

Viscosity & Flash Point Standards

For Reference, Validation, and Calibration

Since 1938 CANNON Instrument Company has been a leader in viscosity measurement. We provide a broad range of viscosity standards and flash point reference materials to customers across various industries. Our standards calibrate and verify the performance of glass capillary viscometers, automated kinematic viscometers, rotational viscometers, falling ball viscometers, cup viscometers and flash point testers.

Viscosity Reference Standards

- General Purpose
- High Viscosity
- High Temperature (HTHS)
- Low Temperature (TESC, CCS, CMRV)
- SimpleVIS®
- Silicone
- Tapered Bearing Simulator
- Thomas®-Stormer®
- Flow Cup

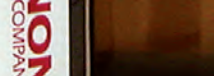
Certified Viscosity Check Oils

Flash Point Reference Materials



| | |
|---|--------------------------------------|
|  Standard Conforming to ASTM Oil Standard CERTIFIED VISCOSITY REFERENCE STANDARD <small>All data are traceable to the National Institute for Standards and Technology</small> | |
| Mfg. Date: 4/6/05 | Use Before: 4/30/08 |
|  Standard Conforming to ASTM Oil Standard CERTIFIED VISCOSITY REFERENCE STANDARD <small>All data are traceable to the National Institute for Standards and Technology</small> | |
| Mfg. Date: 4/6/05 | Use Before: 4/30/08 |
| Viscosity Salt: S90 | Net Contents: 0.47 Liter (1 Pint) |
| Lot Number: 06301 | |

| | |
|---|---------------------------------------|
|  Standard Conforming to ASTM Oil Standard CERTIFIED VISCOSITY REFERENCE STANDARD <small>All data are traceable to the National Institute for Standards and Technology</small> | |
| Mfg. Date: 4/6/05 | Use Before: 4/30/08 |
| Viscosity Salt: S90 | Net Contents: 0.95 Liter (1 Quart) |
| Lot Number: 06301 | |
| Temperature °C | °F |
| 20.00 | 68.00 |
| 25.00 | 77.00 |
| 30.00 | 86.00 |
| 35.00 | 95.00 |
| 40.00 | 104.00 |
| 45.00 | 113.00 |
| 50.00 | 122.00 |
| 55.00 | 131.00 |
| 60.00 | 140.00 |
| 65.00 | 149.00 |
| 70.00 | 158.00 |
| 75.00 | 167.00 |
| 80.00 | 176.00 |
| 85.00 | 185.00 |
| 90.00 | 194.00 |
| 95.00 | 203.00 |
| 100.00 | 212.00 |
| 105.00 | 221.00 |
| 110.00 | 230.00 |
| 115.00 | 239.00 |
| 120.00 | 248.00 |
| 125.00 | 257.00 |
| 130.00 | 266.00 |
| 135.00 | 275.00 |
| 140.00 | 284.00 |
| 145.00 | 293.00 |
| 150.00 | 302.00 |
| 155.00 | 311.00 |
| 160.00 | 320.00 |
| 165.00 | 329.00 |
| 170.00 | 338.00 |
| 175.00 | 347.00 |
| 180.00 | 356.00 |
| 185.00 | 365.00 |
| 190.00 | 374.00 |
| 195.00 | 383.00 |
| 200.00 | 392.00 |
| 205.00 | 401.00 |
| 210.00 | 410.00 |
| 215.00 | 419.00 |
| 220.00 | 428.00 |
| 225.00 | 437.00 |
| 230.00 | 446.00 |
| 235.00 | 455.00 |
| 240.00 | 464.00 |
| 245.00 | 473.00 |
| 250.00 | 482.00 |
| 255.00 | 491.00 |
| 260.00 | 500.00 |
| 265.00 | 509.00 |
| 270.00 | 518.00 |
| 275.00 | 527.00 |
| 280.00 | 536.00 |
| 285.00 | 545.00 |
| 290.00 | 554.00 |
| 295.00 | 563.00 |
| 300.00 | 572.00 |
| 305.00 | 581.00 |
| 310.00 | 590.00 |
| 315.00 | 599.00 |
| 320.00 | 608.00 |
| 325.00 | 617.00 |
| 330.00 | 626.00 |
| 335.00 | 635.00 |
| 340.00 | 644.00 |
| 345.00 | 653.00 |
| 350.00 | 662.00 |
| 355.00 | 671.00 |
| 360.00 | 680.00 |
| 365.00 | 689.00 |
| 370.00 | 698.00 |
| 375.00 | 707.00 |
| 380.00 | 716.00 |
| 385.00 | 725.00 |
| 390.00 | 734.00 |
| 395.00 | 743.00 |
| 400.00 | 752.00 |
| 405.00 | 761.00 |
| 410.00 | 770.00 |
| 415.00 | 779.00 |
| 420.00 | 788.00 |
| 425.00 | 797.00 |
| 430.00 | 806.00 |
| 435.00 | 815.00 |
| 440.00 | 824.00 |
| 445.00 | 833.00 |
| 450.00 | 842.00 |
| 455.00 | 851.00 |
| 460.00 | 860.00 |
| 465.00 | 869.00 |
| 470.00 | 878.00 |
| 475.00 | 887.00 |
| 480.00 | 896.00 |
| 485.00 | 905.00 |
| 490.00 | 914.00 |
| 495.00 | 923.00 |
| 500.00 | 932.00 |
| 505.00 | 941.00 |
| 510.00 | 950.00 |
| 515.00 | 959.00 |
| 520.00 | 968.00 |
| 525.00 | 977.00 |
| 530.00 | 986.00 |
| 535.00 | 995.00 |
| 540.00 | 1004.00 |
| 545.00 | 1013.00 |
| 550.00 | 1022.00 |
| 555.00 | 1031.00 |
| 560.00 | 1040.00 |
| 565.00 | 1049.00 |
| 570.00 | 1058.00 |
| 575.00 | 1067.00 |
| 580.00 | 1076.00 |
| 585.00 | 1085.00 |
| 590.00 | 1094.00 |
| 595.00 | 1103.00 |
| 600.00 | 1112.00 |
| 605.00 | 1121.00 |
| 610.00 | 1130.00 |
| 615.00 | 1139.00 |
| 620.00 | 1148.00 |
| 625.00 | 1157.00 |
| 630.00 | 1166.00 |
| 635.00 | 1175.00 |
| 640.00 | 1184.00 |
| 645.00 | 1193.00 |
| 650.00 | 1202.00 |
| 655.00 | 1211.00 |
| 660.00 | 1220.00 |
| 665.00 | 1229.00 |
| 670.00 | 1238.00 |
| 675.00 | 1247.00 |
| 680.00 | 1256.00 |
| 685.00 | 1265.00 |
| 690.00 | 1274.00 |
| 695.00 | 1283.00 |
| 700.00 | 1292.00 |
| 705.00 | 1301.00 |
| 710.00 | 1310.00 |
| 715.00 | 1319.00 |
| 720.00 | 1328.00 |
| 725.00 | 1337.00 |
| 730.00 | 1346.00 |
| 735.00 | 1355.00 |
| 740.00 | 1364.00 |
| 745.00 | 1373.00 |
| 750.00 | 1382.00 |
| 755.00 | 1391.00 |
| 760.00 | 1400.00 |
| 765.00 | 1409.00 |
| 770.00 | 1418.00 |
| 775.00 | 1427.00 |
| 780.00 | 1436.00 |
| 785.00 | 1445.00 |
| 790.00 | 1454.00 |
| 795.00 | 1463.00 |
| 800.00 | 1472.00 |
| 805.00 | 1481.00 |
| 810.00 | 1490.00 |
| 815.00 | 1499.00 |
| 820.00 | 1508.00 |
| 825.00 | 1517.00 |
| 830.00 | 1526.00 |
| 835.00 | 1535.00 |
| 840.00 | 1544.00 |
| 845.00 | 1553.00 |
| 850.00 | 1562.00 |
| 855.00 | 1571.00 |
| 860.00 | 1580.00 |
| 865.00 | 1589.00 |
| 870.00 | 1598.00 |
| 875.00 | 1607.00 |
| 880.00 | 1616.00 |
| 885.00 | 1625.00 |
| 890.00 | 1634.00 |
| 895.00 | 1643.00 |
| 900.00 | 1652.00 |
| 905.00 | 1661.00 |
| 910.00 | 1670.00 |
| 915.00 | 1679.00 |
| 920.00 | 1688.00 |
| 925.00 | 1697.00 |
| 930.00 | 1706.00 |
| 935.00 | 1715.00 |
| 940.00 | 1724.00 |
| 945.00 | 1733.00 |
| 950.00 | 1742.00 |
| 955.00 | 1751.00 |
| 960.00 | 1760.00 |
| 965.00 | 1769.00 |
| 970.00 | 1778.00 |
| 975.00 | 1787.00 |
| 980.00 | 1796.00 |
| 985.00 | 1805.00 |
| 990.00 | 1814.00 |
| 995.00 | 1823.00 |
| 1000.00 | 1832.00 |

