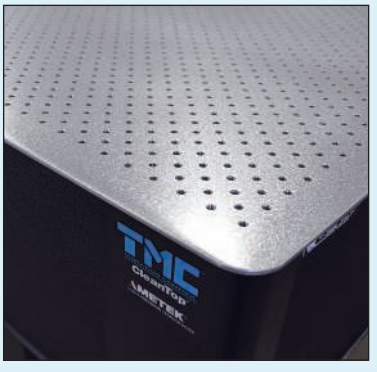
TMC™
VIBRATION CONTROL

The CleanTop® Advantage



Liquid spills on the surface are contained and cannot reach the top's honeycomb core.

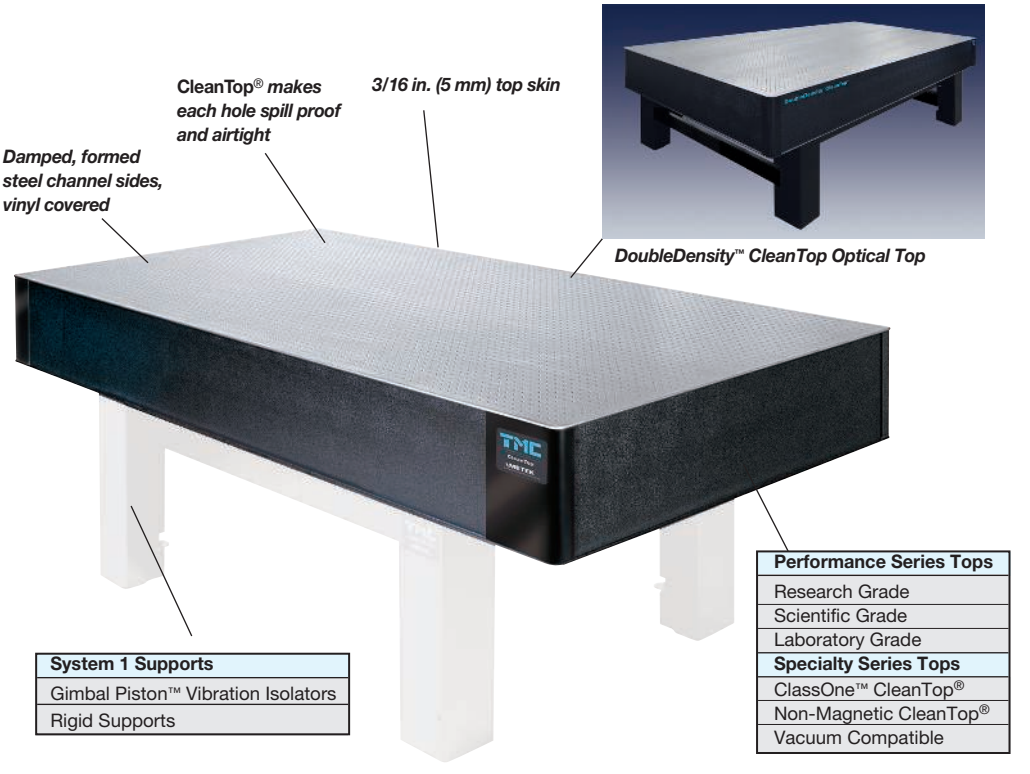
The core and skins are completely clean and dry with no residual thread-cutting oils to compromise an environment as well as the epoxy bonding.

Extremely clean tapped holes make screw insertion smooth and simple.

Easy retrieval of small parts dropped into the holes is assured.

Homogenous thermal expansion across entire structure.

Direct core to skin contact, no intermediate layer.



CleanTop® Optical Tops

With System 1 Supports

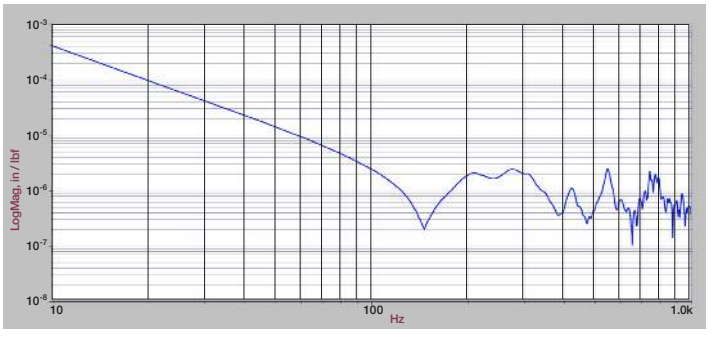
Research Grade CleanTop® provides the ultimate in optical top performance. Unmatched in the industry, Research Grade performance combines the smallest cell-size and highest core density with the unique CleanTop® design, all-steel construction, and the highest level of structural damping commercially available. Research Grade CleanTops are recommended for the most demanding applications including interferometers, holography, and ultra-fast lasers, as well as the most severe floor vibration environments. For the best overall vibration control, consider combining this top with a STACIS® iX support, a hybrid air/piezoelectric, 2-stage vibration cancellation system.

