

# Series 651 Environmental Chambers



## Features

- ▶ Temperature ranges from -129°C (-200°F) to 540°C (1000°F)—depending on model number.
- ▶ Forced convection heating provides rapid heat transfer, overshoot protection.
- ▶ Large circulating fan helps ensure small specimen temperature gradients; fan baffle minimizes radiant heat on specimen.
- ▶ Cooling ranges available from ambient to:
  - 129°C (-200°F) when equipped for liquid nitrogen (standard).
  - 73°C (-100°F) when equipped for liquid 300 psi CO<sub>2</sub> (optional).
- ▶ Model 651.04-01 is specially designed for elastomer testing in a 1000 Hz test environment with MTS 331 Series Load Units. Model 651.06-01 is designed for elastomer testing to 400 Hz.
- ▶ Built-in high quality temperature controller, with digital communications. Plug-in options are available.
- ▶ Removable "U-plug" sections for top and bottom walls allow the chamber to be put in place for testing after mounting the specimen and all instrumentation in the load frame (Model 651.04-01 excluded).
- ▶ Mounting accessories, including a mobile cart, are available for easy chamber installation in MTS Model 318, 331, 380, and most 311 Load Frames (the cart decouples the chamber from the load frame).
- ▶ Local protection against thermal runaway (additional protection is provided by the temperature controller).
- ▶ Internal light illuminates the test area (the 1000°F chamber is externally illuminated).
- ▶ Temperature sensor can be located anywhere in test area.
- ▶ 2.5 inch ports for instrument/—extensometer cables.
- ▶ CE certification available.

MTS Series 651 Environmental Chambers enable the testing of materials and components within various ranges of high and low temperatures. Two electrical heating elements are used for high temperature testing. An electric motor-driven fan with a baffle provides diffused convection heat for uniform temperatures. The specimen is shielded from direct radiant heat by the fan baffle and fan blades.

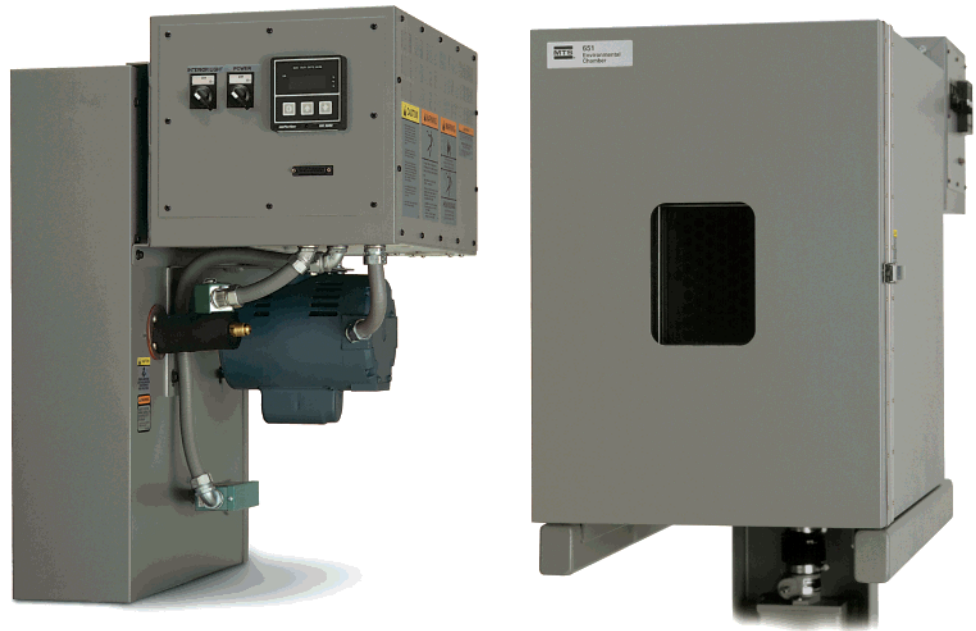
Use of liquid nitrogen (at 22 psi) allows temperature control between ambient and -129°C (-200°F). Chambers may be provided for carbon dioxide operation between ambient and -73°C (-100°F) as an option (specify either 300 psi or 900 psi carbon dioxide supply).