| | |
|---|--------------------------------------|
|  Standard Conforming to ASTM Oil Standard CERTIFIED VISCOSITY REFERENCE STANDARD <small>All data are traceable to the National Institute for Standards and Technology</small> | |
| Mfg. Date: 4/6/05 | Use Before: 4/30/08 |
| Viscosity Salt: S90 | Net Contents: 0.47 Liter (1 Pint) |
| Lot Number: 06301 | |

| | |
|---|--------------------------------------|
|  Standard Conforming to ASTM Oil Standard CERTIFIED VISCOSITY REFERENCE STANDARD <small>All data are traceable to the National Institute for Standards and Technology</small> | |
| Mfg. Date: 4/6/05 | Use Before: 4/30/08 |
| Viscosity Salt: S90 | Net Contents: 0.47 Liter (1 Pint) |
| Lot Number: 06301 | |

CANNON Viscosity & Flash Point Standards

Quality/Traceability

Use of high quality standards and reference materials ensures test reliability and accuracy. This is why the National Institute of Standards and Technology (NIST) delegated responsibility to CANNON for U.S. national standards for certified liquid viscosity reference standards in 2003.

All CANNON viscosity standards are traceable to a NIST calibration and prepared in our ISO 9001-registered, A2LA-accredited laboratory. CANNON Instrument Company holds ISO/IEC 17025 and Guide 34 accreditation (certificates 1262.01 and 1262.02) from A2LA for competency in manufacture and certification of reference materials. ISO/IEC 17025 accreditation further demonstrates our technical competence in calibration including the determination of kinematic and dynamic viscosity of standards as well as viscosity certification of customer samples. CANNON performs calibrations using the master viscometer procedures detailed in ASTM D2162.

Formulation

Most CANNON viscosity standards are hydrocarbon oils produced from mineral oil base stocks, polyalphaolefins, or polybutenes but silicone standards are also available for the calibration of rotational viscometers. Because most CANNON viscosity standards are Newtonian liquids, their viscosity is independent of shear stress or shear rate. However, "viscous heating" may cause high viscosity standards to appear non-Newtonian by effectively lowering their viscosity when measured at high shear rates.

CANNON flash point standards in the lower flash point range are made from high purity alkane

materials. Those in the higher flash point range are made from narrow distributions of decane oligomers.

Custom Blends and Added Temperatures

To meet customer-specific needs, CANNON offers testing at additional temperatures for many of our standards. Contact us for additional information and pricing. We can also blend custom standards to your temperature and viscosity specifications. CANNON custom standards are subject to the same stringent quality control as stock standards listed in our catalog. When ordering custom standards please state the acceptable kinematic or dynamic viscosity range and temperature(s) required. Also specify whether density data is required. Custom standards are quoted based on customer-specific formulation and testing requirements. Standards will be blended within $\pm 5\%$ of the customer



A Note Regarding Values Provided in This Document

The tables on the following pages provide nominal viscosity and flash point values for standards and reference materials supplied by CANNON Instrument Company. Actual values, provided with each standard, may vary slightly from lot to lot. Formulations are also subject to change. If your application requires close conformity with published nominal values, please contact CANNON to obtain the actual viscosity values associated with the current formulation.

CANNON Viscosity & Flash Point Standards

Container Sizes

The default container size for CANNON viscosity standards is a 500 mL (pint) bottle but other container sizes are also available. The table below indicates a suffix that is appended to the base catalog number to designate a particular container size when ordering. EXAMPLE: The catalog number/suffix combination for an N35 General Purpose Viscosity Standard (catalog #9727-C37) in a 1 liter container (suffix # .032) is 9727-C37.032.

Catalog # Suffix for Container Sizes

| U.S. Customary Units | Approximate Metric Unit Equivalent* | Catalog # Suffix |
|----------------------|-------------------------------------|------------------|
| 4 oz. Size | 120 mL | .004 |
| Pint Size | 500 mL | .016 |
| Quart Size | 1 L | .032 |
| Gallon Size | 4 L | .128 |
| 5-Gallon Size | 20 L | .500 |

*NOTE: Conversions from U.S. customary units to metric units are approximate.

Default container sizes for Certified Viscosity Check Oils are 1 L (quart) and 3.8 L (gallon). Default container sizes for Flash Point Reference Materials and Silicone Viscosity Standards are 200 mL and 500 mL respectively.

CANNON Bath Oils

In addition to viscosity standards, CANNON also supplies a wide selection of silicone bath oils. Silicone bath oils are clear, colorless liquids that can be used as heat transfer media in CANNON automated viscometers and some high-temperature CANNON baths where IBF fluid is not effective. Three viscosity grades of silicone bath fluid are available for different temperature/viscosity ranges. 10 cSt oil is recommended for use from 25 to 100 °C. 20 cSt oil is recommended for use from 80 °C to 135 °C. 50 cSt oil is recommended for use from 135 °C to 150 °C. IBF is an ideal bath oil for CANNON heated baths with applications at ambient temperature and above. IBF Bath Oil contains an oxidation inhibitor which reduces tendency to darken at higher temperatures. Viscosity is 36 cSt at 40 °C, 5.6 cSt at 100 °C. This bath oil is recommended only for applications below 135 °C (275 °F).



CANNON General Purpose Viscosity Standards

ASTM D445/D446

Tables 1-3 provide nominal values for kinematic viscosity in mm²/s (cSt), dynamic viscosity in mPa·s (cP) and density in g/mL for CANNON General Purpose Viscosity Standards. All CANNON General Purpose Viscosity Standards meet the precision specifications of ASTM D445/D446 and ISO 3104/3105. Lot specific data is provided with each standard.

Table 1 • Nominal Kinematic Viscosity Values of General Purpose Viscosity Standards in mm²/s (cSt)