Features

- **Maximum Structural Damping – Research Grade**
- **CleanTop individual nylon cups under each tapped hole are airtight (25mm)**

Specifications

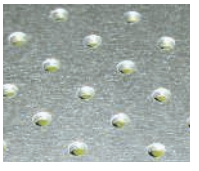
Core: Steel honeycomb, closed-cell, 0.010 in. thick foil
Core shear modulus: 275,000 psi
Core cell size: <0.5 in.^{2}
Core density: 13.3 lb/ft^3 (230 kg/m^3)
Flatness: ∓ 0.005 in. (0.13 mm)
Top skin: 430 series ferromagnetic stainless steel, 3/16 in. thick (5 mm)
Sidewalls: Damped, formed steel channel, vinyl covered
Tapped holes: Backed by 1 in. (25 mm) long CleanTop nylon cups



Note: Corner Compliance data measures the displacement of the top in response to impact by a calibrated hammer. The lack of response below 300 Hz is indicative of extremely high damping and excellent overall structural performance. Compliance was measured on a 48 x 96 x 12 in. top.

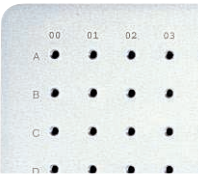
TMC offers a comprehensive line of options and accessories to help you obtain maximum efficiency from TMC optical tops. We also provide unequaled expertise and fast turnaround in designing and building custom configurations to your specifications.

CleanTop® DoubleDensity™



By combining our existing uniquely small honeycomb cell size (0.50 in.^{2}) with our proprietary CleanTop® individual sealed hole technology, we are now able to offer twice the number of tapped holes.

Alpha-Numeric Grid



By electro-chemically etching a coordinate pattern on the top surface, each tapped hole has an address. This is also helpful in documenting a setup for OEM applications.

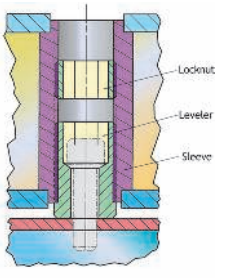
Rounded Corners

CleanTop® Tops include user-friendly 1-in. radiused rounded corners as a standard feature. If required, conventional square corners are available at no extra charge.

Overhead Shelf

An ideal storage rack for equipment and instrumentation. It spans the long axis of the table, is adjustable in height and free standing. Included a UL-approved electrical strip with two eight-grounded outlet strips in the 6-ft shelf and four eight-grounded outlets in the 8- and 10-ft shelves. (125 V, 60 Hz, 15 A). Optional accessories include a second tier shelf. The shelf includes two rows of holes on a 2 in. (50 mm) spacing to facilitate mounting of fixtures. The structure is formed steel with a non-resonant design, black powder-coat finish, and leveling feet for uneven floors. Capacity is 200 lb (90 kg). For custom requirements such as non-U.S. format outlet strips, contact TMC.

Breadboard Leveler



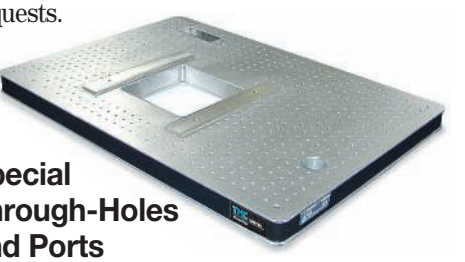
As an option on 2 in. (50 mm) thick breadboards with 1/8 in. (3 mm) or 3/16 in. (5 mm) skins, TMC provides a breadboard leveler mechanism. The leveler consists of a threaded sleeve bonded into the top, a bushing leveler, and a locknut. An M6 or 1/4-20 bolt may then be used to fasten the breadboard to another top. The leveler is adjusted and locked with a Allen wrench.

Earthquake Restraint System

TMC's earthquake restraint bracket system provides increased safety and stability for optical tables in high-risk earthquake areas without affecting table performance. The TMC earthquake restraint system relies on top brackets and upper tiebars to control motion of the table top and, where severe occurrences are anticipated, floor brackets with lower tiebars to secure the support structure to the floor.

Special Materials

Tables made of any commercially available metallic materials are readily manufactured by TMC. Aluminum, non-ferromagnetic 300 series stainless steel, and thermally stable Invar Alloys are among the most frequent requests.



Special Through-Holes and Ports

Our multiple new 2,000-watt laser machining centers coupled with our capacity to punch, drill, shear, form, and weld steel makes inclusion of custom hole patterns readily available. Common patterns include notches, rectangular through-holes, laser ports, and threaded bosses.

