Downloaded from http://www.everyspec.com

METRIC
A-A-59354
April 6, 2000
SUPERSEDING
MIL-H-46001D
7 December 1989

COMMERCIAL ITEM DESCRIPTION

HYDRAULIC FLUIDS, PETROLEUM BASE, FOR MACHINE TOOLS

The General Services Administration has authorized the use of this commercial item description, for all federal agencies.

1. SCOPE. This specification covers four grades of petroleum-based hydraulic fluids, hereafter referred to as "fluid". This product is intended for use in hydraulic systems of metalworking machine tools that require anti-wear oils.

2 CLASSIFICATION.

2.1 Grades. The fluid shall conform to the following viscosity grades:

Grade 1 – ISO VG 32
Grade 2 – ISO VG 46
Grade 3 – ISO VG 68
Grade 4 – ISO VG 150

3. SALIENT CHARACTERISTICS

3.1 Materials. The fluids shall be derived from petroleum fractions, but may contain additives to meet all of the salient characteristics.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any other data which may improve this document should be sent by letter to: U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/IE, Warren, MI 48397-5000.

ASMC N/A FSC 9150

DISTRIBUTION STATEMENT A. Approved for public release, distribution is unlimited.

Downloaded from http://www.everyspec.com

3.2 Viscosity. The fluid shall have a viscosity at 40 degrees Celsius (°C) as follows when tested in accordance with (IAW) ASTM D 445:

Grade 1 – between 28.8 and 35.2 square millimeter per second (mm^2/s)
Grade 2 – between 41.4 and 50.6 mm^2/s
Grade 3 – between 61.2 and 74.8 mm^2/s
Grade 4 – between 135 and 165 mm^2/s

The fluid viscosity index shall not be less than 90 when tested IAW ASTM D 2270.

3.3 Low-temperature use. Fluid grades 1, 2, and 3 shall have a pour point not greater than -12°C, and fluid grade 4 shall have a pour point not greater than –6°C when tested IAW ASTM D 97.

3.4 Fire safety. The fluid shall have flash and fire points not less than the following when tested IAW ASTM D 56.

	Grade 1	Grade 2	Grade 3	Grade 4
Flash point (in °C)	188	196	196	221
Fire point (in °C)	216	218	218	246

3.5 Protection from hydraulic cavitation. The fluid shall produce no greater than 100 milliliters (mL) of foam after the 10-minute settling periods of both the first and second 24°C tests, and no greater than 25 mL of foam after the 10-minute settling period of the 93.5°C test when tested IAW ASTM D 892.

3.6 Wear protection.

3.6.1 Pump wear test (Grades 1, 2 and 3 only). The fluid shall have wear characteristics that provide a pump ring and vane weight loss of not greater than 50 milligrams (mg) when tested IAW ASTM D 2882.

3.6.2 Galvanic corrosion. The fluid shall pass Method 5322 of FED-STD-791.

3.6.3 Rust prevention. The fluid shall pass Procedure A of ASTM D 665.

3.6.4 Neutralization number. Fluid grades 1, 2, and 3 shall have a weak acid neutralization number not greater than 1.5 and fluid grade 4 shall have a weak acid neutralization number less than 0.2 when tested IAW ASTM D 664.

3.7 Fluid quality. The fluid shall have an ASTM color that conforms to the following limits when tested IAW ASTM D 1500:

Grade 1 - not more than 2.0
Grade 2 - not more than 3.0
Grade 3 - not more than 3.0
Grade 4 - not more than 5.0

Downloaded from http://www.everyspec.com

3.8 Toxicity. The fluid shall not present a health hazard when used as intended (see 1). Questions on toxicity shall be referred by the procuring activity to the appropriate departmental medical service.

4. REGULATORY REQUIREMENTS. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

5. PRODUCT CONFORMANCE. The products provided shall meet the salient characteristics of this CID, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace. The Government reserves the right to require proof of such conformance (see 7.3).

5.1 Market acceptance. The fluid offered shall be certified that it meets a machine tool manufacturers quality requirements for use in its machine tools. A machine tool manufacturer is one that has been producing machine tools for commercial sale for at least the last 5 consecutive years.

