Viscosity & Flash Point Standards

For Reference, Validation, and Calibration

CANNON certified viscosity standards provide kinematic viscosities (in cSt or mm^2/s), densities (in g/mL) and viscosities (in cP or mPa·s) at many temperatures, ranging from –55°C to 150°C. All CANNON viscosity standards, are traceable to the NIST (National Institute of Standards and Technology) and are prepared in CANNON's ISO 9001-registered, and A2LA-accredited laboratory.

CANNON
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CANNON® Viscosity Standards

Most viscosity standards supplied by CANNON are hydrocarbon oils. Most of the lower viscosity standards consist of mineral oil base stocks, while others are made from polyalphaolefins. The higher viscosity standards are polybutenes. In general, these standards are Newtonian liquids (that is, the viscosity is independent of the shear stress or shear rate). Some deviation from true Newtonian response may occur when measurements are made with high viscosity standards at high shear rates. Frequently the heat developed at high rates of shear can cause the standard to appear non-Newtonian when in fact the viscosity has been lowered by "viscous heating." In addition to hydrocarbon standards, CANNON offers silicone standards for calibrating rotational viscometers. **Note:** Silicone viscosity standards should NOT be used for other types of viscometers.

Customers can use CANNON hydrocarbon standards for calibrating their own glass capillary viscometers using the ASTM D 445 and ASTM D 446 Methods.

Custom Blends

If you need a standard at a temperature or viscosity not available in a stock standard, please call CANNON to discuss the blending of a custom standard to your temperature and viscosity specifications. Because of the large number of factors involved, we must quote individually for each custom standard. To help us serve you better, when ordering custom standards please state the acceptable viscosity (or kinematic viscosity) range and temperature(s) required. If you also require density data, please state this when ordering. Custom standards are subjected to the same stringent quality controls as the stock standards listed in our catalog.

Container Sizes for CANNON Viscosity Standards

CANNON supplies viscosity standards in a variety of container sizes (see Conversion Table below). Most standards are also available in 4-oz containers. The default container size for most standards is the 500 mL bottle. When ordering a non-default size, use the chart to determine the catalog number suffix (EXAMPLE: the catalog # for the N35 general purpose standard in a 1 Liter container would be 9727-C37.032).

The default size container for flash point standards is 200 mL. The N2700000 (SP) standard is supplied in 55 mL bottles.

Unit Conversions and Container Sizes

Metric Units	*U.S. Customary Units**	*Catalog # Suffix*
120 mL	4 oz. Size	.004
500 mL	Pint Size	.016
1 Liter	Quart Size	.032
4 Liters	Gallon Size	.128
20 Liters	5-Gallon Size	.5

* (conversions are approximate)

Certified Viscosity "Check Oils" for SAE Target Viscosities

New!

CANNON Instrument Company has released a new line of viscosity check oils specifically designed for verification of SAE target viscosities per ASTM D 445, D 5293, and D 4684. The CVCO (Certified Viscosity Check Oil) series includes formulated commercial engine oils with certified values for kinematic viscosity in mm^2/s (cSt) at 40 and 100°C, cranking viscosity in mPa·s (cP) at old and new SAE J300 specification temperatures, pumping viscosity in mPa·s (cP) at SAE J300 specification temperatures, and density in g/mL at 15°C. These new materials are available in 1 L (Qts) and 3.8 L (1 Gallon) sizes. The oils enable users to "check" the performance of their Cold-Cranking Simulator, Mini-Rotary Viscometer, and Kinematic Viscometers by measuring commercially-available formulated engine oils. Viscosity values for the check oils will be at typical blend targets. Custom check oils with customer-specified blend targets may also be requested. Precision of the new check oils will be equivalent to the existing CANNON standard lines. CANNON will provide all necessary calibration certification with all Viscosity Check Oils.

Consult the table for order information for each CVCO formulation and container size.