| Catalog Number | Viscosity Standard | -40 °C/ -40 °F | -20 °C/ -4 °F | 20 °C/ 68 °F | 25 °C/ 77 °F | 37.78 °C/ 100 °F | 40 °C/ 104 °F | 50 °C/ 122 °F | 60 °C/ 140 °F | 80 °C/ 176 °F | 98.89 °C/ 210 °F | 100 °C/ 212 °F | SUS 100 °F | SUS 210 °F | SFS 122 °F |
|----------------|--------------------|-------------------|------------------|-----------------|-----------------|---------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|---------------|---------------|---------------|
| 9727-C10 | N.4† | — | — | 0.47 | 0.45 | 0.41 | 0.40 | — | — | — | — | — | — | — | — |
| 9727-C15 | N.8† | — | — | 0.74 | 0.70 | 0.61 | 0.60 | — | — | — | — | — | — | — | — |
| 9727-C20 | N1.0† | — | 2.5 | 1.3 | 1.2 | 1.0 | 0.97 | 0.91 | — | — | — | — | — | — | — |
| 9727-C22 | N2 | — | — | 2.9 | 2.6 | 2.1 | 2.0 | 1.7 | — | 1.1 | 0.95 | 0.93 | — | — | — |
| 9727-C25 | S3 | 80 | — | 4.6 | 4.0 | 3.0 | 2.9 | 2.4 | — | 1.5 | 1.2 | 1.2 | — | — | — |
| 9727-C27 | N4 | — | — | 6.7 | 5.8 | 4.2 | 4.0 | 3.2 | — | 1.9 | 1.5 | 1.5 | — | — | — |
| 9727-C30 | S6 | — | — | 11 | 8.9 | 6.0 | 5.7 | 4.4 | — | 2.4 | 1.8 | 1.8 | — | — | — |
| 9727-C31 | N7.5 | — | — | 14 | 12 | 8.0 | 7.5 | 5.8 | — | 3.1 | 2.3 | 2.3 | — | — | — |
| 9727-C32 | N10 | — | — | 21 | 17 | 11 | 10 | 7.3 | — | 3.5 | 2.5 | 2.4 | — | — | — |
| 9727-C34 | N14 | 1,700 | — | 30 | 25 | 15 | 14 | 10 | — | 5.0 | 3.5 | 3.4 | — | — | — |
| 9727-C35 | S20 | — | — | 44 | 34 | 20 | 18 | 13 | — | 5.6 | 3.9 | 3.8 | 100 | — | — |
| 9727-C36 | N26 | — | — | 57 | 46 | 27 | 25 | 18 | — | 7.9 | 5.3 | 5.2 | 130 | — | — |
| 9727-C37 | N35 | — | — | 87 | 66 | 35 | 32 | 21 | — | 8.5 | 5.4 | 5.3 | 170 | — | — |
| 9727-C38 | N44 | — | — | 110 | 86 | 48 | 44 | 30 | — | 12 | 7.7 | 7.5 | 220 | — | — |
| 9727-C40 | S60 | — | — | 160 | 120 | 60 | 54 | 35 | — | 12 | 7.7 | 7.5 | 280 | — | — |
| 9727-C41 | N75 | — | — | 200 | 150 | 82 | 75 | 50 | — | 19 | 12 | 12 | 380 | — | — |
| 9727-C42 | N100 | — | — | 330 | 230 | 110 | 97 | 60 | — | 19 | 11 | 11 | 500 | — | — |
| 9727-C43 | N140 | — | — | 400 | 300 | 160 | 140 | 90 | — | 31 | 19 | 18 | 720 | — | — |
| 9727-C45 | S200 | — | — | 550 | 410 | 200 | 180 | 120 | — | 40 | 24 | 23 | 950 | 112 | — |
| 9727-C46 | N250 | — | — | 770 | 570 | 280 | 250 | 160 | — | 51 | 30 | 29 | 1,300 | 140 | — |
| 9727-C47 | N350 | — | — | 970 | 710 | 350 | 310 | 190 | — | 60 | 34 | 32 | 1,620 | 160 | — |
| 9727-C48 | N415 | — | — | 1,400 | 990 | 470 | 420 | 250 | — | 77 | 43 | 41 | 2,180 | 200 | — |
| 9727-C50 | S600 | — | — | 1,740 | 1,200 | 600 | 520 | 300 | — | 92 | 50 | 49 | — | 240 | 150 |
| 9727-C51 | N750 | — | — | 2,600 | 1,900 | 850 | 750 | 440 | — | 130 | 68 | 66 | — | — | — |
| 9727-C52 | N1000 | — | — | 3,400 | 2,400 | — | 940 | 550 | 350 | 150 | — | 80 | — | — | — |
| 9727-C53 | N1400 | — | — | 5,100 | 3,600 | — | 1,400 | 820 | 510 | 220 | — | 120 | — | — | — |
| 9727-C55 | S2000 | — | — | 8,300 | 5,300 | 1,900 | 1,600 | 800 | — | 160 | 75 | 72 | — | 360 | — |
| 9727-C56 | N2500 | — | — | 10,400 | 7,000 | — | 2,500 | 1,300 | 750 | 290 | — | 140 | — | — | — |
| 9727-C57 | N4000 | — | — | 20,000 | 12,000 | — | 3,400 | 1,600 | 850 | 290 | — | 120 | — | — | — |
| 9727-C58 | N5100 | — | — | 28,000 | 18,000 | — | 5,100 | 2,500 | 1,300 | 420 | — | 170 | — | — | — |
| 9727-C60 | S8000 | — | — | 41,000 | 25,000 | 8,000 | 6,700 | 3,200 | — | 530 | — | 215 | — | — | — |
| 9727-C61 | N10200 | — | — | 58,000 | 36,000 | — | 10,200 | 4,900 | 2,500 | 775 | — | 300 | — | — | — |
| 9727-C62 | N15000 | — | — | 77,000 | 47,000 | — | 13,000 | 6,100 | 3,000 | 980 | — | 360 | — | — | — |
| 9727-C63 | N18000 | — | — | 103,000 | 64,000 | — | 18,000 | 8,500 | 4,300 | 1,320 | — | 500 | — | — | — |
| 9727-C65 | S30000 | — | — | — | 79,000 | 27,000 | 22,000 | 11,000 | — | 1,700 | — | 630 | — | — | — |

† Incurs additional shipping charges due to low flash point

CANNON General Purpose Viscosity Standards

ASTM D445/D446

Tables 1-3 provide nominal values for kinematic viscosity in mm²/s (cSt), dynamic viscosity in mPa·s (cP) and density in g/mL for CANNON General Purpose Viscosity Standards. All CANNON General Purpose Viscosity Standards meet the precision specifications of ASTM D445/D446 and ISO 3104/3105. Lot specific data is provided with each standard.

Table 2 • Nominal Dynamic Viscosity Values of General Purpose Viscosity Standards in mPa·s (cP)

