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# Vane Spindles

for foods, cosmetics, sealants...

...for use with paste-like materials, gels and fluids where suspended solids migrate away from the measurement surface of standard spindles.

Minimal disruption of sample during spindle immersion

Keeps particles in suspension during testing cycle

Viscosity data includes complete flow curve analysis when software is used

Provides information on yield behavior at low rotational speeds

Follows industry recommendations on length/diameter ratios for vane spindles

3-piece spindle set for versatile range capability

Optional V-74 and V-75 spindles for even greater range capability and immersion into small size sample containers



## Vane Spindle Ranges

SPINDLE	TORQUE RANGE	SHEAR STRESS RANGE (Pa)	VISCOSITY RANGE cP(mPa*s)
V-71	NOT RECOMMENDED FOR USE ON LV TORQUE		
V-72	LV	.188-1.88	104.04-1.04K
V-73	LV	.938-9.38	502-5.02K
V-74	LV	9.38-93.8	5.09K-50.9K
V-75	LV	3.75-37.5	1.996K-19.96K
V-71	RV	.5-5	262-2.62K
V-72	RV	2-20	1.11K-11.1K
V-73	RV	10-100	5.35K-53.5K
V-74	RV	100-1K	54.3K-543K
V-75	RV	40-400	21.3K-213K
V-71	HA	1-10	524-5.24K
V-72	HA	4-40	2.22K-22.2K
V-73	HA	20-200	10.7K-107K
V-74	HA	200-2K	108.6K-1.086M
V-75	HA	80-800	42.6K-426K
V-71	HB	4-40	2.096K-20.96K
V-72	HB	16-160	8.88K-88.8K
V-73	HB	80-800	42.8K-428K
V-74	HB	800-8K	434.4K-4.344M
V-75	HB	320-3.2K	170.4K-1.704M
V-71	5xHB	20-200	10.48K-104.8K
V-72	5xHB	80-800	44.4K-444K
V-73	5xHB	400-4000	214K-2.14M
V-74	5xHB	4K-40K	2.172M-21.72M
V-75	5xHB	1.6K-16K	852K-8.52M

Note: 1. 1 Pa = 10 dyne/cm<sup>2</sup> 2. Viscosity Range is given at rotational speed of 10 RPM  
3. 5xHB is the highest torque range available 4. Not for use with DV-E Viscometers

M = 1 million K = 1 thousand Pa = Pascal  
cP = Centipoise mPa\*s = Millipascal\*seconds

