

Crash or Non-Crash Rated - How would you like your barriers?

Non-rated, rated, certified, K-rated, M40, PU30, P1, L2 or one of the other many options? What does the terminology mean and how does it apply to your organizations needs to protect vital assets?

In the spring of 2009 the standards changed with the Department of State (DOS) SD-STD-02.01, Vehicle Crash Testing of Perimeter Barriers and Gates, Revision A, dated March 2003 being retired. All future barriers will be tested under ASTM F 2656-07. The following information will help to better explain the certifications and what they mean when designing, purchasing or considering the idea of installing a crash barrier.

Terms to know:

Crash-Rated Barrier: A barrier that has been crash tested and certified by a certifying agency such as DOS, DOD, ASTM, BSI (British Standards) There are cases of this term being used to describe products that have not been tested or certified by any independent agency or observer. If there is a doubt, ask for a copy of the certificate from the certifying agency.

Engineer-Rated or Non-Crash Rated: A barrier that has been designed, analyzed, and stamped by a professional engineer. Many barriers with this rating have been analyzed using computer modeling programs. Some products are structurally analyzed to determine crash-worthiness while others are designed based on the design and testing of similar products.

Common US Standards:

Department of State SD-STD-02.01, April 1985	Department of Defense	ASTM International Designation F 2656-07																																																
<p>Qualifications: Barriers where the penetration of the cargo bed must not exceed 1 meter beyond the pre-impact inside edge of the barrier. The rating of the barrier is determined when a 15,000 lb. (6810 kg) gross-weight vehicle impacts a barrier from a perpendicular direction.</p>	<p>Qualifications: Barriers meeting the certification criteria of DOS SD-STD-02.01, Revision A, Dated March 2003, with the exception of penetration, which had been evaluated to the previous SD-STD-02.01, April 1985. All barriers that are on the current DOS Certified Anti-Ram Vehicle Barriers List are considered to be DOD Certified</p>	<p>Qualifications: This test method provides a structured procedure to establish a penetration rating for perimeter barriers subjected to a vehicle impact. Knowing the penetration rating provides the ability to select an appropriate barrier for site-specific conditions around a facility.</p> <p>The barrier penetration rating does not imply that a barrier will perform as rated in all site conditions, approach routes, and topography. Also, only single-specimen tests at a specified impact location are required by this test method, and therefore, not all points of impact can be tested and validated for the penetration rating. Other impact locations may respond differently</p>																																																
<p>Definition: "K" indicates the DOS certified barrier speed rating's maximum vehicle impact speed achieved when a vehicle traveling at a nominal speed is successfully arrested by the barrier from a perpendicular direction.</p> <p>K12 = 50 mph (80 kph) K8 = 40 mph (65 kph) K4 = 30 mph (48 kph)</p>	<p>Definition: "K" indicates the DOS certified barrier's maximum vehicle impact speed rating</p> <p>K12 = 50 mph (80 kph) K8 = 40 mph (65 kph) K4 = 30 mph (48 kph)</p> <p>"L" indicates the distance of penetration of the cargo bed beyond the pre-impact edge of the inside of the barrier.</p> <p>L3 = 3 ft. (915 mm) or less L2 = 3 ft. to 20 ft. (915 mm to 6.1 m) L1 = 20 ft. to 50 ft. (6.1 m to 15.3 m)</p>	<p>Definition: Typical Test Vehicle (weight) RATING (speed) (test range) Kinetic energy (ft-kips)</p> <table border="0"> <tr> <td colspan="2">Small passenger car (C) (2430lbs)</td> <td></td> </tr> <tr> <td>C40 (40mph)</td> <td>(38.0-46.9 mph)</td> <td>131</td> </tr> <tr> <td>C50 (50mph)</td> <td>(47.0-56.9 mph)</td> <td>205</td> </tr> <tr> <td>C60 (60mph)</td> <td>(57.0mph-above)</td> <td>295</td> </tr> <tr> <td colspan="2">Pickup truck (P)2300 (5070lbs)</td> <td></td> </tr> <tr> <td>PU40 (40 mph)</td> <td>(38.0-46.9 mph)</td> <td>273</td> </tr> <tr> <td>PU50 (50 mph)</td> <td>(47.0-56.9 mph)</td> <td>426</td> </tr> <tr> <td>PU60 (60 mph)</td> <td>(57.0-above mph)</td> <td>613</td> </tr> <tr> <td colspan="2">Medium-duty truck (M) (15 000lbs)</td> <td></td> </tr> <tr> <td>M3050 (30 mph)</td> <td>(28.0-37.9 mph)</td> <td>451</td> </tr> <tr> <td>M4065 (40 mph)</td> <td>(38.0-46.9 mph)</td> <td>802</td> </tr> <tr> <td>M5080 (50 mph)</td> <td>(47.0-above mph)</td> <td>1250</td> </tr> <tr> <td colspan="2">Heavy goods vehicle (H) (65 000lbs)</td> <td></td> </tr> <tr> <td>H30 (30 mph)</td> <td>(28.0-37.9 mph)</td> <td>1950</td> </tr> <tr> <td>H40 (40 mph)</td> <td>(38.0-46.9 mph)</td> <td>3470</td> </tr> <tr> <td>H50 (50 mph)</td> <td>(47.0-above mph)</td> <td>5430</td> </tr> </table> <p>"P" indicates the test vehicle's distance of penetration upon impact with barrier. P1 ≤ 1 m (3.3 ft) P2 1.01 to 7 m (3.31 to 23.0 ft) P3 7.01 to 30 m (23.1 to 98.4 ft) P4 30 m (98 ft) or greater</p> <p>Example: A M30 P1 crash barrier is designed to stop a Medium Duty Truck (M) traveling 30mph with a penetration distance of < 3.3ft</p>	Small passenger car (C) (2430lbs)			C40 (40mph)	(38.0-46.9 mph)	131	C50 (50mph)	(47.0-56.9 mph)	205	C60 (60mph)	(57.0mph-above)	295	Pickup truck (P) 2300 (5070lbs)			PU40 (40 mph)	(38.0-46.9 mph)	273	PU50 (50 mph)	(47.0-56.9 mph)	426	PU60 (60 mph)	(57.0-above mph)	613	Medium-duty truck (M) (15 000lbs)			M3050 (30 mph)	(28.0-37.9 mph)	451	M4065 (40 mph)	(38.0-46.9 mph)	802	M5080 (50 mph)	(47.0-above mph)	1250	Heavy goods vehicle (H) (65 000lbs)			H30 (30 mph)	(28.0-37.9 mph)	1950	H40 (40 mph)	(38.0-46.9 mph)	3470	H50 (50 mph)	(47.0-above mph)	5430
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