| Catalog Number | Viscosity Standard | -40 °C/ -40 °F | -20 °C/ -4 °F | 20 °C/ 68 °F | 25 °C/ 77 °F | 37.78 °C/ 100 °F | 40 °C/ 104 °F | 50 °C/ 122 °F | 60 °C/ 140 °F | 80 °C/ 176 °F | 98.89 °C/ 210 °F | 100 °C/ 212 °F |
|----------------|--------------------|-------------------|------------------|-----------------|-----------------|---------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|
| 9727-C10 | N.4† | — | — | 0.32 | 0.30 | 0.28 | 0.27 | — | — | — | — | — |
| 9727-C15 | N.8† | — | — | 0.64 | 0.60 | 0.52 | 0.51 | — | — | — | — | — |
| 9727-C20 | N1.0† | — | 2 | 0.93 | 0.86 | 0.72 | 0.70 | 0.62 | — | — | — | — |
| 9727-C22 | N2 | — | — | 2.2 | 2.0 | 1.6 | 1.5 | 1.3 | — | 0.85 | 0.66 | 0.65 |
| 9727-C25 | S3 | — | — | 3.9 | 3.3 | 2.5 | 2.4 | 1.9 | — | 1.2 | 0.90 | 0.90 |
| 9727-C27 | N4 | — | — | 5.2 | 4.5 | 3.3 | 3.1 | 2.5 | — | 1.4 | 1.1 | 1.1 |
| 9727-C30 | S6 | — | — | 10 | 8.0 | 5.3 | 5.0 | 3.8 | — | 2.0 | 1.5 | 1.5 |
| 9727-C31 | N7.5 | — | — | 11 | 9.5 | 6.3 | 5.9 | 4.5 | — | 2.4 | 1.7 | 1.7 |
| 9727-C32 | N10 | — | — | 21 | 16 | 9.5 | 8.8 | 6.3 | — | 2.9 | 2.1 | 2.0 |
| 9727-C34 | N14 | 1,400 | — | 24 | 20 | 12 | 11 | 8.2 | — | 3.8 | 2.7 | 2.6 |
| 9727-C35 | S20 | — | — | 37 | 29 | 17 | 15 | 11 | — | 4.6 | 3.0 | 3.0 |
| 9727-C36 | N26 | — | — | 47 | 37 | 22 | 20 | 14 | — | 6.2 | 4.1 | 4.0 |
| 9727-C37 | N35 | — | — | 75 | 56 | 30 | 27 | 18 | — | 7.1 | 4.5 | 4.4 |
| 9727-C38 | N44 | — | — | 92 | 71 | 39 | 36 | 24 | — | 9.5 | 6.0 | 5.9 |
| 9727-C40 | S60 | — | — | 141 | 104 | 52 | 47 | 30 | — | 10 | 6.4 | 6.2 |
| 9727-C41 | N75 | — | — | 170 | 125 | 68 | 61 | 41 | — | 16 | 9.5 | 9.2 |
| 9727-C42 | N100 | — | — | 283 | 202 | 95 | 84 | 52 | — | 16 | 9.5 | 9.2 |
| 9727-C43 | N140 | — | — | 340 | 250 | 130 | 120 | 74 | — | 25 | 15 | 14 |
| 9727-C45 | S200 | — | — | 460 | 340 | 170 | 150 | 98 | — | 31 | 18 | 18 |
| 9727-C46 | N250 | — | — | 650 | 480 | 230 | 210 | 130 | — | 41 | 23 | 23 |
| 9727-C47 | N350 | — | — | 820 | 600 | 300 | 260 | 150 | — | 49 | 25 | 25 |
| 9727-C48 | N415 | — | — | 1,200 | 830 | 390 | 350 | 210 | — | 62 | 34 | 33 |
| 9727-C50 | S600 | — | — | 1,500 | 1,100 | 490 | 450 | 260 | — | 75 | 40 | 39 |
| 9727-C51 | N750 | — | — | 2,200 | 1,600 | 710 | 620 | 370 | — | 100 | 55 | 53 |
| 9727-C52 | N1000 | — | — | 2,900 | 2,000 | — | 800 | 460 | 280 | 120 | — | 65 |
| 9727-C53 | N1400 | — | — | 4,300 | 3,000 | — | 1,200 | 680 | 420 | 180 | — | 92 |
| 9727-C55 | S2000 | — | — | 7,300 | 4,700 | 1,700 | 1,400 | 700 | — | 140 | 62 | 59 |
| 9727-C56 | N2500 | — | — | 9,000 | 6,000 | — | 2,100 | 1,100 | 630 | 240 | — | 110 |
| 9727-C57 | N4000 | — | — | 17,000 | 11,000 | — | 2,900 | 1,400 | 730 | 250 | — | 100 |
| 9727-C58 | N5100 | — | — | 25,000 | 16,000 | — | 4,500 | 2,100 | 1,100 | 360 | — | 140 |
| 9727-C60 | S8000 | — | — | 33,000 | 20,000 | 7,000 | 5,900 | 2,800 | — | 450 | — | 200 |
| 9727-C61 | N10200 | — | — | 52,000 | 32,000 | — | 9,000 | 4,200 | 2,100 | 660 | — | 250 |
| 9727-C62 | N15000 | — | — | 68,000 | 41,000 | — | 11,000 | 5,400 | 2,600 | 840 | — | 320 |
| 9727-C63 | N18000 | — | — | 92,000 | 57,000 | — | 16,000 | 7,500 | 3,800 | 1,140 | — | 420 |
| 9727-C65 | S30000 | — | — | — | 71,000 | 23,000 | 20,000 | 9,300 | — | 1,400 | — | 540 |

† Incurs additional shipping charges due to low flash point.

CANNON General Purpose Viscosity Standards

ASTM D445/446

Tables 1-3 provide nominal values for kinematic viscosity in mm²/s (cSt), dynamic viscosity in mPa·s (cP) and density in g/mL for CANNON General Purpose Viscosity Standards. All CANNON General Purpose Viscosity standards meet the precision specifications of ASTM D445/D446 and ISO 3104/3105. Lot specific data is provided with each standard.

Table 3 • Nominal Density Values of General Purpose Viscosity Standards in g/mL

| Catalog Number | Viscosity Standard | 20 °C/ 68 °F | 25 °C/ 77 °F | 37.78 °C/ 100 °F | 40 °C/ 104 °F | 50 °C/ 122 °F | 60 °C/ 140 °F | 80 °C/ 176 °F | 98.89 °C/ 210 °F | 100 °C/ 212 °F |
|----------------|--------------------|-----------------|-----------------|---------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|
| 9727-C10 | N.4† | 0.669 | 0.664 | 0.652 | 0.65 | — | — | — | — | — |
| 9727-C15 | N.8† | 0.867 | 0.862 | 0.851 | 0.849 | — | — | — | — | — |
| 9727-C20 | N1.0† | 0.73 | 0.726 | 0.717 | 0.715 | 0.707 | — | — | — | — |
| 9727-C22 | N2 | 0.762 | 0.758 | 0.749 | 0.748 | 0.741 | — | 0.719 | 0.706 | 0.705 |
| 9727-C25 | S3 | 0.868 | 0.864 | 0.855 | 0.854 | 0.847 | — | 0.826 | 0.812 | 0.811 |
| 9727-C27 | N4 | 0.787 | 0.783 | 0.775 | 0.773 | 0.767 | — | 0.746 | 0.734 | 0.733 |
| 9727-C30 | S6 | 0.878 | 0.874 | 0.866 | 0.864 | 0.858 | — | 0.837 | 0.824 | 0.823 |
| 9727-C31 | N7.5 | 0.801 | 0.798 | 0.789 | 0.788 | 0.781 | — | 0.761 | 0.749 | 0.748 |
| 9727-C32 | N10 | 0.884 | 0.881 | 0.872 | 0.871 | 0.864 | — | 0.844 | 0.832 | 0.831 |
| 9727-C34 | N14 | 0.812 | 0.809 | 0.801 | 0.8 | 0.793 | — | 0.774 | 0.762 | 0.761 |
| 9727-C35 | S20 | 0.863 | 0.86 | 0.852 | 0.85 | 0.844 | — | 0.824 | 0.812 | 0.811 |
| 9727-C36 | N26 | 0.82 | 0.817 | 0.809 | 0.808 | 0.801 | — | 0.783 | 0.771 | 0.77 |
| 9727-C37 | N35 | 0.868 | 0.864 | 0.856 | 0.854 | 0.849 | — | 0.83 | 0.818 | 0.817 |
| 9727-C38 | N44 | 0.828 | 0.825 | 0.817 | 0.816 | 0.809 | — | 0.791 | 0.779 | 0.778 |
| 9727-C40 | S60 | 0.876 | 0.873 | 0.865 | 0.863 | 0.857 | — | 0.838 | 0.826 | 0.825 |
| 9727-C41 | N75 | 0.833 | 0.83 | 0.822 | 0.82 | 0.814 | — | 0.796 | 0.785 | 0.784 |
| 9727-C42 | N100 | 0.882 | 0.879 | 0.871 | 0.87 | 0.863 | — | 0.845 | 0.833 | 0.832 |
| 9727-C43 | N140 | 0.838 | 0.835 | 0.827 | 0.826 | 0.819 | — | 0.801 | 0.79 | 0.789 |
| 9727-C45 | S200 | 0.84 | 0.837 | 0.829 | 0.827 | 0.821 | — | 0.803 | 0.792 | 0.791 |
| 9727-C46 | N250 | 0.842 | 0.839 | 0.831 | 0.83 | 0.824 | — | 0.806 | 0.795 | 0.794 |
| 9727-C47 | N350 | 0.843 | 0.84 | 0.833 | 0.831 | 0.825 | — | 0.808 | 0.797 | 0.796 |
| 9727-C48 | N415 | 0.846 | 0.843 | 0.835 | 0.834 | 0.828 | — | 0.81 | 0.799 | 0.798 |
| 9727-C50 | S600 | 0.847 | 0.844 | 0.836 | 0.835 | 0.829 | — | 0.811 | 0.8 | 0.799 |
| 9727-C51 | N750 | 0.849 | 0.846 | 0.838 | 0.837 | 0.831 | — | 0.813 | 0.802 | 0.801 |
| 9727-C52 | N1000 | 0.85 | 0.847 | — | 0.838 | 0.832 | 0.826 | 0.814 | — | 0.802 |
| 9727-C53 | N1400 | 0.851 | 0.848 | — | 0.839 | 0.833 | 0.827 | 0.815 | — | 0.804 |
| 9727-C55 | S2000 | 0.877 | 0.874 | 0.867 | 0.865 | 0.86 | - | 0.842 | 0.832 | 0.831 |
| 9727-C56 | N2500 | 0.866 | 0.863 | — | 0.854 | 0.849 | 0.843 | 0.832 | — | 0.820 |
| 9727-C57 | N4000 | 0.883 | 0.88 | — | 0.872 | 0.866 | 0.86 | 0.85 | — | 0.838 |
| 9727-C58 | N5100 | 0.886 | 0.883 | — | 0.875 | 0.87 | 0.864 | 0.853 | — | 0.842 |
| 9727-C60 | S8000 | 0.89 | 0.888 | 0.881 | 0.879 | 0.874 | — | 0.858 | — | 0.847 |
| 9727-C61 | N10200 | 0.891 | 0.888 | — | 0.88 | 0.874 | 0.869 | 0.858 | — | 0.847 |
| 9727-C62 | N15000 | 0.894 | 0.891 | — | 0.823 | 0.877 | 0.872 | 0.861 | — | 0.85 |
| 9727-C63 | N18000 | 0.895 | 0.892 | — | 0.884 | 0.879 | 0.873 | 0.863 | — | 0.852 |
| 9727-C65 | S30000 | — | 0.894 | 0.887 | 0.886 | 0.881 | — | 0.865 | — | 0.854 |

