



Solkane[®] 123

Refrigerant



Solvay
Fluor und Derivate



Product Description

- Low pressure refrigerant
- Physical properties comparable to R11
- Non-flammable
- Use of conventional oils possible
- ODP reduced by 98 % related to R11
- Low HGWP

Applications

Solkane 123 is an interim replacement for CFC 11.

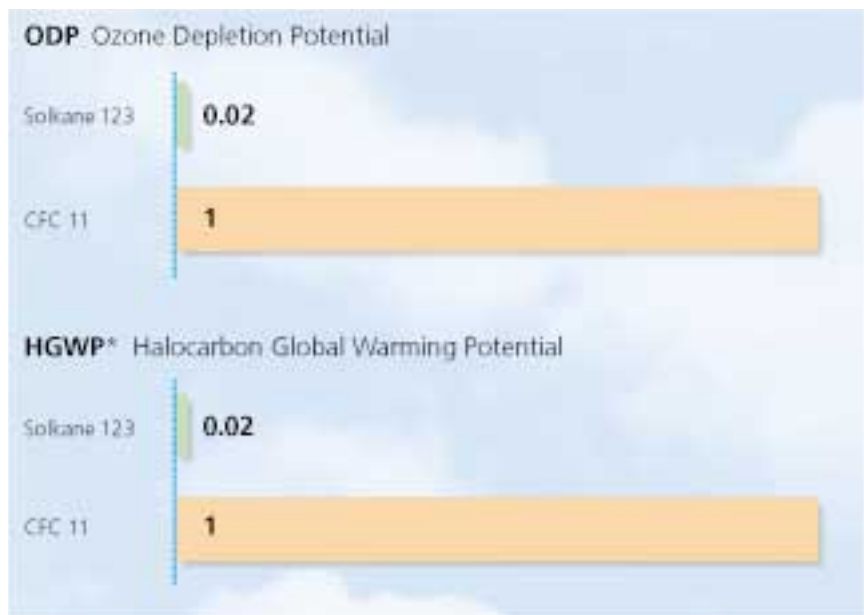
Applications:

- Centrifugal chillers for industrial and commercial use
- Centrifugal compressors
- ORC - processes
- Heat - pumps

CFC 11 compatible mineral oils can be used with Solkane 123.

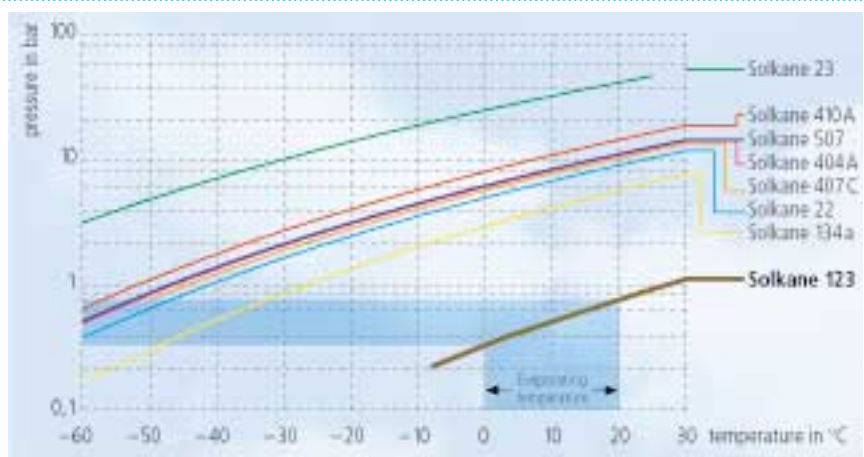
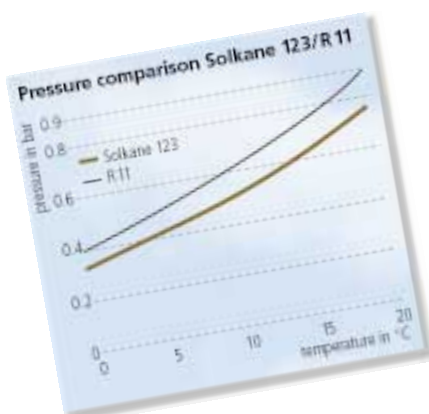
Solkane 123, as an interim refrigerant, ensures the operation of existing CFC 11-equipment with low residual lifetime.

Environmental Aspects



*The HGWP is related to R11 for an infinite time horizon.

