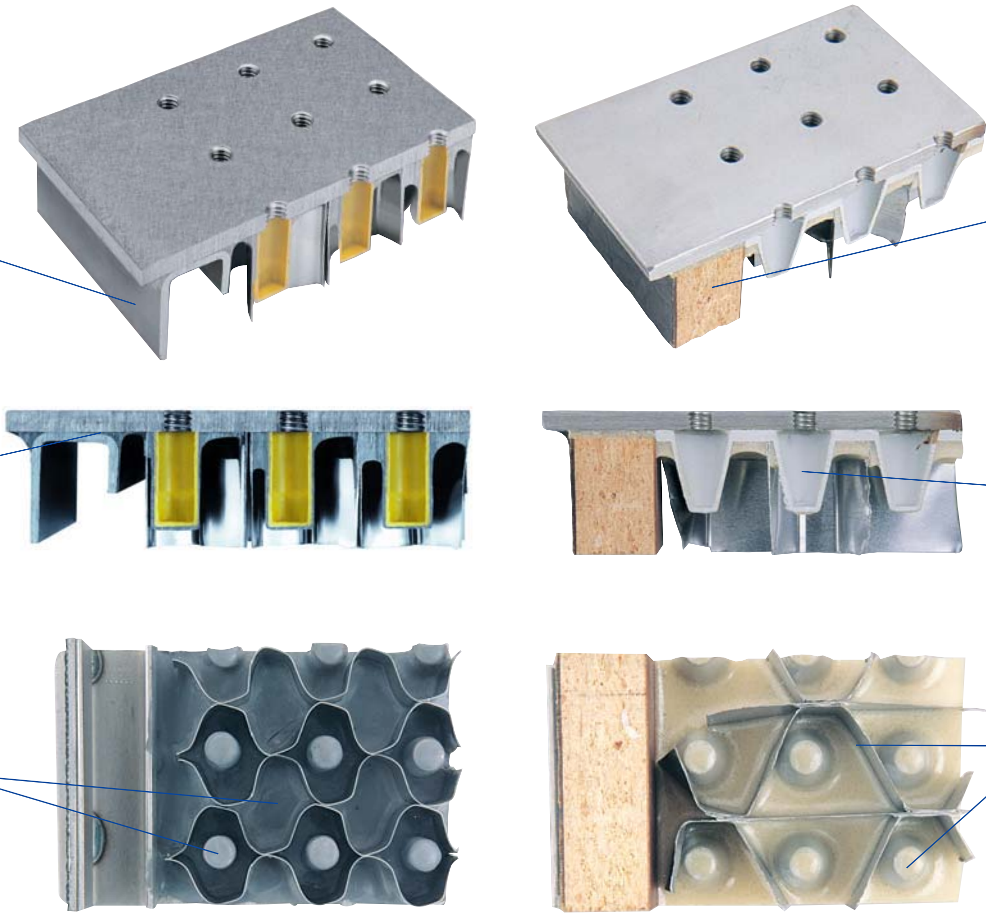
Return to Table of Contents

20 Reasons for Choosing TMC Optical Tops

TMC CleanTop® II | **Competitive Construction**



1. Sidewalls of TMC ferromagnetic tops are 0.075 in. (2 mm) thick, damped, cold-rolled formed steel (see center CleanTop® II photo, above), unlike the moisture-absorbing particle board favored by other manufacturers, presumably for its low cost. In addition, steel provides structural integrity unattainable with particle board sidewalls.

2. TMC's CleanTop II design does not require enlarging core cell size because CleanTop II cups are cylindrical, not conical like molded plastic membrane cavities. Our average cell size of 0.5 in.^{2} (3 cm^2) is at least 50% smaller than molded cavity top designs, assuring the highest stiffness and greatest core-to-skin bonding contact area.

3. CleanTop II achieves a spill-proof core with only two bonding layers: top skin to core and core to bottom skin. Imitations must add a third bonding layer, which severely weakens the structure: top skin to plastic layer, plastic layer to core, and core to bottom skin.

Return to Table of Contents

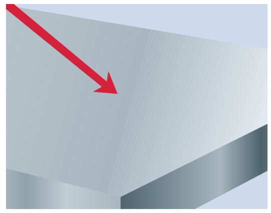
20 Reasons for Choosing TMC Optical Tops (continued)

4. Additionally, to avoid excessive epoxy being squeezed into the plastic cups, imitative designs use only the thinnest layer of epoxy between the top skin and plastic layer. The thinness of this layer can produce “voids” when the top is bonded by trapping air, significantly weakening the bond.

5. TMC employs a proprietary process to clean our machined skins to a level that is virtually “sterilized.” This ensures the cleanest threaded holes and superb epoxy bonding. Furthermore, the cleaning station is in an entranceway to a clean, finishing building, so that the cleaned top never sees a heavy, industrial machining environment. In the CleanTop® II design, no machining, grinding, or sanding of any kind is performed subsequent to this cleaning process.

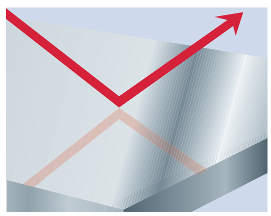
6. TMC top skins are stretcher-leveled, stress-relieved, and pressure-bonded against a precision-lapped granite plate, without subsequent grinding – avoiding heat and stress. The finished top is flat within ∓0.005 in. (0.13 mm) within the normal hole pattern area, guaranteed.