Joined Tables

By welding a precision ground and aligned joiner plate system to the table skins, TMC can provide a rigid coupling between optical tables. In addition to tables coupled end-to-end, we can easily join them in "L" or "T" shapes. In addition, we can provide configurations with two working heights on one table by coupling tables of differing thicknesses.

CleanTop® Optical Tops

With System 1 Supports

TMC optical tops provide the highest core density and smallest honeycomb cell area in an all-steel construction with the first, and still best, spill-proof tapped hole design. The small honeycomb cell size results in a more rigid structure, a heavier structure, and a table with the highest inertia.

TMC utilizes broadband damping that does not need careful tuning and therefore is less susceptible to mass loading of the table that can change the table's resonant frequency.

We offer three different levels of Performance: Research, Scientific or Laboratory grade, as well as Specialty Tables for environmental considerations.

TMC's Optical Tops with Micro-g® System 1 Vibration Isolation Legs feature patented Gimbal Piston™ Isolators which provide unparalleled isolation efficiency in both horizontal and vertical directions. Combined with its highly tuned, non-linear damping response, the Gimbal Piston provides the most stable experimental working environments for advanced research.

TMC's Micro-g® System 1 isolators are available in a variety of different configurations. The most popular being the internal casters which allows for easy placement of the system in the lab. Many vibration isolation/cancellation options exist within TMC, allowing the end user to overcome just about any vibration problem.

Perhaps no single characteristic of an optical top is as crucial as its structural damping. TMC's R&D Department is

System 1

constantly evaluating new techniques and materials to maximize structural damping performance. We are able to offer various levels of performance and added flexibility in specifying a TMC top.

TMC's CleanTop Optical Top is the best method yet for providing a spill-proof, clean, precise, and corrosion resistant optical top with unmatched structural performance.

STACIS® iX LaserTable-Base™

Hybrid Piezoelectric/Air Active Vibration Cancellation System

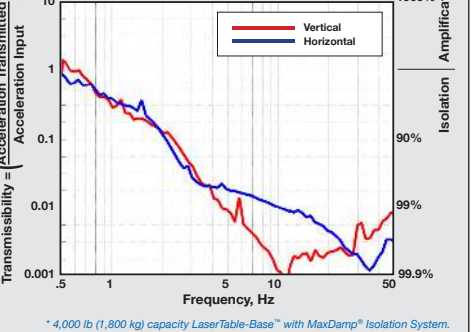
Two-stage hybrid active/passive system achieves breakthrough vibration isolation performance

For the ultimate in vibration isolation performance, TMC developed STACIS® iX LaserTable-Base™, a new, hybrid active/passive two-stage isolation system. Though low frequency air isolators provide excellent high frequency isolation, passive mass-spring-dampers actually amplify vibration at their resonant frequency, typically 1 to 3 Hz. LaserTable-Base combines the patented STACIS® piezoelectric vibration cancellation system achieving almost 20 dB of isolation at 2 Hz with TMC's MaxDamp® Gimbal Piston™ Isolators to provide unprecedented overall vibration isolation performance. LaserTable-Base is ideal for the most demanding, vibration-sensitive applications including atomic force microscopy, single molecule biophysics, laser trapping, and interferometry.

Features

- Incorporates patented STACIS® technology
- Active inertial vibration cancellation system
- Vibration cancellation starts below 1 Hz
- 6 active degrees-of-freedom
- Consists of two isolation systems in series for maximum vibration cancellation
- Installs easily, minimal tuning required
- Incorporates patented MaxDamp Air Isolators
- Includes TMC's DC-2020 Digital Controller

Transmissibility*



** 4,000 lb (1,800 kg) capacity LaserTable-Base™ with MaxDamp® Isolation System. Payload of 2,000 lbs (907 kg), tested with simulated floor vibration at VC-C (500 micro-inches per second, 12.5 microns per second).*

How to configure your CleanTop® Optical Top part number

1. Select a performance level or specialty type code from the Prefix Chart.
2. Select a size code for any one of the thicknesses indicated from the Size Chart.
3. Select a suffix code indicating hole pattern/laser ports requirements from the Suffix Chart.