† Incurs additional shipping charges due to low flash point.

CANNON High Viscosity Standards

ASTM D2170, ASTM D2171

High Viscosity Standards

CANNON High Viscosity Standards cover viscosity ranges of particular interest for asphalt and polymer applications. See ASTM D2170, Kinematic Viscosity of Asphalts (Bitumens) and ASTM D2171, Viscosity of Asphalts by Vacuum Capillary Viscometer. Lot specific kinematic viscosity data in mm²/s (cSt) and dynamic viscosity data in mPa·s (cP) is provided with each standard as appropriate. Nominal values are shown in Table 4.

Table 4 • Nominal Viscosity Values of High Viscosity Standards

| Catalog Number | Viscosity Standard | Dynamic Viscosity in mPa·s (cP) | | | | | Kinematic Viscosity mm ² /s (cSt) | | |
|----------------|--------------------|---|-----------------|------------------|------------------|-------------------|--|-------------------|-------------------|
| | | 20 °C/ 68 °F | 25 °C/ 77 °F | 40 °C/ 104 °F | 60 °C/ 140 °F | 135 °C/ 275 °F | 60 °C/ 140 °F | 100 °C/ 212 °F | 135 °C/ 275 °F |
| 9727-E10 | N600† | — | 1,100 | — | 160 | 15 | 200 | — | 22 |
| 9727-C52 | N1000*† | 2900 | 2,000 | 800 | 280 | — | 350 | 80 | — |
| 9727-E15 | N2000† | — | 4,900 | — | 380 | 21 | 440 | — | 26 |
| 9727-C57 | N4000*† | 17,000 | 11,000 | 2,900 | 730 | — | 850 | 120 | — |
| 9727-E20 | N8000† | — | 20,000 | — | 1,400 | — | 1,600 | — | — |
| 9727-C62 | N15000*† | 68,000 | 41,000 | 11,000 | 2,600 | — | 3,000 | 360 | — |
| 9727-E25 | N30000† | 120,000 | 70,000 | — | 4,700 | — | 5,400 | — | — |
| 9727-E27 | N62000 | — | 200,000 | — | 13,000 | — | — | 1,600 | — |
| 9727-E29 | N150000 | — | 420,000 | — | 24,000 | — | — | 3,000 | — |
| 9727-E30 | N190000 | 840,000 | 520,000 | 140,000 | 33,000 | — | — | 4,000 | — |
| 9727-E35 | N450000 | — | 1,600,000 | — | 100,000 | 2,350 | — | — | — |
| 9727-E40 | N2700000 | — | 5,300,000 | — | 340,000 | — | — | — | — |
| 9727-E42 | N2700000SP | Dynamic Shear Rheometer (DSR) standard at 52 °C, 58 °C, 64 °C, 70 °C and 76 °C. Available in a 55 mL bottle only. | | | | | | | |

* Viscosity data for additional temperatures provided with these standards are listed in Tables 1 and 2.

† Density values provided at all test temperatures.



CANNON High Temperature High Shear Viscosity Standards

ASTM D4683, ASTM D4741, ASTM D5481

High Temperature (HTHS) Viscosity Standards

CANNON High Temperature Viscosity Standards are produced in accordance with ASTM D5481, Apparent Viscosity at High-Temperature and High-Shear Rate by Multicell Capillary Viscometer and ASTM D4741, Viscosity at High Temperature and High Shear Rate by Tapered Plug Viscometer. Lot specific viscosity data in mPa·s (cP) is provided with each standard. Nominal values are shown in Table 5.

Table 5: Nominal Viscosity Values of High-Temperature HTHS Viscosity Standards

| Catalog Number | Viscosity Standard | Type | Dynamic Viscosity in mPa.s (cP) | | | Applicable ASTM Method(s) |
|----------------|--------------------|---------------|---------------------------------|--------|--------|---------------------------|
| | | | 80 °C | 100 °C | 150 °C | |
| 9727-U45 | HT22 * | Newtonian | — | 3.5 | 1.5 | D5481 |
| 9727-U50 | HT39 * | Newtonian | — | 4.7 | 2.0 | D5481 |
| 9727-U55 | HT75 * | Newtonian | — | 7.0 | 2.7 | D5481 |
| 9727-U60 | HT150 * | Newtonian | — | 10.5 | 3.7 | D5481 |
| 9727-U65 | HT240 * | Newtonian | — | 15.4 | 5.0 | D5481 |
| 9727-U70 | HT390 * | Newtonian | — | 23.5 | 7.0 | D5481 |
| 9727-U92 | HTNN-1 † | Non-Newtonian | — | — | 3.6 | D5481 D4741 D4683 |
| 9727-U94 | HTNN-2 † | Non-Newtonian | — | — | 3.1 | D5481 D4741 D4683 |
| 9727-R05.32 | HT22 *¥ | Newtonian | — | 3.5 | 1.5 | D4741 |
| 9727-R10.032 | RL 102 *¥‡ | Newtonian | 8.4 | 4.1 | 1.8 | D4741 |
| 9727-R15.032 | RL 103 *¥‡ | Newtonian | 12.8 | 6.1 | 2.4 | D4741 |
| 9727-R20.032 | RL 104 *¥‡ | Newtonian | 18.0 | 9.8 | 3.6 | D4741 |
| 9727-R25.032 | RL 105 *¥‡ | Newtonian | 25.5 | 12.8 | 4.4 | D4741 |
| 9727-R30.032 | RL 106 *¥‡ | Newtonian | 26.9 | 15.3 | 5.2 | D4741 |
| 9727-R35.032 | RL 107 * ¥‡ | Newtonian | 36.8 | 17.4 | 5.8 | D4741 |
| 9727-R62.032 | RL 232 †¥ | Non-Newtonian | — | 6.2 | 3.2 | D5481 D4741 D4683 |
| 9727-P10 | R-100 *‡ | Newtonian | 3.5 | 2.4 | 1.2 | D4683 |
| 9727-P15 | R-200/R-2200 *‡ | Newtonian | 5.1 | 3.4 | 1.5 | D4683 |
| 9727-P20 | R-300/R-2300 *‡ | Newtonian | 8.0 | 4.8 | 1.8 | D4683 |
| 9727-P25 | R-350/R-2350 *‡ | Newtonian | 12.5 | 7.2 | 2.7 | D4683 |
| 9727-P30 | R-400/R-2400 *‡ | Newtonian | 18.1 | 10.0 | 3.6 | D4683 |
| 9727-P35 | R-450/R-2450 *‡ | Newtonian | 24.0 | 13.5 | 4.1 | D4683 |
| 9727-P40 | R-500 *‡ | Newtonian | 27.0 | 14.5 | 5.0 | D4683 |
| 9727-P45 | R-600 *‡ | Newtonian | 46.0 | 23.5 | 7.0 | D4683 |

