Tectonus DMAX Brace Dynamic Performance (Testing as per ASCE07-16)

The Tectonus DMAX is a steel brace supplied end to end, incorporating the well-proven Tectonus DFFJ friction damper. The DMAX brace provides high damping and ductility for brace applications without experiencing any damage. The high consistency and very low tolerances of the dynamic performance of Tectonus DMAX have been the significant advantages when compared to other friction-based dampers available in the market (providing the best-in-class overstrength factor of 1.15). Its elastic perfectly plastic hysteresis performance makes it as an efficient alternative to BRBs, EBFs and CBFs.

It should be noted, providing lateral stability for friction-based braces has always been a challenge because the initiation of friction sliding in the damper forms a plastic hinge resulting in the brace global buckling at the damper location. The lateral stability of the Tectonus DMAX brace is provided by an external jacket as a robust anti-buckling mechanism (a proprietary design).

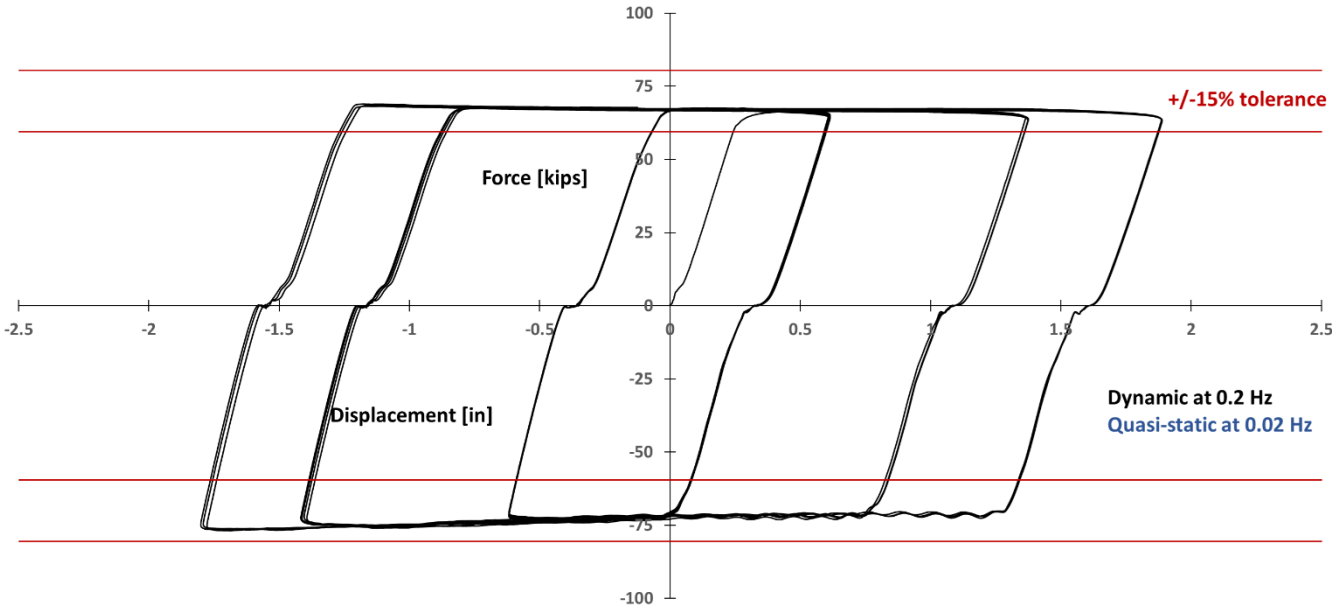
To demonstrate the dynamic performance of Tectonus DMAX brace, a full-scale testing has been conducted at the Structures Lab of the Auckland University of Technology using a MTS dynamic actuator. The loading protocol was specified as per ASCE07-16 providing a rigorous testing regime (at the frequency of 0.2Hz). The number and amplitudes of the loading cycles have been:

- 10 cycles at +/-0.7 inch **(37.5% of the maximum displacement)**
- 5 cycles at +/-1.3 inch **(75%)**
- 3 cycles at +/-1.8 inch **(100%)**

Link to the test video: HERE

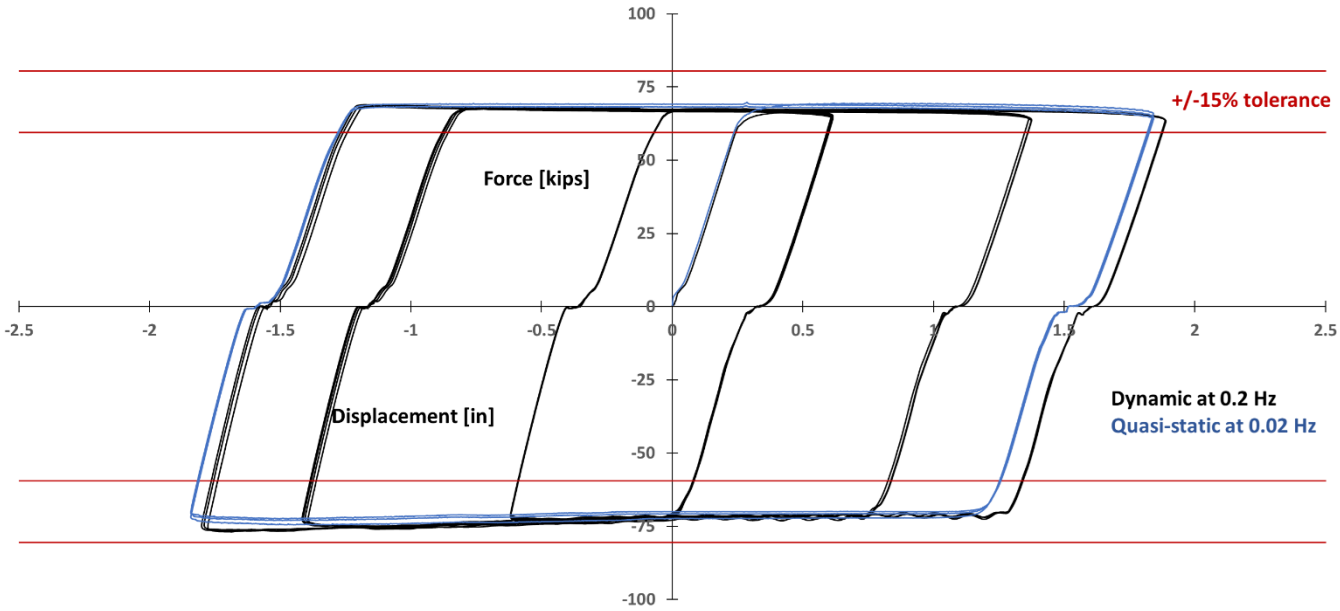
Dynamic testing of Tectonus DMAX brace with a capacity of 70 Kips

The DMAX brace tested had a capacity of about 70 Kips. The result of the dynamic performance is presented demonstrating the compatibility of the hysteresis curves after simulated severe events without any stiffness and strength degradation. It should be noted that the performance tolerances are below +/-15% resulting is a very low overstrength factor critical for having an efficient capacity design of the adjacent members and foundation, in particular for retrofitting projects.



High-consistent dynamic performance of Tectonus DMAX brace with a tolerance lower than +/-15% (as per ASCE07-16)

In addition, as part of the ASCE07-16 requirements to demonstrate the velocity independence of the brace performance, a quasi-static testing was conducted at the full stroke on the same brace at a frequency of 0.02Hz (10 times slower than the dynamic test). As shown in the comparison plot, the performances are quite compatible verifying another unique feature of the Tectonus DMAX brace.



Demonstration of velocity independence by comparing the quasi-static & dynamic performances