## Brookfield Vane Spindle Set

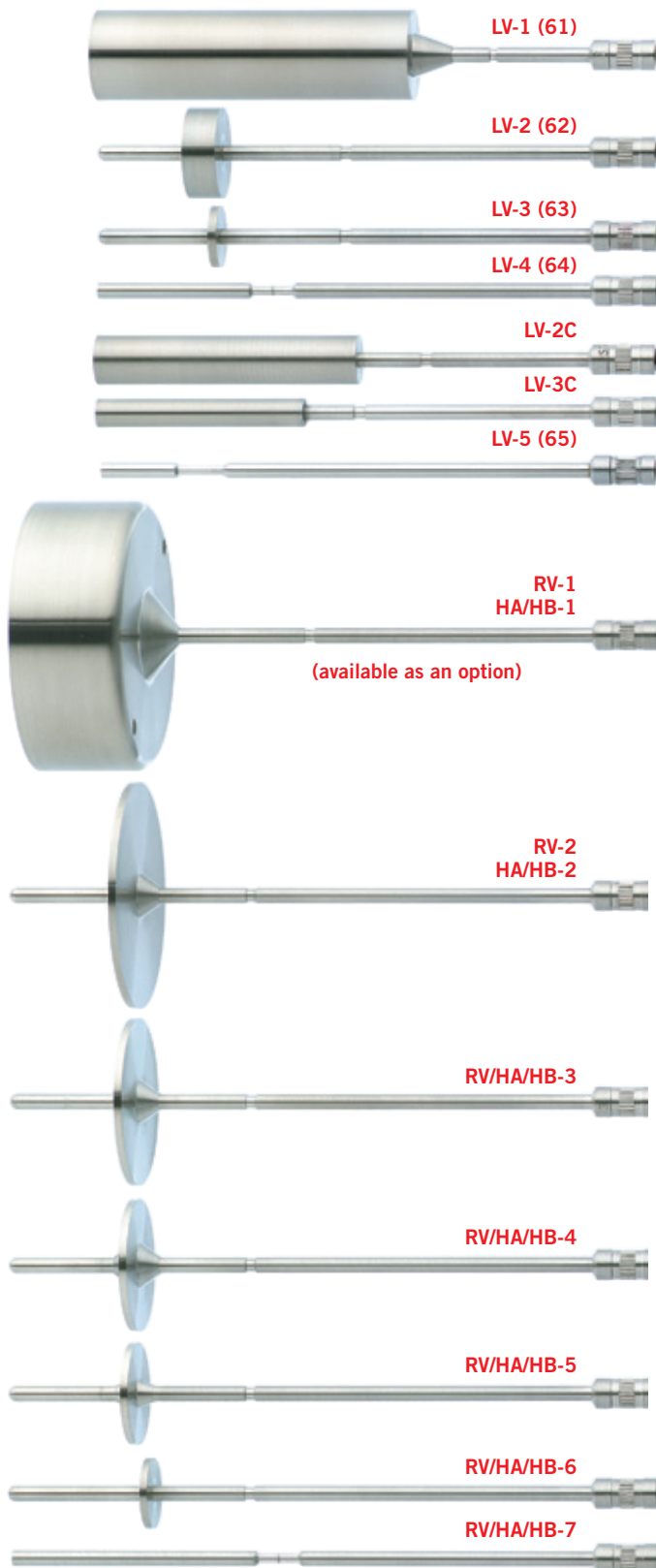
Includes V-71, V-72, and V-73 vane spindles. See the individual specifications in the spindle section. (p44)

Optional V-74 and V-75 spindles are smaller in size than V-73.

## EZ-Lock Option

Vane Spindles are available with special EZ-Lock spindle coupling for use on standard Brookfield Viscometers/ Rheometers already equipped with the EZ-Lock feature. (p50)

# Spindles



LV Spindles cP(mPa•s)	
SPINDLE	RANGE*
LV-1 (61)	15 - 20K
LV-2 (62)	50 - 100K
LV-3 (63)	200 - 400K
LV-4 (64)	1K - 2M

LV-5 (65)	2K - 4M	LV-5 is an optional spindle designed to increase measuring range.
LV-2C	50 - 100K	
LV-3C	200 - 400K	

\* Based on Standard LV speeds .3 - 60 rpm M = 1 million K = 1 thousand  
 Note: LV-1 through LV-4 are supplied with LV instruments.  
 LV-2C & LV-3C are optional "cylindrical spindles" offering geometry for calculating shear rates.  
 LV and RV/HA/HB spindles are supplied in 302 stainless steel.  
 Optional 316 stainless or teflon coated spindles are available

RV/HA/HB Spindles cP(mPa•s)			
SPINDLE	RANGE* RV SERIES	RANGE* HA SERIES	RANGE* HB SERIES
RV-1 **	100 - 20K	200 - 40K	800 - 160K
HA/HB-1 **	100 - 20K	200 - 40K	800 - 160K
RV-2	100 - 80K	200 - 160K	800 - 640K
HA/HB-2	100 - 80K	200 - 160K	800 - 640K
RV/HA/HB-3	100 - 200K	200 - 400K	800 - 1.6M
RV/HA/HB-4	200 - 400K	400 - 800K	1.6K - 3.2M
RV/HA/HB-5	400 - 800K	800 - 1.6M	3.2K - 6.4M
RV/HA/HB-6	1K - 2M	2K - 4M	8K - 16M
RV/HA/HB-7	4K - 8M	8K - 16M	32K - 64M