CVCO – CANNON Viscosity Check Oils

Catalog #	*ASTM Method*	*Temp., °C*	*Typical Viscosity*
CVCO-5W30	D445	40	58 cSt
9727-S00.032 (1 L)	D445	100	11 cSt
9727-S00.128 (3.8 L)	D5293	-25	2500 mPa·s
	D5293	-30	4600 mPa·s
	D4684	-35	17,000 mPa·s
	D4052	15	0.85 g/mL
CVCO-10W30	D445	40	70 cSt
9727-S01.032 (1 L)	D445	100	11 cSt
9727-S01.128 (3.8 L)	D5293	-25	2800 mPa·s
	D5293	-25	5700 mPa·s
	D4684	-30	21,000 mPa·s
	D4052	15	0.88 g/mL
CVCO-15W40	D445	40	100 cSt
9727-S02.032 (L)	D445	100	14 cSt
9727-S02.128 (3.8 L)	D5293	-15	3800 mPa·s
	D5293	-20	7200 mPa·s
	D4684	-25	30,000 mPa·s
	D4052	15	0.88 g/mL

A Note About Viscosity Values

The tables on the following pages provide nominal values for viscosity standards supplied by CANNON Instrument Company. Please note that actual values will vary slightly from lot to lot; the amount of variation is dependent on the type of standards. Formulations are subject to change at any time. If your application requires materials in close conformity with published nominal values, please contact CANNON Instrument Company to obtain the viscosity values associated with the current formulation. CANNON Instrument Company has received ISO/IEC 17025-1999 accreditation for technical competence in the field of calibration through A2LA. The accreditation covers the calibration of glass capillary viscometers, the determination of kinematic and dynamic viscosity (including that of viscosity standards and the viscosity certification of customer samples), and the provision of calibration services for viscometers and kinematic viscosity thermometers in accordance with ISO/IEC 17025-1999.

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CANNON® General Purpose Viscosity Standards

The Table below provides kinematic viscosity values for the General Purpose Viscosity Standards from CANNON Instrument Company. CANNON certified standards are useful for calibration and verification procedures for all types of viscometers, including glass capillary viscometers, rotational viscometers, falling ball viscometers, cup viscometers, and others. Calibration or verification with a certified viscosity standard helps to ensure the reliability of measurements made with any viscometer.

Table 1 • Kinematic Viscosity in mm²/s (Centistokes)

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*	*SUS 100°F*	*SUS 210°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†	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*	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	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	400	200	180	110	—	35	22	20	925	105
9727-C46	N250	770	570	280	250	160	—	51	30	29	1300	140
9727-C47	N350	1000	720	340	310	190	—	55	34	32	1570	160
9727-C48	N415	1400	990	470	420	250	—	77	43	41	2180	200
9727-C50	S600‡	1700	1300	590	520	310	—	93	51	50	—	240
9727-C51	N750	2600	1900	850	750	440	—	130	68	66	—	—
9727-C52	N1000	3400	2400	—	940	550	350	150	—	80	—	—
9727-C53	N1400	5100	3600	—	1400	820	510	220	—	120	—	—
9727-C55	S2000	8300	5300	1900	1600	800	—	160	75	72	—	360
9727-C56	N2500	8400	6000	—	2500	1500	950	430	—	230	—	—
9727-C57	N4000	20000	12000	—	3400	1600	850	290	—	120	—	—
9727-C58	N5100	28000	18000	—	5100	2500	1300	420	—	170	—	—
9727-C60	S8000	41000	25000	8000	6700	3200	—	530	—	215	—	—
9727-C61	N10200	58000	36000	—	10200	4900	2500	775	—	300	—	—
9727-C62	N15000	77000	47000	—	13000	6100	3000	980	—	360	—	—
9727-C63	N18000	103000	64000	—	18000	8500	4300	1320	—	500	—	—
9727-C65	S30000	—	79000	27000	22000	11000	—	1700	—	630	—	—

* cSt value at –40°C/–40°F (70) also provided

† Incurs additional shipping charges due to low flash point

‡ SFS value at 122°C (150) also provided

Need a custom blend? We can provide it! See page 2.

CANNON® General Purpose Viscosity Standards
Dynamic Viscosity Values

Quality/Traceability

The Table below provides dynamic viscosity values for the General Purpose Viscosity Standards from CANNON Instrument Company. Viscosities for all standards sold by CANNON are based on the National Institute of Standards and Technology (NIST) value of 1.0016 mPa·s (centipoise) for water at 20°C (68°F).