7. Top surfaces of TMC tops are lightly sanded with an orbital pattern to remove burrs and provide a non-glare, non-reflecting finish, without inducing internal stress.



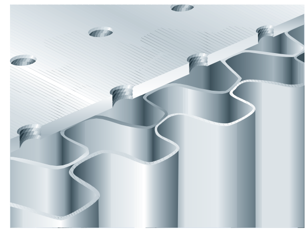
TMC no-glare surface (above).

Ground surface of competitive design creates reflection and glare (below).

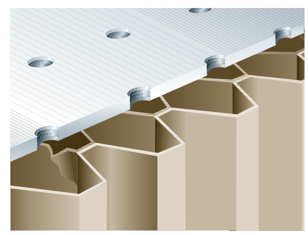


8. Standard mounting holes in TMC tops are tapped, either 1/4-20 on 1 in. centers or M6 on 25 mm centers. Imperial 1/4-20 tapped holes on 1 in. staggered centers and metric M6 on 25 mm staggered centers are available at a nominal additional fee. Custom patterns, including large through-holes for cables, etc., are easily accomplished with our multiple 2,000-watt laser machining centers.

9. All TMC mounting holes are in register with open cells in the honeycomb core (a given with CleanTop II but not necessarily with other designs). This assures that the core is not damaged by subsequent drilling and tapping during manufacture, that the structural integrity of the assembly is maintained, and that all mounting screws can be inserted to full depth without obstruction.

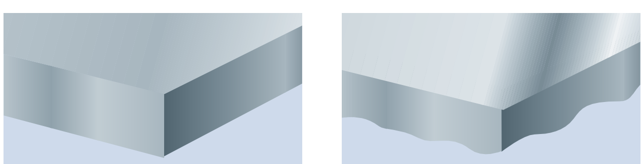


TMC-registered holes (shown without CleanTop® II cups)

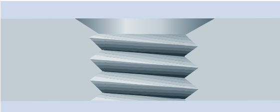


Competitive non-registered holes

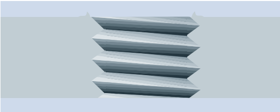
10. Every hole in a TMC top is lead-screw-tapped, the most precise method known, and there are no inserts. Inserts can loosen, and top skins can be distorted when inserts are pressed into undersized holes.



TMC top skin (left) and competitive design top skin after grinding (right)



TMC-countersunk holes (above) vs. non-countersunk holes in competitive design (below)

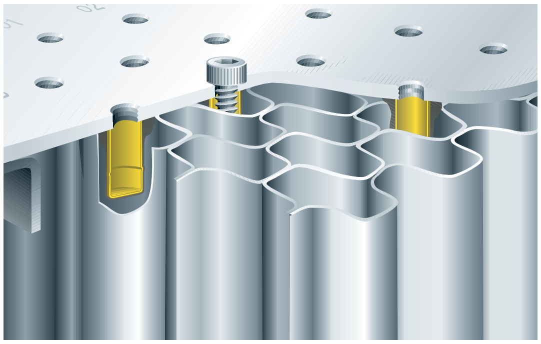


11. TMC mounting holes are slightly countersunk to remove ridges and burrs. Every TMC mounting screw can be finger tightened at first insertion – no wrench is needed.

12. TMC's broadband dry damping approach is the only logical one for an optical top. Others use "tuned" dampers which only work on a discrete frequency. Structural resonances are not discrete and therefore not eliminated but rather "split" into two resonances by tuned dampers.

13. TMC's honeycomb core is made of 0.010 in. (0.25 mm) thick steel, work-hardened and plated to prevent corrosion and assure years of service. Steel honeycomb is the ideal material for optical tops since the Young's modulus of steel is three times that of aluminum.

14. TMC's honeycomb core is a closed-cell structure with basic cell size of 0.5 in.^{2} (3 cm^2), giving a core density of 13-14 lb/ft^3 (300 kg/m^3), significantly greater than others on the market. The effective core density is 18-20 (16 lb/ft^3) including sidewalls and dampers.



TMC's honeycomb core

15. Our honeycomb structures are totally TMC-manufactured, assuring reduced manufacturing cost, top quality, and dimensional precision.

16. The core, skins, and sidewalls of TMC tops are rigidly and permanently bonded with specially formulated high-strength epoxy, which has no viscoelastic creep or hysteresis. The overall shear modulus of TMC's finished, bonded core is 275,000 psi (19,300 kg/cm^2).

17. The stainless steel version of TMC's CleanTop® II cups offers the ultimate in an unbroken stainless steel barrier. This design renders the top immune to even repeated spills of the most corrosive liquids.

18. Structural damping of TMC tops is accomplished using broadband mass dampers which are separate from the core, do not permit hysteresis or creep of the top, and do not detract from the top's stiffness.

19. Our unique, direct core-to-top bonding improves the thermal conductivity of the core to the outside environment, reducing the "thermal relaxation time" for the top.

20. Our skins, core, sidewalls, and dampers are all made of steel and therefore have the same coefficient of thermal expansion. Thus, even in situations with repeated temperature cycling, a TMC top expands and contracts as a whole, assuring structural integrity and preventing long-term internal stress buildup.