

The right temperature worldwide

LAUDA

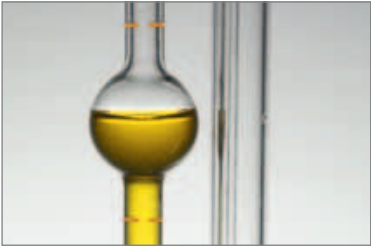






LAUDA Measuring Instruments

Viscometer, Tensiometer

Analysis of oils,
polymers and plastics

Your advantages at a glance

| + | The glass capillary viscometer advantages | Your benefits |
|---|--|--|
|  | <ul style="list-style-type: none"> • Ring marks with no detection disturbances | <ul style="list-style-type: none"> • Precise, positioned, NIR permeable ring marks with exactly 40 mm clearance. The capillary constant is valid for stopwatch and automatic measuring systems. |
|  | <ul style="list-style-type: none"> • Corrosion resistant labelling | <ul style="list-style-type: none"> • There is no risk of abrasion or etching off of the labeling even with the use of strong acids and aggressive solvents used as samples or cleaning agents. |
|  | <ul style="list-style-type: none"> • Ubbelohde for dilution series with calibration certificate and filter frit | <ul style="list-style-type: none"> • Absolute measuring now also possible with calibrated dilution viscometers. The integrated frit ensures filtration when the sample dissolves in the viscometer. |
|  | <ul style="list-style-type: none"> • Complete application from one supplier | <ul style="list-style-type: none"> • LAUDA supplies all components for the viscosity application – clear-view thermostats, automatic viscosity measuring systems and glass capillary viscometers. |
|  | <ul style="list-style-type: none"> • Customer-specific variants available on request | <ul style="list-style-type: none"> • Special variants as desired by the customer, specifically for adaptation to automatic measuring systems. |

LAUDA Glass capillary viscometers

Ubbelohde Viscometers

For automatic and stopwatch measurement. Standard design with no thread for easy removal prior to external cleaning.

- ISO 3105, DIN 51562, BS 188, NFT 60-100
- Filling volume: 15...20 ml
- Total length: approx. 290 mm
- Measurement accuracy: $\pm 0.2\%$

Also available in ASTM version

| Type | Cap. const. mm ² /s ² | DIN/ASTM mm ² /s | PVS or iVisc mm ² /s | Ø i mm | Cat. No. calibrated | Cat. No. uncalibrated |
|------|---|-----------------------------|---------------------------------|--------|---------------------|-----------------------|
| 0c | 0.003 | 0.7...3 | 0.3...2 | 0.47 | EGV 700 | EGV 709 |
| 0a | 0.005 | 1...5 | 0.5...3 | 0.53 | EGV 701 | EGV 710 |
| I | 0.01 | 2...10 | 0.7...7 | 0.63 | EGV 702 | EGV 711 |
| Ic | 0.03 | 6...30 | 2...20 | 0.84 | EGV 703 | EGV 712 |
| II | 0.1 | 20...100 | 6...60 | 1.13 | EGV 704 | EGV 713 |
| IIc | 0.3 | 60...300 | 20...200 | 1.50 | EGV 705 | EGV 714 |
| III | 1 | 200...1,000 | 60...600 | 2.01 | EGV 706 | EGV 715 |
| IIIc | 3 | 600...3,000 | 200...2,000 | 2.65 | EGV 707 | EGV 716 |
| IV | 10 | 2,000...10,000 | 600...6,000 | 3.60 | EGV 708 | EGV 717 |
| IVc | 30 | 6,000...30,000 | 2,000...20,000 | 4.70 | EGV 699 | EGV 697 |



Ubbelohde Viscometers for automatic cleaning

For automatic and stopwatch measurement. With screw connections and aspirating tube for permanent installation. Recommended for automatic cleaning with LAUDA VRM modules.