The chambers will maintain a constant temperature within a few degrees (see specifications) of the desired setting with very little temperature gradient across the specimen. Temperature gradient across the specimen, while heating or cooling, depends mainly on the geometry, mass, and material of the specimen.

Typical uses are elastomer material studies, body and engine mount tests, shock absorber tests, tire cord tests, plastics, composite material tests, laminate tests, and vibration isolator tests. These chambers are used in research, in reliability testing, quality control, and production testing.

Chambers are of all-welded construction with Fiberglass® insulation between the outer liner and the stainless steel inner liner. The door opens to 180°, or it may be lifted from the chamber if that is more convenient. The window is multipane, tempered glass, sealed to keep moisture out and to prevent fogging and frosting.

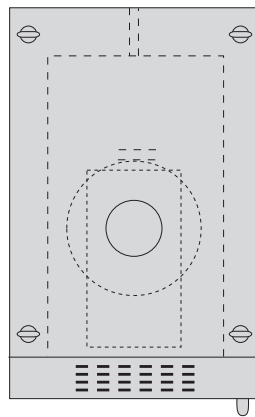
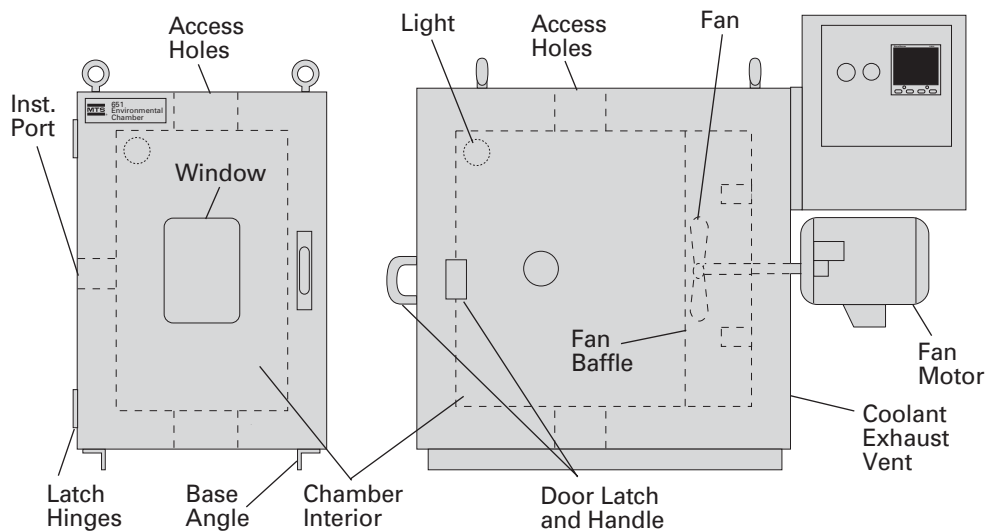
MTS can also supply special chambers designed for use with mechanical refrigeration, humidity control, or salt spray applications and in special sizes to suit your unique requirements. Contact your MTS sales engineer for more information about these options.



