

# TECHNICAL DATA SHEET



SPI Supplies  
206 Garfield Avenue,  
West Chester, PA 19380, USA

## Cargille™ Immersion Oils: Type DF, FF, and HF

For Fluorescence Microscopy: Optical and Physical Properties: Type DF, FF, and HF

### Product Information:

Immersion Oil	Type LDF	Type FF	Type HF
<b>Refractive Index @23° C:</b>			
F Line (4861 Å)	1.5232	1.4850	1.5234
E Line (5461 Å)	1.5180	1.4810	1.5180
D Line (5893 Å)	1.5150	1.4790	1.5150
C Line (6563 Å)	1.5116	1.4766	1.5117
<b>Dispersion: <math>n_F - n_C</math></b>			
	0.0116	0.0084	0.0118
Abbe $V_D$	44.2	57.0	43.8
Abbe $V_E$	44.0	56.5	43.6
<b>Temperature Coefficient</b>			
(15-35° C) $dn_D/dt$	- 0.00039	- 0.00037	- 0.00038
<b>Stability (change in <math>n_D</math> @25° C after 24 hrs at stated temperature)*</b>			
60° C:	0	0	0.0001
100° C:	+0.0002	0	0.0006

**Fluorescence\*:**

Short UV:	Very-Very-Low	None	Very-Very-Low
Long UV:	Very-Low	None	Very-Low

**Color: (Gardner)** <1 <1 <1

**Viscosity: Centistokes**

+/-10% @ 23° C 330 170 700

**Density: @ 23° C**

g/cc: 1.225 0.877 0.9306  
lb/gal (US): 10.22 7.32 7.77

**Cloud Point:**

<-6° C (<21.2° F) <-6° C (<21.2° F) 2° C (35.6° F)

**Flash Point:**

198° C (390° F) 215.5° C (420° F) >171.1° C (>340° F)

Neutralization: (mg KOH/gm) 0.15 Max 0.01 Max 0.03 Max

\*Relative to Cedarwood Oil

**Date: 9/15**