

# NYE<sup>®</sup> WILLIAM F. NYE, INC. P.O. Box G-927, New Bedford, Mass. SPRING 1988

# LUBEletter

## MAILING LIST UPDATE

### Golden Oldies Collection Promised to Lubeletter Subscribers

For you to receive future Nye Lubeletters, we ask that you fill in and return the post card included with this mailing. A special bonus, **THE NYE LUBELETTER DIGEST**, will be sent to you if you do so.

The first Nye Lubeletter was published in 1972. We've sent a lot of things up the flagpole in the days since then, and more than a few are still flying. Certain Lubeletter articles from those sixteen years have proved quite durable, and we find ourselves photo-copying from old issues to provide certain basic information in response to inquiries of today.

**THE NYE LUBELETTER DIGEST**, to be published later in 1988, will assemble the eight or ten most durable articles from the Lubeletters for years 1972-1987. We believe this will be a valuable reference work for anyone involved with specialty lubrication. Anyone on the new mailing list which we are putting together will receive their own copy. So, please fill in and return the card which is attached. It needs no postage.

## NEW CATALOG PUBLISHED

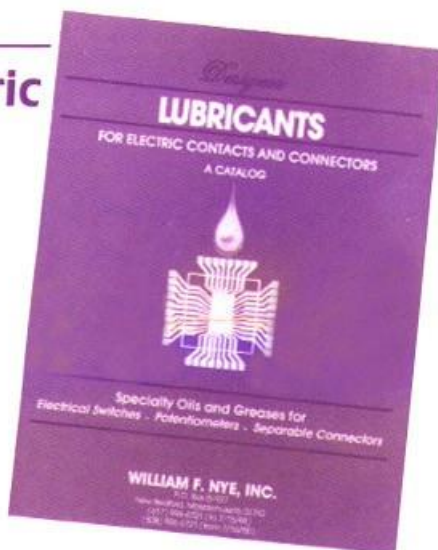
### New Catalog for Electric Contact Lubricants

Our original catalog on Lubricants for Electric Contacts and Connectors has been completely rewritten to include the latest new developments in this special area of lubrication. The new edition describes thirty different oils, greases and specialty products, all specifically formulated for use on electric contacts or connectors. Among the new products discussed are four formulations based on the new 6-ring polyphenyl ether, which has shown such exceptional promise for long-term connector lubrication at higher temperatures (See our 1987 Lubeletter).

The catalog discusses separately the lubricants needed in four different application areas: (1) greases for sliding electrical contacts, as in electric switches; (2) oils for sliding contacts and potentiometers; (3) potentiometer greases; and (4) lubricants for stationary separable connectors.

Lubricant properties and operating temperature ranges are listed; and special sections discuss lubricants for arcing conditions, for salt water resistance, and for resistance to fuel vapor or splash. Specific products are recommended for gold-plated electrical connectors and for tin or tin-lead connectors.

Copies of this new catalog are available at no charge on letterhead or telephone request. Or you can obtain a copy by checking the box on our mailing list up-date card attached.



### Precision Bearing Greases: ULTRAFILTERED PACKAGING

Stocks of a variety of both petroleum and synthetic-based bearing greases, representing products of a number of different grease manufacturers including ourselves, are maintained by William F. Nye Co. for resale to bearing manufacturers and re-lubers who have only smaller volume needs for such lubricants. These are all lubricants which are widely accepted as suitable for precision bearing lubrication.

These products are sold re-packaged into convenient smaller containers, including jars, tubes or plastic cartridges, as may be specified by the customer doing the bearing lubing.

Of more specific interest for precision bearings is the availability, if requested, of these greases in "ultrafiltered" condition, whereby all particles larger than 35 microns are removed from the grease, and the number of particles between 10 and 35 microns is minimized, with a permissible maximum (at least for most greases) of 1000 particles/cc. A certification of particulate contamination analysis can be provided.

The advantages of grease filtration for precision bearings, along with traditional concerns regarding the filtering of greases, were discussed in the lead article in our 1985 Lubeletter (copy available on request). Technical developments since that article was written have now permitted us to filter also the fluorocarbon-gelled greases, such as the fluorinated ether greases, with impressive and extremely beneficial results.