Range of Application



Physical Properties

Chemical description		1,1-Dichloro-2,2,2-trifluoroethane
Chemical Formula		CHCl ₂ -CF ₃
Molecular Weight	kg/kmol	152.9
Boiling Point at 1.013 bar	°C	27.6
Critical Temperature	°C	183.8
Critical Pressure	bar	36.7
Critical Density	kg/m ³	550
Critical Volume	m ³ /kg	1.82 x 10 ⁻³
Density Liquid ¹⁾	kg/m ³	1465
Density Saturated Vapour ¹⁾	kg/m ³	5.953
Heat of Vaporization ¹⁾	kJ/kg	170.7
Specific Heat Capacity ²⁾ (Liquid)	kJ/kgK	1.040
Specific Heat Capacity ³⁾ (Vapour)	kJ/kgK	0.715
Toxicity	ppm (v/v)	IIIB, MAK
¹⁾ at 25°C ²⁾ at 30°C ³⁾ at 30°C and 1.013 bar		

Toxicity

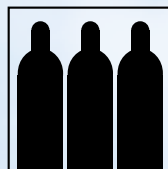
PAFT-Results (Programme for Alternative Fluorcarbon Toxicity Testing):

- Short-term studies: low toxicity
- Long-term studies: on rats an increased incidence of benign tumours was observed

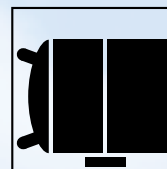
Attention:

- Classified group III B by the German MAK-commission (Group III B substances are suspected carcinogens).
- Measurements on centrifugal chillers showed that the operation under approved technical procedures can be safely maintained.

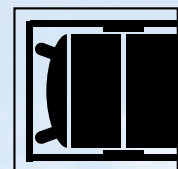
Packaging



Low-steel-cylinders
(50 and 80 kg)



Returnable tanks
(1000 kg)



ISO Tank
containers
(20 000 kg)

Other sizes of packaging are available from our wholesalers.

Comments:

The recommendations for the use of Solkane-refrigerants are given to the best of our knowledge and information and are not binding.

All users are themselves responsible for the observance of the relevant legal regulations and existing copyright.

Under no circumstances do we accept liability for damages which arise from the use of Solkane-refrigerants and such products, which are manufactured with Solkane-refrigerants.