\* Based on standard RV/HA/HB speeds .5-100 RPM. M = 1 million K = 1 thousand  
 Note: LV and RV/HA/HB spindles are supplied in 302 stainless steel.  
 Optional 316 stainless or teflon coated spindles are available  
 \*\* This spindle available as an option

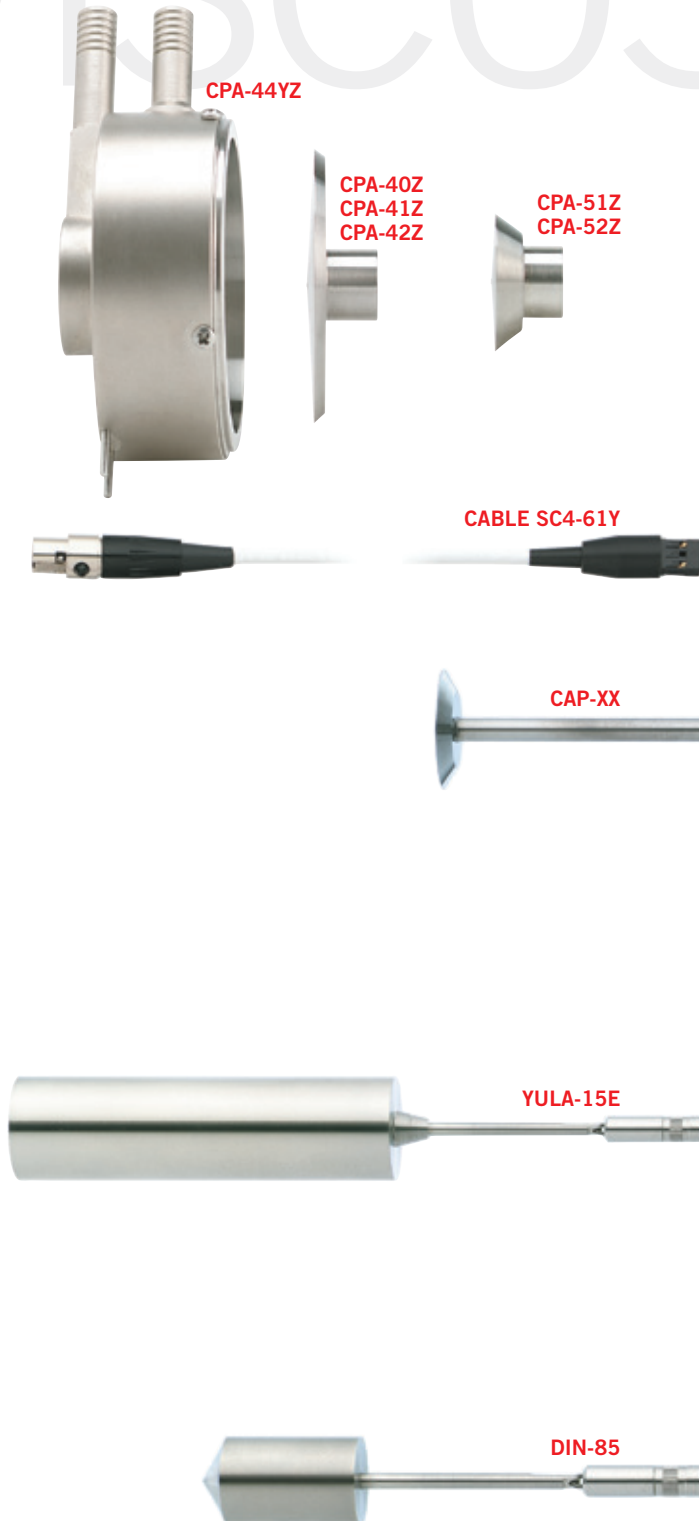


RV/HA/HB Spindle Set includes spindles #2 - #7 and is supplied with standard Brookfield Viscometers and Rheometers.

Spindle #1 is available as an option.