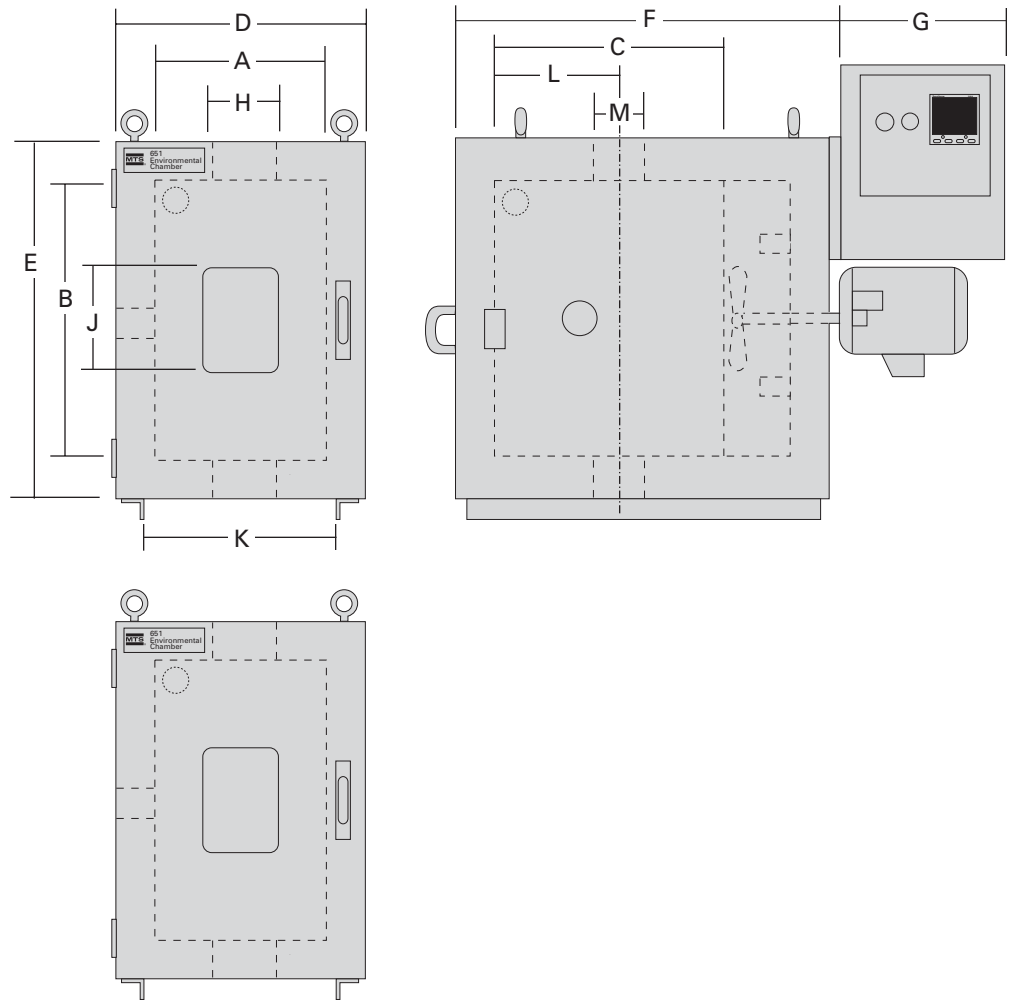
## Description

### Mounting Accessories

- ▶ Various chamber mounting accessories are available for use with MTS load frames. These accessories allow the chambers to be mounted to the load frame columns or base plate or on a cart, depending on the application and preference of the user.
- ▶ Carts enable the best access to the specimen and are the only choice in some situations. The cart fully supports the chamber and there is no interference between chamber and load frame test parameters. Chamber height is easily and precisely adjustable by means of a high gear ratio jackscrew on the cart. Leveling feet can be used to maintain cart position and to adjust for uneven floors.



### Dimensions



### Dimensions of 651 Environmental Chambers

Model		A	B	C	D	E	F*	G*	H	J	K	L	M
651.04-01	mm	305	305	305	400.1	400	784	356	76	152	†	178	76
	in	12	12	12	15.75	15.75	30.87	14	3	6	†	6	3
651.06-01	mm	305	406	305	457.2	559	762	356	102	152	†	152	76
	in	12	16	12	18	22	25	14	4	6	†	6	3
651.06-03	mm	356	558.9	432	508	711.2	762	356	102	152	406	254	101
	in	14	22	17	20	28	30	14	4	6	16	10	4
651.10-04	mm	356	660	432	508	813	813	356	102	152	406	254	102
	in	14	26	17	20	32	32	14	4	6	16	10	4
651.06-04	mm	356	813	432	508	965	762	356	102	152	406	254	102
	in	14	32	17	20	38	30	14	4	6	16	10	4

\*Dimensions shown are appropriate. Dimensions shown in millimeters are rounded to closest millimeter.

†See drawing at upper right for mounting information for these models.

MTS reserves the right to change dimensions without notice.



