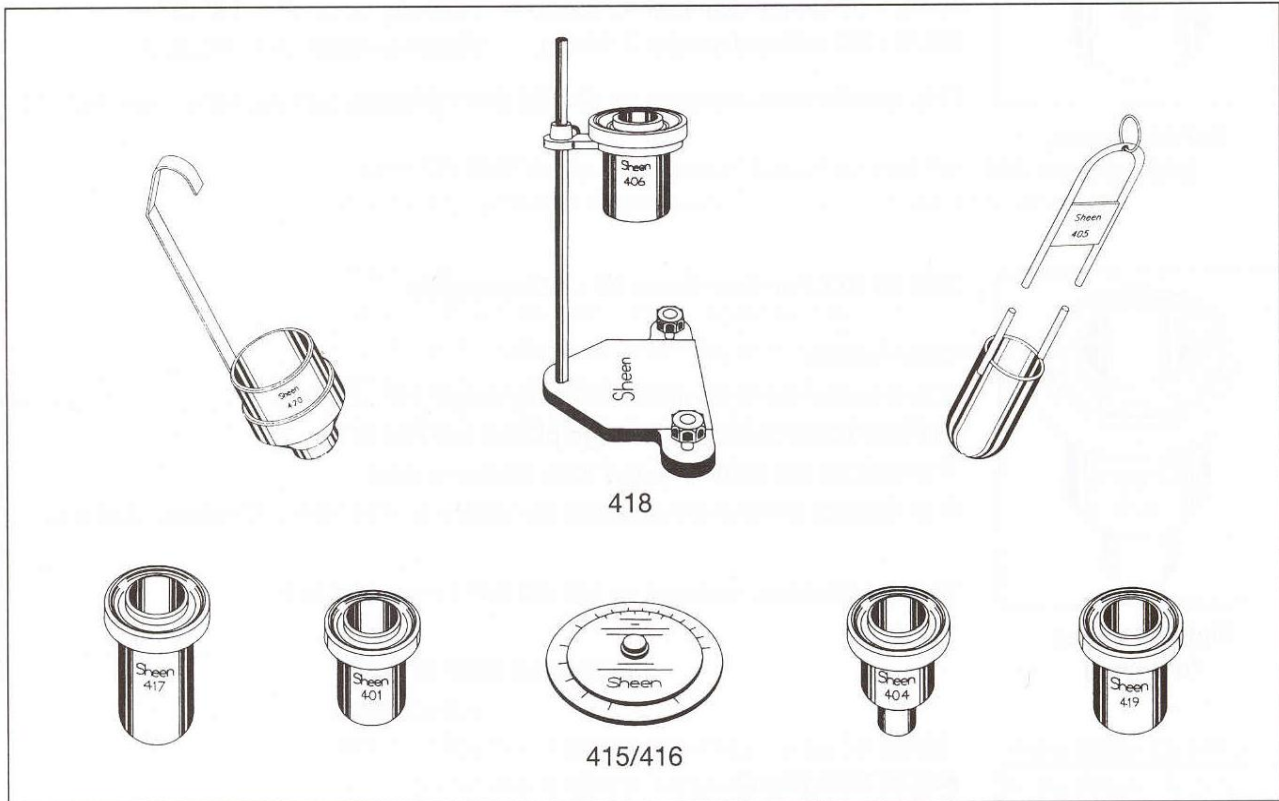




FLOW CUPS



These easy to use cups determine the flow time of paints, varnishes and other Newtonian (or near Newtonian) fluids. There are many types available, all engineered to the relevant national standards.

CERTIFICATION

Certificates of Conformity or Calibration can be supplied for any cup. These certificates must be requested at the time of purchase. Calibration certificates for 419 series and stated special size orifices are available calibrated against our Reference cups.