Spindle Rack is also available as an option with both LV and RV/HA/HB spindle sets.

# Spindles



## Wells/Brookfield Spindles & Cups

SPINDLE	SHEAR RATE	SAMPLE VOLUME	CONE ANGLE	CONE RADIUS
CPA-40Z	7.50N sec <sup>-1</sup>	.5mL	.8°	2.4cm
CPA-41Z	2.00N sec <sup>-1</sup>	2.0mL	3°	2.4cm
CPA-42Z	3.84N sec <sup>-1</sup>	1.0mL	1.5°	2.4cm
CPA-51Z	3.84N sec <sup>-1</sup>	.5mL	1.5°	1.2cm
CPA-52Z	2.00N sec <sup>-1</sup>	.5mL	3°	1.2cm
CUP				
CPA-44YZ	Standard cup without temperature probe			
CPA-44PYZ	Standard cup with RTD temperature probe			
PCPA-3YZ	Cup with 1 purge fitting			
PCPA-6YZ	Cup with luer fitting and 1 purge fitting			
PCPA-4YZ	Cup with luer fitting and 2 purge fittings			
PCPA-7YZ	Cup with luer fitting and 4 purge fittings			

- Note: 1. Wells-Brookfield cones and cups are calibrated at the factory.  
 Cones ordered after shipment require cups to be returned for calibration to new cone.  
 2. CPA cups and spindles are compatible with CPE cups and spindles  
 3. See page 18 for viscosity ranges

## CAP Spindles

SPINDLE	SHEAR RATE	SAMPLE VOLUME	CONE ANGLE	CONE RADIUS
CAP-01	13.3N sec <sup>-1</sup>	67 µL	0.45°	1.511cm
CAP-02	13.3N sec <sup>-1</sup>	38 µL	0.45°	1.200cm
CAP-03	13.3N sec <sup>-1</sup>	24 µL	0.45°	0.953cm
CAP-04	3.3N sec <sup>-1</sup>	134 µL	1.8°	1.200cm
CAP-05	3.3N sec <sup>-1</sup>	67 µL	1.8°	0.953cm
CAP-06	3.3N sec <sup>-1</sup>	30 µL	1.8°	0.702cm
CAP-07	2.0N sec <sup>-1</sup>	1700 µL	3.0°	2.399cm
CAP-08	2.0N sec <sup>-1</sup>	400 µL	3.0°	1.511cm
CAP-09	2.0N sec <sup>-1</sup>	100 µL	3.0°	0.953cm
CAP-10	5.0N sec <sup>-1</sup>	170 µL	1.2°	1.511cm

- Note: 1. Recommend ordering calibration fluids specific to cone for field calibration  
 2. See page 21 for viscosity ranges

## UL Spindles & Chambers

SPINDLE	TYPE	SAMPLE VOLUME	SHEAR RATE
YULA-15(E)	Spindle - 304 stainless steel		1.224N
YULA-15(E)Z	Spindle - 316 stainless steel		1.224N
ULA-31(E)Y	Sample Chamber - 304 stainless steel	16mL	
ULA-31(E)YZ	Sample Chamber - 316 stainless steel	16mL	

- Note: 1. See page 41 for viscosity ranges  
 2. (E) represents enhanced UL version (introduced Jan. 2006) N = rpm

## DIN Spindles

SPINDLE	SHEAR RATE	SAMPLE VOLUME
ULA-DIN-85	1.29N	17.0mL
ULA-DIN-86	1.29N	6.5mL
ULA-DIN-87	1.29N	2.0mL
HT-DIN-81 for Thermosel	1.29N	7.0mL
SC4-DIN-82 for SSA	1.29N	1.5mL
SC4-DIN-83 for SSA	1.29N	1.5mL
CHAMBER		
ULA-DIN-6Y	for use with ULA-DIN-86 and 87	
DAA-1	for use with ULA-DIN-85	



CCT-XX



RCT-XX-X



VT-80-40



RSS-90Y (1-4000BU)



SC4-XXBS SOLID SHAFT\*



SC4-XX LINK HANGING



HT-2



HT-2DB-100



CHAMBER RACK HT-54

Call or visit our website for more information on spindles with EZ-Lock connectors.