## Specifications

Model Number	651.04E-01	651.06E-01	651.06E-03	651.10E-04	651.06C-04
Name	"1000 Hertz"	"400 Hertz"	"Standard"	"1000° F"	"Stretch"
Part number	53-813-101	538132-xx	538130-01	53-813-301	525573-xx
Test space: (nominal)	305 mm W, 356 mm D, 305 mm H (12 in W, 12 in D, 12 in H)	305 mm W, 305 mm D, 406 mm H (12 in W, 12 in D, 16 in H)	356 mm W, 432 mm D, 559 mm H (14 in W, 17 in D, 22 in H)	356 mm W, 432 mm D, 660 mm H (14 in W, 17 in D, 26 in H)	356 mm W, 432 mm D, 813 mm H (14 in W, 17 in D, 32 in H)
Typical application:	Elastomer testing to 1000 Hz	Elastomer testing to 400 Hz	General materials tests	General materials tests	Large specimens/ Large grips in chamber
Air temperature range:	-129°C to +204°C (-200°F to +400°F)	-129°C to +315°C (-200°F to +600°F)	-129°C to +315°C (-200°F to +600°F)	-129°C to +540°C (-200°F to +1000°F)	-129°C to +315°C (-200°F to +600°F)
Air temperature Performance <sup>*</sup> :					
Heating	Ambient to +400°F in less than 30 minutes	Ambient to +600°F in less than 30 minutes	Ambient to +600°F in less than 30 minutes	Ambient to +1000°F in less than 30 minutes	Ambient to +600°F in less than 30 minutes
LN <sub>2</sub> cooling	Ambient to -200°F in less than 20 minutes	Ambient to -200°F in less than 20 minutes	Ambient to -200°F in less than 20 minutes	Ambient to -200°F in less than 20 minutes	Ambient to -200°F in less than 20 minutes
Temperature gradient <sup>†‡</sup>	±2% or ±2°C (±4°F), whichever is greater	±2% or ±2°C (±4°F), whichever is greater	±2% or ±2°C (±4°F), whichever is greater	±2% or ±2°C (±4°F), whichever is greater	±2% or ±2°C (±4°F), whichever is greater
Temperature stability <sup>†</sup>	±2°C (±4°F)	±2°C (±4°F)	±2°C (±4°F)	±2°C (±4°F)	±2°C (±4°F)
Cooling requirements:					
LN <sub>2</sub> pressure	22 psi to 30 psi max.	22 psi to 30 psi max.	22 psi to 30 psi max.	22 psi to 30 psi max.	22 psi to 30 psi max.
Recovery time to set point temperature					
Door open 1 min.	4 minutes	4 minutes	5 minutes	8 minutes	4 minutes
Door open 2 min.	5 minutes	5 minutes	6 minutes	10 minutes	5 minutes
Heater circuit power Requirements:	208/230 V AC, 50/60 Hz, single-phase; 25 A circuit minimum	208/230 V AC, 50/60 Hz, single-phase; 25 A circuit minimum	208/230 V AC, 50/60 Hz, single-phase; 30 A circuit minimum	208/230 V AC, 50/60 Hz, single-phase; 50 A circuit minimum	208/230 V AC, 50/60 Hz, single-phase; 50 A circuit minimum
Weight:	86 kg (190 lb)	105 kg (230 lb)	123 kg (270 lb)	200 kg (440 lb)	141 kg (310 lb)
Internal light:	40 watt, 110 V tempered bulb (220 V optional)			External light	Internal light
Exterior color:	Medium brown	Medium gray	Medium gray	Medium gray	Medium gray

<sup>\*</sup> Performance data derived with chamber empty and access holes blocked. Consult MTS Systems Corporation for temperature performance for testing specimens having high thermal mass.

<sup>†</sup> After 30 minute stabilization time.

<sup>‡</sup> Due to large variety of possible test setups an air gradient is given. Specimen gradient is much less.

Specifications are subject to change without notice. Contact MTS for verification of critical specifications.  
See the 409.80 Temperature Controller Product Specifications for controller information.

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100-007-650 Chamber651-02WEB Printed in U.S.A. 4/01