* Density values provided at test temperatures

† Data provided at an apparent shear rate of $1 \times 10^6 \text{ s}^{-1}$

¥ Sold in a 1 liter can only

^ Sold in 0.5 liter, 1 liter and 4 liter sizes

‡ Viscosity data also provided at 40 °C and 120 °C



CANNON Low Temperature Viscosity Standards

ASTM D2983, SAE J300

Low Temperature Viscosity Standards (General Purpose, CCS and CMRV)

CANNON Low Temperature Viscosity Standards verify viscometer performance at sub-zero temperatures. These standards are applicable to SAE Specification J300 as well as a variety of ASTM Methods including:

- ASTM D2983, Low-Temperature Viscosity of Lubricants Measured by Brookfield Viscometer
- ASTM D3829, Predicting the Borderline Pumping Temperature of Engine Oil
- ASTM D4684, Determination of Yield Stress and Apparent Viscosity of Engine Oils at Low Temperature
- ASTM D6821, Low Temperature Viscosity of Drive Line Lubricants in a Constant Shear Stress Viscometer
- ASTM D6896, Determination of Yield Stress and Apparent Viscosity of Used Engine Oils at Low Temperature
- ASTM D5293, Apparent Viscosity of Engine Oils and Base Stocks Between -5 °C and -35 °C Using Cold-Cranking Simulator

The General Purpose Low Temperature Viscosity Standards in Table 6 are applicable to a variety of applications such as testing the viscosity of gear oils (SAE 70W, 75W, 80W and 85W) and automatic transmission fluids (ATF) per ASTM D2983 and SAE J300 with CANNON's Thermoelectric Sample Conditioner System (TESC). Lot specific viscosity data is provided with each standard. Nominal viscosity values are shown in Table 6.

Table 6 • Nominal Viscosity Values of General Purpose Low Temperature Viscosity Standards

| Catalog Number | Viscosity Standard | Approximate Viscosity in mm ² /s (cSt) /mPa·s (cP) except where noted | | | | | | | | | | | | |
|----------------|--------------------|--|-----------------------|-------------------|---------------------|-----------------------|---------------------|-------------------|---|-------------------|-----------------------|---------------------|------------------|---------------------|
| | | -55 °C/ -67 °F | -40 °C/ -40 °F | -34 °C/ -30 °F | -29 °C/ -20 °F | -26 °C/ -15 °F | -25 °C/ -13 °F | -23 °C/ -10 °F | -20 °C/ -4 °F | -18 °C/ 0 °F | -12 °C/ 10 °F | -10 °C/ 14 °F | -7 °C/ 20 °F | 0 °C/ 32 °F |
| 9727-G10 | N27B† | — | 24,000/ 20,000 | 12,000/ 10,000 | 6,100/ 5,200 | 4,500/ 4,000 | — | 3,500/ 3,000 | — | 2,000/ 1,700 | — | — | — | — |
| 9727-G12 | N27C† | — | 45,000/ 40,000 | 22,000/ 20,000 | 12,000/ 10,000 | 8,000/ 7,000 | — | 6,100/ 5,000 | — | 3,500/ 3,000 | — | — | — | — |
| 9727-G15 | N115B† | — | — | — | 160,000/ 140,000 | 110,000/ 95,000 | — | 75,000/ 65,000 | — | 37,000/ 30,000 | 20,000/ 17,000 | — | 12,000/ 9,500 | — |
| 9727-G25 | N60B† | 150,000 mPa·s (cP) | — | — | — | — | — | — | — | — | — | — | — | — |
| 9727-G30 | N120B† | — | 150,000 mPa·s (cP) | — | — | — | — | — | — | — | — | — | — | — |
| 9727-G35 | N480B† | — | — | — | — | 150,000 mPa·s (cP) | — | — | — | — | — | — | — | — |
| 9727-G40 | N1400B† | — | — | — | — | — | — | — | — | — | 150,000 mPa·s (cP) | — | — | — |
| 9727-G45 | N2B | — | — | — | — | — | — | — | 8 mm ² /s (cSt) jet fuel standard | — | — | — | — | — |
| 9727-G50 | N74B | — | — | — | — | — | — | — | — | — | — | — | — | 3,400 mPa·s (cP) |
| 9727-G55 | N38B† | — | — | — | — | — | — | — | — | — | — | 4,200 mPa·s (cP) | — | — |
| 9727-G60 | N25B† | — | — | — | — | — | 8,000 mPa·s (cP) | — | — | — | — | — | — | — |
| 9727-G65 | N14B† | — | 17,000 mPa·s (cP) | — | — | — | — | — | — | — | — | — | — | — |

†Density values provided at all test temperatures.



CANNON Low Temperature Viscosity Standards

ASTM D5293, SAE J300

Low Temperature CCS Viscosity Standards are used for measuring dynamic viscosity (in cP or mPa·s) at temperatures from -5 °C to -40 °C. They are used to calibrate the CANNON Cold-Cranking Simulator (CCS) for oil testing per ASTM D5293, Apparent Viscosity of Engine Oils and Base Stocks Between -5 °C and -35 °C Using Cold-Cranking Simulator and SAE Specification J300. Lot specific viscosity data in mPa·s (cP) is provided with each standard. Nominal viscosity values are shown in Table 7.

Table 7 • Nominal Viscosity Values (in mPa·s or cP) of Low Temperature CCS Viscosity Standards

| Catalog Number | Viscosity Standard | -40 °C | -35 °C | -30 °C | -25 °C | -20 °C | -18 °C | -15 °C | -10 °C | -5 °C |
|----------------|--------------------|---|--------|--------|--------|--------|--------|--------|--------|-------|
| 9727-N02 | CL080 | 1,430 | 850 | — | — | — | — | — | — | — |
| 9727-N04 | CL090 | 1,930 | 1,150 | — | — | — | — | — | — | — |
| 9727-N06 | CL100 (CL10) | 2,450 | 1,450 | 875 | — | — | — | — | — | — |
| 9727-N07 | CL110 | 2,880 | 1,680 | 1,030 | — | — | — | — | — | — |
| 9727-N08 | CL120 (CL12) | 3,580 | 2,050 | 1,230 | 775 | — | — | — | — | — |
| 9727-N09 | CL130 | 4,580 | 2,600 | 1,550 | 975 | — | — | — | — | — |
| 9727-N10 | CL140 (CL14) | 6,380 | 3,550 | 2,080 | 1,300 | 775 | 675 | — | — | — |
| 9727-N11 | CL150 | 7,830 | 4,310 | 2,500 | 1,530 | 950 | — | — | — | — |
| 9727-N12 | CL160 | 10,300 | 5,580 | 3,200 | 1,900 | 1,200 | 1,000 | — | — | — |
| 9727-N13 | CL170 | 12,000 | 6,430 | 3,650 | 2,180 | 1,330 | — | 850 | — | — |
| 9727-N14 | CL190 (CL19) | 15,900 | 8,380 | 4,680 | 2,750 | 1,680 | 1,400 | 1,080 | — | — |
| 9727-N16 | CL200 | 21,100 | 10,900 | 6,030 | 3,500 | 2,130 | — | 1,330 | 875 | — |
| 9727-N18 | CL220 (CL22) | — | 13,600 | 7,380 | 4,230 | 2,550 | 2,050 | 1,600 | 1,030 | — |
| 9727-N20 | CL240 | — | 16,900 | 9,100 | 5,180 | 3,050 | — | 1,900 | 1,230 | — |
| 9727-N22 | CL250 (CL25) | — | 20,000 | 10,700 | 6,000 | 3,500 | 2,880 | 2,180 | 1,380 | — |
| 9727-N24 | CL260 | — | — | 13,100 | 7,300 | 4,300 | — | 2,650 | 1,680 | — |
| 9727-N26 | CL280 (CL28) | — | — | 16,500 | 9,080 | 5,280 | 4,300 | 3,200 | 2,030 | — |
| 9727-N28 | CL300 | — | — | 20,700 | 11,300 | 6,480 | — | 3,880 | 2,430 | — |
| 9727-N30 | CL320 (CL32) | — | — | — | 14,300 | 8,150 | 6,600 | 4,850 | 3,000 | — |
| 9727-N31 | CL340 | — | — | — | 17,000 | 9,580 | — | 5,650 | 3,480 | — |
| 9727-N32 | CL380 (CL38) | — | — | — | 20,800 | 11,600 | 9,330 | 6,800 | 4,180 | 2,650 |
| 9727-N33 | CL420 | — | — | — | — | 14,000 | — | 8,180 | 4,950 | — |
| 9727-N34 | CL480 (CL48) | — | — | — | — | 17,400 | 13,700 | 10,100 | 6,000 | 3,780 |
| 9727-N35 | CL530 | — | — | — | — | 22,000 | — | 12,500 | 7,500 | — |
| 9727-N36 | CL600 (CL60) | — | — | — | — | — | 20,300 | 15,700 | 9,300 | 5,700 |
| 9727-N37 | CL680 | — | — | — | — | — | — | 19,400 | 11,300 | — |
| 9727-N38 | CL740 (CL74) | — | — | — | — | — | — | — | 12,600 | 7,650 |
| 9727-N43 | Set of 18 | Set of CCS-2050/2100 Low Temp Standards (includes CL080, CL090, CL100, CL110, CL120, CL130, CL140, CL150, CL160, CL190, CL220, CL250(2), CL280, CL320, CL380, CL480, CL600) | | | | | | | | |