- ISO 3105, DIN 51562, BS 188, NFT 60-100
- Filling volume: 18...22 ml
- Total length: approx. 290 mm
- Measurement accuracy: $\pm 0.2\%$

Also available in ASTM version

| Type | Cap. const. mm ² /s ² | DIN/ASTM mm ² /s | PVS or iVisc mm ² /s | Ø i mm $\pm 0,01$ | Cat. No. calibrated | Cat. No. uncalibrated |
|------|---|-----------------------------|---------------------------------|-------------------|---------------------|-----------------------|
| 0c | 0.003 | 0.7...3 | 0.3...2 | 0.47 | EGV 930 | EGV 940 |
| 0a | 0.005 | 1...5 | 0.5...3 | 0.53 | EGV 931 | EGV 941 |
| I | 0.01 | 2...10 | 0.7...7 | 0.63 | EGV 932 | EGV 942 |
| Ic | 0.03 | 6...30 | 2...20 | 0.84 | EGV 933 | EGV 943 |
| II | 0.1 | 20...100 | 6...60 | 1.13 | EGV 934 | EGV 944 |
| IIc | 0.3 | 60...300 | 20...200 | 1.50 | EGV 935 | EGV 945 |
| III | 1 | 200...1,000 | 60...600 | 2.01 | EGV 936 | EGV 946 |
| IIIc | 3 | 600...3,000 | 200...2,000 | 2.65 | EGV 937 | EGV 947 |
| IV | 10 | 2,000...10,000 | 600...6,000 | 3.60 | EGV 938 | EGV 948 |



Micro-Ubbelohde Viscometers

For small sample quantities and/or short measurement times. Designed with no thread for easy removal prior to external cleaning. Compatible with LAUDA VRM modules.

- DIN 51562/2
- Filling volume: 3...4 ml
- Total length: approx. 290 mm
- Measurement accuracy: $\pm 0.5\%$

| Type | Cap. const. mm ² /s ² | DIN/ASTM mm ² /s | PVS or iVisc mm ² /s | Ø i mm | Cat. No. calibrated | Cat. No. uncalibrated |
|------|--|--------------------------------|------------------------------------|-----------|------------------------|--------------------------|
| I | 0.01 | 1...6 | 0.30...6 | 0.40 | EGV 718 | EGV 723 |
| Ic | 0.03 | 3...18 | 0.8...18 | 0.53 | EGV 719 | EGV 724 |
| II | 0.1 | 10...60 | 3...60 | 0.70 | EGV 720 | EGV 725 |
| IIc | 0.3 | 30...180 | 8...180 | 0.95 | EGV 721 | EGV 726 |
| III | 1 | 100...800 | 30...800 | 1.26 | EGV 722 | EGV 727 |



Micro-Ostwald Viscometers

For small sample quantities and/or very short measurement times. Designed with no thread for easy removal prior to external cleaning. Compatible with LAUDA VRM modules. Precise volume input required. Especially recommended for heavy-foaming samples.

- Filling volume: 2 ml
- Total length: approx. 290 mm
- Measurement accuracy: $\pm 0.5\%$

| Type | Cap. const. mm ² /s ² | DIN/ASTM mm ² /s | PVS or iVisc mm ² /s | Ø i mm | Cat. No. calibrated | Cat. No. uncalibrated |
|------|--|--------------------------------|------------------------------------|-----------|------------------------|--------------------------|
| I | 0.01 | 1...6 | 0.30...6 | 0.43 | EGV 820 | EGV 825 |
| Ic | 0.03 | 3...18 | 0.8...18 | 0.60 | EGV 821 | EGV 826 |
| II | 0.1 | 10...60 | 3...60 | 0.77 | EGV 822 | EGV 827 |
| IIc | 0.3 | 30...180 | 8...180 | 1.00 | EGV 823 | EGV 828 |
| III | 1 | 100...800 | 30...800 | 1.36 | EGV 824 | EGV 829 |



LAUDA Glass capillary viscometers

Cannon-Fenske Routine Viscometers for automatic cleaning

Viscometers for automatic and stopwatch measurement. With screw connections and aspirating tube for permanent installation. Recommended for automatic cleaning with LAUDA VRM modules. Precise volume input required.

