PROPOSAL FOR THE 06 SERIES OF SUPPLEMENT OF REGULATION NO. 22
(PROTECTIVE HELMETS)

ACCESSORIES (INTERCOM SYSTEM)

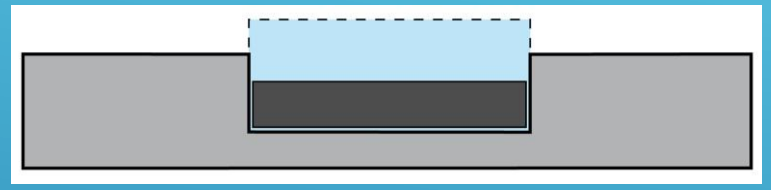
4. Speakers and microphone simulators for helmet testing

4.1 Speakers simulator

The speaker simulator will be made from rigid plastic and will have a dimension of 40+0-1 mm diameter and [**8**] mm thick

If the helmet is declared to host speakers up to 45 mm diameter, the speaker simulator to be used will have a dimensions of 45+0-1 mm diameter and [8]mm thick.

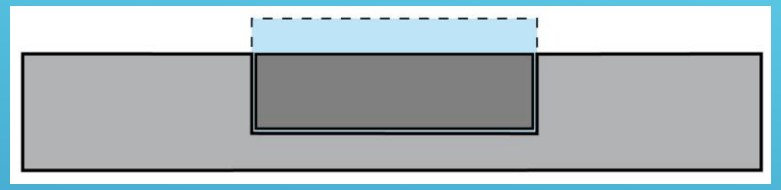
Comparison of behavior 5 mm vs 8 mm rigid speakers simulator when used in critical helmets



5 mm rigid simulator in 8 mm pocket

LINEAR Impact		WO Speakers		With 5 mm Sym.	
Point X	cond./anvil	HIC	g	HIC	g
A XL/60 Left	Amb. / Flat	2384	271	2393	274
A XL/60 Right	Amb. / Flat	2389	273	2379	270

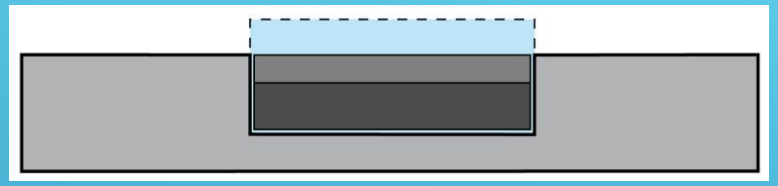
This example shows a typical case where a 5mm rigid simulator placed in an 8mm pocket, with 3mm thick EPS overhanging, seems to have no effect.



8 mm rigid simulator in 8 mm pocket

LINEAR Impact		WO Speakers		With 5 mm Sym.		With 8 mm Sym.	
Point X	cond./anvil	HIC	g	HIC	g	HIC	g
A XL/60 Left	Amb. / Flat	2384	271	2393	274	2605	291
A XL/60 Right	Amb. / Flat	2389	273	2379	270	2425	278

a 8mm rigid simulator placed in an 8mm pocket, without thick EPS overhanging, seems to have effect ……



5 mm / 8 mm rigid simulator vs 10 mm speakers in 8 mm pocket

LINEAR Impact		WO Speakers		With 5 mm Sym.		With 8 mm Sym.		With Speak. 10 mm	
Point X	cond./anvil	HIC	g	HIC	g	HIC	g	HIC	g
A XL/60 Left	Amb. / Flat	2384	271	2393	274	2605	291	2485	285
A XL/60 Right	Amb. / Flat	2389	273	2379	270	2425	278	2409	278

In this case it is possible to note that the values with the speakers are almost in line with the values obtained with 8 mm simulator and in any case out of the limits.

Conclusion

The 8 mm simulator results are close to those obtained with speakers up to 10 mm, the draft supplement allows speakers with a thickness of up to 12 mm.

LINEAR Impact		WO Speakers		With Speak. 9 mm		With Speak. 10 mm		With 8 mm Sym.	
Point X	cond./anvil	HIC	g	HIC	g	HIC	g	HIC	g
1 L/60 Left	Amb. / kerb	1045	147	1093	156	1119	155	1109	155
1 L/60 Right	Amb. / Flat	1862	228	1778	225	1922	231	1856	233
2 XL/60 Left	Amb. / kerb	1112	160			1134	160	1157	178
2 XL/60 Right	Amb. / Flat	1798	219			1882	221	1594	203
3 XL/60 Left	Amb. / Flat					2350	258		
3 XL/60 Right	Amb. / Flat							2405	260

The use of a 5 mm simulator instead of 8 mm , with a thickness less than the depth of the pocket, could lead to the following risk:

The helmet that would not pass the tests with the speakers installed, (no SA approvable), could get the approval as a UA in accordance with the Regulations N 22.

LINEAR Impact		WO Speakers		With 5 mm Sym.		With 8 mm Sym.		With Speak. 10 mm	
Point X	cond./anvil	HIC	g	HIC	g	HIC	g	HIC	g
A XL/60 Left	Amb. / Flat	2384	271	2393	274	2605	291	2485	285
A XL/60 Right	Amb. / Flat	2389	273	2379	270	2425	278	2409	278
B XL/60 Left	Amb. / Flat	2387	275	2394	273	2586	285	2468	278
B XL/60 Right	Amb. / Flat	2358	271	2387	272	2663	291	2503	283
C XL/60 Left	Amb. / Flat	2258	269	2309	267	2807	291	2753	289
C XL/60 Right	Amb. / Flat	2301	273	2315	270	2864	301	2663	294

Therefore it could be possible to combine an accessory (intercom) approved in accordance with the Regulations with this kind of helmet UA if approved with 5 mm simulator … **BUT the product obtained would be NOT compliant with Regulation 22.**