

## PCR Names Nye Distributor of Custom, Mil-Spec Silicone Fluid

PCR, a Division of Harris Specialty Chemicals in Gainesville, Florida, selected Nye Lubricants, Inc. as its exclusive United States distributor of Prosil 52 M-20, a custom synthesized silicone fluid that combines the ability to withstand severe operating environments with superior wear prevention characteristics.

Developed and formerly marketed by General Electric, which licensed its manufacture to PCR, Prosil 52 M-20 is a chlorophenylpolysiloxane that offers excellent thermooxidative stability, minimum change in viscosity with temperature, and a broad serviceable temperature range from -70° C to +200° C. Further, because Prosil 52 M-20 is halogenated with chlorine, it provides good wear prevention characteristics for many metal combinations under boundary conditions, where other silicone fluids tend to be poor lubricants.

Prosil 52 M-20 meets Mil S-81087C, and is now distributed by Nye under the name Nyosil-M20.

"We ultra-filter Prosil 52 M-20 before packaging it as Nyosil-M20," said Nye Technical Director Paul Bessette, "but chemically the products are identical. PCR remains the 'qualified producer,' and Nye takes on the role of marketer."

Nye also offers PCR's non-Mil-spec version of the fluid under the name Nyosil-M25. Nyosil-M20 and Nyosil-M25 are both available in one quart plastic bottles and five gallon pails.

Nyosil-M20 and Nyosil-M25 are severe service fluids. They are intended for use in lubrication, hydraulic, damping, and related applications including: hydraulic systems and servomechanisms; crankcases and gear boxes for mechanical compressors; engines and pumps; lightly loaded ball, sleeve, and pivot bearings in precision instruments; electronic equipment and electrical motors; clocks and timing devices; and fluid transmissions.

Nye also formulates two greases with Nyosil. Nye NyoGel 781D, suitable for lightly to moderately loaded rolling element bearings, is a soft lithium soap-gelled grease serviceable from -70° C to +200° C. Nye Fluorocarbon Gel 813-1, one of a broad family of popular PTFE-thickened greases by Nye, is frequently used to meet the wide temperature and low starting torque requirements of potentiometers.

For technical data and evaluation samples of Nyosil-M20, Nyosil-M25, or their grease counterparts, call Nye at (508) 996-6721, or fax your request to Nye at (508) 997-5285.

## Nye Publishes Chapters on Grease and Aerospace Lubes

An excellent addition to an engineer's reference shelf is Synthetic Lubricants and High Performance Functional Fluids (Marcel Dekker, Inc., New York, 1993), written by 37 recognized experts. Paul Bessette, Nye's Technical Director, wrote the chapter on synthetic grease applications in the first edition. David Stone, Ph.D., Nye's Engineering Manager for New Products, has collaborated with Paul on the grease chapter for the second edition, updated to include the latest information on grease solvent dispersions, grease packaging, analytical testing methods, and technical references.

Paul and David also recently completed a chapter on aerospace lubricants for Space Vehicle Mechanisms: Elements of Successful Design, edited by Peter Conley, due to be published in late 1997 by John Wiley, Inc.



**Changing Names, Same Product.** Developed by General Electric Silicones as GE F-50, manufactured by PCR as Prosil 52 M-20, and distributed by Nye as Nyosil-M-20, this custom synthesized, Mil S-81087C silicone fluid offers good boundary lubrication at temperatures as low as -70° C. Evaluation samples are available from Nye.

## Nye Celebrates Its First 150 Years



The Last American Whale-Oil Company, A History of Nye Lubricants, Inc., 1844-1994, was publicly introduced at a lecture by the author, Ed Parr, at The New Bedford Whaling Museum on September 12, 1996.

Published by Nye, the 103-page, illustrated book traces the Company's gradual transformation from a whale-oil refinery in the nineteenth century to a manufacturer of synthetic lubricants.

Nye began its transition into the synthetic lubricant arena in the late 1950s, when it started purchasing synthetic lubricants in bulk from manufacturers, blending and repackaging them as a value-added service for companies that wanted smaller quantities. By the early 1970s, Nye had expanded its technical staff, and began custom formulation of lubricants for specific applications.

Today, Nye Lubricants works with OEMs, NASA, and the United States military to design and manufacture custom synthetic lubricants that improve the performance and operating life of highly engineered mechanical and electromechanical devices. Our customers, world-class design engineers and manufacturers, are found in nearly every major industry— from aviation, aerospace, automotive, and computers, to electronics, telecommunications, exercise equipment, and toys.

The Nye history book is sold through The Whaling Museum, 18 Johnny Cake Hill, New Bedford, MA 02740. Tel: (508) 997-0046.

## Synthetic Hydrocarbon Rivals PFPE for Space, Other Low Vapor Pressure Applications

At a technical conference about five years ago, an engineer from TRW, Inc. — the company that built rocket engines for the Apollo program, and more recently the communications systems for the first Milstar satellite — asked a researcher from Pennzoil Products Company if they could develop a synthetic hydrocarbon lubricant with a vapor pressure comparable to the vapor pressure of linear perfluorinated polyethers.

Low vapor pressure is an important requirement for lubricants in the vacuum of space, since volatility can be a significant factor in lubricant loss. For base fluids with very low vapor pressure, linear perfluoroethers were, far and away, the leading choice.

While linear perfluoropolyethers offer several qualities that have made them the preferred lubricant in space — low vapor pressure, very low pour points, thermal stability, to name three — they tend to degrade under boundary lubrication conditions with several commonly used bearing materials. That could jeopardize critical components in aerospace devices, and the mission itself. An alternative synthetic hydrocarbon oil with comparable low vapor pressure would at least open the door to new lubricant formulations designed specifically for boundary conditions.

Two years later, Pennzoil met the challenge. They introduced Pennzane® X-2000, an unformulated multiply-alkylated cyclopentane base oil with a 25°C Vapor Pressure of 3.5 x 10<sup>-11</sup> Torr. Pennzoil then began working with Nye Lubricants to develop commercial applications for their new synthetic material.

"Pennzoil did an admirable job of bringing a new commercial product to the marketplace," says Nye's Technical Director Paul Bessette, who is guiding the commercial development of the new oil at Nye. "There

was nothing that even approached the linear perfluorinated ethers in terms of vapor pressure and suitability in rolling element bearings. With this alternative material, there's new optimism about having spacecraft operate longer than they did in the past."

Lubricant migration is one common problem posed by most fluorinated oils that can be overcome with Pennzane X-2000. Though incompatible with fluorinated oils, NyeBar® barrier film can be used with Pennzane X-2000. By coating the inner and outer race faces, shields, shims, shield retainers, and retaining rings with NyeBar, the lubricant can be better contained within the raceway.

Nye distributes worldwide the unformulated Pennzane X-2000 base oil under the name Nye Synthetic Oil 2001A. We also offer Synthetic Oil 2001, a fortified version with boundary lubricants for improved film strength. Our Rheolube 2000 is a sodium-soap grease companion to Synthetic Oil 2001. The temperature range for each product is -45°C to 125°C. Currently, about 20 customers use the product in aerospace applications.



***Lubricant migration is one common problem posed by most fluorinated oils that can be overcome with Pennzane® X-2000.***

"This oil is also a viable candidate for disk drive bearings," Paul added, "where low volatility reduces the risk of contaminating the media. We look forward to working with disk drive manufacturers and other companies who want to explore how Pennzane X-2000 may serve their lubrication needs."

**Nye**<sup>®</sup>  
LUBRICANTS

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