



GELNORM[®] – TC / Gel-Time instrument



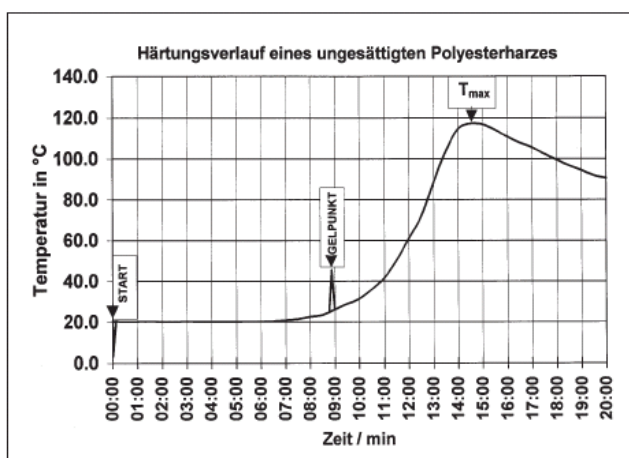
The automatic GELNORM[®]-Geltimer TC for the measurement of gelation time under standardised conditions is easy to use and the results show exceptionally good reproducibility with all reaction resins such as:

- unsat. Polyester resins
- Epoxid resins
- Polyurethane resins
- Acrylic resins
- Silicone resins etc.

The instrument incorporates a switch-off mechanism that responds to pressure: the gelation time limit is reached when the measuring stamper meets a defined reaction force in the reaction resin. As a result of this automatic switch-off system, the size of resin sample employed is not limited. The disposable stamper of stainless steel wire carries out a defined reciprocating movement as soon as the instrument is set in operation and, when the change in viscosity is reached, a built in timer is stopped and the gelation time can be read off.

TEST PROCEDURE

Place 100g reaction resin (deviations of 1% are permissible according to DIN 16 945) in a beaker. Add hardening agent and, if applicable, accelerator of the required quantities as specified by the supplier, measuring to an accuracy of 0,01g. If necessary, first ensure that resin and hardening agent are saturated at the correct temperature. After adding of hardening agent, start timer and thoroughly stir test mixture (approx. 1 minute). When the measuring stamper is inserted, the stop mechanism is switched off. If the exotherme temperature is to be measured in addition to Gelation time, a Thermbox are connected to the rear of the instrument. A thermocouple Ni-Cr-Ni is inserted into the specimen. The Stop-Start sequence is specially marked by the software with Therm-





Temperature Measurement

A GELNORM® – Thermbox I can be connected to the control unit. The gel time as well as the change of temperature inside the probe can be recorded by means of a line recorder.

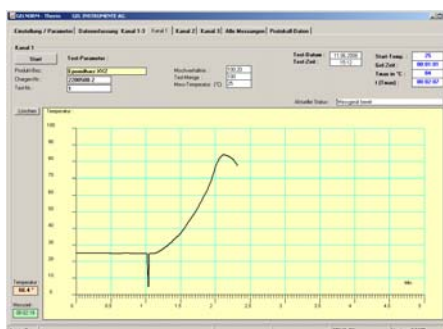
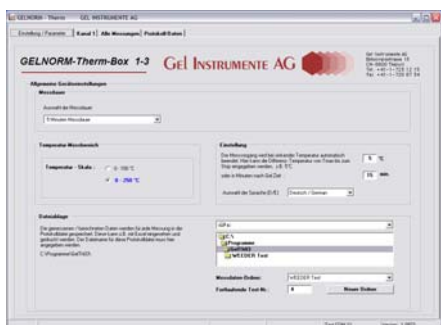
- Gel-time time to reach the gelpoint after DIN 16 945
- T_{max} maximal temperature
- $t(T_{max})$ time from start to the maximal temperature point



Therm-Box 1

Print Screens from the Software of GELNORM® Thermbox

The stored data's can be used with excel



Thermostatic bath

For good result with a thermostatic bath you should have a repeatable accuracy of the temperature.

Thermostatic Bath with silicon-oil, 30 °C ... 140 °C

It is possible to perform tests at defined temperatures by submersing the portion of the test tube with the reaction resin into a thermostatic bath. The amount of the liquid in the bath should be adjusted such that it's level is about 1 cm higher than the level of the reaction resin in the test tube. (Please note, that the volume excluded by the test tube influences the experiment and, hence, it has to be constant in order to reach an optimal reproducibility of the results.) The method is recommended for temperatures from 30 to 140 °C. Two different thermostatic baths are available for one (Ref. 20.50) and three test units (Ref. 20.51). Special supports for the test units enable measuring in a closed thermostatic bath.





Electric Heating Block GT with Temperature Controller TC-4, 50 °C ... 200 °C

At temperatures of 50 up to 200 °C our Electric Heating Block GT (Ref. 20.41) can be used. Temperature control of the heating block is performed with the temperature controller TC-4 (Ref. 70.06).

- max temperature limiter
- sensor over watching function



TECHNICAL DATA

actual - intended (Pt100):	- range:	0 ... 200,0 °C
	- accuracy:	± 0,3% (of the scale range ± 1 digit)
intended value:	- range:	0 ... 200,0 °C
	- resolution:	0,1 K
	- accuracy:	± 0,3 K
Supply voltage:		100 - 240 VAC, 50/60 Hz

Load output

Power max.	- resistive:	1200 W
	- inductive:	150 W



CODE, ITEM NUMBER

GELNORM[®]-Geltimer TC . 21.10
incl. Stand and 100 stampers for measuring gel time
Electrical supply: 230VAC / 50Hz or 115VAC / 60Hz
Time range: 23h59min59sec

same as Ref. 21.10 excl. Stand 21.11

Accessories

1	Package of Stampers (steel wire) for measuring the gel time	(500 pcs.)	20.35
1	Thermopile Ni-Cr-Ni	(5 m)	20.32
1	Sensor Thermocouple NiCrNi	(L = 1.5 m)	50.15
1	Package of Glass Capillaries	(100 Stk, L = 125 mm)	50.37
1	GELNORM [®] -Therm-Box I for Thermopile NiCrNi, connection to the Geltimer TC, USB interface		160.81
1	Program TC II in combination with Thermbox I Ref. 160.81		110.60
1	Thermostatic Bath suitable for Geltimer TC 20 – 200 °C, 230VAC / 50Hz or 115VAC / 60Hz		20.50
1	Thermoblock up to 200 °C, for test tubes 20 mm		20.41a
1	Stand for Geltimer TC		21.15
1	Specimen container (individual - beaker)		21.20