All CANNON viscosity standards meet the precision specifications of ASTM D 445/446 and ISO 3104/3105, and are traceable to the NIST (National Institute of Standards and Technology). CANNON viscosity standards are manufactured and/or certified in CANNON's ISO 9001:2000 registered and A2LA-accredited laboratory. A2LA has accredited CANNON for technical competence in the field of calibration (certificate number 1262.01). The accreditation includes the determination of kinematic and dynamic viscosity (including that of viscosity standards and customer samples) in accordance with ISO/IEC 17025-1999. All calibrations are based on the master viscometer procedures detailed in ASTM D 2162.

CANNON has been delegated by NIST to provide U.S. national measurement standards and to issue calibrationand measurement certificates for certified liquid viscosity reference standards.

Table 2 • Dynamic Viscosity in mPa·s (Centipoise)

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*	*SUS 100°F*	*SUS 210°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†	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	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	100	—
9727-C36	N26	47	37	22	20	14	—	6.2	4.1	4.0	130	—
9727-C37	N35	75	56	30	27	18	—	7.1	4.5	4.4	170	—
9727-C38	N44	92	71	39	36	24	—	9.5	6.0	5.9	220	—
9727-C40	S60	141	104	52	47	30	—	10	6.4	6.2	280	—
9727-C41	N75	160	125	68	61	41	—	16	9.5	9.2	380	—
9727-C42	N100	283	202	95	84	52	—	16	9.5	9.2	500	—
9727-C43	N140	340	250	130	120	74	—	25	15	14	720	—
9727-C45	S200	460	330	160	145	90	—	25	16	14	925	105
9727-C46	N250	650	480	230	210	130	—	41	23	23	1300	140
9727-C47	N350	830	600	280	250	150	—	40	26	24	1570	160
9727-C48	N415	1200	830	390	350	210	—	62	34	33	2180	200
9727-C50	S600‡	1500	1100	490	440	260	—	75	41	40	—	240
9727-C51	N750	2200	1600	710	620	370	—	100	55	53	—	—
9727-C52	N1000	2900	2000	—	800	460	280	120	—	65	—	—
9727-C53	N1400	4300	3000	—	1200	680	420	180	—	92	—	—
9727-C55	S2000	7300	4700	1700	1400	700	—	140	62	59	—	360
9727-C56	N2500	7100	5100	—	2100	1200	780	350	—	180	—	—
9727-C57	N4000	17000	11000	—	2900	1400	730	250	—	100	—	—
9727-C58	N5100	25000	16000	—	4500	2100	1100	360	—	140	—	—
9727-C60	S8000	33000	20000	7000	5900	2800	—	450	—	200	—	—
9727-C61	N10200	52000	32000	—	9000	4200	2100	660	—	250	—	—
9727-C62	N15000	68000	41000	—	11000	5400	2600	840	—	320	—	—
9727-C63	N18000	92000	57000	—	16000	7500	3800	1140	—	420	—	—
9727-C65	S30000	—	71000	23000	20000	9300	—	1400	—	540	—	—

† Incurs additional shipping charges due to low flash point.
‡ SFS value at 122°C (150) also provided

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High-Viscosity & Low Temperature Viscosity Standards

ASTM D 2170/2171, ASTM D 2983, ASTM D 3829/4684

High-Viscosity Standards

These standards are furnished in a range of viscosities and temperatures which are of particular interest in asphalt viscosity determinations and the determination of the viscosities of polymers. See ASTM D 2170 and D 2171.

See Table 3 for approximate viscosities. Exact values are supplied with each standard. All data are traceable to the NIST.

Table 3 • High-Viscosity Standards

Catalog Number	Viscosity Standard	Approximate 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
9727-E10	N600†	—	1100	—	160	17	200	—
9727-C52	N1000*	2900	2000	800	280	—	350	80
9727-E15	N2000†	—	4900	—	380	21	440	—
9727-C57	N4000*	17 000	11 000	2900	730	—	850	120
9727-E20	N8000	—	20 000	—	1400	—	1600	—
9727-C62	N15000*	68 000	41 000	11 000	2600	—	3000	360
9727-E25	N30000	130 000	80 000	—	4700	—	5400	—
9727-E27	N62000	—	200 000	—	13 000	—	—	1600
9727-E29	N150000	—	420 000	—	24 000	—	—	3000
9727-E30	N190000	900 000	520 000	140 000	33 000	—	—	4000
9727-E35	N450000	—	1 600 000	—	100 000	2350	—	—
9727-E40	N2700000	—	5 300 000	—	340 000	—	—	—
9727-E42	N2700000SP Dynamic Shear Rheometer (DSR) standard at 52, 58, 64, 70, & 76°C							

* Additional data provided with these standards are listed in Tables 1 and 2.