CANNON Low Temperature & SimpleVIS® Viscosity Standards

ASTM D3829, ASTM D4684, ASTM D6821, ASTM D6896, SAE J300

The Low Temperature Viscosity Standards in Table 8 are designed for use with the CANNON Mini-Rotary Viscometer (CMRV) for:

- ASTM D3829, Predicting the Borderline Pumping Temperature of Engine Oil
- ASTM D4684, Determination of Yield Stress and Apparent Viscosity of Engine Oils at Low Temperature
- ASTM D6821, Low Temperature Viscosity of Drive Line Lubricants in a Constant Shear Stress Viscometer
- ASTM D6896, Determination of Yield Stress and Apparent Viscosity of Used Engine Oils at Low Temperature
- SAE Specification J300

Lot specific viscosity data is provided with each standard. Nominal viscosity values are shown in Table 8.

Table 8 • Nominal Viscosity Values of Low Temperature CMRV Viscosity Standards

| Catalog Number | Viscosity Standard | Approximate Viscosity |
|----------------|--------------------|--|
| 9727-T10 | N105B† | 30,000 mPa·s (cP) at -20 °C CMRV viscosity standard 56,200 mPa·s (cP) at -25 °C CMRV viscosity standard |
| 9727-T20 | YS-30 | Exhibits yield stress of 70 Pa ±35 Pa at -30 °C |
| 9727-T25 | YS-35 | Exhibits yield stress of 70 Pa ±35 Pa at -35 °C |

†Density values provided at all test temperatures.



SimpleVIS® Viscosity Standards

CANNON SimpleVIS viscosity standards verify the performance of the CANNON SimpleVIS automated viscometer. Lot specific kinematic viscosity data is provided at 20 °C, 25 °C, 40 °C and 100 °C. Nominal values are shown in Table 9.

Table 9 • Nominal Viscosity Values of SimpleVIS Viscosity Standards

| Catalog Number | Viscosity Standard | Approximate Viscosity in mm ² /s (cSt) | | | |
|----------------|--------------------|---|-----------------|------------------|-------------------|
| | | 20 °C/ 68 °F | 25 °C/ 77 °F | 40 °C/ 104 °F | 100 °C/ 212 °F |
| 03.5942.004 | SV3 | 4.6 | 4 | — | — |
| 03.5946.004 | SV20 | 44 | 34 | — | — |
| 03.5950.004 | SV35 | — | — | 32 | — |
| 03.5954.004 | SV350 | — | — | 310 | 32 |
| 03.5958.004 | SV1400 | — | — | — | 120 |



CANNON Silicone & Thomas®- Stormer® Viscosity Standards

Silicone Viscosity Standards for Rotational Viscometers

CANNON Silicone Viscosity Standards are specifically formulated for use with rotational viscometers. Lot specific viscosity data in mPa·s (cP) at 20 °C, 23 °C, 24 °C, 25 °C, 26 °C, 27 °C and 40 °C is provided with each standard. Nominal values at 25 °C are shown in Table 10. Silicone Viscosity Standards are sold in 500 mL bottles. Note: CANNON Silicone Viscosity Standards are intended for use with rotational viscometers only. Silicone Viscosity Standards are not recommended for glass capillary viscometers (including vacuum viscometers), metal cup-type viscometers (such as ISO, Zahn, Ford and Shell cups), or any other viscometers providing kinematic viscosity—CANNON hydrocarbon-based oil standards should be used for these types of viscometers.

Table 10 • Nominal Viscosity Values of Silicone Viscosity Standards at 25 °C

| Catalog Number | Viscosity Standard | Approximate Viscosity in mPa·s (cP) at 25 °C |
|----------------|--------------------|--|
| 9727-Z10 | RT5† | 4.6 |
| 9727-Z14 | RT10† | 9.4 |
| 9727-Z18 | RT50† | 48 |
| 9727-Z22 | RT100† | 96 |
| 9727-Z26 | RT500† | 480 |
| 9727-Z30 | RT1000† | 960 |
| 9727-Z34 | RT5000† | 4,800 |
| 9727-Z38 | RT12500† | 12,000 |
| 9727-Z42 | RT30000† | 29,000 |
| 9727-Z46 | RT60000† | 58,000 |
| 9727-Z50 | RT100000† | 97,000 |

†Density values provided at all test temperatures.



Thomas®-Stormer® Viscosity Standards

Thomas-Stormer Viscosity Standards calibrate manual and electronic Thomas-Stormer viscometers. The KREBS UNIT (KU) is often used for Thomas-Stormer viscometers. Lot specific viscosity data is provided with each standard at 23 °C, 24 °C, 24.5 °C, 25 °C, 25.5 °C and 26 °C in both mPa·s (cP) and KU. Nominal values at 25 °C are shown in Table 11.

Table 11 • Nominal Viscosity Values of Thomas-Stormer Viscosity Standards at 25 °C

| Catalog Number | Viscosity Standard | Approximate Viscosity | |
|----------------|--------------------|-----------------------|-----------------|
| | | mPa·s (cP) | Krebs Unit (KU) |
| 9727-Y10 | S200(KU)† | 350 | 62 |
| 9727-Y15 | N350(KU)† | 600 | 73 |
| 9727-Y20 | K400(KU)† | 940 | 84 |
| 9727-Y25 | S600(KU)† | 1,050 | 87 |
| 9727-Y30 | N1000(KU)† | 2,000 | 106 |

†Density values provided at all test temperatures.



CANNON® Flow Cup Viscosity Standards

ASTM D4212, ASTM D1200

Table 12 • Nominal Viscosity Values of Flow Cup Viscosity Standards at 25 °C

| Catalog Number | Viscosity Standard | Kinematic viscosity mm ² /s (cSt) | Zahn Cup | | Shell Cup | | Ford Cup | |
|----------------|--------------------|--|-------------|------------------|---------------|------------------|-------------|------------------|
| | | | Size | Drain time (sec) | Size | Drain time (sec) | Size | Drain time (sec) |
| 9727-W10 | C6* | 8.9 | — | — | 1 2 | 52 20 | — | — |
| 9727-W12 | C10* | 17 | 1 — | 45 — | 2 2½ | 35 22 | 1 — | 70 — |
| 9727-W15 | C20* | 34 | 1 2 — | 60 24 — | 2 2½ 3 | 64 40 24 | 2 — — | 42 — — |
| 9727-W20 | C35* | 66 | 2 — — | 33 — — | 2½ 3 3½ | 74 46 32 | 2 3 — | 64 35 — |
| 9727-W25 | C60* | 120 | 2 — | 48 — | 3½ 4 | 57 36 | 3 4 | 58 36 |
| 9727-W30 | C100* | 230 | 3 4 | 27 21 | 4 5 | 68 36 | 4 — | 64 — |
| 9727-W35 | C200* | 420 | 3 4 | 43 32 | 5 6 | 64 26 | 5 — | 36 — |
| 9727-W40 | C350 | 710 | 4 5 | 53 31 | 6 — | 44 — | 5 — | 60 — |
| 9727-W45 | C600 | 1200 | 5 | 54 | — | — | — | — |

* Data is also provided for ISO cups

Viscosity Standards for use with Zahn, Shell, & Ford Cups

CANNON flow cup viscosity standards are for use in Zahn, Shell and Ford flow cups. Lot specific kinematic viscosity data in mm²/s (cSt) and calculated cup drain times are provided with each standard. Nominal values at 25 °C are shown in Table 12. Data is also provided at 20 °C and 23 °C.