- ISO 3105, ASTM D 2515, BS 188
- With filling and cleaning tube
- Filling volume: approx. 5...10 ml
- Total length: approx. 245 mm
- Measurement accuracy: $\pm 0.3\%$

| Type | Cap. const. mm ² /s ² | DIN/ASTM mm ² /s | PVS or iVisc mm ² /s | Ø i mm | Cat. No. calibrated | Cat. No. uncalibrated |
|------|---|-----------------------------|---------------------------------|--------|---------------------|-----------------------|
| 50 | 0.004 | 0.8...4 | 0.4...3 | 0.44 | EGV 951 | EGV 986 |
| 75 | 0.008 | 1.6...8 | 0.8...6 | 0.54 | EGV 952 | EGV 987 |
| 100 | 0.015 | 3...15 | 2...10 | 0.63 | EGV 953 | EGV 988 |
| 150 | 0.035 | 7...35 | 4...25 | 0.78 | EGV 954 | EGV 989 |
| 200 | 0.1 | 20...100 | 8...60 | 1.01 | EGV 955 | EGV 990 |
| 300 | 0.25 | 50...250 | 20...100 | 1.27 | EGV 956 | EGV 991 |
| 350 | 0.5 | 100...500 | 40...200 | 1.52 | EGV 957 | EGV 992 |
| 400 | 1.2 | 240...1,200 | 100...500 | 1.92 | EGV 958 | EGV 993 |
| 450 | 2.5 | 500...2,500 | 200...1,000 | 2.35 | EGV 959 | EGV 994 |
| 500 | 8 | 1,600...8,000 | 700...3,500 | 3.20 | EGV 960 | EGV 995 |
| 600 | 20 | 4,000...20,000 | 1,500...7,500 | 4.20 | EGV 961 | EGV 996 |

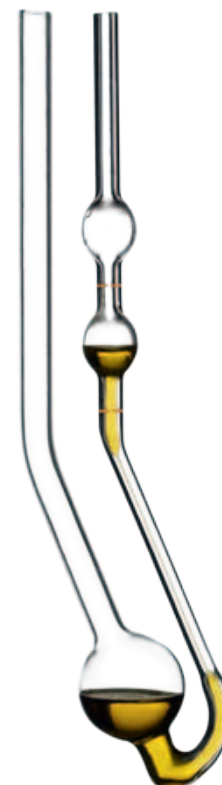


Cannon-Fenske Routine Viscometers

For automatic and stopwatch measurement. Standard design with no thread for easy removal prior to external cleaning. Precise volume input required.

- ISO 3105, ASTM D 2515, BS 188
- Filling volume: approx. 5...10 ml
- Total length: approx. 245 mm
- Measurement accuracy: $\pm 0.3\%$

| Type | Cap. const. mm ² /s ² | DIN/ASTM mm ² /s | PVS or iVisc mm ² /s | Ø i mm | Cat. No. calibrated | Cat. No. uncalibrated |
|------|---|-----------------------------|---------------------------------|--------|---------------------|-----------------------|
| 50 | 0.004 | 0.8...4 | 0.4...3 | 0.44 | EGV 861 | EGV 873 |
| 75 | 0.008 | 1.6...8 | 0.8...6 | 0.54 | EGV 862 | EGV 874 |
| 100 | 0.015 | 3...15 | 2...10 | 0.63 | EGV 863 | EGV 875 |
| 150 | 0.035 | 7...35 | 4...25 | 0.78 | EGV 864 | EGV 876 |
| 200 | 0.1 | 20...100 | 8...60 | 1.01 | EGV 865 | EGV 877 |
| 300 | 0.25 | 50...250 | 20...100 | 1.27 | EGV 866 | EGV 878 |
| 350 | 0.5 | 100...500 | 40...200 | 1.52 | EGV 867 | EGV 879 |
| 400 | 1.2 | 240...1,200 | 100...500 | 1.92 | EGV 868 | EGV 880 |
| 450 | 2.5 | 500...2,500 | 200...1,000 | 2.35 | EGV 869 | EGV 881 |
| 500 | 8 | 1,600...8,000 | 700...3,500 | 3.20 | EGV 870 | EGV 882 |
| 600 | 20 | 4,000...20,000 | 1,500...7,500 | 4.20 | EGV 871 | EGV 883 |