### RST Spindles

SPINDLE	VISCOSITY RANGE	SHEAR RATE	MAX. SHEAR STRESS	SAMPLE VOLUME
COAXIAL	Pa*s	sec <sup>-1</sup>	Pa	mL
CCT-DG	0.00005-4.07K	0.043-5.64K	177	15.7
CCT-40	0.0003-27.6K	0.0215-2.79K	594	68.5
CCT-25	0.002-177K	0.013-1.67K	2.28K	16.8
CCT-14	0.012-1M	0.013-1.68K	13K	3.4
CCT-8	0.065-5.41M	0.013-1.672K	69.6K	1.0
CONE				
RCT-25-1	0.005-407K	0.06-7.8K	24.4K	0.1
RCT-25-2	0.01-814K	0.03-3.9K	24.4K	0.2
RCT-50-1	0.0006-50.9K	0.06-7.8K	3.05K	1.0
RCT-50-2	0.0012-101K	0.03-3.9K	3.05K	2.0
RCT-75-1*	0.0002-15K	0.06-7.8K	905	2.5
RCT-75-2*	0.0004-30K	0.03-3.9K	905	5.0
PLATE				
RPT-25	0.03-2.49M	0.013-1.7K	32.6K	0.5
RPT-50	0.002-155K	0.027-3.4K	4.07K	2.0
RPT-75*	0.0004-30.7K	0.04-5.1K	1.2K	4.5

\*For use with water bath version only 1 Pa\*s = 1,000 cP K = 1 thousand M = 1 million  
Note: Values based on minimum speed of 1 RPM and maximum speed of 1000 RPM

### RST Vane Spindles

SPINDLE	VANE LENGTH	VANE DIAMETER	SHEAR STRESS
	mm	mm	Pa
VT-10-5	10	5	330-210K
VT-20-10	20	10	41-27K
VT-20-20	20	20	9-5.9K
VT-30-15	30	15	12-8K
VT-40-20	40	20	5.2-3.4K
VT-40-40	40	40	1.2-740
VT-50-25	50	25	2.7-1.7K
VT-60-8	60	8	24-15K
VT-60-15	60	15	7-4.3K
VT-60-30	60	30	1.6-1K
VT-80-40	80	40	0.7-420
VT-80-70	80	70	0.2-120

Values based on minimum speed of 1 RPM and maximum speed of 1000 RPM K = 1 thousand

### Thermosel Spindles and Chambers

Link hanging configuration is standard

SPINDLE	SHEAR RATE	SAMPLE VOLUME
SC4-18	1.32N	8.0mL
SC4-31	.34N	10.0mL
SC4-34	.28N	9.5mL
SC4-21	.93N	8.0mL
SC4-27**	.34N	10.5mL
SC4-28	.28N	11.5mL
SC4-29	.25N	13.0mL
HT-DIN-81	1.29N	7.0mL

\*SC4-XXBS = Solid Shaft. Not available for SC4-18 and SC4-21 spindles  
\*\*Also available as SC4-27D-100 = Disposable spindle, 100 units • SC4-DSY Chuck/Closer is required

CHAMBER	TYPE
HT-2	Sample Chamber - Reuseable, stainless steel
HT-2DB-100	Sample Chamber - Disposable, aluminum, 100 units

