

Energy Absorbing Composite Distribution Poles



- By far, the lowest cost “TL-2 Device” solution
- Can greatly reduce injuries in vehicle impacts
- Pole lengths to 50’
- Full-scale tested
- Light weight, easily transported and installed
- No chemical additives
- Virtually maintenance-free
- FHWA accepted as Test Level 2 (TL-2) device



Statistics are harsh. Vehicle collisions with poles account for ten percent of all fatalities from fixed-object car crashes. This is of course why safety organizations and regulators have vigorously pursued TL-2 devices which mitigate the G-forces deceleration factor in collisions. Solutions have been extremely expensive. Until now.

Shakespeare Composite Structure Energy Absorbing Distribution Poles meet or exceed TL-2 requirements.

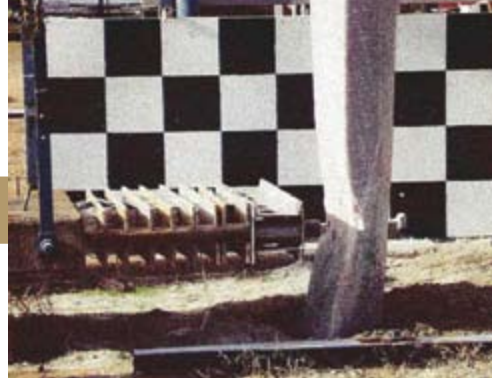


Shakespeare Composite Structures high performance Energy Absorbing Distribution Poles can make a difference.



In full-scale crash testing, Shakespeare Composite Structures' Energy Absorbing Distribution Poles reduced ridedown forces to well within TL-2 specifications.

After impact by a vehicle at 70 km/hr, this Energy Absorbing pole kept ridedown forces to less than 5.6 G's longitudinal and 0.9 G's lateral, half of preferred limits.

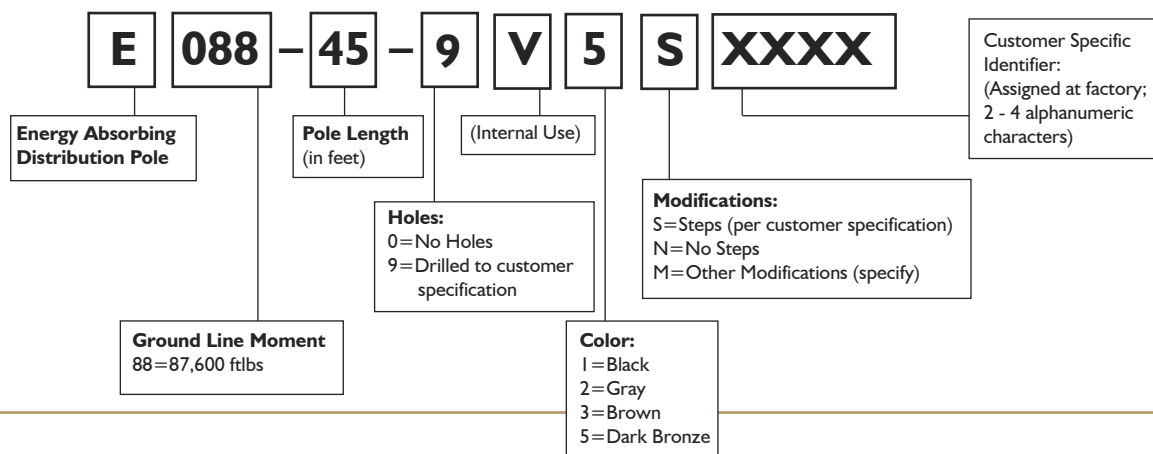


Armed with required performance criteria (chart below), our engineers developed the Energy Absorbing Tuff-Pole® using state-of-the-art technologies. They began with extensive finite element computer modeling and analysis to predict composite shapes' behavior during a collision. After extensive development, prototyped designs were subjected to destructive testing - for example, pendulum impact, above center. Finally, actual crash testing was undertaken to verify predicted results in the real world. Compare the computer model at left to the crash test at right. The computer simulation predicts actual behavior of vehicle and pole with uncanny accuracy.

Energy Absorbing Pole Testing Test Level 2 from NCHRP Report 350, Table 5.1

Evaluation Criteria	Results: 50 km/h	Pass/Fail	Results: 70 km/h	Pass/Fail
B. The test article should readily activate in a predictable manner by breaking away, fracturing, or yielding.	The test article collapsed predictably in the manner designed.	Pass	The test article collapsed predictably in the manner designed.	Pass
D. Detached elements, fragments or other debris from the test article should not penetrate or show potential for penetrating the occupant compartment, or present undue hazard to other traffic, pedestrians, or personnel in work zone. Deformations of, or intrusion into, the occupant compartment that could cause serious injuries should not be permitted.	No elements detached from the test article.	Pass	No elements detached from the test article.	Pass
F. The vehicle should remain upright during and after collision although moderate roll, pitching and yawing are acceptable.	The test vehicle did not significantly roll, pitch or yaw during impact.	Pass	The test vehicle did not significantly roll, pitch or yaw during impact. Measured from test film.	Pass
H. Occupant Impact Velocity Limits (m/s) Longitudinal: 9 m/s Preferred Limit 12 m/s Max. Limit Lateral: 3 m/s Preferred Limit 5 m/s Max. Limit	Maximum change in velocity in the longitudinal direction was 10.6 m/s and 0.4 m/s in the lateral direction.	Pass	Maximum change in velocity in the longitudinal direction was 10.7 m/s and 0.5 m/s in the lateral direction.	Pass
I. Occupant Ridedown Acceleration Limits (G's) Longitudinal and Lateral Direction: 15 G's Preferred Limit 20 G's Maximum Limit	Maximum ridedown accelerations were: 7.6 G's Longitudinal 2.3 G's Lateral	Pass	Maximum ridedown accelerations were: 5.6 G's Longitudinal 0.9 G's Lateral	Pass
K. After collision it is preferable that the vehicle's trajectory not intrude into adjacent traffic lanes.	The vehicle was stopped by the pole.	Pass	The vehicle was stopped by the pole.	Pass
N. Vehicle trajectory behind the test article is acceptable.	Not Applicable	N/A	Not Applicable	N/A

Ordering Template and Options



**Shakespeare Composite Structures
Energy Absorbing Composite
Distribution Tuff-Poles® have been
subjected to extensive, full-scale
testing. For copies of the engineering
reports, or for more information,
email utility@skp-cs.com, or just call.**



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