

Rigid-body Pendulum type
Physical Properties
Testing Instrument

RPT-3000W



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RPT-3000W

RPT-3000W is the high accurate from liquid to solid state and for

● Recommended installation

Two-sided UV radiation



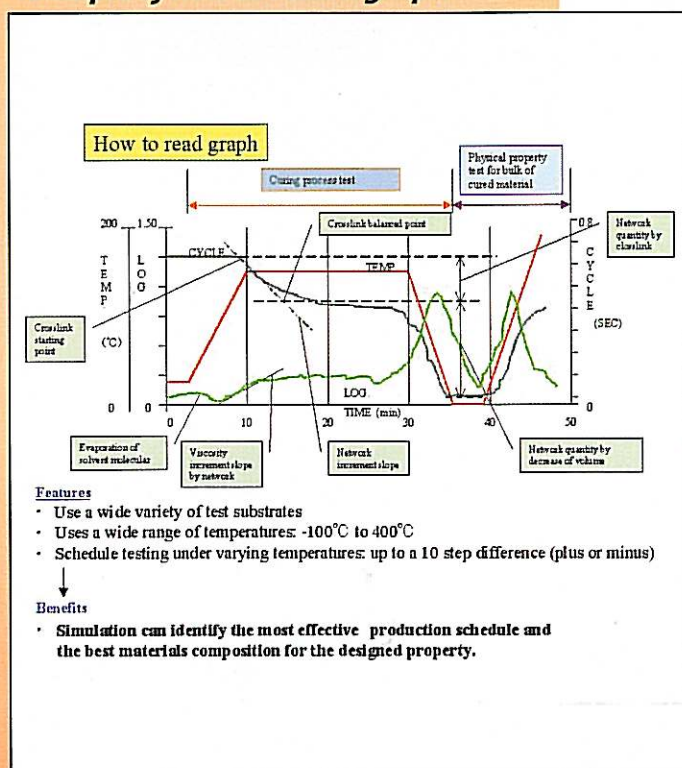
Oblique view



VIBRATION ANALYSIS

When the material is cured and dried, the components which organize the material increase their molecular weight through a chemical reaction, called a Chemical Network. The chain molecule moves by thermals and generates a phenomenon called Yarn's Entanglement, and becomes a Physical Network. When fillers, like pigments, are added to the system, the material absorbs the fillers, although absorption depends on the materials. This is called a Physical-Chemical Network. The effect appears in the form of a molecular increase. When the material is placed on the base plate, material absorption takes place on the base plate and becomes a Physical-Chemical Network. An increase in molecular weight causes an increase in viscosity, and when it is vibrated in a high viscosity solvent, the amplitude of vibration decreases and makes logarithmic damping ratio greater. Therefore, by evaluating the logarithmic damping ratio, the viscosity change caused by the creation of the network can be measured. With the molecular weight, even if it is due to the same network, the viscosity lowers when the temperature rises, and the logarithmic damping ratio becomes small. When the network is created, the size of the network becomes too small. When the size of the network is greater, the pendulum moves a great distance in order to crush or stretch the network. Therefore, the period of time the pendulum swings increases. However, when the network is created and the size of the network decreases, the distance of the pendulum movement shortens. By measuring the frequency, that is the time of pendulum movement, the size of the network due to the crosslinking can be measured. Thus, the curing and drying conditions of the materials can be evaluated by analyzing the logarithmic damping ratio and the change of frequency.

● Sample of how to read a graph



RPT

All materials become a solid state from a liquid state through some action (heat, light, time and others), and produce various physical properties. The change of phase from liquid to solid causes various problems. Due to this fact, there are cases that the expected performance design cannot be achieved and the performance of the material is lowered and changed by some environmental factor in the process. The most important evaluation item among the material evaluations is to pursue the aging change of the chemical-physical performances in the process of curing and drying from a liquid state to a solid state. The instrument developed for this evaluation purpose is a rigid-body pendulum type physical properties testing machine, model RPT-3000W.