METHOD OF USE (excluding Zahn - type cups)

N.B. Please refer to the relevant national standard for detailed instructions

- 1) Select a suitable cup. (Please see over for flow times).
- 2) Ensure that the cup and test fluid are at the required temperature (or use a temperature / viscosity calculator, Ref 415/416).
- 3) Ensure no bubbles or debris are in the test fluid.
- 4) Seal the cup orifice (usually with a finger) and fill with test fluid, level the top of the fluid with a scraper.
- 5) Break-point procedure - remove finger from the orifice and simultaneously begin to time. At the first break in flow stop the timer. This elapsed time represents the 'flow-time' of the test fluid.
- 6) Fixed-volume procedure - proceed as above, but stop timing when 50ml has passed into a graduated measuring cylinder.

These flow cups are precision engineered from hard aluminium alloy and conform to the stated national and international standards, unless otherwise stated.



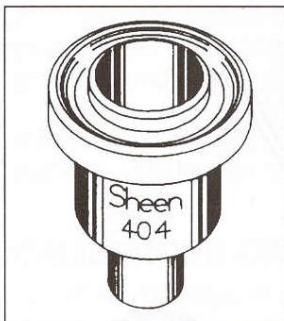
**Ref 401 series
(old type)**

BS3900 : Part A6, 1971. For flow times 30 - 300 seconds

Order codes

| | |
|-------------------------------------|-----------------------------|
| 401/2 - B2 orifice diameter 2.38mm. | Viscosity range 38-71cSt |
| 401/3 - B3 orifice diameter 3.17mm. | Viscosity range 38-147cSt |
| 401/4 - B4 orifice diameter 3.97mm. | Viscosity range 71-455cSt |
| 401/5 - B5 orifice diameter 4.76mm. | Viscosity range 299-781cSt |
| 401/6 - B6 orifice diameter 7.14mm. | Viscosity range 781-1650cSt |

This specification replaced by EN ISO 2431/8S3900 part A6:1996 - see Ref 417



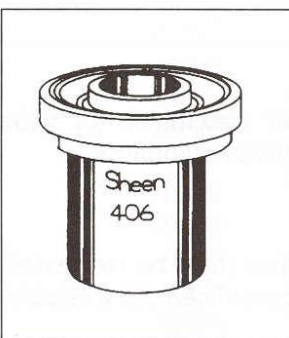
**Ref 404 series
(old type)**

DIN 53 211. For flow times 25 - 150 seconds.

Order codes

404/4 orifice diameter 4mm. Viscosity range 112 - 685cSt.
For flow times outside this range please see Ref 417
The orifices are manufactured from stainless steel.
N.B. Special orifices are available to order e.g. 404/2mm; 404/6mm; 404/8mm.

This specification replaced by EN ISO 2431 - see Ref 417



Ref 406 series

ASTM D1200 (Ford)

Order codes

| | | |
|--------------------------------|-----------------------------|------------------------|
| 406/1 No 1 orifice dia. 2.1 mm | Viscosity range 10-35cSt | Flow times 55-100 secs |
| 406/2 No 2 orifice dia. 2.8mm | Viscosity range 25-120cSt | Flow times 40-100 secs |
| 406/3 No 3 orifice dia. 3.4mm | Viscosity range 49-220cSt | Flow times 30-100 secs |
| 406/4 No 4 orifice dia. 4.1 mm | Viscosity range 70-370cSt | Flow times 30-100 secs |
| 406/5 No 5 orifice dia. 5.8mm | Viscosity range 200-1200cSt | Flow times 30-100 secs |

The orifices are manufactured from stainless steel.



Ref 417 series

BS EN ISO 2431, ASTM D 5125, BS3900 part A6:1996

For flow times 30 - 100 secs.

Order codes

| | |
|----------------------------------|---|
| 417/3 No 3 orifice diameter 3mm. | Viscosity range 7 -42cSt |
| 417/4 No 4 orifice diameter 4mm. | Viscosity range 35-135cSt |
| 417/5 No 5 orifice diameter 5mm. | Viscosity range 91-325cSt |
| 417/6 No 6 orifice diameter 6mm. | Viscosity range 188-684cSt |
| 417/8 No 8 orifice diameter 8mm. | Viscosity range 600 -2000cSt Special size |

The orifices are manufactured from stainless steel.

