

# Shoes for the BioRID and Hybrid III

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# Background

- GTR no. 7 specifies the shoes for the dummy used for dynamic testing.
- Different requirements are given for the shoes of the Hybrid III and BioRID II in the draft GTR no. 7 text.
- Hybrid III is used in European regulation (UN-R94) and consumer testing (Euro NCAP) with instrumented legs.
- FMVSS does not require instrumented legs.
- BioRID is used mainly in consumer testing (p. ex. Euro NCAP, JNCAP, KNCAP, IIHS etc.)

# Specifications

## Hybrid III

- UN-R94
- “The foot shall be fitted with the shoe specified in Annex 5, paragraph 2.9.2.”
- §2.9.2. A size 11XW shoe, which meets the configuration size, sole and heel thickness specifications of the US military standard MIL S 13192, revision P and whose weight is  $0.57 \pm 0.1$  kg, shall be placed and fastened on each foot of the test dummies.
- Euro NCAP
- Each dummy shall be fitted with shoes equivalent to those specified in MIL-S13192 rev P. (size XW)

# Specifications

## BioRID IIg

- GTR no. 7

Shoes are men's dress oxford type, US size 11 (**European size 45**) extra wide that meet military specifications MIL-S-13192P. Each shoe weighs [**0.613 +/- 0.2 kg**] and **has an overall length of 320-325 mm.**

- Euro NCAP (Whiplash Testing Protocol 3.1, June 2011)

7.4.1. The dummies feet should be shod with size 11 (**45 European or 279 mm**) Oxford-style, hard-soled, work shoes (e.g. MIL-S-13192P).

- RCAR-IIWPG: (RCAR-IIWPG Seat/Head Restraint Evaluation Protocol (Version 3))

### 6.3 Clothing

..... The dummies feet should be shod with size 11 (**45 European or 27.9 cm**) Oxford-style, hard-soled work shoes (e.g., MIL-S-13192P).

## Example (BAST Dummies)



Hybrid III 50%



BioRID II

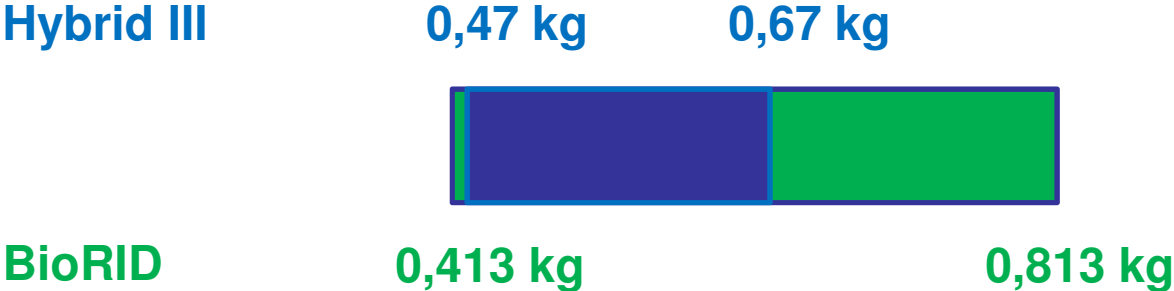


# Conclusion

## Weight range for dummy shoes:

Hybrid III UN-R94:  $0.57 \pm 0.1$  kg = 0.47 ... 0.67 kg

BioRID UN GTR No. 7:  $0.613 \pm 0.2$  kg = 0.413 ... 0.813 kg



Weight range of Hybrid III shoes specified in UN-R94 is sub range of GTR no. 7 BioRID UN weight range.

