



## XDR Curemeters

by CCSi

A well known problem has existed with previous Oscillating Disk Rheometers: the temperature of the test sample is not homogeneous due to heat leakage from the heated upper and lower dies to the unheated rotor and other lower temperature areas of the machine.

The temperature of the rotor being substantially below that of the dies which enclose the sample, results in continuous heat loss by conduction from the rotor down the drive shaft causing the rotor to be colder than the dies. Thus, the average effective cure temperature can never be accurately measured or reproduced because of this unpredictable temperature gradient.

Therefore, to translate cure parameters from an existing Oscillating Disk Rheometer (ODR) to practical isothermal applications is difficult and at best an approximation.

This condition not only negatively impacts reproducibility, but also substantially increases the time for the sample to cure while giving erroneous and misleading “presumed to be isothermal” cure parameters.

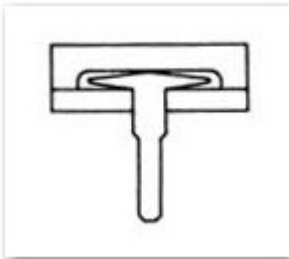
The appropriate solution to this problem is to maintain the rotor at the 'set point' temperature of the dies by directly heating the head of the rotor.

The XDR® Oscillating Disk Rheometer incorporates a heater and temperature control sensor inserted into the head of the rotor (patent pending), precisely maintaining the temperature.

As a result, the measured time for completion of cure is shorter and the test more accurately reflects the curing characteristics of the stock at that set isothermal temperature. The rapid heat recovery combined with a homogeneous temperature environment substantially improves reproducibility while shortening testing times and providing more nearly true isothermal data.

The heated rotor will also substantially negate the adverse effect of 'loading time' on variability of results, a characteristic previously observed with the Oscillating Disk Rheometer. Consequently, the results variability of the XDR® in the Oscillating Disk Rheometer heated rotor mode approach that of the MDR.

The heated rotor makes this improvement available to the user while providing the option to operate under conventional Oscillating Disk Rheometer (non heated rotor) conditions for correlation with historical data. The application of this feature are key to overcoming some of the performance limitations of existing curemeters. These facets are discussed in detail in the article “[Innovations](#)”.



*“... in the conventional Oscillating Disk Rheometer (ODR) configuration, the sample is sealed between the upper and lower die cavities, surrounding the oscillating biconical rotor. The patented heated rotor reduces test times and greatly improves precision and accuracy.”*

### XDR® Oscillating Disk Rheometer: Features & Benefits

#### XDR® ODR FEATURES:

- S', S'', and S\* data;
- Pneumatic rotor clamping;
- Patented, uniquely heated rotor;
- Convertibility to an MDR or Mooney reduces initial and future investments;
- Meets [ASTM D2084](#), ISO 3417 and BSI 1673.

#### XDR® ODR BENEFITS:

- Quick & easy sample removal;
- Modular design reduces maintenance cost & down time;
- Reduced test times with patented uniquely heated rotor;
- Replicate historical test results;
- Obtains complete dynamic properties;
- Easily & inexpensively reconfigured to an MDR.

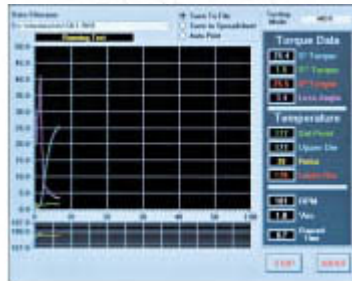
## XDR® Oscillating Disk Rheometer: Specifications

- Torque:
  - 0.1 to 200 lb/in
- Selectable Test Times:
  - 0.0 to 99 minutes
- Selectable Temperature Range:
  - Ambient to 225 C°
- Angular Displacement:
  - ± 0.5°, 1°, 3°, 6° (selectable)
- Weight:
  - 160 kg (352.8 lb.)
- Space Requirements:
  - Instrument: 610 x 610 x 1220 mm (24 x 24 x 48 in.)
  - Computer: 300 x 610 x 710 mm (varies) (12 x 24 x 27 in.)
  - Monitor: 410 x 410 x 410 mm (varies) (16 x 16 x 16 in.)



### XDR® OPERATING SYSTEM FEATURES:

- Computerized data acquisition & analysis meets [ASTM E1579](#);
- Viscometer Module complies with [ASTM D1646](#), ISO R289, & BSI 1673;
- ODR Module complies with [ASTM D2084](#), ISO 3417, & BSI 1673;
- MDR Module is compatible with [ASTM D5289](#);
- Microsoft® Windows Operating System;
- Pentium® Processor & Intel® chipset;
- Computerized PID temperature management systems;
- Automatic system calibration;
- Computerized torque measurement system;
- Computerized calibration and verification (no mechanical adjustments necessary);
- Automatic mechanical deflection corrections;
- Superior ability to detect differences in compounds and raw polymers;
- Raw data stored for easy retrieval or transfer;
- Standard and User defined test parameters;
- Real time display of test data and parameters;
- Selectable presentation of data in printed, graphed or overlay formats;
- Real Time Plot & Digital display of:
  - S', S", and S\* Data
  - Loss Angle Data
  - Temperature, All Dies
  - Temperature Set Point
- Digital display of:
  - Test Mode
  - Operation Mode
  - Test File Name
- Printed Data Output Options:
  - Single Test
  - Overlay Multiple Tests
  - Overlay Historic Tests
- Display Data Output Options:
  - Test In Progress
  - Historic Single Test
  - Overlay Historic Multiple Tests
  - Apply different parameters to historic results for an “if–then–else” analysis.



## XDR® eXchangeable Die Rheometer: Module and System Pricing

XDR® Individual Modules	
MDR	<a href="#">Please Submit a RFQ</a>
ODR (heated rotor standard option)	<a href="#">Please Submit a RFQ</a>
Mooney Viscometer	<a href="#">Please Submit a RFQ</a>
XDR® Module Combinations	
MDR & ODR Modules	<a href="#">Please Submit a RFQ</a>
MDR & Mooney Modules	<a href="#">Please Submit a RFQ</a>
ODR & Mooney Modules	<a href="#">Please Submit a RFQ</a>
XDR® Complete	
Mooney, MDR & ODR Modules	<a href="#">Please Submit a RFQ</a>
<b>Lease Options Available</b>	

Please visit the [MDR](#) and [Viscometer](#) pages to learn more about the flexibility of the XDR®. Detailed technical aspects of the XDR® are examined at length in the article titled “[Innovations](#)”.

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