Foam Pressure Rheometer
Model: UR-2030 Series

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Specially designed for foam testing, the UR-2030 & UR-2030SD provide accuracy of automatic die oscillating frequency and torque transmission.

The U-CAD software provides contour lines of physical properties to help the users choose excellent formula matching.

Standard Functions:

Graphical Curves

1. Foam pressure curve
2. Blowing rate curve
3. Elastic torque curve (s')
4. Viscous torque curve (s")
5. Elastic & viscous complex curve (s*)
6. Tan. Delta curve (Tan ð)
7. Loss angle curve
8. Cure rate curve
9. Test temperature curve

Cure Data

1. Scorch time (Ts1, Ts2, Ts3…)
2. Cure time (Tc50, TC60, Tc90...)
3. Minimum torque (ML)
4. Highest torque (MH)
5. Cure rate
6. Loss angle value
7. Tan delta value (Tan ð)
8. Any selected dynamic value on the curve from any scale.

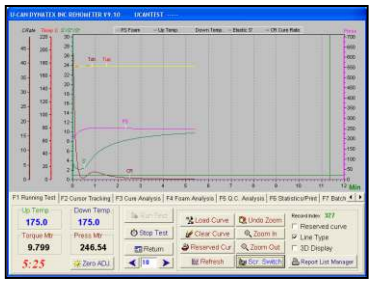
Foam Data

1. Any foam pressure value against its coincident foam time, and vice versa
2. Any coincident value of the foam pressure or foam time against the corresponding cure time or torque value, and vice versa
3. Minimum and maximum foam pressure value
4. Foam pressure and foam time at the point of maximum blowing rate.

Die Chamber Types:

Die Chamber with Seal (UR-2030SD)

Die Chamber without Seal (UR- 2030)



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Optional Functions:

Optimum Cure Analysis System (OCAS):

- Including this system's tools, particular software, temperature measurement, temperature calibration of tools etc.
- Combine the curing data from rheometer to the processing time from workshop.
- Provide direct values in percentage (%) to understand the curing
- process from different positions on the same specimen.
- Calculate the best curing time at workshop to avoid the under-curing or over-curing at particular position.

SPC Software

(Statistical Process Control software) is able to analyze and store the following test data:

- Data storage: ML, MH, scorch time, cure time, elastic and viscous values, cure rate, and test date.
- Provide statistical analysis of curing by X-Rm, X-R, Normal Distribution, and Histogram Chart.
- Evaluation of cure testing properties and making classification in A, B or defect categories.

VCH software

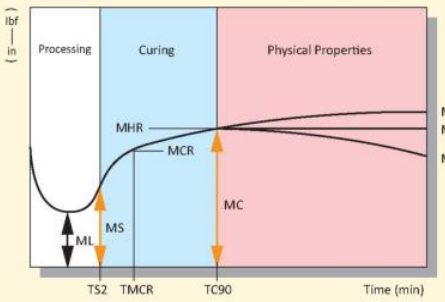
Able to analyse functions of compounding homogeneity:

- Showing the compound viscous and elastic variation in the curing process by dynamic diagram.
- Showing whether moving die frequency and torque transmitting normal.
- Support detecting mechanical noise.

UCAD software

- Able to choose the excellent formula-matching and experimental recommendations:
- When the formula is renewed by single or multiple chemicals, this software will analyse the interaction between the new chemicals and the requested product properties.
- Furthermore, it will provide new formulas by reorganizing chemical quantity matching and give experimental recommendations.
- The math model of this software can arrange testing points in the experimental disposition space into rationalizations, minimizing the testing frequencies, but still can sufficiently obtain an effective data.
- Varieties of functions in this software can obtain the best combinations among the demand of product property, cost, and the feasibility of producing technology.