Table 13 • Equations and Ranges of Viscosity Flow Cups at 25 °C

| Cup Number | Equations † where t = Flow time in seconds n = Kinematic viscosity in mm ² /s | Drain time (seconds) | | Approximate Kinematic viscosity mm ² /s (cSt) | |
|----------------------------|--|----------------------|-----|--|-------|
| | | min | max | min | max |
| Zahn Cup (See ASTM D4212) | | | | | |
| 1 | $n = 1.1 (t - 29)$ | 35 | 80 | 5 | 60 |
| 2 | $n = 3.5 (t - 14)$ | 20 | 80 | 20 | 250 |
| 3 | $n = 11.7 (t - 7.5)$ | 20 | 80 | 100 | 800 |
| 4 | $n = 14.8 (t - 5)$ | 20 | 80 | 200 | 1,200 |
| 5 | $n = 23t$ | 20 | 80 | 400 | 1,800 |
| Shell Cup (See ASTM D4212) | | | | | |
| 1 | $n = 0.226 (t - 13)$ | 20 | 80 | 2 | 20 |
| 2 | $n = 0.576 (t - 5)$ | 20 | 80 | 10 | 50 |
| 2½ | $n = 0.925 (t - 3)$ | 20 | 80 | 20 | 80 |
| 3 | $n = 1.51 (t - 2)$ | 20 | 80 | 30 | 120 |
| 3½ | $n = 2.17 (t - 1.5)$ | 20 | 80 | 40 | 170 |
| 4 | $n = 3.45 (t - 1)$ | 20 | 80 | 70 | 270 |
| 5 | $n = 6.5 (t - 1)$ | 20 | 80 | 125 | 520 |
| 6 | $n = 16.2 (t - 0.5)$ | 20 | 80 | 320 | 1,300 |
| Ford Cup (See ASTM D1200) | | | | | |
| 1 | $n = 0.49 (t - 35.0)$ | 55 | 100 | 10 | 35 |
| 2 | $n = 1.44 (t - 18.0)$ | 40 | 100 | 25 | 120 |
| 3 | $n = 2.31 (t - 6.58)$ | 20 | 100 | 49 | 220 |
| 4 | $n = 3.85 (t - 4.49)$ | 20 | 100 | 70 | 370 |
| 5 | $n = 12.1 (t - 2.00)$ | 20 | 100 | 200 | 1,200 |

Equations for Zahn, Shell, & Ford Cups

The equations in Table 13 convert cup drain times, collected at 25 °C and between the minimum and maximum drain times indicated, into kinematic viscosity values in mm²/s (cSt). For more information on cups, contact our Technical Service team.

Note: While the equations in Table 13 are widely used, $n = at - b/t$ is often more applicable at short flow times and low KV.



CANNON Flash Point Reference Materials

ASTM D56, ASTM D92, ASTM D93

Flash Point Reference Materials

CANNON Flash Point Reference Materials are produced in accordance with ASTM D56, Tag Closed Cup Flash Point, ASTM D92, Cleveland Open Cup Flash Point and ASTM D93, Pensky Marten Closed Cup Flash Point. Lot specific data including average flash point and observed standard deviation (from a statistical analysis of 40 tests in 20 different laboratories) is provided with each standard. Nominal flash points are shown in Table 14. Flash Point Reference Materials are sold in 200 mL bottles.

Table 14 • Nominal Values of Flash Point Reference Materials

| Catalog Number | Product ID | ASTM D56 Nominal Flash Point (°C) | ASTM D92 Nominal Flash Point (°C) | ASTM D93 Nominal Flash Point (°C) |
|----------------|------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 9727-A10 | FPRM10* | 50 | - | 55 |
| 9727-A15 | FPRM11 | 66 | - | 72 |
| 9727-A20 | FPRM14 | - | 116 | 113 |
| 9727-A25 | FPRM16 | - | 137 | 132 |
| 9727-A30 | FPRM2D | - | 163 | 155 |
| 9727-A35 | FPRM4D | - | 224 | 218 |
| 9727-A40 | FPRM9D | - | 274 | - |

*Incurs additional shipping charges due to low flash point



CANNON Certified Viscosity Check Oils

ASTM D445, ASTM D5293, ASTM D4684

Certified Viscosity Check Oils

CANNON Certified Viscosity Check Oils verify SAE target viscosities for kinematic viscometers per ASTM D445, cold-cranking simulators per ASTM D5293, and mini-rotary viscometers per ASTM D4684. Each check oil contains a commercial engine oil with certified values at common blend target values for density in g/cm³ (g/mL) at 15 °C, kinematic viscosity in mm²/s (cSt) at 40 °C and 100 °C as well as cranking and pumping viscosities in mPa·s (cP) at SAE J300 specification temperatures. CANNON Certified Viscosity Check Oils are available in 1 L (quart) and 3.8 L (gallon) sizes. Refer to Table 15 for catalog numbers and specifications.

Table 15 • Nominal Viscosity Values of CANNON Viscosity Check Oils (CVCO)

| Catalog Number | ASTM Test Method | Temp. (°C) | Typical Viscosity |
|--|------------------|------------|-------------------|
| CVCO-5W30 9727-S00.032 (1 L) 9727-S00.128 (3.8 L) | D445 | 40 | 58 cSt |
| | D445 | 100 | 11 cSt |
| | D5293 | -25 | 3,000 mPa·s |
| | D5293 | -30 | 5,800 mPa·s |
| | D4684 | -35 | 20,000 mPa·s |
| | D4052 | 15 | 0.85 g/mL |
| CVCO-10W30 9727-S01.032 (1 L) 9727-S01.128 (3.8 L) | D445 | 40 | 70 cSt |
| | D445 | 100 | 11 cSt |
| | D5293 | -20 | 2,800 mPa·s |
| | D5293 | -25 | 5,700 mPa·s |
| | D4684 | -30 | 21,000 mPa·s |
| | D4052 | 15 | 0.88 g/mL |
| CVCO-15W40 9727-S02.032 (1 L) 9727-S02.128 (3.8 L) | D445 | 40 | 100 cSt |
| | D445 | 100 | 14 cSt |
| | D5293 | -15 | 3,500 mPa·s |
| | D5293 | -20 | 6,500 mPa·s |
| | D4684 | -25 | 25,000 mPa·s |
| | D4052 | 15 | 0.88 g/mL |

Get to know Cannon Instrument Company

Where Precision and Accuracy Intersect

About Cannon Instrument Company

Cannon Instrument Company delivers value to our customers by providing the highest quality instruments, services, and certified reference materials for the characterization of viscosity, rheology and other physical properties. At Cannon Instrument Company, we strive to be the trusted world leader in viscosity and physical property characterization.

Cannon Instrument Company has earned international acclaim for the quality of its viscosity-related products and services since its founding in 1938 by scientist, inventor, and educator Dr. Michael R. Cannon.

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- Innovative spirit and a desire to exceed customer expectations are the traits that we value most in our employees.
- As an internationally recognized expert in viscosity characterization, we seek to advance technology through our service and leadership in various international standardization and professional trade organizations.

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At Cannon Instrument Company, we strive to be the trusted world leader in viscosity and physical property characterization. We are passionate about driving our financial growth through:

- Technological excellence and new product innovations
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- And an obsessive commitment to customer satisfaction



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