



# Optical Tabletops and Vibration Isolated Workstations



Optical tabletops, breadboards and workstations from **OPTA** display a remarkable quality and functionality. As a special service **OPTA** offers customer designed solutions and provides assistance and advice on the construction and use of special optical table systems. Very short delivery time can be realized. In the following the different types of available table tops are described.

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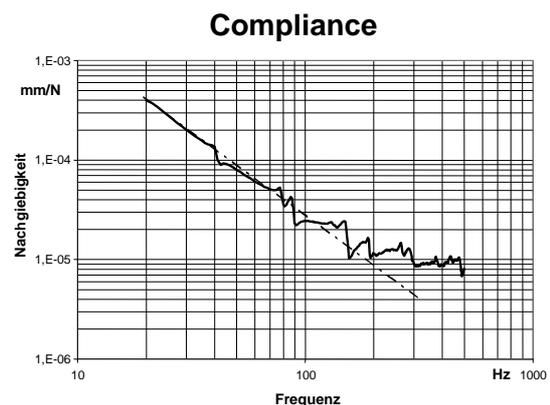
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## OPTA Tabletops

OPTA offers four different ranges of tabletops. The following table gives a survey of available types.

Type	Description
HD	Main Core: Steel honeycomb. Top Plate: Magnetic stainless steel, without mounting holes.
HDT	Main Core: Steel honeycomb. Top Plate: Magnetic stainless steel, with mounting holes.
HS	Main Core: Mineral filling material with high stiffness and density. Top Plate: Magnetic stainless steel, without mounting holes.
HST	Main Core: Mineral filling material with high stiffness and density. Top Plate: Magnetic stainless steel, with mounting holes.



Compliance Curve for a type HDT Optical Tabletop (Size 1200x1800x300mm, Point Load 114kg in middle of the table, excitation by sinus sweep 20-500Hz)

Optical tables should exhibit an optimum on static rigidity simultaneously with sound damping characteristics. But in general it is not possible to optimize both properties at the same time. An increased stiffness will result in low damping and vice versa. For the functionality of an optical table static rigidity is of inferior significance since negative effects can always be compensated for by alignment of the optical setup. Much more disturbing interference arises from increased resonance in the upper frequency range which can only be eliminated by appropriate self-damping. The recognition of this circumstance has caused **OPTA** to choose a different way in building optical tables. **OPTA** tables are optimized in view of their self-damping characteristic by which resonance in the upper frequency ranges are suppressed nearly completely for tables of type HD/T.

### Specifications

#### Top Plate

- Stainless steel 3 + 2mm
- Magnetic or antimagnetic
- Planarity +/- 0,1 mm
- Brushed finish
- Hole Spacing 25mm
- Insert Mounting Holes M6
- With overlap 8 mm





### Bottom Plate

- Stainless steel 3 mm
- Magnetic or antimagnetic
- With overlap

### Main Core

- HD/T**      magnetic:      Honeycomb structure formed from 0.5mm galvanized iron plates / jointed with special synthetic resin adhesives.
- antimagnetic:      Special aluminium core
- HS/T**      Mineral filling, reinforced with steel

### Sealed Mounting Holes

- Floating mounted threads M6
- Magnetic or antimagnetic
- No connection to the breadboard core because of sealed sockets
- Possible displacement of mounting threads around 0,5 mm with simultaneous inclination around  $\pm 3^\circ$
- Max. thread depth 30 mm

### Sides

- Black laminated steel
- Magnetic or antimagnetic

### Tabletop Thickness

- Customer requirements
- special sizes (up to L3000 x B 1500 mm) without extra charge
- connecting of two tables possible with special table-connecting-system is possible
- special forms available on request
- possible with laser port



## OPTA Optical Table Support Systems

Support systems can be ordered as freestanding isolators or tie bar connected. The table support itself is offered in three different versions and the legs can be equipped with different footings.



## Support System without Vibration Isolation

Rigid Table Support  
 Type **LMT**  
 (Leveling Mount Table)

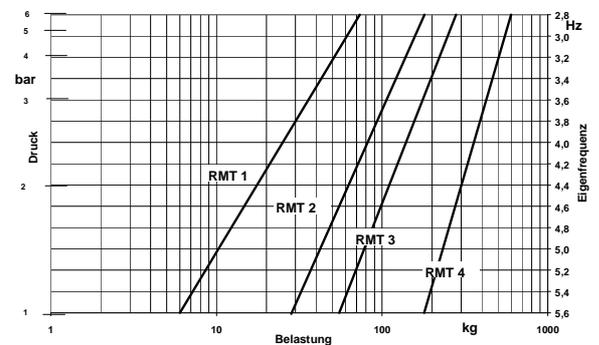
The table top is joint inflexible to the support system. Leveling screws which have an characteristic frequency above 10Hz are installed between table legs and table feet to compensate for unevenness in the laboratory floor.