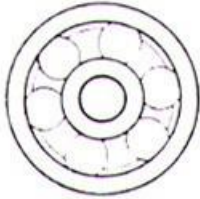
The type of containers used for "ultrafiltered" greases are somewhat more restricted than with ordinary re-packaged product, since we do not filter into metal containers, only into plastic or glass, which in either case has been specially cleaned to accept the filtered grease. Most popular have been polyethylene "Semco" cartridges, which fit readily into automatic dispensing systems.

Unless the customer supplies Nye with grease which he has purchased, these products are usually sold under a Nye label, since we do not necessarily have permission from the grease manufacturer to use their label on product which we sell. We can, however, certify to the origin of specific greases which we supply.

Our standard price for an "ultrafiltered" 6-ounce "Semco" plastic cartridge, which applies to all except exotically expensive greases, is \$20.00. Seven of the most widely-used U.S.-manufactured precision bearing greases are stocked here in this package.

A 1-pound jar in "ultrafiltered" condition is \$36.00, and a 20-ounce "Semco" cartridge is \$45.00. A \$100.00 set-up charge must be added on any order for these larger containers, as well as for the 6-ounce cartridge for a "non-stocked" grease. We will attempt to obtain and filter any commercially-available grease which a potential customer needs to receive in "ultrafiltered" condition.

## Synthetic Hydrocarbons Provide Wide Range of Viscosities for Ball Bearings



The above heading may look familiar to our older readers. It duplicates a headline on the Lubeletter for 1976. Since that time the synthetic hydrocarbon oils have proven themselves many times over in precision ball bearings and in other demanding lubricant applications. We have a new bulletin summarizing data on this family of quality synthetic oils, available in a homologous series with 100°F viscosities ranging from below 20 centistokes to over 500 centistokes, as listed below.

| Synthetic Oil | Viscosity, cs |      |         |
|---------------|---------------|------|---------|
|               | 100°C         | 40°C | -17.8°C |
| 132B          | 3.85          | 17   | 350     |
| 179           | 5.8           | 30   | 780     |
| 181B          | 9.2           | 56   | 2170    |
| 188B          | 14.5          | 107  | 4700    |
| 185C          | 24            | 205  | 14000   |
| 176H          | 39            | 400  | 40000   |
| 174           | 57            | 680  | 80000   |

These synthetic hydrocarbon-based precision bearing oils are prepared from varying molecular weights of poly-1-decene. They are formulated with anti-oxidants and anti-wear additives to permit operating temperatures from below -55°C for lower viscosities to near 120°C. Higher temperatures to 150°C or more can be tolerated (especially for the higher viscosities) under cycling conditions, for short periods, with bulk fluid, or where lube replenishment is practical. Their change of viscosity with temperature is significantly less than with naturally-derived petroleum.

The synthetic hydrocarbon oils are now widely used both as ball bearing oils and as impregnating fluids in sintered metal bearings. Applications extend over the range of precision rotating devices, both military and commercial. Some precision bearing applications require ultrafiltration of these oils; we can supply any member of this series filtered to conform to MIL-STD-1246A, Cleanliness Level 100 or better. Write for our new bulletin, or call us if you have any special requirements.

## BASIC PRECAUTIONS

### Lubricant Compatibility with Plastics or Elastomers

When introducing an oil or grease into a product, the designer must consider the interaction of the lubricant components with all other materials with which it will come into contact. This can be of special importance with plastics and elastomers where certain lubricants, especially of particular synthetic fluid families, can dissolve, weaken, attack or distort certain types of plastic or rubber.

In making a lubricant recommendation, we will always try to ask what specific plastics or elastomers will come into contact with the lubricant, and each application should be given specific attention in this regard. Some general guidelines are in order for advance planning, however.

To consider plastics first, many standard construction materials do not present lubricant compatibility problems. Acetals, polyamides (Nylons), phenolics, diallyl phthalate, and the terephthalate polyesters, as well as polytetrafluoroethylene, appear to be generally compatible with the range of lubricant types.

