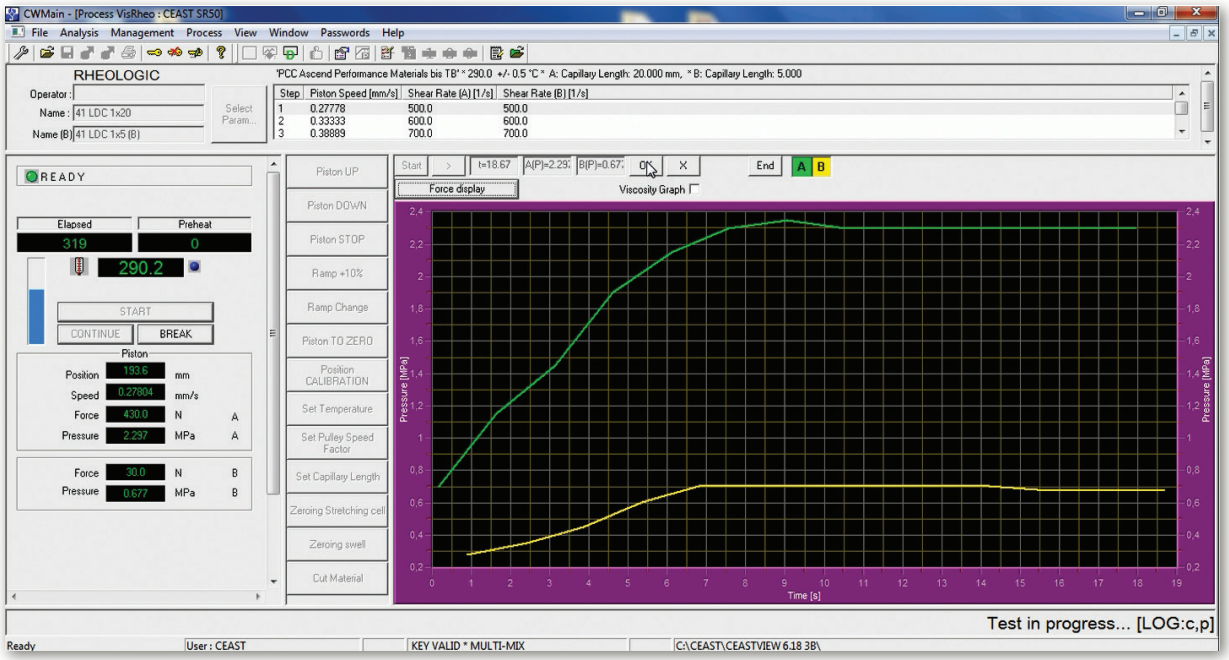
INSTRON®

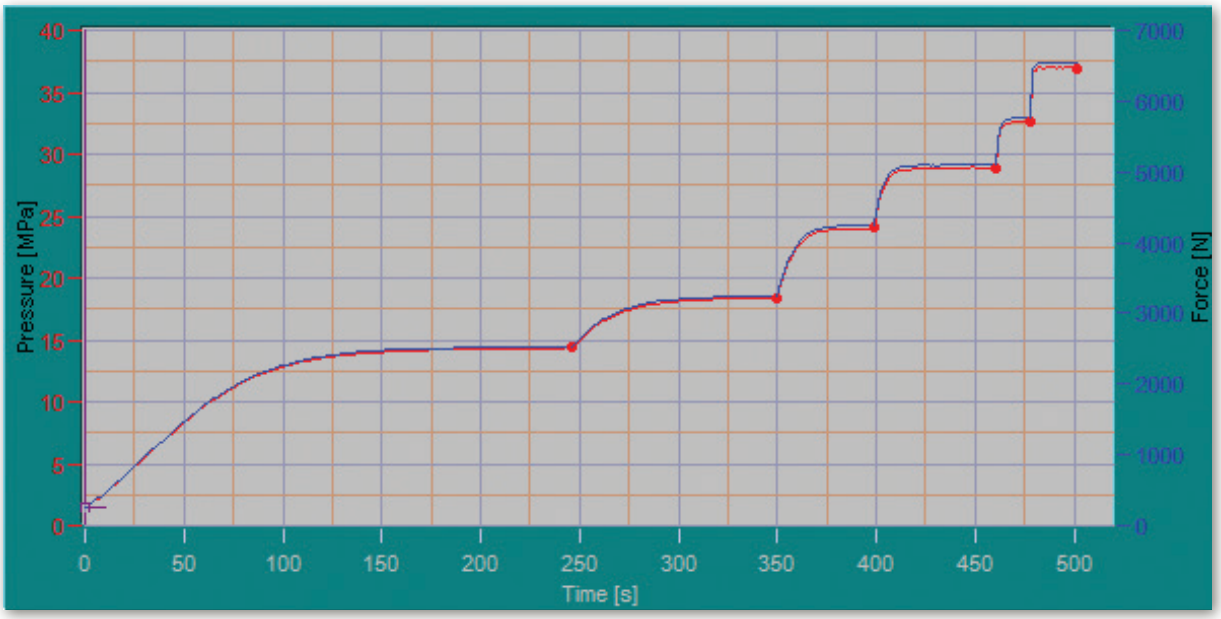
*The difference is measurable®*

# VisualRHEO | Software for CEAST SR Series Capillary Rheometers

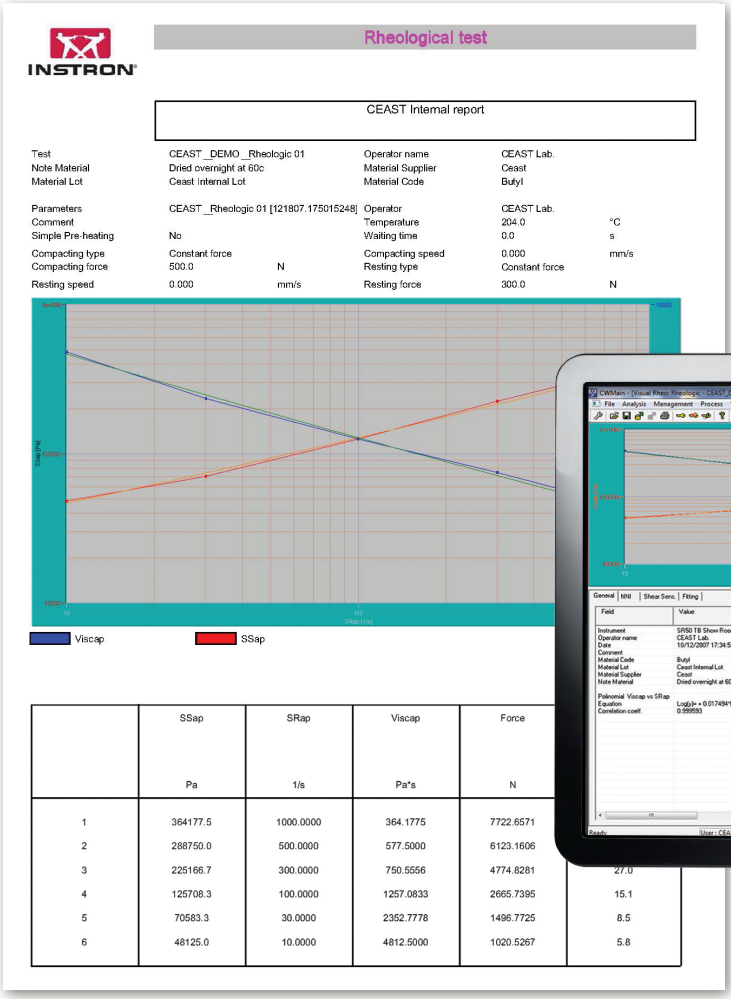
A fundamental part of a capillary rheometer system is the software. As the system investigates the flow behavior of plastics over a wide range of shear conditions, the software controls the instrument from a PC, acquiring and analyzing data, calculating results, and exporting data to easily share and perform further analysis. Performing tests that are much more effective and informative than a trial-and-error approach, the software provides a user-friendly interface for lab operators when programming and monitoring the tests.




Test Execution During Rheological Test




Raw Data of Rheological Test



Rheological test

CEAST Internal report

| | | | | | |
|---|---|---|---|---|---|
| Test | CEAST _DEMO _Rheologic 01 | | Operator name | CEAST Lab. | |
| Note Material | Dried overnight at 60c | | Material Supplier | Ceast | |
| Material Lot | Ceast Internal Lot | | Material Code | Butyl | |
| Parameters | CEAST _Rheologic 01 [121807.175015248] | | Operator | CEAST Lab. | |
| Comment | | | Temperature | 204.0 | °C |
| Simple Pre-heating | No | | Waiting time | 0.0 | s |
| Compacting type | Constant force | | Compacting speed | 0.000 | mm/s |
| Compacting force | 500.0 | N | Resting type | Constant force | |
| Resting speed | 0.000 | mm/s | Resting force | 300.0 | N |

