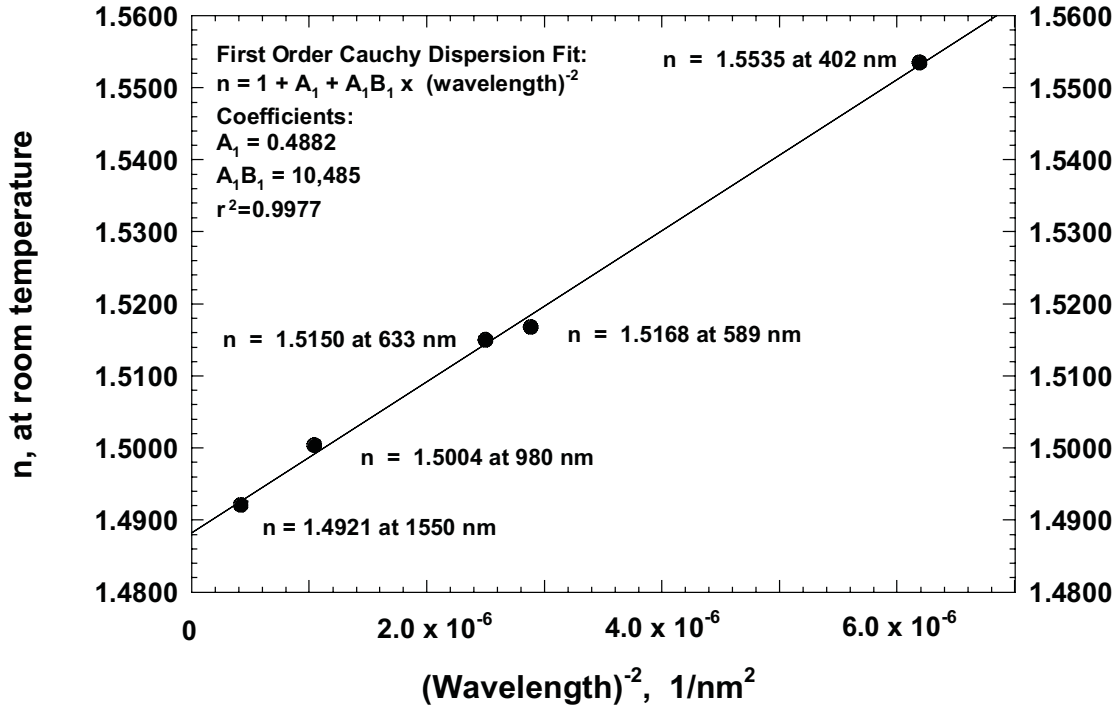


Optical Coupling Fluids & Gels serve as a “bridge” for light signals by carrying light between different media such as transparent plastic or glass light pipes or lenses. These materials, also known as *Index Matching Fluids and Gels*, are used to optimize light transmission (by matching the refractive index of the mating materials) while allowing pliable mechanical connections between rigid parts. Unlike a rigid optical epoxy, Nye’s pliable gels are viscoelastic and can take up the differential thermal expansion of precision optical parts without inducing excessive stresses or delamination. In many devices, these materials serve an additional function: they help seal out ambient dust or fluids from sensitive optical components. Nye’s optical fluids and gels are formulated to be ultraclean, non-yellowing, and unaffected by x-ray, ultraviolet or sunlight exposure. They have extremely low outgassing and volatility characteristics, and are free from light-absorbing microscopic particulates. Nye’s optical products are chemically stable, non-toxic, synthetic materials with wide temperature serviceability and are suitable for designs with high reliability and long service life.