**Proposal: UN-R94 weight specification for BioRID shoes.**

# Lenght range for dummy shoes

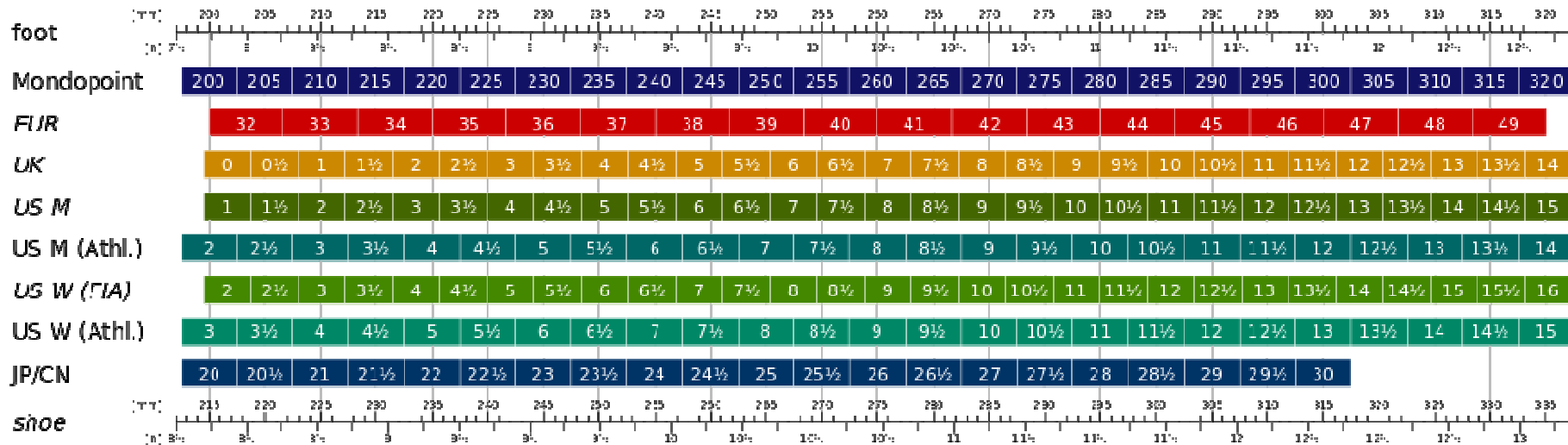


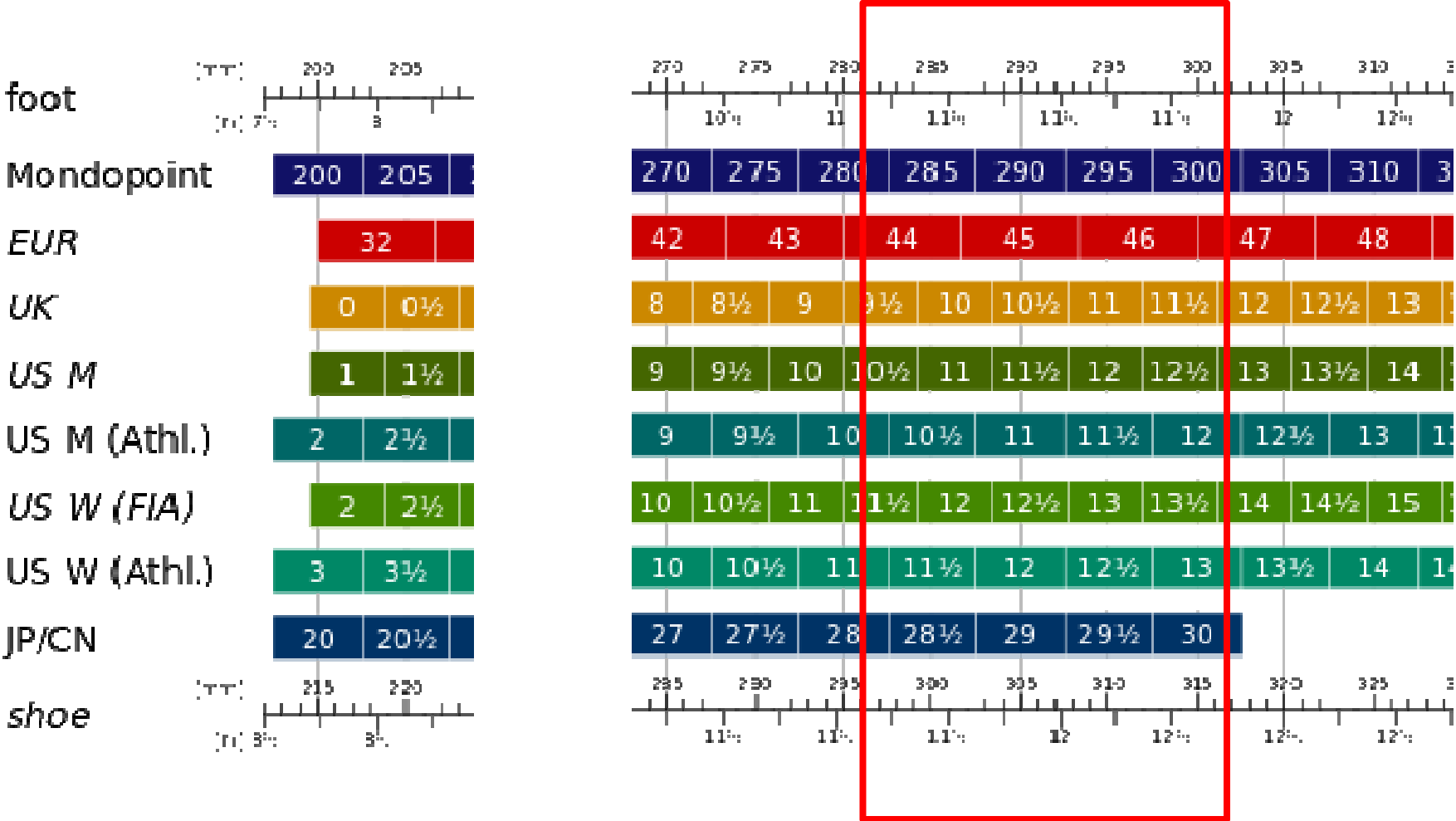
Table: Foot length and shoe size, source Wikipedia

There is a significant difference in the length range of the shoes for GTR no. 7 and Euro NCAP. Both requirements are based on the same shoe definition MIL-S-13192P (size 11 equal to 45 European size).

**Euro NCAP and RCAR IIWPG specifies 279 mm, GTR no. 7: 320-325 mm, max difference 46 mm!**

# Conclusion

Lenght range for dummy shoes:



Source Wikipedia



# Conclusion

## Lenght range for dummy shoes (example):

**Hybrid III UN-R94:** no lenght specification  
**BioRID UN GTR No. 7:** 320 – 325 mm  
**Euro NCAP / RCAR:** 267 mm

Dummy	Right shoe	Left shoe	Brand
	[mm]	[mm]	
HIII 50% A	325	325	Bates Vibram
HIII 50% B	326	327	Bates Vibram
HIII 50% C	328	326	Bates Vibram
HIII 50% D	325	324	Olullivans
BioRID	329	326	Bates Vibram
New shoe	325	319	Bates Vibram

Shoe lenght of 279 mm specified in Euro NCAP and RCAR-IIWPG seems to be an error/ typo as ist is much shorter than European size 45 or 11 US-size. Measurements from some shoes show that the shoes currently in use are borderline or above the proposed specifications.

**Proposal:** ? New limits?

Thank you for your attention!

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