Viscap SSap

| | SSap Pa | SRap 1/s | Viscap Pa*s | Force N | |
|---|---|---|---|---|---|
| 1 | 364177.5 | 1000.0000 | 364.1775 | 7722.6571 | |
| 2 | 288750.0 | 500.0000 | 577.5000 | 6123.1606 | |
| 3 | 225166.7 | 300.0000 | 750.5556 | 4774.8281 | 27.0 |
| 4 | 125708.3 | 100.0000 | 1257.0833 | 2665.7395 | 15.1 |
| 5 | 70583.3 | 30.0000 | 2352.7778 | 1496.7725 | 8.5 |
| 6 | 48125.0 | 10.0000 | 4812.5000 | 1020.5267 | 5.8 |

Printed Reports

Viscosity Results of Rheological Test

## VisualRHEO Software: Basic Package

The Instron® CEAST VisualRHEO software is supplied as a basic package with all capillary rheometers. Compatible with Windows® 2000/XP/Vista/7 (32 bit and 64 bit), the basic package is ideal for controlling the instrument from the PC, data acquisition, and analysis of results. Main features include:

- Rheological tests with steps at constant piston speed or shear rate
- Real-time graphic display of the measured quantity
- Post-process graphs of rheological quantities (apparent and corrected values)
- Bagley and Rabinowitsch corrections
- Non-Newtonian Index calculation
- Password-protected operator access levels
- Export to spreadsheets, text files, and LIMS systems
- Test comparison and reference viscosity curves
- Shear sensitivity calculation
- Advanced database search

VisualRHEO allows operators to view raw data and results at the same time after running a test and to customize the data analysis environment based on their specific needs. Users can also associate measure units, graph colors and axes, and results tables to their profile and can access them at any time. A versatile built-in Report Editor helps the user while creating and customizing test reports, documenting parameters, results and graphs.

To expand the capabilities of the basic VisualRHEO package, two additional packages are available for laboratories that require more than standard shear viscosity tests and related basic calculations.

## VisualRHEO Advanced Analysis Package

This advanced analysis package adds the following features to the basic package:

- Advanced fitting capabilities on rheological curves, using Polynomial, Power Law, Cross and Yasuda-Carreau equations, and showing related coefficients
- Elongational viscosity estimation, using Cogswell method based on Bagley-corrected shear viscosity data
- Wall-slip speed estimation, using Mooney method based on standard tests with different dies (same L/D but different diameters)
- Viscosity Dependence on Temperature analysis, applying Arrhenius and WLF equations to multiple tests at different temperatures to obtain the viscosity-temperature relationship for each shear rate condition.
- Performs also the Flow/No-Flow analysis to estimate the limiting temperature condition for flowing.

Note: The elongational viscosity feature requires tests done with at least two capillary dies with the same diameter, but different lengths. The wall-slip feature requires tests done with at least two capillary dies with the same L/D ratio, but different diameters.

Advanced Fitting on Rheological Curves

## VisualRHEO Advanced Test Management Package

This advanced test management package adds the following features and benefits to the basic package:

- Viscosity dependence on time test mode and analysis. This allows the operator to measure viscosity at different times to study the thermal degradation and other time-depending phenomena. The viscosity results are plotted against time.
- Melt fracture test mode, which allows a shear rate sweep of programmable range and speed, aimed at quickly finding the conditions for unstable flow.
- Stress relaxation test mode, which allows the system to keep measuring the pressure and to calculate viscosity after stopping the piston movement, therefore looking at relaxation phenomena of the sample.

## Additional Features Available on Request

- Molecular Weight Distribution analysis with estimation of Polydispersity Index starting from rheological tests
- Simultaneous tests on two rheometers controlled by a single PC
- Remote support for machine and software troubleshooting by our Factory Specialists

Additionally, each optional accessory activates dedicated features of VisualRHEO for specific test management and data analysis. Please refer to our SR Series documentation to learn more:

- Die Swell, for extrudate swell measurement under different shear conditions
- PVT, to investigate the relationship between Pressure, Volume, and Temperature
- Thermal Conductivity, transient line-source technique for high-pressure measurements on melts
- Melt Stretching, for melt-strength measurements up to high speeds

## Upgrade Your Software

Upgrades to the latest version of VisualRHEO are possible for existing systems. Our Product Specialists are available to deliver advanced training sessions for Instron® CEAST Rheometers and related accessories and software. Please contact us for details.



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