Care must be taken, however, with such plastics as polycarbonates, a-b-s resins, polyphenylene oxides, polysulfones, polystyrene, or polyvinyl chloride. These plastics can be attacked by ester-based fluids and by some polyethers. With these materials, synthetic hydrocarbons or silicone oils would be the proper lubricants. In fact hydrocarbons generally are plastic-compatible, with the exception that polyethylene, especially of low-density, can absorb (and be softened by) lighter hydrocarbons. Also, the normally-innocuous combination of a hydrocarbon with a particular plastic can be made into a problem by the addition of flame retardants to the plastic. All of which reinforces our standard policy that each application deserves a special look.

With regard to elastomers, natural and many synthetic rubbers are much less forgiving with oils and greases. In fact, it is difficult to find any except either silicones or fluorinated lubricants which can be comfortably used with natural rubber, Buna S, butyl, or ethylene-propylene copolymer. As with plastics, esters and many ethers will swell nitrile rubbers and neoprene. Silicone rubbers can be compromised by silicone oils. The fluorinated elastomers are more widely compatible with a greater range of fluid types. In some situations, of course, a degree of swelling is desirable, as with some O-ring uses, so each application deserves a specific analysis.

The large and increasing variety of plastics and elastomers presents a never-ending challenge in establishing compatibilities with the widening range of lubricants now available. The following table is a very condensed summary of our current knowledge; we welcome further input to elaborate the comparisons.

#### COMPATIBILITY RATINGS - ROOM TEMPERATURE

A = Usually OK; B = Be careful; C = Causes problems.

|                      | Paraffinic<br>(Synthetic)<br>Hydrocarbons | Ethers<br>or<br>Esters | Silicones<br>of all<br>Types | Fluorinated<br>Ethers |
|----------------------|---|------------------------|------------------------------|-----------------------|
| <b>PLASTICS</b>      |   |                        |                              |                       |
| Acetals              | A   | A                      | A                            | A                     |
| Polyamides           | A   | A                      | A                            | A                     |
| Phenolics            | A   | A                      | A                            | A                     |
| Terephthalates       | A   | A                      | A                            | A                     |
| Polycarbonates       | A   | C                      | A                            | A                     |
| A-b-s resins         | A   | C                      | A                            | A                     |
| Polyphenylene oxides | A   | C                      | A                            | A                     |
| Polysulfones         | A   | C                      | A                            | A                     |
| Polyethylene         | B   | B                      | A                            | A                     |
| <b>RUBBERS</b>       |   |                        |                              |                       |
| Natural rubber       | C   | C                      | A                            | A                     |
| Buna S               | C   | C                      | A                            | A                     |
| Butyl                | C   | C                      | A                            | A                     |
| Ethylene propylene   | C   | B                      | A                            | A                     |
| Nitrile (Buna N)     | A   | B                      | A                            | A                     |
| Neoprene             | A   | C                      | A                            | A                     |
| Silicone             | B   | B                      | C                            | A                     |
| Fluoroelastomers     | A   | A                      | A                            | A                     |

## MINI-SPRAYCAN

# Polyphenyl Ether Electrical Connector Lube in Small Aerosol Can

For field servicing of electrical connectors deserving of the protective/lubricating properties of the ultra-stable Nye Synthetic Oil 439 (described in the lead article of the 1987 Lubeletter), we are responding to market demand and will be offering this product as our NyeTact 520 in a small 3-ounce aerosol container.

NyeTact 520 in this package will consist of a 1% solution of Nye Synthetic Oil 439, a 6-ring polyphenyl ether, in the fast-evaporating, non-flammable solvent, trichlorotrifluoroethane. Extended studies support the effectiveness of this high viscosity, oxidatively-stable oil in providing dependable lubrication and protection to stationary separable electrical connectors over long years of operating life, even with continuous exposure at 100°C or higher.

If you can use this handy maintenance item for electrical connectors, write us for pricing and availability.

