

CRASH RATING STANDARDS

Crash Fencing and Gate Standards

There are three test standards that are commonly used and stated for the UK: PAS 68; IWA 14-1; and the ASTM standard. The different ratings are detailed below:

PAS 68

The PAS 68 standard is probably the most detailed standard and identifies the type of attack, details of the vehicle, the force of the attack, speed and weight, the angle of attack and the penetration along with the dispersal of major debris from the attack.

As an example, the classification for a static Harrier 4 bollard is PAS 68:2010 7500(N3)/80/90:10.6/11.1

The method of testing - in this case V - vehicle test type (pendulum and simulated tests are also used in PAS 68), type of vehicle with the category in brackets (N3), the weight of the vehicle -7500kg, the impact speed - 80km/h, the angle of attack - 90 degrees, the penetration - 10.6m, and the distance that major debris landed - 11.1m.

Vehicle Type and Speed of Tests

VEHICLE	WEIGHT	SPEED
CAR	1500KG	16,32,48,64,80,96,112 K/MPH
4x4 PICK UP	2500KG	16,32,48,64,80,96,112 K/MPH
LIGHT VAN	3500KG	16,32,48,64,80,96 K/MPH
LORRY	7500KG	16,32,48,64,80 K/MPH
HEAVY LORRY	30,000KG	16,32,48,64,80 K/MPH

TYPE	WEIGHT
M1	1500kg
N1G	2500kg
N1	3500kg
N2	7500kg
N3	7500kg
N3	30000kg

It should be noted that if a product has passed a PAS standard it should have passed all of the levels below that rating. This is different to the US standard below and has some safeguards for the users.



American Society for Testing and Materials (ASTM)

DESIGNATION	WEIGHT OF VEHICLE	IMPACT SPEED
C40	1100KG	65KMPH (40MPH)
C50	1100KG	80KMPH (50MPH)
C60	1100KG	100KMPH (60MPH)
PU40	2300KG	65KMPH (40MPH)
PU50	2300KG	80KMPH (50MPH)
PU60	2300KG	100KMPH (60MPH)
M30	6800KG	50KMPH (30MPH)
M40	6800KG	65KMPH (40MPH)
M50	6800KG	80KMPH (50MPH)
H30	29,500KG	50KMPH (30MPH)
H40	29,500KG	65KMPH (40MPH)
H50	29,500KG	80KMPH (50MPH)

The prefix to the designation refers to the vehicle type C car, PU pickup, M medium duty truck, H heavy goods.

The penetration distance for the ASTM standard is used in addition to the above and is classified as follows:

DESIGNATION	PENETRATION
P1	<=1M
P2	1.01M TO 7M
P3	7.01M TO 30M
P4	30M OR GREATER

Classifying the penetration distance allows for the fence or barrier to be matched to meet the threat and the site conditions for example a government building may need to have a 1m penetration whereas an airport could have 30m at certain points.



IWA 14

Originally published in 2013, the IWA 14 standard draws on elements from the other two major impact test standards, PAS 68 and ASTM. IWA 14 was designed to be considered the 'world's impact test standard' with input from the Centre for Protection of National Infrastructure, British Standards Institute, the US Department of State, and others.

IWA stands for 'International Workshop Agreement' and is overseen by the International Organization for Standardization (ISO).

Similar to PAS 68, the IWA 14 rating starts with the type of test that was conducted, which, in this case, was a vehicle test. This means that an actual vehicle was crashed into the bollard to certify the product.

IWA 14-1 differs from PAS 68 in that vehicle tests are the only method used, while PAS 68 also allows for simulated and pendulum tests.

As an example, the classification for our road blocker is IWA 14-1:2013 V/7200[N2A]/80/90:06

The method of testing - V (vehicle), type of vehicle with the category in brackets, the weight of the vehicle -7200kg, the impact speed - 80km/h, the angle of attack - 90 degrees, the penetration - 0.6m.

The IWA 14 rating does not include debris dispersion, while PAS 68 does.

Vehicle Categories for IWA 14

TYPE	WEIGHT
M1	1500kg
N1G	2500kg
N1	3500kg
N2A	7200kg
N2B	7200kg
N3C	7200kg
N3D	12000kg
N3E	24000kg
N3F	30000kg

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