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TECHNICAL SHEET

Date of issue: 17. 02. 2011
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1. SUBSTANCE/PREPARATION AND COMPANY NAME :

1.1. Product name: Thesol
1.2. Use: Antifreeze/anticorossion fluid with low freezing point for clasic and vacuum solar systems with extended lifetime.
1.3. Producer : Thermo|Solar, s.r.o. Ziar nad Hronom

2. WORKING CONDITIONS :

Unfreezing temperature	-32°C
Working temperature	-32°C/+230°C (max. 2,5MPa)
Short term overheat temperature	300°C

3. LIFETIME :

Expected life time is 10 years in case of regularly revised systems. Recommended service of ZVA parameter and unfreezing point is every 2 years.

4. PHYSICAL AND CHEMICAL PROPERTIES:

4.1. General information

Appearance:	softly viscid
Colour:	green

4.2. Technical information

pH mixed with 33% distilled wate:	7,2 – 9,0
Boiling point:	105°C
Density at 20°C:	> 1 035 kg/m^3
Index of refraction by 20°C:	1,387 – 1,390

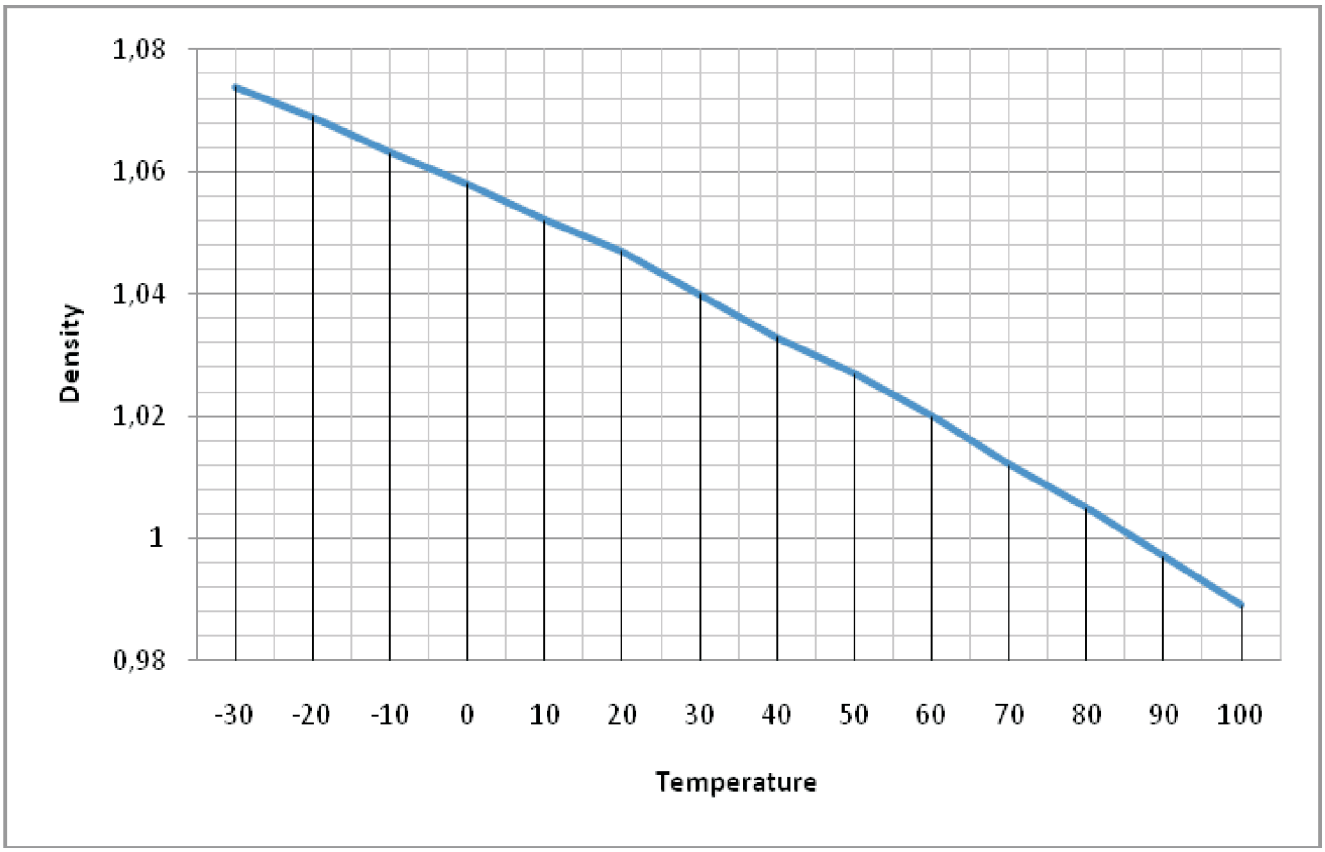
4.3. Corroding process

Material	ASTM D 3306 [mg/vz.]		TL 774 C [g/m2]	
	Achieved value	Desired value	Achieved value	Desired value
copper	<2	≤ 10	<0.7	≤ 4
soldering metal	<2	≤ 30	<0,7	≤ 4
brass	<1	≤ 10	<0.3	≤ 4
steel	<0,2	≤ 10	<0.1	≤ 4
iron	<0,2	≤ 10	<0,1	≤ 4

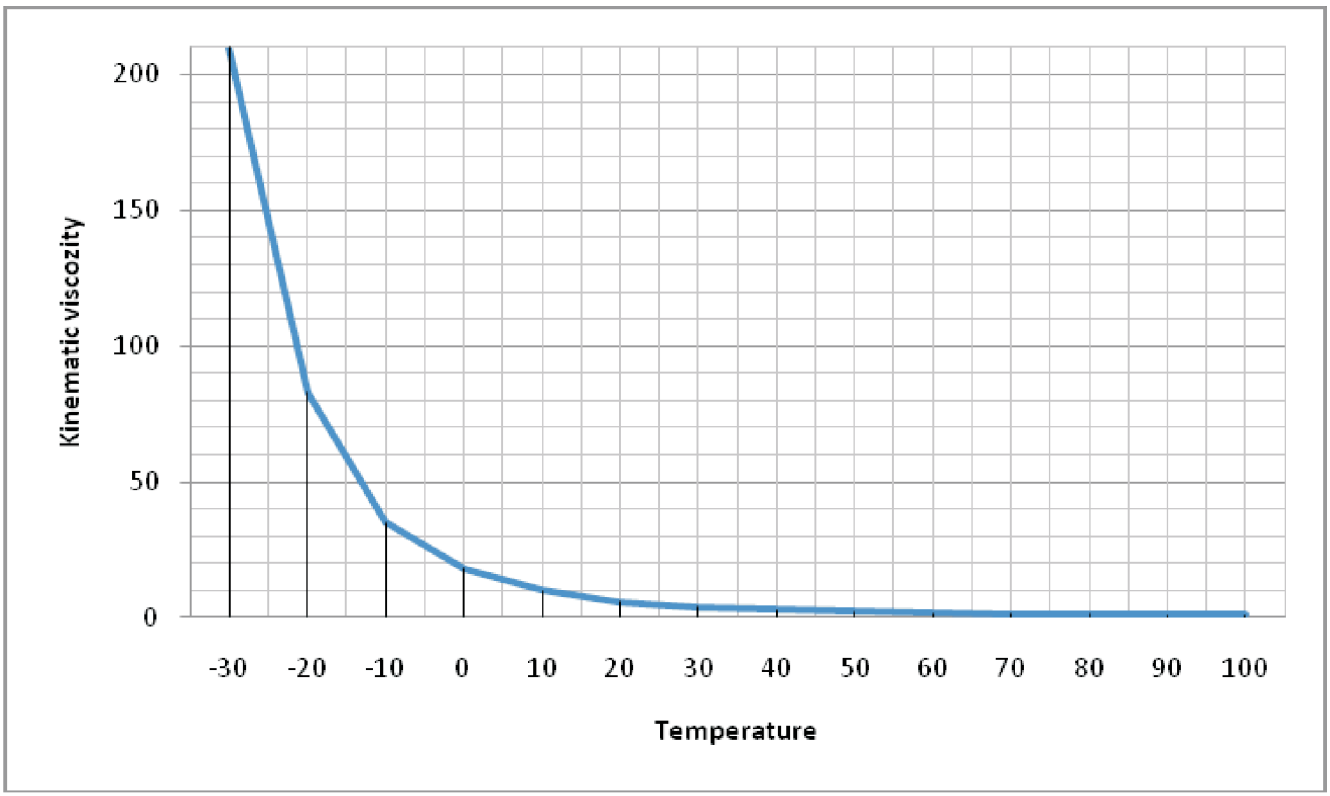
5. TECHNICAL PARAMETERS:

Temperature	Density	Kinematic viscozity	Heat capacity	Heat conductivity	Prandtl number
°C	g/cm³	mm²/s	J/g.K	W/m.K	
-30	1,074	210	-	-	-
-20	1,069	83	3,31	0,295	996
-10	1,063	35	3,35	0,310	402
0	1,058	18	3,40	0,325	200
10	1,052	10	3,44	0,340	106
20	1,047	6	3,48	0,355	62
30	1,040	4	3,52	0,370	40
40	1,033	3	3,56	0,385	29
50	1,027	2,3	3,60	0,400	21
60	1,020	1,8	3,64	0,415	16
70	1,012	1,5	3,68	0,430	13
80	1,005	1,3	3,72	0,445	11
90	0,997	1,1	3,77	0,460	9
100	0,989	0,9	3,82	0,475	7

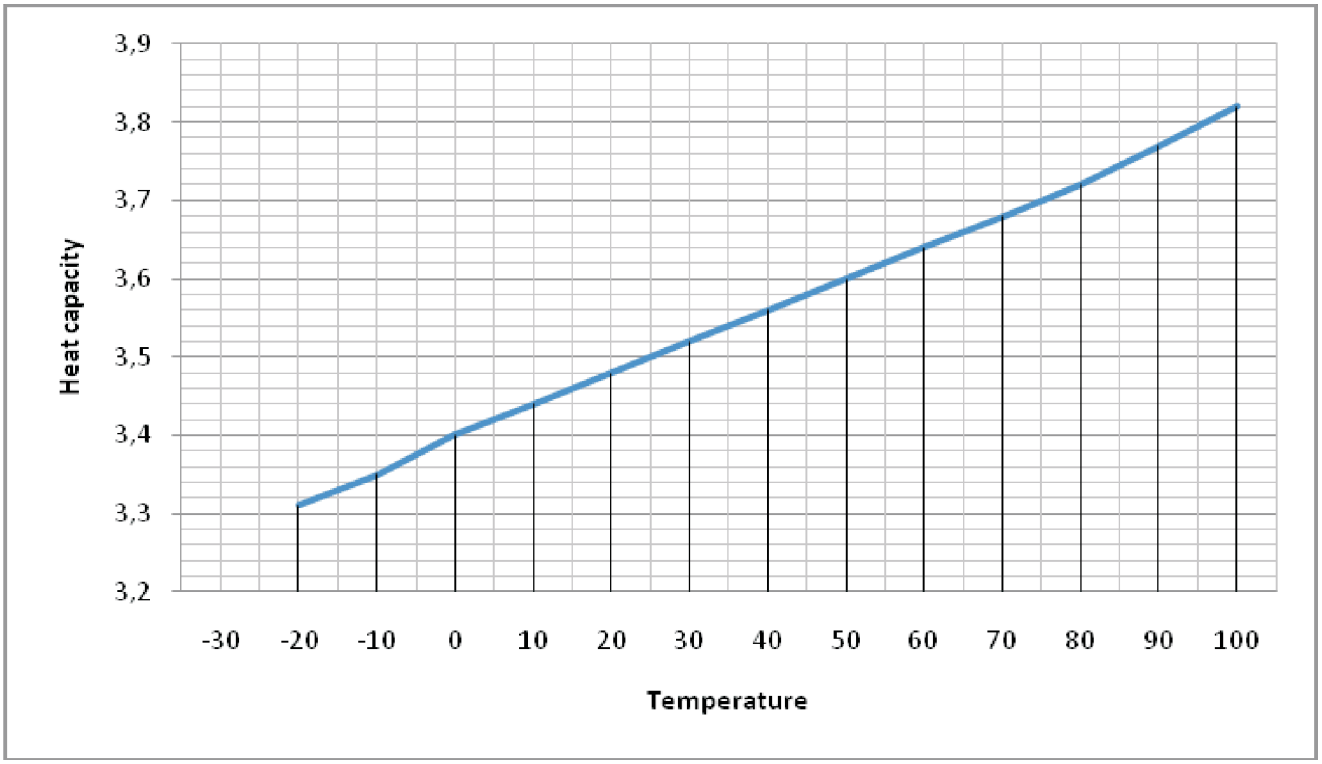
5.1. Density:



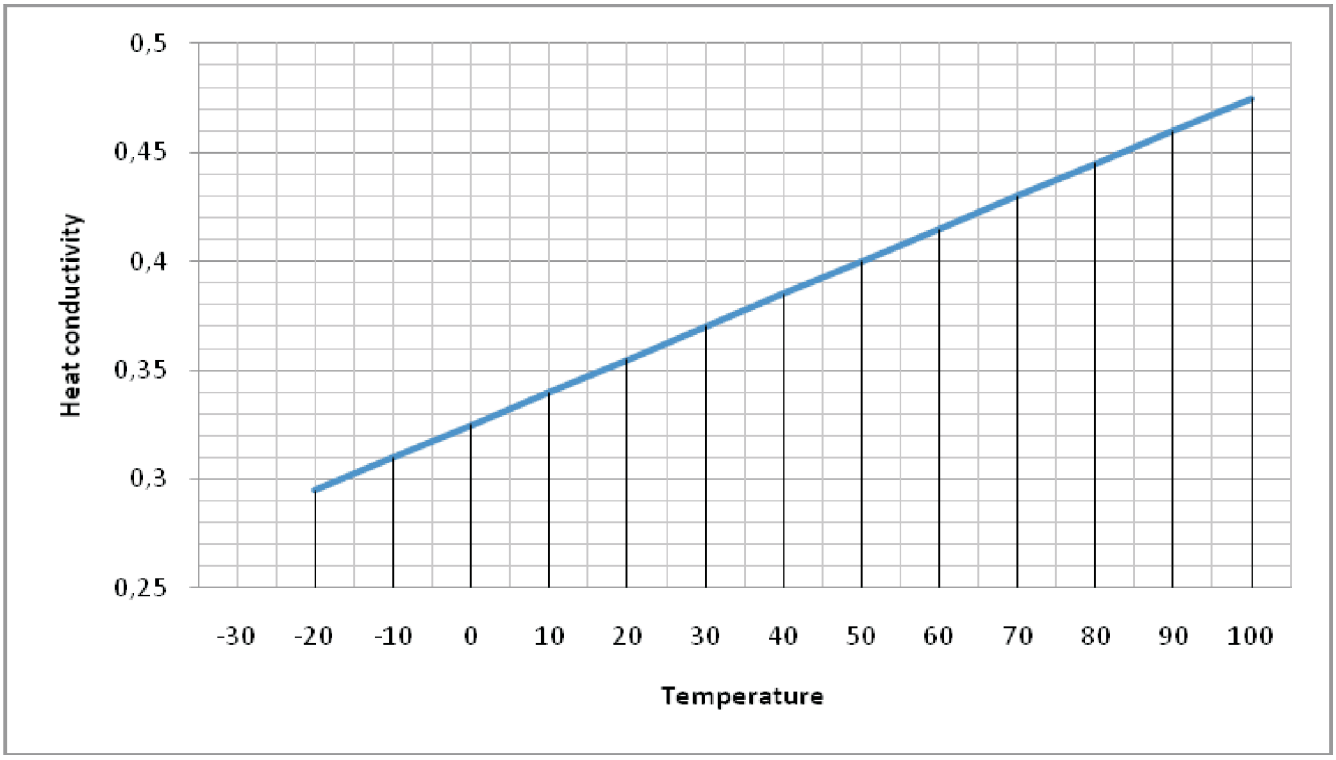
5.2. Kinematic viskozity



5.3. Heat capacity

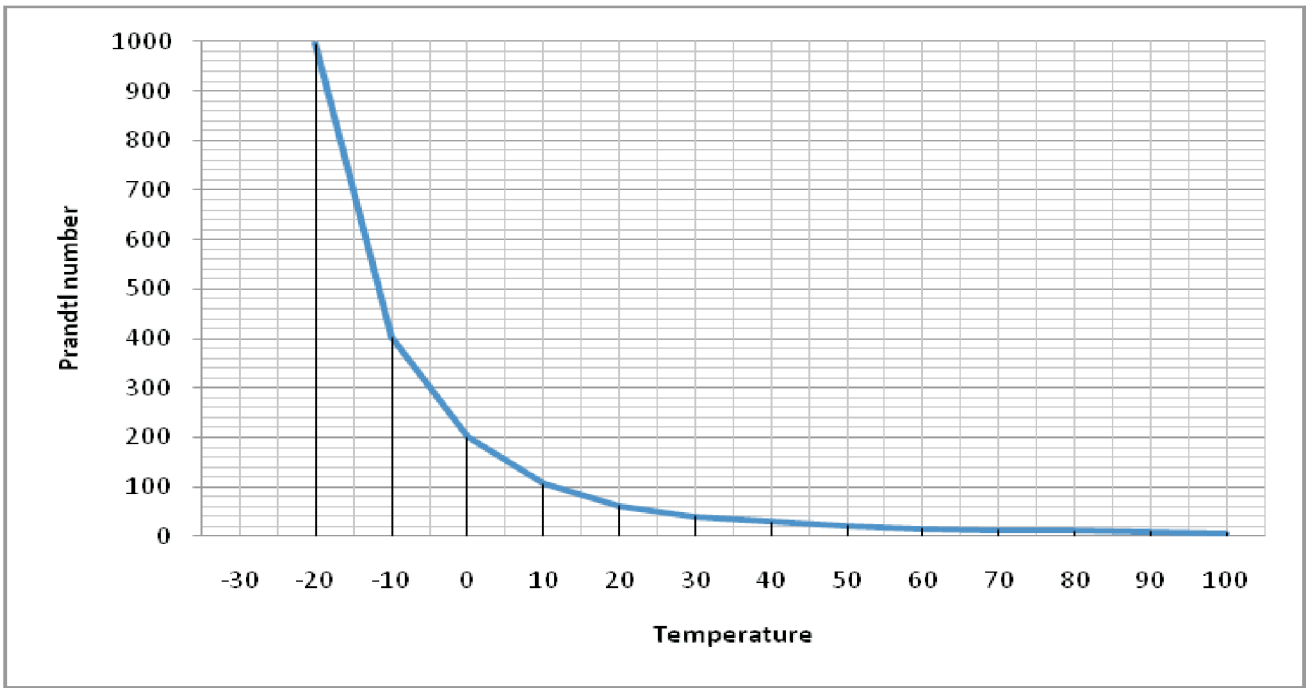


5.4. Heat conductivity



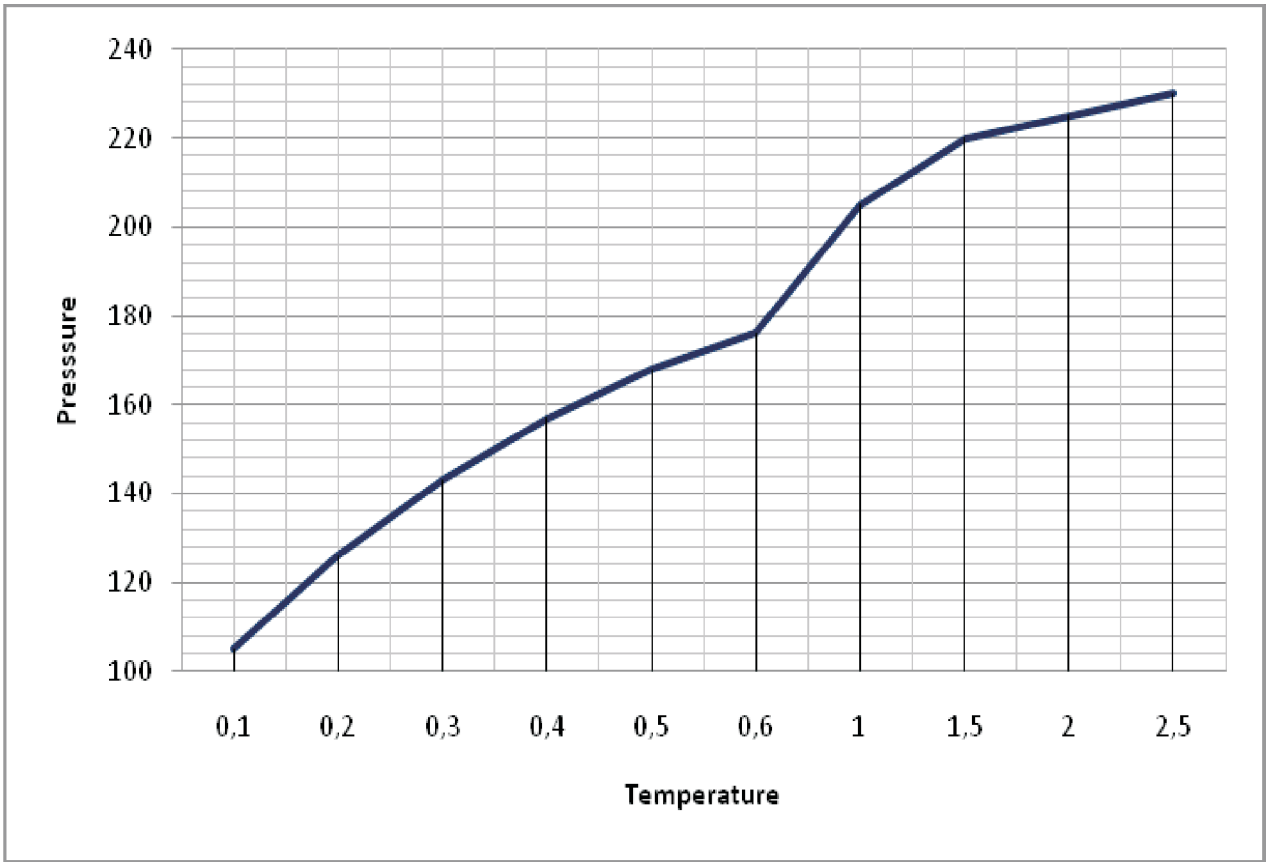
5.5 Prandtl number

$$\text{Prandtl number} = \frac{\text{Density} \times \text{Kinematic viscozity} \times \text{Heat capacity}}{\text{Heat conductivity}}$$



5.6 Dependence of pressure on boiling point

Pressure (Mpa)	0,1	0,2	0,3	0,4	0,5	0,6	1,0	1,5	2,0	2,5
Temperature (°C)	105	126	143	157	168	176	205	220	225	230



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