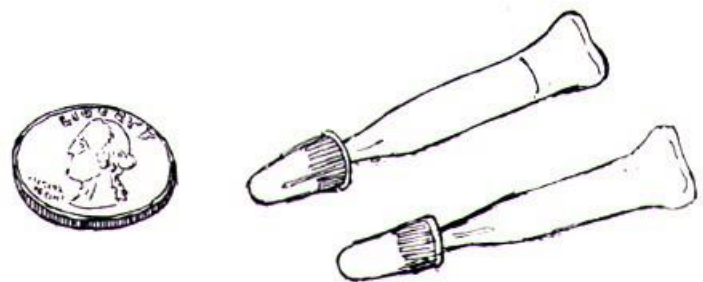
## A RE-USEABLE MILLILITER

# Mini-Dispensers for Oils or Greases

The range of small containers which we stock here for packaging oils or greases for field service use has been expanded to include small plastic pipettes in sizes down to 1 ml. Each pipette is fitted with a screw cap over the dispensing tip to permit re-use.

There are many field re-lube situations where only an extremely small amount of lubricant is needed per device; and use of larger tubes or bottles leads to waste of both lube and money and could even create disposal problems.

These ultra-small, re-useable dispensers provide increased flexibility for field relubrication of all devices. Let us know your specific needs. We can put forward quotations for packaging of virtually any lubricant, yours or ours, in these handy mini-containers.



Cut along the above line and mail in your company envelope to:

**WILLIAM F. NYE, INC.**

P.O. Box G-927, New Bedford, MA 02742-0927  
Telephone (617) 996-6721

Send sample to:

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

P.O. or Street \_\_\_\_\_

City \_\_\_\_\_

State, Zip \_\_\_\_\_

Special Requests or Comments:

*Send at no charge or obligation a lubricant sample especially selected to meet the following needs:*

Type of Mechanism \_\_\_\_\_

Components to be Lubed \_\_\_\_\_

Materials of Construction \_\_\_\_\_

Ball or Sleeve Bearing (if either)? \_\_\_\_\_ Sintered Metal? \_\_\_\_\_

Preference for Oil \_\_\_\_\_ Grease \_\_\_\_\_ Dry-Film \_\_\_\_\_

Is Oil Creep a Problem? \_\_\_\_\_

Will Lube Touch Plastics? \_\_\_\_\_ Type: \_\_\_\_\_

Elastomers? \_\_\_\_\_ Type: \_\_\_\_\_

Lowest Operating Temperature \_\_\_\_\_ °C/°F.

Highest Operating Temperature \_\_\_\_\_ °C/°F.

If an electric contact, is arcing expected? \_\_\_\_\_

Desired Life at High Temperature \_\_\_\_\_

Present Lube \_\_\_\_\_

If unsatisfactory, in what way? \_\_\_\_\_

# The Rush Order

The sketch below is offered in tribute to the loyal and hard-working employees of William F. Nye Co. Many customers don't realize how precise we have to be, since so many of our lubricants

are custom-made for specific user applications. For example, there is a Nyogel 759, 759F, 759G, 759L, 759MS, 759P, 759Q, 759QR-12, 759X and 759Z.



## Expansion of the Lubeletter Mailing List

In addition to sending us the completed mailing list card attached to this Lubeletter mailing, would you help us expand our mailing list for the Nye Lubeletter? In many companies, lubricant selection for a new or re-designed product becomes an individual project engineer problem; not all firms have Materials Labs or Materials Engineers who look after lubricant questions for the range of company products.

It then becomes a real Easter egg hunt to identify these individuals by name and to get our product literature to them.

Would you fill in below the names of any individuals in your company whom you believe would want to receive this publication and especially the forthcoming NYE LUBELETTER DIGEST?

| NAME                   | TITLE                          |
|------------------------|--------------------------------|
| _____                  | Engineering Manager<br>_____   |
| _____                  | Chief Design Engineer<br>_____ |
| _____                  | _____                          |
| _____                  | _____                          |
| _____                  | _____                          |
| Company: _____         |                                |
| Mailing Address: _____ |                                |
| _____                  |                                |

Please mail above to: WILLIAM F. NYE CO., P.O. BOX G-927, NEW BEDFORD, MA 02742-0927.