## Support System with Low-Frequency Vibration Isolation

Vibration Isolated Table Top  
 Type **RMT**  
 (Rubber Mount Table)

The connection between table top and support system is realized with reinforced elastomeric shock absorbers. Characteristic frequency of these systems lie between 2,5 and 5 Hz.



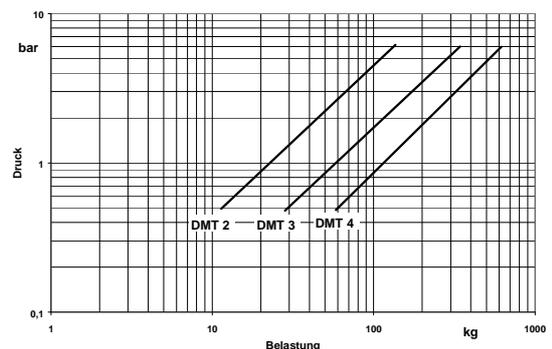
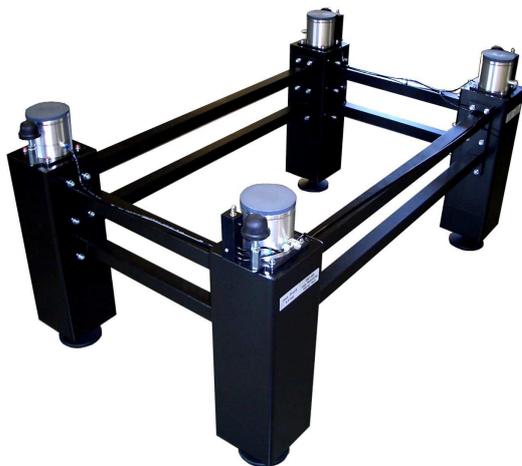
Vertical Characteristic frequencies of the Table Support System RMT in dependence of load per table leg.





Vibration Isolated Table Top  
Type **DMT**  
(Diaphragm Mount Table)

In case of these table support system the legs are used as air cambers..  
The table is stocked in top of a club-shaped diaphragm mount.



Load of the table support system in dependence of the pressure per table leg

The advantage of this bearing is the low-frequency tuning of the system which results in an effective isolation against floor concussion. The vertical characteristic frequency of this support is lower than 0,85 Hz. Assuming floor concussions with resonance above 8 Hz this corresponds to a degree of insulation of more than 90%. The lateral characteristic of the bearing system is dependent from the set up.

For the support systems **RMT** and **DMT** different level-control systems are optionally available.

### Level Control System

A change in the load distribution on the table or a change in the load itself causes an optical table with air bearings to change its horizontal alignment and height. To maintain the table level at a constant height a level control system is required.

The level control system from **OPTA** precisely compensates for any load changes and keeps the table at its pre adjusted height. The self leveling repeatability amounts under optimum conditions to  $\pm 10 \mu\text{m}$ . Throttle valves are used to control the leveling rate. The air pressure required lies below 6 bar. The number of table support legs is determining the pneumatic control scheme. Usually four legs are used to support a table top. A three-point support is realized by a parallel connection of two air bearings. In case if more than four legs are required they have to be connected such that always three controllable groups are formed with one control valve per group. A pressure reducing valve at the control unit which is available as accessory can be used to adjust the required system pressure under different loads. Simultaneously the pressure of the three air bearings can be monitored.

The level control systems PVS and SVS from **OPTA** work without electronic components. As level monitoring devices pneumatic valves are used which mechanically detect the actual value of the system. The nominal standard will also be regulated by mechanically valves.



Level-Control System Type **PVS**  
(**P**ressure **V**alve **S**ystem)

System for standard applications. Pressure reading directly at the regulating valves.

Level-Control System Type **SVS**  
(**S**pecial **V**alve **S**ystem)

System for demanding applications. Adjustable leveling rate. Special valves with precise reset function.

Level-Control System Type **ECS**  
(**E**lectronic **C**ontrol **S**ystem)

Contact-free operating self-leveling system which represents an optimized vibration isolation. (Only available in connection with table top DMT).