Model Number Examples

784 — 455 — 02R

1	2	3
Prefix Code	**Size Code**	**Suffix Code**
Performance/ Damping Level	Basic Part Size code	Hole Pattern/ Laser Ports
Research Performance Level	48 in. x 96 in. x 8 in.	1 in. centers - 1/4-20

714 — 675 — 12DR

1	2	3
Prefix Code	**Size Code**	**Suffix Code**
Performance/ Damping Level	Basic Part Size code	Hole Pattern/ Laser Ports
Non-Magnetic Specialty Type	1.5 m x 3.0 m x 12	M6 25mm staggered centers double density holes

1. Prefix Chart

Code	CleanTop® Performance Level	Damping Level
784	Research Grade	Maximum structural damping
783	Scientific Grade	Standard structural damping
781	Laboratory Grade	Nominal structural damping
Code	**CleanTop® Specialty Type**	
794	ClassOne™ (cleanroom compatible)	Maximum structural damping
794ss	ClassOne™ (cleanroom compatible)	Maximum structural damping (stainless steel cups)
793	ClassOne™ (cleanroom compatible)	Standard structural damping
793ss	ClassOne™ (cleanroom compatible)	Standard structural damping (stainless steel cups)
714	Non-Magnetic	Maximum structural damping (304 Alloy)
714L	Non-Magnetic 316L	Maximum structural damping (316 Alloy)
730	Vacuum Compatible	n/a

2. Size Chart

Surface Dimensions			Code			
in.	ft	m	8 in. Thick (200 mm)	12 in.Thick (300 mm)	18 in.Thick (450 mm)	24 in.Thick (600 mm)
30 x 60		0.75 x 1.5	– 432 –	– 632 –		
30 x 72		0.75 x 1.8	– 491 –	– 691 –		
30 x 96		0.75 x 2.4	– 492 –	– 692 –		
30 x 120		0.75 x 3.0	– 493 –	– 693 –		
36 x 60	3 x 5	0.9 x 1.5	– 436 –	– 636 –		
36 x 72	3 x 6	0.9 x 1.8	– 439 –	– 639 –		
36 x 96	3 x 8	0.9 x 2.4	– 440 –	– 640 –	– 740 –	– 840 –
36 x 120	3 x 10	0.9 x 3.0	– 494 –	– 694 –	– 794 –	– 894 –
40 x 60		1.0 x 1.5	– 443 –	– 643 –		
40 x 80		1.0 x 2.0	– 444 –	– 644 –	– 744 –	– 844 –
40 x 120		1.0 x 3.0	– 445 –	– 645 –	– 745 –	– 845 –
48 x 48	4 x 4	1.2 x 1.2	– 447 –	– 647 –		
48 x 60	4 x 5	1.2 x 1.5	– 449 –	– 649 –		
48 x 72	4 x 6	1.2 x 1.8	– 451 –	– 651 –	– 751 –	– 851 –
48 x 96	4 x 8	1.2 x 2.4	– 455 –	– 655 –	– 755 –	– 855 –
48 x 120	4 x 10	1.2 x 3.0	– 459 –	– 659 –	– 759 –	– 859 –
48 x 144	4 x 12	1.2 x 3.6	– 463 –	– 663 –	– 763 –	– 863 –
48 x 168	4 x 14	1.2 x 4.2	– 465 –	– 665 –	– 765 –	– 865 –
48 x 192	4 x 16	1.2 x 4.8	– 467 –	– 667 –	– 767 –	– 867 –
59 x 60	5 x 5	1.5 x 1.5	– 470 –	– 670 –	– 770 –	– 870 –
59 x 72	5 x 6	1.5 x 1.8	– 471 –	– 671 –	– 771 –	– 871 –
59 x 80		1.5 x 2.0	– 472 –	– 672 –	– 772 –	– 872 –
59 x 96	5 x 8	1.5 x 2.4	– 473 –	– 673 –	– 773 –	– 873 –
59 x 120	5 x 10	1.5 x 3.0	– 475 –	– 675 –	– 775 –	– 875 –
59 x 144	5 x 12	1.5 x 3.6	– 476 –	– 676 –	– 776 –	– 876 –
59 x 168	5 x 14	1.5 x 4.2	– 477 –	– 677 –	– 777 –	– 877 –
59 x 192	5 x 16	1.5 x 4.8	– 478 –	– 678 –	– 778 –	– 878 –
Weight Factor (WF) (approx.); Area x WF = Total Weight			0.225 lb/in.^{2} (0.016 kg/cm^2)	0.265 lb/in.^{2} (0.019 kg/cm^2)	0.420 lb/in.^{2} (0.030 kg/cm^2)	0.475 lb/in.^{2} (0.033 kg/cm^2)

Online Installation videos available for setup assistance.

3. Suffix Chart

Code	Hole Pattern - Threads	Double Density*	Laser Port**
00R	No Holes	no	no
01R	1 in. centers - 1/4-20	no	yes
02R	1 in. centers - 1/4-20	no	no
11R	25 mm centers - M6	no	yes
12R	25 mm centers - M6	no	no
01DR	1 in. staggered centers - 1/4-20	yes	yes
02DR	1 in. staggered centers - 1/4-20	yes	no
11DR	25 mm staggered centers - M6	yes	yes
12DR	25 mm staggered centers - M6	yes	no

TMC™ VIBRATION CONTROL

AMETEK® ULTRA PRECISION TECHNOLOGIES

Contact sales@techmfg.com to easily configure a custom system.