Thermodynamic properties of saturated Solkane® 123

Release 1.01

t	p	v'	v''	rho'	rho''	h'	h''	r	s'	s''	t	p	v'	v''	rho'	rho''	h'	h''	r	s'	s''
°C	bar	dm ³ /kg	dm ³ /kg	kg/dm ³	kg/m ³	kJ/kg	kJ/kg	kJ/kg	kJ/kgK	kJ/kgK	°C	bar	dm ³ /kg	dm ³ /kg	kg/dm ³	kg/m ³	kJ/kg	kJ/kg	kJ/kg	kJ/kgK	kJ/kgK
0	0.328	0.655	442.91	1.527	2.258	200.00	382.73	182.73	1.0000	1.6690	95	7.015	0.791	23.79	1.264	42.029	302.26	438.19	135.93	1.3198	1.6890
1	0.343	0.656	424.29	1.524	2.357	201.08	383.33	182.25	1.0039	1.6687	96	7.177	0.793	23.25	1.261	43.012	303.37	438.74	135.37	1.3228	1.6895
2	0.359	0.657	406.62	1.522	2.459	202.16	383.93	181.77	1.0079	1.6685	97	7.342	0.795	22.72	1.258	44.013	304.48	439.28	134.80	1.3257	1.6899
3	0.376	0.658	389.83	1.519	2.565	203.24	384.52	181.29	1.0118	1.6683	98	7.509	0.797	22.20	1.254	45.036	305.59	439.82	134.23	1.3287	1.6904
4	0.393	0.659	373.87	1.517	2.675	204.31	385.12	180.81	1.0157	1.6680	99	7.680	0.799	21.70	1.251	46.078	306.70	440.36	133.66	1.3316	1.6908
5	0.411	0.660	358.70	1.515	2.788	205.39	385.72	180.33	1.0195	1.6679	100	7.853	0.802	21.21	1.248	47.140	307.81	440.90	133.09	1.3346	1.6912
6	0.429	0.661	344.21	1.512	2.905	206.50	386.31	179.81	1.0235	1.6677	101	8.029	0.804	20.74	1.244	48.224	308.93	441.43	132.51	1.3375	1.6917
7	0.448	0.662	330.48	1.510	3.026	207.58	386.91	179.33	1.0274	1.6675	102	8.208	0.806	20.27	1.241	49.329	310.04	441.97	131.92	1.3405	1.6921
8	0.468	0.663	317.42	1.507	3.150	208.65	387.51	178.86	1.0312	1.6674	103	8.390	0.808	19.82	1.237	50.456	311.17	442.50	131.34	1.3434	1.6926
9	0.489	0.664	304.99	1.505	3.279	209.73	388.11	178.38	1.0350	1.6672	104	8.576	0.811	19.38	1.234	51.606	312.29	443.03	130.74	1.3464	1.6930
10	0.510	0.666	293.02	1.503	3.413	210.87	388.70	177.83	1.0390	1.6671	105	8.764	0.813	18.95	1.230	52.778	313.42	443.56	130.15	1.3493	1.6935
11	0.532	0.667	281.73	1.500	3.549	211.94	389.30	177.35	1.0428	1.6670	106	8.955	0.815	18.53	1.227	53.975	314.55	444.09	129.54	1.3523	1.6939
12	0.554	0.668	270.97	1.498	3.690	213.01	389.89	176.88	1.0466	1.6669	107	9.150	0.818	18.12	1.223	55.194	315.68	444.61	128.93	1.3552	1.6944
13	0.577	0.669	260.71	1.495	3.836	214.09	390.49	176.41	1.0503	1.6668	108	9.347	0.820	17.72	1.219	56.438	316.81	445.13	128.32	1.3581	1.6948
14	0.602	0.670	250.92	1.493	3.985	215.16	391.09	175.93	1.0541	1.6667	109	9.548	0.823	17.33	1.216	57.708	317.95	445.65	127.70	1.3611	1.6952
15	0.626	0.671	241.57	1.490	4.140	216.23	391.69	175.46	1.0578	1.6667	110	9.752	0.825	16.95	1.212	59.022	319.09	446.17	127.08	1.3640	1.6957
16	0.652	0.672	232.65	1.488	4.298	217.30	392.29	174.99	1.0615	1.6667	111	9.959	0.828	16.58	1.208	60.324	320.24	446.68	126.44	1.3670	1.6961
17	0.679	0.673	224.09	1.485	4.462	218.39	392.88	174.49	1.0652	1.6666	112	10.170	0.830	16.21	1.205	61.672	321.39	447.19	125.81	1.3699	1.6965
18	0.706	0.674	215.92	1.483	4.631	219.48	393.48	173.99	1.0690	1.6666	113	10.384	0.833	15.86	1.201	63.046	322.54	447.70	125.16	1.3728	1.6970
19	0.734	0.675	208.11	1.481	4.805	220.57	394.07	173.50	1.0727	1.6666	114	10.601	0.835	15.52	1.197	64.450	323.70	448.21	124.51	1.3758	1.6974
20	0.763	0.677	200.67	1.478	4.983	221.64	394.67	173.03	1.0764	1.6666	115	10.822	0.838	15.18	1.193	65.882	324.86	448.71	123.86	1.3787	1.6978
21	0.793	0.678	193.55	1.476	5.167	222.71	395.27	172.56	1.0800	1.6666	116	11.047	0.841	14.85	1.190	67.343	326.02	449.21	123.20	1.3817	1.6982
22	0.824	0.679	186.74	1.473	5.355	223.78	395.87	172.09	1.0836	1.6667	117	11.274	0.843	14.53	1.186	68.834	327.19	449.71	122.53	1.3846	1.6986
23	0.856	0.680	180.19	1.471	5.550	224.88	396.46	171.59	1.0873	1.6667	118	11.506	0.846	14.21	1.182	70.356	328.36	450.21	121.85	1.3876	1.6991
24	0.889	0.681	173.95	1.468	5.749	225.94	397.06	171.12	1.0909	1.6668	119	11.740	0.849	13.91	1.178	71.910	329.53	450.70	121.17	1.3905	1.6995
