101?

Nothing special needs to be done. It is to be added into the system as you are adding thermic fluid in the system. Make sure that it reaches to main circulation system and does not remain in expansion tank.

Example : suppose you are having system of 50 barrels of thermic fluid. Take out 10 barrels from the system. Add from expansion tank 8 barrels of sigma THERM® FF - 101. Then add 2 barrels of thermic fluid taken out from the system. This will make sure that all sigma THERM® FF - 101 comes into circulation system and in expansion tank you have your own thermic fluid. Now operate thermic fluid system.

5.0 Do we need to stop working of thermopack?

No. With the help of sigma THERM® FF - 101 one need not to take shut down of the plant up to 240° C. You can use your thermic fluid added with sigma THERM® FF - 101. So there is no down time and your thermic fluid system is going to clean without stoppage.

6.0 What is a minimum period required for cleaning?

One need to operate thermic fluid system for at least 50 hours before removing thermic fluid if sigma THERM® FF - 101 is used at the time of replacing the same.

7.0 What is the maximum time that we can use?

There is no limit of time for maximum period.

sigma THERM® - FF 101

8.0 Is it harmful to thermic fluid system?

No, it is completely safe for the thermic fluid system and thermic fluid. It is a neutral one and does not have any side effect like corrosion.

9.0 Is any industry in India has used sigma THERM® FF - 101 in thermic fluid system.

Yes. There are so many industries in India, used sigma THERM® FF - 101 with great satisfaction.

10.0 Does it remove 100 % carbon?

It will depend on Carbon (insoluble) % in thermic fluid. By adding 10 to 20 % generally it will remove 85 % of carbon deposition.

11.0 Is it costly affaire to dose thermic fluid system with sigma THERM® FF - 101

No. Not at all. It requires only 10-20 % of thermic fluid system quantity. And the same quantity is spare by replacing with existing thermic fluid. Removed thermic fluid is also used for top up purpose in the same system. At the same time price of sigma THERM® FF – 101 is economical.

12.0 Can it completely clean block tubes of heater?

No. Because, Additive does not reach to the same area, hence it cannot clean. Additive will clean all those area where it passes.

13.0 If used only to reduce Kin. Vis. of thermic fluid, what is the performance?

The performance in reduction of Kin. Vis. with the help of the product is as below.

Existing Thermic Fluid	Kin. Vis. @ 40° C of Thermic Fluid after adding sigma THERM® FF - 101						
KV@ 40° C, cSt	8%	10%	12%	14%	16%	18%	20%
40	32	31	29	28	26	25	24
45	36	34	32	30	29	27	26
50	39	37	35	33	31	29	28
55	42	40	38	35	34	31	30
60	46	43	41	38	36	33	32
65	49	46	44	40	38	35	33
70	52	49	46	43	40	37	35

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