



# Lubeneotes:

*Design Engineers' Guide to Selecting a Lubricant*

## Lubricants for Stationary Separable Electrical Connectors

### The Advantages of Lubricating Electrical Connectors

**Reduces friction, eases mating.** A thin film of lubricant can reduce mating force by as much as 80 percent, an important factor in connector assembly. For electronic connectors with dozens or even hundreds of pins, or for automotive connectors that are in hard-to-reach places, a low insertion force makes assembly more efficient and ensures solid connections. For gold-plated connectors an effective lubricant reduces the potential for noble metal wear during mating and separation.

**Guards against corrosion.** Lubricants guard against oxidation and the effects of harsh environments. With gold-plated connectors this means protection against substrate corrosion. Thin gold plating can be microscopically porous; and a thin film of lubricant can seal the pores, prevent substrate attack and assure low contact resistance.

**Prevents fretting corrosion.** In addition to atmospheric corrosion, tin/lead connectors are also subject to "fretting corrosion," the result of low amplitude vibration caused by nearby motion as from fans or motors or from merely opening and closing a cabinet door. Fretting corrosion continually exposes fresh layers of metal surface to oxidation. A lubricant film minimizes metal-to-metal contact during vibration, protecting the connector from metal wear.

### Applying Connector Lubricants

**Neat lubricants vs. solvent dispersions.** Nye manufactures connector lubricants neat and in solvent dispersions. Neat lubricants tend to be used in larger connectors, where the larger volume of lubricant acts as an environmental seal. Solvent dispersions are recommended where only a thin film of lubricant is desired.

Nye's solvent dispersions are called NyeTacts. When the solvent evaporates, a thin film of active lubricant is left on the connector surface. The amount of oil or grease in NyeTacts varies from one to 20 percent by weight, depending on the thickness of the film desired. Suitable for both dip and spray methods, NyeTacts can be supplied in hand-held, refillable metal containers, pressurized with plant air. We also work closely with customers to recommend or design connector lubricants for automated application systems.

**Solvent options.** Nye currently offers three solvent options: fluoroalkanes, a proprietary halogenated hydrocarbon blend, and mineral spirits. Though compatible only with fluoroethers, fluoroalkanes are fast-evaporating, nonflammable solvents classified by the EPA as completely ozone-safe. Our new proprietary solvent, used with our polyphenyl ethers and synthetic hydrocarbon lubricants, is fast-evaporating, nonflammable, and ozone-safe as well. It also allows for the addition of UV or colored dyes for identification of lubricant on contact surfaces. We offer but do not recommend mineral spirits as a solvent. We feel its low flash point, long drying time, and tendency to migrate with the lubricant away from the connector outweighs its low cost.

*For the best choice in lubricants,*

*Call Nye 508-996-6721*

**Types of Synthetic Connector Lubricants**

Nye’s connector lubricants can be divided into two general classes: lubricants for noble metal connectors and tin/lead connectors. For noble metals, fluoroethers are the lubricants of choice. They withstand extreme temperatures and resist aggressive chemicals and solvents. Five and six-ring polyphenyl ethers are also extremely stable in thin film, and offer an excellent track record on gold-plated connectors. For tin/lead connectors, synthetic hydrocarbons provide excellent film strength, broad temperature serviceability, and protection against fretting corrosion.

**Selecting the right lubricant for your application.** Following is a partial list of the most widely used Nye connector lubricants. Each can be supplied with a UV tracer for identification of lubricant on contact surfaces. For technical specifications, evaluation samples, or questions about any Nye products — or to discuss a lubricant *custom-designed* for your application — call us at (508) 996-6721. Nye is ready to work with you to ensure you make the best possible lubricant choice.

Lubricants for Stationary Separable Electrical Connectors	Temp Range (C°)	Tin/Lead	Noble Metal	Low Current	High Current	Plastic Compatible	Wax Binder <sup>(a)</sup>
NyeTact 502H-20	-40 to 120	●		●		●	
NyeTact 515H-2 <sup>(a)</sup>	-20 to 100	●		●		●	●
NyeTact 520H-2	+20 to 250		●	●			
NyeTact 570H-2	-40 to 225		●	●		●	
NyeTact 523H-2-UV <sup>(a)(b)</sup>	+20 to 250		●	●			●
NyoGel <sup>®</sup> 760G <sup>(b)</sup>	-40 to 125	●	●	●	●	●	
UniFlor <sup>™</sup> 8512 <sup>(c)</sup>	-50 to 225	●	●	●	●	●	

(a) Wax binders produce a drier film with less tendency to migrate.

(b) A UV tracer, which allows easy identification of lubrication on contact surfaces, is standard in NyeTact 523H-2-UV and NyoGel 760. UV tracers are also available for all lubricants listed above.

(c) Reduces insertion and withdrawal forces exceptionally well

Dulub Co., Ltd. [www.dulub.com.tw](http://www.dulub.com.tw) tel : 886-7-536 5500



Nye Lubricants, Inc.	12 Howland Rd.	Fairhaven, MA 02719	Phone: 508-996-6721	Fax: 508-997-5285
<p>Because we cannot anticipate or control the many different conditions under which this information and our products may be used, we cannot guarantee the applicability of this information or the suitability of our products in any individual situation. For the same reason, the products discussed are sold without warranty, express or implied. Statements concerning the possible use of our products are not intended as recommendations to use our product in the infringement of any patent.</p>				