Definition of scorch data



TS: Scorch time
TC: Cure time
ML: Minimun torque
MH: Highest torque attained (During a specified period of time when no plateau or maximum torque is obtained)
MS: Torque value at Ts
MC: Torque value at Tc
MCR: Maximum cure rate
TMCR: Corresponding time to MCR
MHR: Maximum torque of reverting curve
MHF: Maximum torque where curve plateaus
MHRF: Final reversion torque value
Ts2=Corresponding time to the ML+2 units of torque.
Tc90=(TMH-TML)X90%+TML

PH: Maximum foam pressure
PL: Minimum foam pressure
Psa: Foam pressure at particular foam point "a" ("a" can be at any point)
Pca : Foam pressure at a % of foaming ("a%" can be any % of foaming)
T@Psa: Coincident foam time at Psa
T@Pca: Coincident foam time at Pca
MPR: Maximum blowing rate
T@MPR: Foam time at MPR point

Chart of (X) Value Statistics

Chart of Rm-Value Statistics

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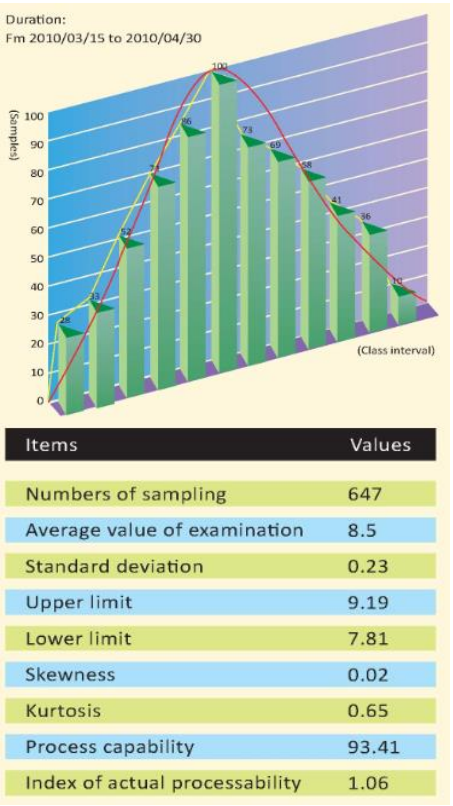
Features:

- Two types of mold cavity: Chamber with seal and Chamber without seal. Both types can apply to the listed additional software.
- New type rheometer offers good repeatability and reproducibility based on the anti-noise circuit and the exclusive DSP analysis program improves significantly the machine design and quality.
- Able to calibrate torque and loss angle automatically.
- Noise from the equipment and torque transmission can be checked automatically by our VCH software.
- It would not exceed 2 min and 40 seconds when heating up from room temperature to the equilibrium of 170°C±0.3°C
- Time needed for changing temperature:
- From 170°C to 190°C and reach the state of equilibrium 190°C±0.3°C....within 55 secs.
- From 190°C to 170°C and reach the state of equilibrium 170°C±0.3°C....within 1min 40secs.
- During testing, die chamber temperature will be redeemed to the tolerance of ±0.3°C within 30±3 seconds from die closure.
- The software can check whether motor speed (or die oscillation frequency) conforming to the 100rpm (or 100cpm) regulated in standards. (ASTM/ISO)
- With built-in software able to provide suitable volume of specimen to fit the die cavity.



Items	Values
Numbers of sampling	647
Average value of examination	8.5
Standard deviation	0.23
Upper limit	9.19
Lower limit	7.81
Skewness	0.02
Kurtosis	0.65
Process capability	93.41
Index of actual processability	1.06

Specifications:

- The standard UR-2030 or UR-2030SD models consist of one main testing unit and one subunit of control and data analysis equipped with one IBM compatible PC, colour monitor, hard disk, DVD drive and one printer.
- Manufacturing Standards: in compliance with ASTM D5289, ISO 6502
- Temperature Range: from room temp. to 200°C
- Temperature Accuracy: within ±0.3°C, providing with smaller resolution.
- Temperature Display Resolution: 0.1°C, providing with smaller resolution.
- Oscillating Frequency: 1.66Hz (or 100cpm)
- Torque Range: pre-set at 25, 50, 100, 200 lbf-in; or discretionary at user pleasure.
- Torque Unit: lbf-in., kg-cm., or dN-m.
- Torque Accuracy: ±0.2% of full scale
- Oscillating Angle: ±0.5°, ±1°, ±3°
- Electricity Supply: AC 220V±10%, 50/60Hz±3Hz, 7A, Single Phase. *Others are available by order.*
- Pneumatic Pressure: 65Psi or 4.5kg/cm 2 or 0.45Mpa (Air-compressor is to be user's own equipment.)

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