† Additional data provided at 135°C.

Low-Temperature Standards

For Low Temperature Gear Oils (SAE 70W, 75W, 80W and 85W). Also for ATF fluids. See ASTM D 2983.

Catalog Number	Viscosity Standard	Table 4 • Low-Temperature Viscosity Standards
9727-G10	N27B	Viscosities in centistokes/centipoise at –40°F (24,000/20,000), –30°F (12,000/10,000), –20°F (6100/5200), –15°F (4500/4000), –10°F (3500/3000), and 0°F (2000/1700)
9727-G12	N27C	Viscosities in centistokes/centipoise at –40°F (45,000/40,000), –30°F (22,000/20,000), –20°F (12,000/10,000), –15°F (8000/7000), –10°F (6100/5000), and 0°F (3500/3000)
9727-G15	N115B	Viscosities in centistokes/centipoise at –20°F (160,000/140,000), –15°F (110,000/95,000), –10°F (75,000/65,000), 0°F (37,000/30,000), +10°F (20,000/17,000), and +20°F (12,000/9500)
9727-G25	N60B	150,000 mPa·s (cP) at –55°C
9727-G30	N120B	150,000 mPa·s (cP) at –40°C
9727-G35	N480B	150,000 mPa·s (cP) at –26°C
9727-G40	N1400B	150,000 mPa·s (cP) at –12°C
9727-G45	N2B*	Jet Fuel standard, 8 mm^2/s (cSt) at –20°C
9727-G50	N74B	3400 mPa·s (cP) at 0°C
9727-G55	N38B	3100 mPa·s (cP) at –10°C
9727-G60	N25B	8000 mPa·s (cP) at –25°C
9727-G65	N14B	17,000 mPa·s (cP) at –40°C

* Incurs additional shipping charges due to low flash point

For CANNON Mini-Rotary Viscometer (CMRV) (see ASTM D 3829 and ASTM D 4684).

Catalog Number	Viscosity Standard	Table 5 • Approximate Viscosity in mPa·s (Centipoise)
9727-T10	N105B	CMRV viscosity standard, 30,000 mPa·s (cP) at –20°C; 56,200 mPa·s (cP) at –25°C
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

CANNON® CCS Viscosity Standards

CANNON CL Standards provide certified dynamic viscosity data (in cP or mPa·s) at temperatures from –5°C to –35°C. These standards are used to calibrate the CANNON Cold-Cranking Simulator (CCS) oil testing (see ASTM D 5293 and SAE Specification J300).

Table 6 • Dynamic Viscosity in mPa·s (Centipoise)

