Comparison of Impact Velocities and Test Lines

Comparison of Impact Velocities

The impact velocity is the speed of the drop apparatus just before the helmet strikes the anvil. The numbers are in meters per second, translating to drop heights of about:

M/S	Meters	Speed KPH	Speed MPH
6.6	2.2	23.8	14.8
6.5	2.2	23.4	14.6
6.2	2.0	22.3	13.9
6.0	1.8	21.6	13.4
5.6	1.6	20.2	12.5
5.4	1.49	19.4	12.1
5.0	1.28	18.0	11.2
4.8	1.18	17.3	10.7
4.6	1.1	16.6	10.3
4.4	1.0	15.8	9.8
3.8	0.74	13.7	8.5

The hemispheric anvil is grapefruit-size, with a 48mm/1.9" radius. The curbstone anvil is a slightly rounded 90 degree bend, with the helmet dropped vertically onto the bend.

Standard	Flat Anvil	Hemi	Curbstone	Notes
CPSC Bicycle	6.2	4.8	4.8	
F429 Football	5.4	N/A	N/A	NOCSAE headform Multiple hits on MEP pad
F 1045 Ice Hockey	4.5	N/A	N/A	Multiple hits on MEP pad
F 1163 Equestrian	6.0		Hazzard: 5.0	
F 1447 Bicycle	6.2	4.8	4.8	
F 1492 Skate	4.6	4.6	4.6	2 hits on flat. Cylindrical and triangular anvils.
F 1849 Short Track	6.2		Blade anvil	Blade anvil: 3.8
F 1898 Infant-Toddler	6.2	4.8	4.8	
F 1952 Downhill MBR	6.2	5.6	5.6	
F 2032 BMX Bike	6.2	4.8	4.8	
F 2040 Snow	6.2	4.8		Edge: 4.5
F 2530 Bull Riding	6.0		Hazzard: 5.0	
F 3103 O.R. Motorcycle	6.2	5.4		(DOT-dwell time)
Snell B-90A Bicycle	6.6/6.2	5.0	4.8	
Snell B-95 Bicycle	6.6	5.4/5.0	5.4/5.0	
EN 1078 Bicycle/Skate	5.4		4.6	Euro rig, 250g

Comparison of Test Lines

The test line is drawn on a helmet to mark the lowest limit where a lab technician can impact the helmet. The distances are above the reference plane, a line drawn around the headform at the ear level. Lower numbers are better, indicating that the test line is closer to the reference plane and the helmet must have more coverage.

Comparison of Test Lines for J Headform (Medium)

All distances in millimeters above Reference Plane

Standard	Front	Middle	Rear	Notes
CPSC Bicycle	41	41	27	Rear same for all sizes
F 1045 Ice Hockey	50.5	25	0	
F 1163 Equestrian	37	12	-13	Same all sizes
F 1447 Bicycle	41	41	25	Rear 27 for size O
F 1492 Skate	50.5	50.5	-8	
F 1849 Short Track	50	25	0	
F 1898 Infant-Toddler	32	12.7	-16	E (small) Headform
F 1952 Downhill MBR	50.5	25	0	
F 2032 BMX Bike	41	25	0	
F 2040 Snow	50	25	0	Center same all sizes
F 2416 EPAMD	50.5	50.5	-8	
F 2530 Bull Riding	37	12.7	-13	Same all sizes
Snell B-90A Bicycle	41	41	28	
Snell B-95 Bicycle	40.5	20.5	20.5	
Dutch eBike	38.5	12.7	0	

Comparison of Test Lines for M Headform (Large)

All distances in millimeters above Reference Plane

Standard	Front	Middle	Rear	Notes
CPSC Bicycle	41	41	27	Rear same for all sizes
F 1163 Equestrian	37	12	-13	Same all sizes
F 1447 Bicycle	41	41	27	Rear 27 for size O
F 1492 Skate	52	52	-8	
F 1849 Short Track	**52**	26	0	
F 1898 Infant-Toddler	32	12.7	-16	E Headform
F 1952 Downhill Mtn Bk Rac.	**52**	27	0	
F 2032 BMX Bike	41	27	0	
F 2040 Snow	52	25	0	Center same all sizes
F 2416 EPAMD	52	52	-8	
F 2530 Bull Riding	37	12.7	-13	Same all sizes
Snell B-90A Bicycle	41	41	28	
Snell B-95 Bicycle	41.2	20,2	20.2	
Dutch eBike	38.5	12.7	0	

BHSI March 11, 2017