

**REACT 350<sup>®</sup> (36")**  
**GENERAL SPECIFICATIONS**

**I. GENERAL**

All REACT 350 (Reusable Energy Absorbing Crash Terminal 350) shall be produced by Energy Absorption Systems, Incorporated, of Chicago, Illinois.

**II. DESCRIPTION OF SYSTEM**

A. General

REACT 350<sup>®</sup> refers to a family of reusable crash cushions made up from arrays of cylinders that have the ability to recover a major portion of their shape, position, and capabilities after being impacted. Transitions are available and may be required depending on the site conditions.

B. Component Description

1. The cylinders shall be made of high molecular weight, high-density polyethylene (HMW/HDPE). Each cylinder shall be nominally 915 mm [36"] in outside diameter and 1.22 m [48"] high. The wall thickness of the cylinders may vary from 20 mm [.8"] to 43 mm [1.8"]. Cylinder color shall be black.
2. The REACT 350 (36") shall have a restraining cable system consisting of heavy galvanized steel wire rope on each side of the system.
3. Two options for backups are available for the REACT 350 (36").
  - a. The Self-Contained Backup Assembly has a cable system that begins and ends at the front anchor and is looped through an adjustable tensioning device on the sides of the backup, thus providing two cable strands on each side of the unit.
  - b. The Side Mounted Anchor System is designed to be anchored to an existing concrete block. The system shall have two sets of cable strands on each side of the System, thus providing four cable strands on each side of the System.

C. Material Specifications

1. Metal work shall be fabricated from either MI020 Merchant Quality or ASTM A-36 steel. After fabrication, metal work shall be galvanized in accordance

with ASTM A-I23. All welding shall be done by or under the direction of a certified welder.

2. The System shall be assembled with galvanized fasteners. All bolts, nuts and washers shall be Commercial Quality "American National Standard" unless otherwise specified.

### **III. PERFORMANCE CRITERIA**

A. The REACT 350<sup>®</sup> (36") System shall perform as a re-directive, non-gating crash cushion as specified in the National Cooperative Highway Research Program Report 350, 1993, (NCHRP 350).

1. The REACT 350 (36") Nine Row System shall perform as specified in NCHRP 350 when impacted at a speed of 100 km/h (62 mph).
2. The REACT 350 (36") Six Row System shall perform as specified in NCHRP 350 when impacted at a speed of 90 km/h (55 mph).
3. The REACT 350 (36") Four Row System shall perform as specified in NCHRP 350 when impacted at a speed of 70 km/h (43mph).
4. The REACT 350 (36") System will be able to withstand multiple impacts without cylinder replacement. All cylinders require replacement when the REACT 350 (36") System cannot be pulled out and held at 90% of its original length. It is anticipated that the plastic cylinders will survive in a highway environment for a period ranging from 10 to 15 years unless damaged due to impacts. To ensure full impact performance the unit shall require inspection after each impact and shall be pulled out to its original length.

#### **B. Evaluation Criteria**

1. For head-on impacts into the nose, a REACT 350 (36") System shall be specified that is capable of meeting the Occupant Risk Criteria as recommended in NCHRP 350. For vehicles weighing between 820 and 2000 kg [1810 and 4410 lbs.], the theoretical impact velocity of a hypothetical front seat passenger against the vehicle's interior (calculated from vehicle acceleration and 660 mm [24"] forward displacement) shall be less than 12 m/s [39.4 ft/sec]. In addition, the vehicle's highest 10 millisecond average acceleration subsequent to the instant of the hypothetical passenger impact shall be less than 20 G's.
2. The REACT 350 (36") Nine Row System shall be capable of redirecting 2000 kg [4,410 lb.] vehicles that impact the sides of the system at speeds up to 100 km/h [62 mph] at angles of 20° for both right-way and wrong-way impacts (angles measured from system's longitudinal centerline) assuming appropriate

transition hardware is properly installed. The REACT 350 (36") Nine Row System shall be capable of redirecting 820 kg [1,810 lb.] vehicles that impact the sides of the system at speeds up to 100 km/h [62 mph] at angles of 15°.

3. The REACT 350<sup>®</sup> (36") System shall be designed and constructed so no solid debris is present from the system that can create a hazard on the roadway after either head-on or side angle design impacts.
4. The TL-3 (100 km/hr) version of the narrow REACT shall be capable of protecting against multiple head-on impacts (NCHRP 350 tests 3-30, followed by 3-31, then another 3-31) without requiring any resetting or repair. This test series demonstrates the ability of the REACT to not only self-restore, but also continue to meet NCHRP 350 without refurbishment. Despite these test results Energy still recommends unit inspections after impacts and refurbishment as needed and does not suggest the REACT is maintenance free.

#### **IV. TEST CRITERIA**

The REACT 350 (36") Nine Row System shall have been fully tested per the recommended criteria set forth in the National Cooperative Highway Research Program (NCHRP) Report 350, 1993, Test Level 3 for re-directive, non-gating terminals and crash cushions.

#### **V. DESIGN AND SELECTION CRITERIA**

- A. Design, selection and placement of crash cushions shall conform to The American Association of State and Highway and Transportation Officials (AASHTO) Publication, "Roadside Design Guide" 1996.
- B. Installation of REACT 350 (36") Systems shall be accomplished in accordance with the recommendations of Energy Absorption Systems, Inc.