Catalog Number	*Viscosity Standard**	*–5°C*	*–10°C*	*–15°C*	*–20°C*	*–25°C*	*–30°C*	*–35°C*
9727-N02	CL080	—	—	—	—	—	—	800
9727-N04	CL090	—	—	—	—	—	—	1200
9727-N06	CL100 (CL10)	—	—	—	—	—	900	1700
9727-N07	CL110	—	—	—	—	—	1400	2500
9727-N08	CL120 (CL12)	—	—	—	—	800	1600	3200
9727-N09	CL130	—	—	—	—	1500	2700	4800
9727-N10	CL140 (CL14)	—	—	—	800	1600	3300	7000
9727-N11	CL150	—	—	—	1200	2500	4500	8000
9727-N12	CL160 (CL16)	—	—	—	1200	2500	5500	11000
9727-N13	CL170	—	—	1100	1800	3500	6200	11000
9727-N14	CL190 (CL19)	—	—	900	1800	3500	7400	17200
9727-N16	CL200	—	—	1200	2400	4300	7400	13000
9727-N18	CL220 (CL22)	—	—	1300	2500	5000	11000	25000
9727-N20	CL240	—	—	1700	3400	6000	10000	20000
9727-N22	CL250 (CL25)	—	900	1800	3500	7300	15900	33000
9727-N24	CL260	—	1200	2500	4400	7200	14000	—
9727-N26	CL280 (CL28)	—	1300	2500	5000	9300	21000	50000
9727-N28	CL300	—	1700	3500	6000	11000	18000	—
9727-N30	CL320 (CL32)	—	1800	3500	7300	15900	32000	—
9727-N31	CL340	—	2500	4200	7000	12000	—	—
9727-N32	CL380 (CL38)	1600	2900	5800	13000	26000	—	—
9727-N33	CL420	—	5000	8500	15000	—	—	—
9727-N34	CL480 (CL48)	2300	4500	9500	21000	—	—	—
9727-N35	CL530	—	5900	10000	18000	—	—	—
9727-N36	CL600 (CL60)	3700	7300	15600	—	—	—	—
9727-N37	CL680	—	9500	—	—	—	—	—
9727-N38	CL740 (CL74)	6000	12000	—	—	—	—	—
9727-N43	Set of 14	Set of CCS-2050/2100 Low Temp Standards (includes CL10, CL12, CL14, CL16, CL19, CL22, CL25(2), CL28, CL32, CL38, CL48, CL60, & CL74)						
9727-N42	Set of 8	Set of CCS Low Temp Standards (includes CL14, CL19, CL22, CL25, CL28, CL32, CL48, & CL74)						

* CL Standards nomenclature has changed. The previous standard names are indicated in parentheses.

> "NIST will delegate responsibility for U.S. national standards for certified liquid viscosity reference standards to the CANNON Instrument Company."
>
> James R. Whetstone, Chief
> Process Measurements Division/Chemical Science and Technology Laboratory
> National Institute of Standards and Technology
> January 6, 2003

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CANNON® Cup Viscosity Standards

Table 7 • Certified Data 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 2¼	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	460	3 4	47 36	5 6	72 29	5 —	40 —
9727-W40	C350	850	4 5	62 37	6 —	53 —	5 —	72 —
9727-W45	C600	1300	5	54	—	—	—	—

Viscosity Standards for Zahn, Shell, & Ford Cups

Approximate values are shown in Table 7. Exact values calculated from the equations in Table 8 are supplied with each standard.

For more information on cups, contact Cannon Instrument Company.

Table 8 • Ranges of Viscosity Cups

Cup Number	Equations‡ where t = Time of flow, seconds ν = kinematic viscosity, mm^2/s	Drain time seconds		Kinematic viscosity centistokes	
		min	max	min	max
Zahn Cups (See ASTM D 4212)					
1	ν = 1.1 (t – 29)	35	80	5	60
2	ν = 3.5 (t – 14)	20	80	20	250
3	ν = 11.7 (t – 7.5)	20	80	100	800
4	ν = 14.8 (t – 5)	20	80	200	1200
5	ν = 23t	20	80	400	1800
Shell Cups (See ASTM D 4212)					
1	ν = 0.226 (t – 13)	20	80	2	20
2	ν = 0.576 (t – 5)	20	80	10	50
2½	ν = 0.925 (t – 3)	20	80	20	80
3	ν = 1.51 (t – 2)	20	80	30	120
3½	ν = 2.17 (t – 1.5)	20	80	40	170
4	ν = 3.45 (t – 1)	20	80	70	270
5	ν = 6.5 (t – 1)	20	80	125	520
6	ν = 16.2 (t – 0.5)	20	80	320	1300
Ford Cups (See ASTM D 1200)					
1	ν = 0.49 (t – 35.0)	55	100	10	35
2	ν = 1.44 (t – 18.0)	40	100	25	120
3	ν = 2.31 (t – 6.58)	20	100	49	220
4	ν = 3.85 (t – 4.49)	20	100	70	370
5	ν = 12.1 (t – 2.00)	20	100	200	1200

‡ While the equations in Table VIII are widely used, the equation ν = at - b/t is often more applicable, especially at low flow times and low kinematic viscosity.

Equations for Zahn, Shell, & Ford Cups

Equations for conversion of kinematic viscosity or viscosity into other viscometric units are given here. All data must be at 25°C. Note that the equations apply only between the minimum and maximum drain times shown.

Need SAE Viscosity Check Oils? See page 2!