Available to Evaluate Materials in Versatile Fields

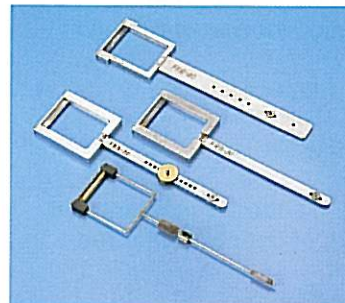
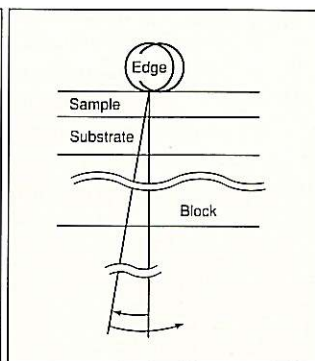
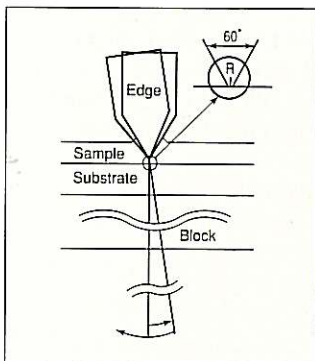
With this instrument, one can evaluate the curing and drying process of organic high polymeric materials and their bulk physical properties, or evaluate the surface's physical properties and other materials, such as inorganic material like concrete, cosmetics, paper and foods in the operational temperature range -100°C~+400°C.

Rigid-body Pendulum type Physical Properties Testing Instrument

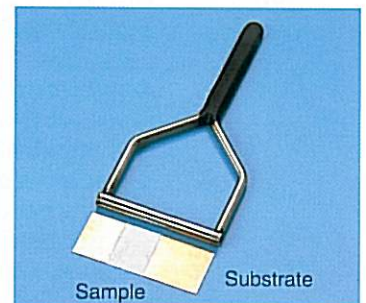
instrument for analysis of curing behavior
practical evaluation of physical property

MEASUREMENT

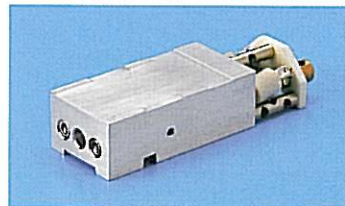
Fix the test piece coating plate on the cooling/heating block.
Set the pendulum so that the knife-edge, the fulcrum of the swing, comes vertically into contact on the test piece coated surface. Apply free vibration to the pendulum.
For measurement of physical properties, use a cylindrical edge.
By analyzing this vibration, the curing process and surface's physical properties can be evaluated.



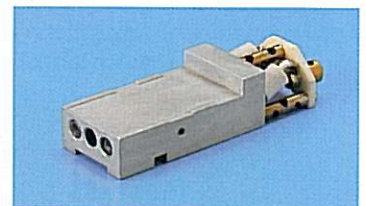
Rigid-type pendulums



Coating tool (CT)



Cooling/heating block (CHB-100)

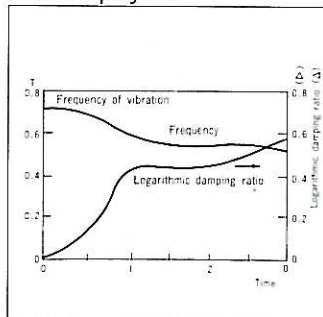


Cooling/heating block (CHB-200)