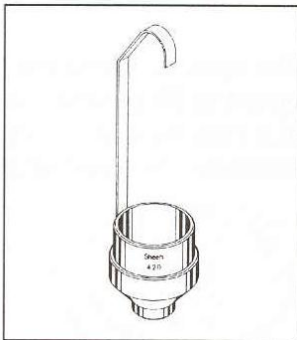


Ref 419 series

AFNOR CUPS. NF -T - 30014: For flow times 30 - 300 seconds.

Order codes

- 419/2.5 - orifice diameter 2.5mm. Viscosity range 5-140cSt
- 419/ 4 - orifice diameter 4mm. Viscosity range 50-1100cSt
- 419/6 - orifice diameter 6mm. Viscosity range 510-5100cSt
- 419/ 8 - orifice diameter 8mm. Viscosity range 700-11500cSt Special size



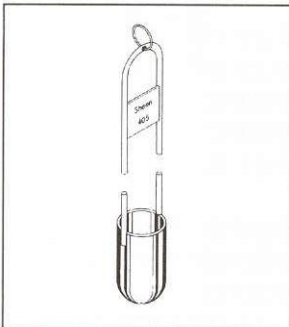
Ref 420 series

FRIKMAR CUP. A dip cup format based on old Ref. 404 style cup

DIN 53 211. (internal dimensions) For flow times 25-150 seconds.

Order codes

- 420/2 - orifice diameter 2mm - Special size
 - 420/4 - orifice diameter 4mm Viscosity range 112-685cSt
 - 420/6 - orifice diameter 6mm - Special size
- The orifices are manufactured from stainless steel



Ref 405 series

ASTM D 4212 Zahn Cups.

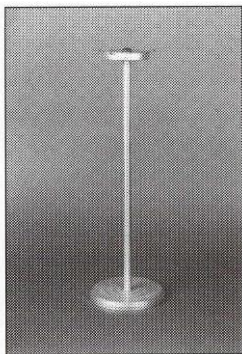
Order codes

- 405/1-orifice dia. 1.93mm Viscosity range 50-60cSt Flow times 35-80secs
- 405/2-orifice dia. 2.69mm Viscosity range 20-250cSt Flow times 20-80secs
- 405/3-orifice dia. 3.86mm Viscosity range 100-800cSt Flow times 20-80secs
- 405/4-orifice dia. 4.39mm Viscosity range 200-1200cSt Flow times 20-80secs
- 405/5-orifice dia. 5.41 mm Viscosity range 400-1800cSt Flow times 20-80secs

These cups are manufactured from steel and then bright nickel plated for a superior finish.

| FLOW CUP COMPARISON CHART | | | | | | |
|--|-------------------------------------|----------|----------|----------|---------|----------|
| Oil Viscosity cSt (mm ² /s) @ 25°C | Cup reference / Flow time (seconds) | | | | | |
| | 401-No 4 | 404-No 4 | 405-No 2 | 406-No 4 | 417-No4 | 420-No 4 |
| 87 | 34 | 23 | 39 | 27 | 66 | 23 |
| 115 | 43 | 29 | 47 | 34 | 86 | 29 |
| 228 | 82 | 52 | 79 | 64 | 167 | 52 |
| 393 | 139 | 87 | 126 | 106 | 287 | 87 |

This chart illustrates the variations in flow times which may be expected when comparing different cup types. **N.B.** These times must not be used as a basis of calibration, as they are derived by calculation and are for illustrative purposes only.



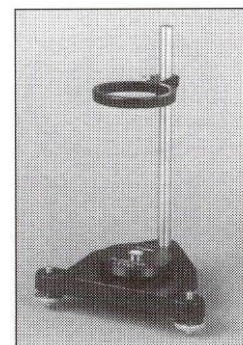
Ref.405/1

FLOW CUP STANDS

Ref. 405 ST- Zahn Cup Stand. Aluminium alloy 41cm high, which will store up to five Zahn viscosity flow cups.

Flow cup stands designed to hold cups (except 405/420) steady and level during flow time measurement.

Ref. 418 Construction -Stainless Steel rod mounted in a cast aluminium base with two adjustable feet. The cup is held within a cast aluminium height adjustable ring. A superior quality spirit level is also supplied.



