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(JGI/JSA)

Lubricating grease

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee, as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Grease Institute (JGI)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS K 2220 : 1993** is replaced with this Standard.

This revision has been made based on **ISO 2137 : 1985** *Petroleum products—Lubricating grease and petrolatum—Determination of cone penetration*, **ISO 2176 : 1995** *Petroleum products—Lubricating grease—Determination of dropping point*, **ISO 11009 : 2000** *Petroleum products and lubricants—Determination of water washout characteristics of lubricating greases* and **ISO 6743-9 : 2003** *Lubricants, industrial oils and related products (class L)—Classification—Part 9 : Family X (Greases)* for the purposes of making it easier to compare this Standard with International Standards; to prepare Japanese Industrial Standard conforming with International Standards; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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the original JIS is to be the final authority.

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Lubricating grease

Introduction This Japanese Industrial Standard has been prepared based on the second edition of **ISO 2137** *Petroleum products—Lubricating grease and petrolatum—determination of cone penetration* published in 1985 for the test method for cone penetration, the second edition of **ISO 2176** *Petroleum products—Lubricating grease—Determination of dropping point* published in 1995 for the test method for dropping point and the first edition of **ISO 11009** *Petroleum products and lubricants—Determination of water washout characteristics of lubricating greases* published in 2000 for the test method for water washout resistance respectively, with some modifications in technical contents. Annex 1 (normative) has been prepared based on the second edition of **ISO 6743-9** *Lubricants, industrial oils and related products (class L)—Classification—Part 9 : Family X (Greases)* published in 2003 without modifying the technical contents.

Portions sidelined or underlined with dots are the matters modified from the original International Standards. The list of modification with its explanation is given in annex 6 (informative).

1 Scope This Standard specifies the lubricating grease (including gear compound) to be mainly used as the lubricants for various kinds of machine parts.

- Remarks**
- 1 The use of this Standard may involve hazardous materials, operations and equipment. This Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.
 - 2 The International Standards corresponding to this Standard are as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

ISO 2137 : 1985 *Petroleum products—Lubricating grease and petrolatum—Determination of cone penetration* (MOD)

ISO 2176 : 1995 *Petroleum products—Lubricating grease—Determination of dropping point* (MOD)

ISO 11009 : 2000 *Petroleum products and lubricants—Determination of water washout characteristics of lubricating greases* (MOD)

ISO 6743-9 : 2003 *Lubricants, industrial oils and related products (class L)—Classification—Part 9 : Family X (Greases)* (MOD)

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS B 1521 *Rolling bearings—Deep groove ball bearings*
- JIS B 7410 *Liquid-in-glass thermometers for testing of petroleum product*
- JIS B 7505 *Bourdon tube pressure gauges*
- JIS G 3459 *Stainless steel pipes*
- JIS G 4051 *Carbon steels for machine structural use*
- JIS G 4105 *Chromium molybdenum steels*
- JIS G 4303 *Stainless steel bars*
- JIS G 4305 *Cold rolled stainless steel plates, sheets and strip*
- JIS H 3100 *Copper and copper alloy sheets, plates and strips*
- JIS H 3250 *Copper and copper alloy rods and bars*
- JIS K 0557 *Water used for industrial water and wastewater analysis*
- JIS K 1101 *Oxygen*
- JIS K 2238 *Machine oils*
- JIS K 2246 *Rust preventive oils*
- JIS K 2251 *Crude petroleum and petroleum products—Sampling*
- JIS K 2265 *Crude oil and petroleum products—Determination of flash point*
- JIS K 2275 *Crude oil and petroleum products—Determination of water content*
- JIS K 2283 *Crude petroleum and petroleum products—Determination of kinematic viscosity and calculation of viscosity index from kinematic viscosity*
- JIS K 2513 *Petroleum products—Corrosiveness to copper—Copper strip test*
- JIS K 2519 *Lubricating oil—Testing methods for load carrying capacity*
- JIS K 6323 *Classical V belts for power transmission*
- JIS K 8034 *Acetone*
- JIS K 8102 *Ethanol (95)*
- JIS K 8594 *Petroleum benzine*
- JIS R 6111 *Artificial abrasives*
- JIS R 6251 *Abrasive cloths*
- JIS R 6252 *Abrasive papers*
- JIS Z 8401 *Guide to the rounding of numbers*
- JIS Z 8402-6 *Accuracy (trueness and precision) of measurement methods and results—Part 6 : Use in practice of accuracy values*
- JIS Z 8801-1 *Test sieves—Part 1 : Test sieves of metal wire cloth*

3 Definitions For the purposes of this Standard, the following definitions apply.

- a) **grease** a solid or semisolid matter produced by dispersing a thickener in base oil. It may contain other components to give special properties
- b) **gear compound** a matter produced by dissolving or dispersing a viscous substance such as asphalt in mineral oil. It is principally used for the lubricants for open gear and may contain other components to give special properties.
- c) **base oil** refined mineral oil, synthetic lubricating oil and their mixed oil to be the raw material for lubricating grease
- d) **thickener** a matter to make raw material a semi solid or solid state by being dispersed in base oil in colloidal state. Thickeners are mainly classified into two types metallic soap type and non-soap type. The former is represented by metallic soaps of lithium, calcium, sodium and others and the latter by inorganic compounds such as bentonite, silica gel, and organic compounds such as urea derivatives, phthalocyanine. The performance of grease greatly depend upon the type of thickener used.
- e) **water resistance** the performance to withstand without any adverse influence on the performance of grease when contacted with moisture or water in practical use
- f) **mechanical stability** the performance to resist the change in hardness when subjected to a mechanical shearing force on grease. It is also called shearing stability.
- g) **pressure feeding property** the fluidity performance of grease when it is fed under pressure through the piping, nozzle and accessories of a lubricating system
- h) **load carrying capacity** the maximum load or pressure under which lubrication can continue without causing defects such seizure or fusion on the bearing or the sliding surface when a lubricant is used under the specified conditions
- i) **cone penetration** the distance that a standard cone penetrates into a test portion under standardized conditions of load, time and temperature. It is expressed in units of 0.1 mm.
- j) **working** the subjection of a lubricating grease to the shearing action of a grease worker
- k) **worked penetration** the cone penetration of a test portion after it has been subjected to a defined number of strokes in a grease worker
- l) **unworked penetration** the cone penetration of a test portion which has received only minimum disturbance in transfer from the sample container to the cup of grease worker
- m) **prolonged worked penetration** the cone penetration of a test portion which has been worked more than the defined number of strokes