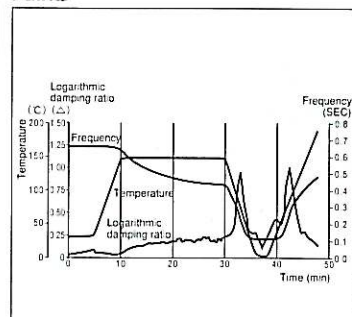
EXAMPLES OF TYPICAL MEASUREMENT

●Curing Behaviors

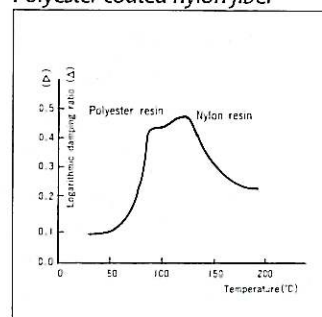
Emulsion polymer



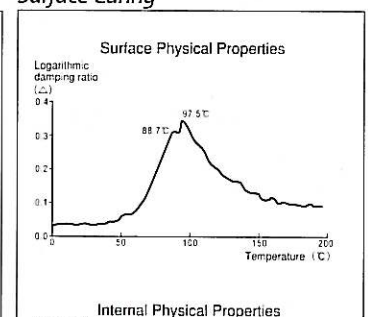
Paints



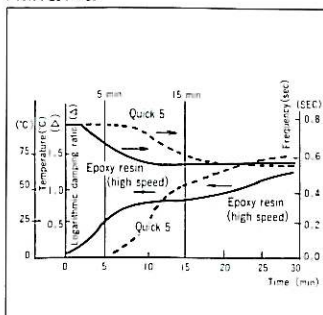
Polyester coated nylon fiber



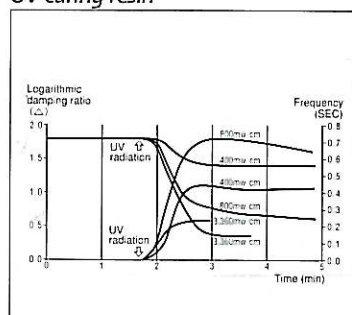
Surface Curing



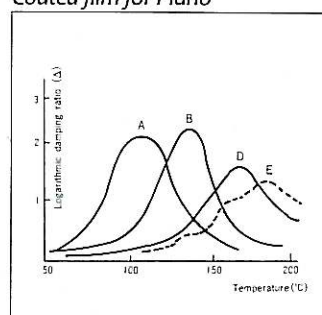
Adhesives



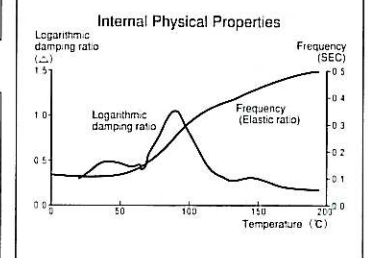
UV curing resin



Coated film for Piano



●Physical Properties



Application of RPT-3000W

This instrument allows measurement of viscoelastic physical properties under a curing process, as well as the surface layer physical properties of the material. Therefore, this instrument is applicable for development/improvement, quality evaluation, designing and trouble-shooting production line and life evaluation of materials.

Coating and Adhesives	<ul style="list-style-type: none"> ●Curing temperature and curing time ●Curability applied by curing agent and physical properties ●Designing data for painting line ●Quality evaluation for coated film and thin film ●Absorption and lotions 	Plastics	<ul style="list-style-type: none"> ●Surface physical properties ●Film physical properties ●For evaluating of surface and internal physical hard coat curing process
Cosmetic and Medical	<ul style="list-style-type: none"> ●Drying characteristics and surface physical properties of nail polish ●Drying behavior, adhesive behavior and elastic behavior of cosmetic pack and adhesive agent ●Lubrifications and lotions 	Ink	<ul style="list-style-type: none"> ●Physical properties of ink on item to be printed ●Dryability ●Transcribing behavior to roller
Food	<ul style="list-style-type: none"> ●Gelling behavior and physical properties of gelatin and agar ●Functional and quantitative evaluation 	Electronics and Electricity	<ul style="list-style-type: none"> ●For evaluation of conductivity paste curing process ●For evaluation of low melting solder melting and set process ●For evaluation of printed circuit board curing process and physical properties
Textiles	<ul style="list-style-type: none"> ●Physical properties ●Fabric handling 	Others	<ul style="list-style-type: none"> ●Concrete and asphaltic materials

Specifications

Swing Angle (Maximum)	— ±0.573 degree
Angle Resolution	— 1.749e-5 degree
Swing Displacement Detection	— Inductance Non-Contact Type Displacement Sensor
Period of Vibration	— 0.050~2.000 sec
Logarithmic Damping Ratio	— 0.001 ~6.000 sec
Test Temperature	— -100~+400°C
Cooling System	— Liquid Nitrogen
Measuring Time	— 1 ~9999 minutes
Option	— Ultraviolet Irradiation Device
Dimensions/Weight (W×D×H)	— Main Body : 300×220×525mm/15kg Controller: 410×350×135mm/12kg
Safety Device	— Safety Lamp for increasing temperature (It turns on at 50°C)
Power Supply	— AC100V 50/60Hz 550VA
OS	— Windows NT 2000

Specifications subject to change for improvement without notice.



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