Ref. 418

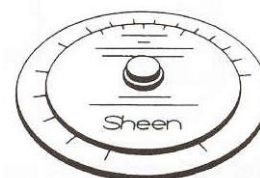
Ref. 418/LC -not illustrated. A lightweight aluminium frame supplied with spirit level

TEMPERATURE / VISCOSITY CALCULATORS

These allow viscosity corrections to be calculated when tests are not carried out at the specified temperature. For example a measured viscosity, in a flow cup, of 80 seconds at 25°C is equivalent to 99 seconds at 21°C and a specified viscosity of 80 divided by 10 i.e. 8 poises at 25°C is equal to 10.5 (105 divided by 10) poises at 20°C at which the determination is to be made. These relationships are not applicable to structured products and heavily pigmented compositions.

Ref 415- coefficient of 5.5% per °C. e.g. resins, clear or pigmented products.

Ref 416- coefficient of 2.66% per °C. e.g. water based products.



CALIBRATION OILS

We offer a full range of oils for calibrating each of our flow cups and spindle viscometers, (nominal volume 500cc) Our recommended oils for calibration of flow cups (nominal values)

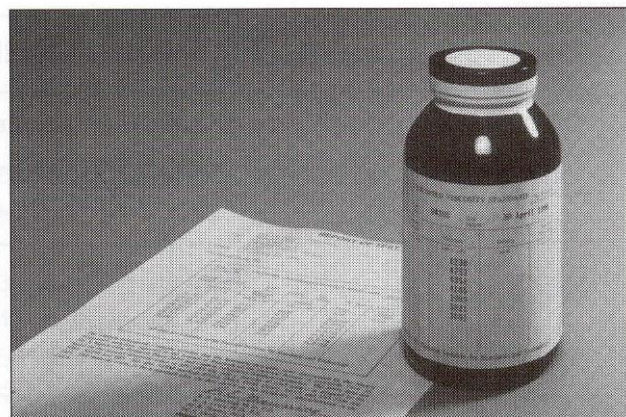
| | | | | | |
|-------|---------|--------|---------|---------|--------|
| 404/4 | 259cSt | @ 23°C | 417/3 | 19cSt | @ 23°C |
| | | | 417/4 | 65cSt | @ 23°C |
| 405/1 | 34cSt | @ 25°C | 417/5 | 259cSt | @ 23°C |
| 405/2 | 118cSt | @ 25°C | 417/6 | 533cSt | @ 23°C |
| 405/3 | 463cSt | @ 25°C | 417/8 | 1322cSt | @ 23°C |
| 405/4 | 572cSt | @ 25°C | | | |
| 405/5 | 1131cSt | @ 25°C | 419/2.5 | 76cSt | @ 20°C |
| | | | 419/4 | 159cSt | @ 20°C |
| 406/1 | 17.4cSt | @ 25°C | 419/6 | 1130cSt | @ 25°C |
| 406/2 | 58cSt | @ 25°C | | | |
| 406/3 | 118cSt | @ 25°C | 420/4 | 259cSt | @ 23°C |
| 406/4 | 228cSt | @ 25°C | | | |
| 406/5 | 800cSt | @ 25°C | | | |

Note: The oil viscosities have been selected to enable cups to be calibrated at the mid point of recommended working viscosity range at the temperatures stated.

Ref 440 Calibration Oils calibrated @ 20 & 25°C only, accuracy ±2%.

Ref 441 Calibration Oils calibrated @ 20, 23, 24, 24.5, 25, 25.5 and 26°C, accuracy ±0.2%.

Accuracy of Ref 441 oils up to 1000 cSt ±0.3%
1001 - 10,000 cSt ±0.4%



Owing to continuous development, we reserve the right to introduce improvements and modify specifications without prior notice.

Sheen Instruments Ltd

2 Gatton Park Business Centre, Wells Place, Redhill, Surrey RH1 3LG

Tel: 01737 649300 Fax 01737 649301

Internet : www.sheeninstruments.com Email: info@sheeninstruments.com