CANNON® Viscosity Standards & Flash Point Reference Materials

High-Temperature Standards

For High-Temperature High-Shear Viscometer measurements at 150°C and $10^6 s^{-1}$ shear rate.
See ASTM D 5481.

Catalog Number	Viscosity Standard	Table 9 • High-Temperature Standards
9727-U50	HT39	2.0 mPa·s (cP) at 150°C, 4.7 mPa·s (cP) at 100°C
9727-U55	HT75	2.7 mPa·s (cP) at 150°C, 7.0 mPa·s (cP) at 100°C
9727-U60	HT150	3.7 mPa·s (cP) at 150°C, 10.5 mPa·s (cP) at 100°C
9727-U65	HT240	5.0 mPa·s (cP) at 150°C, 15.4 mPa·s (cP) at 100°C
9727-U70	HT390	7.0 mPa·s (cP) at 150°C, 23.5 mPa·s (cP) at 100°C
9727-U92	HTNN-1	Non-Newtonian standard, 3.6 mPa·s (cP) at 150°C and $10^6 s^{-1}$
9727-U94	HTNN-2	Non-Newtonian standard, 3.1 mPa·s (cP) at 150°C and $10^6 s^{-1}$

Viscosity Standards for Thomas®-Stormer® Viscometer

The KREBS UNIT (KU) is often used for THOMAS-STORMER Viscometers.

Table 10 • Certified Data at 25°C*			
Catalog Number	*Viscosity Standard*	Viscosity (Centipoise)	Krebs Unit (KU)
9727-Y10	S200(KU)	400	64
9727-Y15	N350(KU)	750	79
9727-Y20	K400(KU)	940	84
9727-Y25	S600(KU)	1060	88
9727-Y30	N1000(KU)	2000	106

* Additional values provided at 23, 24, 24.5, 25.5, and 26°C

Silicone Viscosity Standards for Rotational Viscometers

CANNON silicone standards are intended for calibration of Brookfield type rotational viscometers, such as the 2020 Series Rotary Viscometers offered by CANNON. Viscosity data at 20, 23, 24, 25, 26, 27, and 40°C is provided. CANNON has been granted ISO 9001 registration for the manufacture and certification of viscosity standards, including the silicone standards listed here.

Viscosities for all silicone standards sold by CANNON are based on the National Institute of Standards and Technology (NIST) value of 1.0016 mPa•s (centipoise) for water at 20°C (68°F). All silicone standards are traceable to the NIST. Silicone standards are sold in 500 mL bottles.

Note: The listed silicone standards are intended for use with rotational viscometers only. Silicone standards are not recommended for glass capillary viscometers (including vacuum viscometers), metal cup-type viscometers (such as ISO, Zahn, Ford, Shell, and Fisher cups), or any other viscometers providing kinematic viscosity – CANNON hydrocarbon-based oil standards should be used for these types of viscometers.

Table 11 • Silicone Viscosity Standards		
Catalog Number	Viscosity Standard	Approximate Viscosity mPa·s (Centipoise) 25°C (77°F)
9727-Z10	RT5	4.9
9727-Z14	RT10	9.4
9727-Z18	RT50	48
9727-Z22	RT100	96
9727-Z26	RT500	480
9727-Z30	RT1000	960
9727-Z34	RT5000	4800
9727-Z38	RT12500	12000
9727-Z42	RT30000	29000
9727-Z46	RT60000	58000
9727-Z50	RT100000	97000

Flash Point Reference Materials

CANNON Instrument Company can now provide Flash Point Reference Materials for calibrating Flash Point Testers. A total of six different standards are available for the following ASTM methods: ASTM D 56, ASTM D 92, and ASTM D 93. The data provided for each standard includes the average flash point for the lot and the standard deviation observed from 20 tests in 10 different laboratories. Nominal flash points for the various standards are shown in the accompanying table. The four standards with lower flash points are made from high purity alkane materials, while the two standards with higher flash points are made from narrow distributions of decane oligomers. Flash Point Standards are sold in 200 mL bottles (155 g).

Table 12 • Flash Point Reference Materials				
Catalog Number	*Product ID*	*ASTM D 56 Nominal Flash Point (°C)*	*ASTM D 92 Nominal Flash Point (°C)*	*ASTM D 93 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

* Incurs additional shipping charges due to low flash point

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