Note: See page 37 for spindle ranges

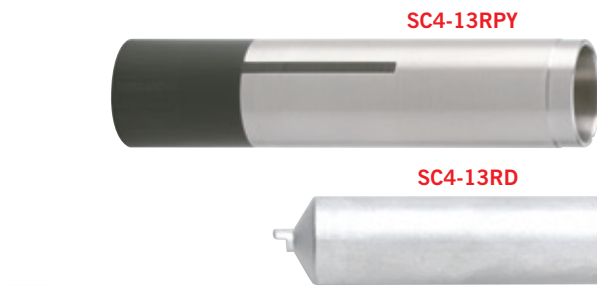
# Spindles



SC4-27SD SOLID SHAFT†

SC4-27 LINK HANGING

Required for SC4-27D disposable spindles: SC4-DSY CHUCK/CLOSER



SC4-13RPY

SC4-13RD



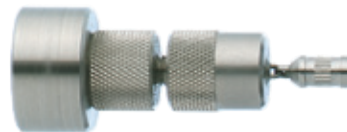
KREBS SPINDLE KU1-10

PASTE SPINDLE KU1-75Y



T-BAR SPINDLE T-A THRU T-F

CHUCK/WEIGHT/CLOSER ASSEMBLY BTU-18Y



SPIRAL ADAPTER SPINDLE SA-70



V-71

## Small Sample Spindles and Chambers

SPINDLE	SAMPLE CHAMBER	SHEAR RATE	SAMPLE VOLUME
SC4-18	13R	1.32N	6.7 mL
SC4-31	13R	0.34N	9.0 mL
SC4-34	13R	0.28N	9.4 mL
SC4-16	8R	0.29N	4.2 mL
SC4-25Z (316 s/s only)	13R	0.22N	16.1 mL
SC4-21†	13R	0.93N	7.1 mL
SC4-27*†	13R	0.34N	10.4 mL
SC4-15	7R	0.48N	3.8 mL
SC4-28	13R	0.28N	11.0 mL
SC4-29	13R	0.25N	13.5 mL
SC4-14	6R	0.40N	2.1 mL
SC4-DIN-82	-	1.29N	1.5 mL
SC4-DIN-83	-	1.29N	1.5 mL

CHAMBER	TYPE
SC4-13R	Sample Chamber w/o temperature probe
SC4-13RPY	Sample Chamber w/RTD temperature probe & cable
SC4-8R	Sample Chamber w/o temperature probe
SC4-8RPY	Sample Chamber w/RTD temperature probe & cable
SC4-7R	Sample Chamber w/o temperature probe
SC4-7RPY	Sample Chamber w/RTD temperature probe & cable
SC4-6R	Sample Chamber w/o temperature probe
SC4-6RPY	Sample Chamber w/RTD temperature probe & cable
SC4-13RD-100‡	Sample Chamber - Disposable, aluminum, 100 units

Note: See page 39 for spindle/chamber ranges ‡ Requires the use of special water jacket SC4-45YD  
 \* Also available as SC4-27D-100 = Disposable spindle, 100 units  
 † Solid shaft option available for spindles SC4-21 (Part No. SC4-21SD) and SC4-27 (Part No. SC4-27SD).

## KU-2 Spindles

SPINDLE	TYPE
KU1-10	Standard Krebs Spindle
KU1-75Y	Optional Paste Spindle

## T-Bar Spindles cP(mPa•s)

SPINDLE	LV	RV	HA	HB
T-A	156 - 62.5K	2K - 400K	4K - 800K	16K - 3.2M
T-B	312 - 124.8K	4K - 800K	8K - 6M	24K - 6.4M
T-C	780 - 312K	10K - 2M	20K - 4M	80K - 16M
T-D	1.5K - 624K	20K - 4M	40K - 8M	160K - 32M
T-E	3.9K - 1.5M	50K - 10M	100K - 20M	400K - 80M
T-F	7.8K - 3.1M	100K - 20M	200K - 40M	800K - 160M

M = 1 million K = 1 thousand

## Spiral Adapter Spindle

SPINDLE	CHAMBER
SA-70	SA-1Y

Note: See page 44 for ranges

## Vane Spindles

SPINDLE	VANE LENGTH (in)	VANE DIAMETER (in)
V-71	2.708	1.354
V-72	1.706	.853
V-73	.998	.499
V-74	.463	.232
V-75	.632	.316

Note: Container diameter should be twice (2x) the vane diameter when possible. See page 43 for ranges.