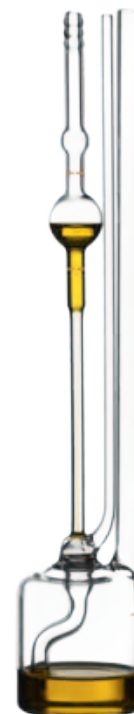
Ubbelohde Dilution Viscometers

For convenient implementation of dilution series and determining concentration dependencies, e.g. IV value measuring of polymers. Standard design with no thread for easy removal prior to external cleaning. Can be connected with LAUDA VRM modules and dosing units. Recommended for automatic measuring with LAUDA viscosity measuring systems.

- Fill volume: 15...75 ml
- Total length: approx. 290 mm
- Measurement accuracy: $\pm 0.2\%$

| Type | Cap. const. mm ² /s ² | PVS or iVisc mm ² /s | Ø i mm | Cat. No. calibrated | Cat. No. uncalibrated |
|------|---|---------------------------------|--------|---------------------|-----------------------|
| 0c | 0.003 | 0.3...2 | 0.47 | EGV 912 | EGV 921 |
| 0a | 0.005 | 0.5...3 | 0.53 | EGV 913 | EGV 922 |
| 0a | 0.005 | 0.5...3 | 0.53 | EGV 913-1* | EGV 922-1* |
| I | 0.01 | 0.7...7 | 0.63 | EGV 914 | EGV 923 |
| I | 0.01 | 0.7...7 | 0.63 | EGV 914-1* | EGV 923-1* |
| Ic | 0.03 | 2...20 | 0.84 | EGV 915 | EGV 924 |
| II | 0.1 | 6...60 | 1.13 | EGV 916 | EGV 925 |

*With integrated filter: porosity G 2



Applications Advantages Devices Accessories

Accessories

| Cat. No. | Description |
|----------|--|
| UG 003 | Viscometer frame for Ubbelohde and Micro-Ubbelohde |
| UG 094 | Viscometer frame for Micro-Ostwald |
| EZ 054 | Cannon-Fenske viscometer holder for 2-legged capillaries (only for manual measuring) |
| EAO 156 | Digital hand stop watch |
| EZ 287 | Suction ball, 60 ml, opening 6.3 mm Ø |
| LZB 011 | Labosol S for cleaning the glass capillary viscometer, 1 L |
| HKB 532 | Adapter for Micro-Ubbelohde (for installation into automatic systems) |



UG 003

Application table

LAUDA supplies glass capillary viscometers in various designs. Use the following table to see which capillary is best suited for your application.

| | Ubbelohde | Micro-Ubbelohde | Micro-Ostwald | Cannon-Fenske Routine |
|------------------------------------|-----------|-----------------|---------------|-----------------------|
| Manual measurement | ++ | ++ | + | + |
| Automatic measurement | ++ | ++ | + | + |
| Frothing liquids | ○ | ○ | + | + |
| Volatile samples | ○ | ○ | + | + |
| Small samples/detergent quantities | - | ++ | + | - |
| High/low temperature | + | + | ○ | ○ |
| Black and used oils | ○ | - | - | ○ |

++ use by preference + well suited ○ less suited - unsuitable