6. PACKAGING. The innermost containers of this product shall have the specification number (A-A-59354) and grade clearly labeled (see 2.1). Additional preservation, marking and packaging shall be as specified in the contract or order (see 7.3).

7. NOTES

7.1 Part or Identification Number (PIN). The following PIN procedure is for Government purposes and does not constitute a requirement for the contractor. The PINs to be used for hydraulic fluids acquired to this CID are created as follows (see 7.3):

AA59354 - XX

Dash number (see table II).
Example: 01

CID number.

Downloaded from http://www.everyspec.com

TABLE II. National stock numbers and dash numbers.

Dash number	Grade	Container	National stock number
01	1	5 gallon can (CN)	9150-00-966-8830
02	1	55 gallon drum (DR)	9150-00-966-8831
03	2	55 gallon drum (DR)	9150-00-966-8833
04	2	5 gallon can (CN)	9150-00-966-8834
05	3	5 gallon can (CN)	9150-00-966-8832
06	3	55 gallon drum (DR)	9150-00-966-8835
07	4	5 gallon can (CN)	9150-00-966-8836
08	4	55 gallon drum (DR)	9150-00-966-8837

7.2 Source of documents.

7.2.1 The Code of Federal Regulations (CFR) may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 or at their Website www.access.gpo.gov/nara/cfr/cfr-table-search.html.

7.2.2 FED-STD-791 "Lubricants, Liquid Fuels, and Related Products; Methods of Testing" may be obtained from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

7.2.3 ASTM D56 "Standard Test Method for Flash Point by Tag Closed Tester (DoD Adopted)"; ASTM D97 "Standard Test Method for Pour Point of Petroleum Products (DoD Adopted)"; ASTM D445 "Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity) (DoD Adopted)"; ASTM D664 "Standard Test Method for Acid Number of Petroleum Products by Potentiometric Titration British Standard 4457 (DoD Adopted)"; ASTM D665 "Standard Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water (DoD Adopted)"; ASTM D892 "Standard Test Method for Foaming Characteristics of Lubricating Oils (DoD Adopted)"; ASTM D1500 "Standard Test Method for ASTM Color of Petroleum Products (ASTM Color Scale) (DoD Adopted)"; ASTM D2270 "Standard Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 and 100 Degrees C (DoD Adopted)"; and ASTM D2882 "Standard Test Method for Indicating the Wear Characteristics of Petroleum and Non-Petroleum Hydraulic Fluids in a Constant Volume Vane Pump (DoD Adopted)" are available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or at their Website www.astm.org.

7.3 Ordering data. The contract or order should specify the following:

a. CID document number, revision, and CID PIN (see 7.1).
b. Product conformance provisions (see 5).
c. Packaging requirements (see 6).

Downloaded from http://www.everyspec.com

7.4 Key word.

Anti-wear oils

7.5 Material Safety Data Sheets (MSDS). Contracting officers should identify those activities requiring copies of completed MSDSs prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in FED-STD-313; and 29 CFR 1910.1200 requires that the MSDS for each hazardous chemical used in an operation must be readily available to personnel using the material. Contracting officers will identify the activities requiring copies of the MSDS.

7.6 Equivalent specifications. If the fluid is already known to pass the following, it should be considered acceptable. The specification numbers below are taken from the Special Manual, Lubricants Purchase Specifications, Approved Products, Publication Number 10-SP-80160 by the Cincinnati Milacron Marketing Company.

A-A-59354 grade	Cincinnati Milacron Specification Number
1	P-68
2	P-70
3	P-69
4	P-54

NOTE: This information is included because these are the industry-accepted standards in the machine tool lubricant industry.

MILITARY INTERESTS:

Custodians:
Army - AT
Navy - AS
Air Force - 68

Review Activities:
Army - AV, MD, SM
Navy - MC1, OS, SA, SH
DLA - GS, PS
NSA - NS

CIVIL AGENCY COORDINATING ACTIVITY:
GSA-FSS

Preparing Activity:
Army - AT

(Project 9150-1240)