



## ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

GREASE, HIGH TEMPERATURE, ANTI-FRICTION,  
LITHIUM HYDROXY TYPE

ESA-M1C165-A

### 1. SCOPE

The material defined by this specification is an NLGI No. 3 grade, quiet running, long life, high temperature lubricant containing lithium complex soap thickener. The lubricant operating temperatures range from - 40 C to + 176 C.

### 2. APPLICATION

This specification was released originally for grease used to lubricate clutch bearings.

### 3. REQUIREMENTS

#### 3.1 STATISTICAL PROCESS

Suppliers must conform to the requirements of Ford Quality System Standard Q-101. A mutually acceptable Control Plan as described therein is required for material/source approval. Appropriate statistical tools must be used to analyze process/product data so that variation in the final product is continuously reduced.

#### 3.2 INFRARED SPECTROPHOTOMETRY AND/OR THERMAL ANALYSIS

Ford Motor Company, at its option, may conduct infrared and/or thermal analysis of material/parts supplied to this specification. The IR spectra and thermograms established for initial approval shall constitute the reference standard and shall be kept on file at the designated material laboratory. All samples shall produce IR spectra and thermograms that correspond to the reference standard when tested under the same conditions.

#### 3.3 CONDITIONING AND TEST CONDITIONS

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

#### 3.4 COLOR

Green

#### 3.5 ODOR

Not unpleasant

#### 3.6 TEXTURE

Smooth, buttery

| Date       | Release No.           | Release/Revision                        |
|------------|-----------------------|-----------------------------------------|
| 1991-12-06 | NEO-E<br>10127076-033 | Revised, Renumbered & Updated R. Romano |
| 1979 01 10 | CAH2823385            | Metricated and Retyped                  |
| 1975 10 19 | AC2-58                | Released E.P.F.                         |

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- 3.7 BASE Lithium complex
- 3.7.1 Soap, Expressed as 12-Hydroxy Stearic Acid (ASTM D 128) 12 - 17 %
- 3.8 MINERAL OIL REQUIREMENTS (After extraction by ASTM D 128)
- 3.8.1 Viscosity at 40 +/- 2 C (ASTM D 445, 100 +/- 2 C, Method II) 108 - 151 mm<sup>2</sup>/s  
10 - 18 mm<sup>2</sup>/s
- 3.8.2 Flash Point, min (ASTM D 92) 233 C
- 3.9 PERFORMANCE REQUIREMENTS
- 3.9.1 Penetration, mm/10 (ASTM D 217)
- Worked 60 strokes 200 - 250  
Worked 10E5 strokes, change from 60 strokes + 45 max
- 3.9.2 Dropping Point, min (ASTM D 566) 260 C
- 3.9.3 Rust Test Rating (ASTM D 1743) 1, 1, 1
- 3.9.4 Water Washout, max (ASTM D 1264) 8 %
- 3.9.5 Oil Separation, by weight, max (ASTM D 1742) 6 %
- 3.9.6 Wheel Bearing Leakage Loss, max (FLTM BJ 113-03) 3 g
- 3.9.7 Oxidation Stability, Pressure Drop, max (ASTM D 942, 500 h) 103 kPa
- 3.9.8 Timken OK Load, min (ASTM D 2509) 4.5 kg
- 3.10 SUPPLIER'S RESPONSIBILITY

All materials supplied to this specification must be equivalent in all characteristics to the material upon which approval was originally granted.