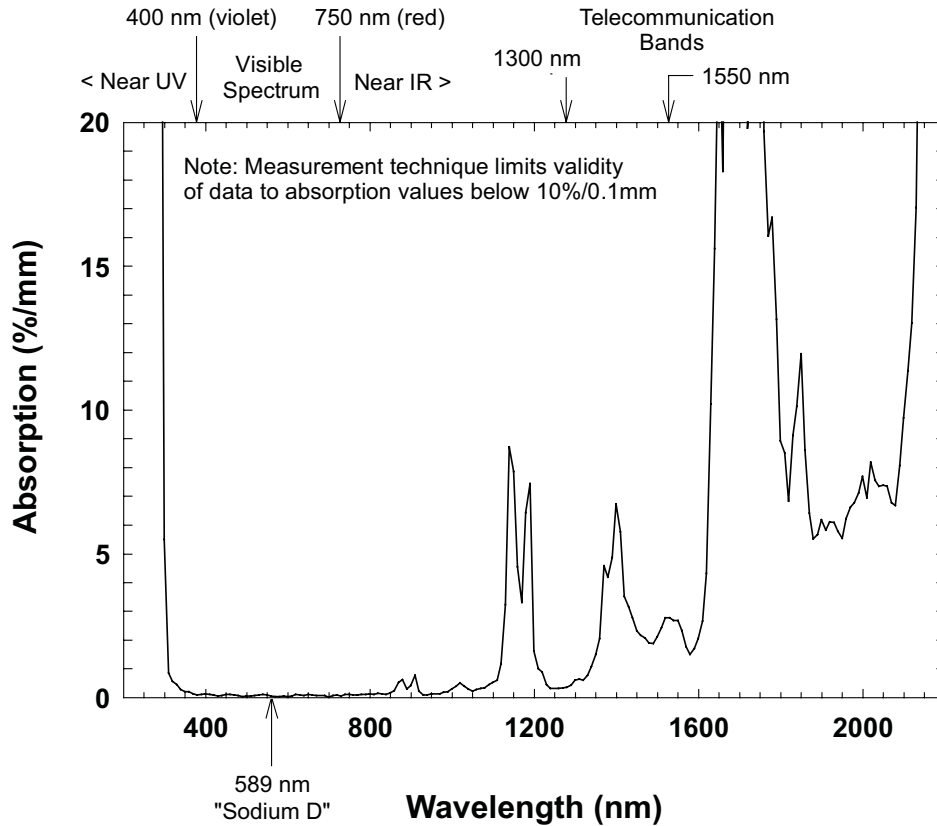
Typical Properties of the Fluid		Typical Value	Test Method	
Color, Appearance		Crystal Clear		
Refractive Index	402 nm	1.5535	ASTM D-1218	
	589.3 nm	1.5168		
	980	1.5004		
	1550	1.4921		
Refractive Index Temp. Coefficient	25°C to 60°C	- 3.7 X 10 ⁻⁴ /°C		
Refractive Index vs. Wavelength, Cauchy Fit		1.4882+10485(λ) ⁻²	ASTM D-1218	
Optical Absorption		400-750 nm	< 2 X 10 ⁻⁴ %/micron	Nye CTM
Kinematic Viscosity (cSt)		25°C	650	ASTM D-445
Evaporation	24 hours	100°C	< 0.1 %	ASTM D-972
Specific Gravity		25°C	1.08	ASTM D-1217
Thermal Coefficient of Expansion		cc/cc/°C	6 X 10 ⁻⁴	ASTM D-1903
Microscopic Particulate Contamination		particulates/100ml	Level 25 or better	MIL-STD-1246C

The typical properties shown on this product data sheet should not be used as a basis for preparing specifications. Refer to the Material Safety Data Sheet for detailed safety information.

Index of Refraction vs. Wavelength Optical Coupling Fluid OCF-452



Optical Clarity vs. Wavelength Optical Coupling Fluid OCF-452



Nye's Optical Products are organized into three families with different fluid/mechanical characteristics:

Optical Coupling Fluids are true fluid materials used in applications where free fluid flow is advantageous.

Thixotropic (non-curing) Optical Gels are ready-to-use materials with high apparent viscosity, and similar in feel to a soft putty.

Curing Optical Gels are available in two-part curing systems; the end user must mix the product components in the specified mix ratio and the product will then cure in place (with a cured consistency which can range from that of a stale gelatin to a medium hard rubber). Curing gels flow easily into tight spaces and are more elastic than non-curing gels.

Selecting the Best Optical Coupling Material for Your Application. Once you have determined which mechanical consistency is best for your application (fluid, non-curing gel, or curing gel), the next step is to determine the ideal index of refraction for optical coupling. Usually, the ideal index is equal to the value of the index of refraction of the two light transmitting plastics or glasses, which are to be "bridged" by the optical fluid or gel. If the mating materials have different indices of refraction, then the geometric mean of the two indices usually approximates the best choice for the optical fluid or gel.