25	0.922	0.682	167.97	1.465	5.953	227.01	397.66	170.65	1.0945	1.6668	120	11.979	0.852	13.61	1.174	73.497	330.71	451.19	120.47	1.3935	1.6999
26	0.957	0.684	162.24	1.463	6.164	228.07	398.25	170.18	1.0980	1.6669	121	12.221	0.855	13.31	1.170	75.117	331.90	451.67	119.77	1.3964	1.7003
27	0.993	0.685	156.73	1.460	6.380	229.16	398.85	169.69	1.1017	1.6670	122	12.467	0.858	13.03	1.166	76.771	333.09	452.15	119.06	1.3994	1.7007
28	1.029	0.686	151.45	1.458	6.603	230.24	399.44	169.20	1.1052	1.6671	123	12.716	0.861	12.75	1.162	78.459	334.28	452.63	118.35	1.4024	1.7011
29	1.067	0.687	146.41	1.455	6.830	231.31	400.04	168.74	1.1088	1.6672	124	12.969	0.864	12.47	1.158	80.185	335.48	453.11	117.62	1.4053	1.7015
30	1.106	0.688	141.55	1.453	7.065	232.39	400.64	168.25	1.1123	1.6673	125	13.226	0.867	12.20	1.154	81.947	336.69	453.58	116.89	1.4083	1.7019
31	1.146	0.690	136.90	1.450	7.305	233.45	401.23	167.78	1.1158	1.6675	126	13.487	0.870	11.94	1.150	83.747	337.90	454.04	116.15	1.4113	1.7023
32	1.187	0.691	132.44	1.448	7.550	234.51	401.83	167.32	1.1193	1.6676	127	13.752	0.873	11.68	1.145	85.587	339.11	454.50	115.39	1.4143	1.7026
33	1.229	0.692	128.13	1.445	7.804	235.60	402.42	166.82	1.1229	1.6677	128	14.021	0.876	11.43	1.141	87.467	340.33	454.96	114.63	1.4172	1.7030
34	1.273	0.693	124.02	1.442	8.063	236.66	403.02	166.35	1.1263	1.6679	129	14.294	0.879	11.19	1.137	89.388	341.56	455.42	113.86	1.4202	1.7034
35	1.317	0.695	120.05	1.440	8.330	237.74	403.61	165.87	1.1298	1.6681	130	14.570	0.883	10.95	1.133	91.353	342.79	455.87	113.08	1.4232	1.7037
36	1.363	0.696	116.25	1.437	8.602	238.81	404.20	165.39	1.1333	1.6682	131	14.851	0.886	10.71	1.128	93.361	344.03	456.31	112.28	1.4262	1.7041
37	1.410	0.697	112.60	1.435	8.881	239.87	404.80	164.93	1.1367	1.6684	132	15.136	0.890	10.48	1.124	95.416	345.27	456.75	111.48	1.4293	1.7044
38	1.458	0.698	109.07	1.432	9.168	240.95	405.39	164.44	1.1401	1.6686	133	15.425	0.893	10.25	1.120	97.517	346.52	457.18	110.66	1.4323	1.7047
39	1.507	0.700	105.70	1.429	9.461	242.01	405.99	163.98	1.1435	1.6688	134	15.718	0.897	10.03	1.115	99.666	347.78	457.61	109.83	1.4353	1.7051
40	1.558	0.701	102.44	1.427	9.762	243.09	406.58	163.49	1.1470	1.6690	135	16.015	0.900	9.82	1.111	101.865	349.04	458.04	108.99	1.4383	1.7054
41	1.610	0.702	99.30	1.424	10.071	244.16	407.17	163.01	1.1504	1.6693	136	16.317	0.904	9.60	1.106	104.117	350.31	458.45	108.14	1.4414	1.7057
42	1.663	0.704	96.29	1.421	10.386	245.22	407.76	162.54	1.1537	1.6695	137	16.623	0.908	9.40	1.101	106.427	351.59	458.87	107.28	1.4444	1.7060
43	1.718	0.705	93.38	1.419	10.709	246.30	408.35	162.06	1.1571	1.6697	138	16.933	0.912	9.19	1.097	108.783	352.87	459.27	106.40	1.4475	1.7063
44	1.774	0.706	90.57	1.416	11.041	247.37	408.94	161.57	1.1605	1.6700	139	17.248	0.916	8.99	1.092	111.201	354.17	459.67	105.50	1.4506	1.7065
45	1.831	0.708	87.88	1.413	11.379	248.43	409.54	161.11	1.1638	1.6702	140	17.567	0.920	8.80	1.087	113.680	355.47	460.06	104.59	1.4536	1.7068
46	1.890	0.709	85.28	1.411	11.726	249.50	410.13	160.62	1.1672	1.6705	141	17.891	0.924	8.60	1.082	116.219	356.78	460.45	103.67	1.4567	1.7070
47	1.950	0.710	82.78	1.408	12.081	250.57	410.72	160.15	1.1705	1.6707	142	18.219	0.928	8.42	1.077	118.823	358.09	460.83	102.73	1.4598	1.7073
48	2.012	0.712	80.36	1.405	12.444	251.64	411.30	159.66	1.1738	1.6710	143	18.552	0.932	8.23	1.072	121.494	359.42	461.20	101.78	1.4629	1.7076
49	2.075	0.713	78.03	1.403	12.815	252.70	411.89	159.19	1.1771	1.6713	144	18.889	0.937	8.05	1.067	124.234	360.75	461.56	100.81	1.4661	1.7079
50	2.140	0.714	75.78	1.400	13.196	253.77	412.48	158.72	1.1804	1.6716	145	19.231	0.941	7.87	1.062	127.048	362.10	4			