## **OPTA** Table Accessories

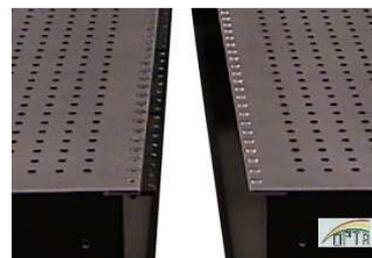
### **Pneumatic**



For the operation of the pneumatic level control a connection to an in-house compressed-air system is needed. If such a system is not available a special compressor with vibration suppression has to be used to maintain a constant pressure in the system. Tables with pneumatic bearings but without level control do not need a permanent pressure supply. A simple air-pump is sufficient to fill the pneumatic bearing chambers.

## **OPTA** Custom manufactured table combinations

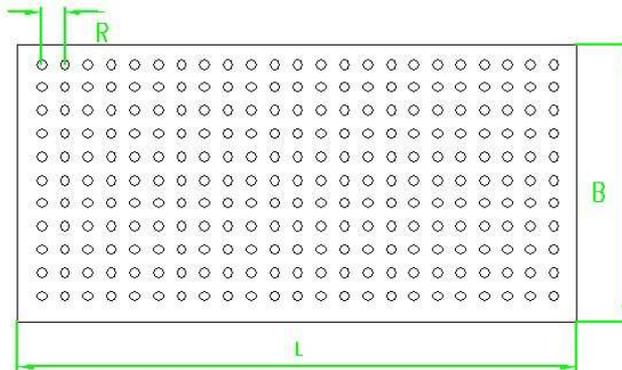
By combining optical tables from **OPTA** large table top areas in L-, T- or H-form can be realized. A uniform mounting hole grid can be maintained across the entire table and is not affected by a joint structure.



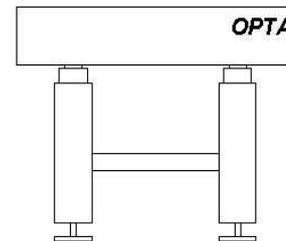
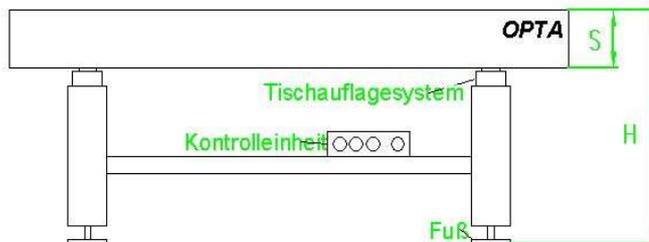


## Quotation-Form

Use the following drawing to specify the desired layout of an optical table.  
Please copy this form and mail or fax it back to us.



**FAX - No.:**  
**0049 - 6251 - 690667**



		<i>Remarks</i>	
<b>Table Top</b>	<b>Type</b>	<input type="checkbox"/> HD/T / <input type="checkbox"/> HS/T	
	<b>Length L [mm]</b>		
	<b>Width B [mm]</b>		
	<b>Thickness S [mm]</b>		
	<b>Height H [mm]</b>		
	<b>Hole Spacing R [mm]</b>		
	<b>Table Combination</b>	<input type="checkbox"/> T / <input type="checkbox"/> L / <input type="checkbox"/> H	please add drawing
<b>Support System</b>	<b>Feet</b>	<input type="checkbox"/> Metal Plate	
		<input type="checkbox"/> Adjustable Feet	
		<input type="checkbox"/> Wheels with Brakes	only available with tie bars
<b>Set-Up</b>	<input type="checkbox"/> Single Legs		
	<input type="checkbox"/> Tie Bars		
<b>Vibration Isolation</b>	<b>Environment?</b>		
	<b>Fremderregung ?</b>		
	<b>Application ?</b>		
	<b>Support System</b>	<input type="checkbox"/> LMT	
		<input type="checkbox"/> RMT	
		<input type="checkbox"/> DMT	
	<b>Leveling System</b>	<input type="checkbox"/> PVS	only with table tops RMT/DMT
<input type="checkbox"/> SVS		only with table tops RMT/DMT	
<input type="checkbox"/> ECS		only with table tops DMT	
<input type="checkbox"/> Control Unit		only with self-leveling system SVS/ECS	
<b>Accessories</b>	<b>Pneumatics</b>	<input type="checkbox"/> Air Pump	only RMT/DMT without self-leveling system
		<input type="checkbox"/> Compressor	bei fehlendem Druckluftanschl. u. Niveauregu
	<b>Other</b>		