

Working Document ECE/TRANS/WP.29/GRSP/2021/24  
(70th GRSP, 06 – 10 December 2021, agenda item 8)  
Submitted by the Chair of Ad-hoc Group of Interested  
Experts on Accessories for Protective Helmets under UN  
Regulation No. 22 (APH-UNREG22)

# PROPOSAL OF SUPPLEMENT TO THE 06 SERIES OF AMENDMENT OF REGULATION NO. 22 (PROTECTIVE HELMETS)

## ACCESSORIES (INTERCOM SYSTEM)

# Status Report \*

Meeting AHG of Interested Experts on Accessories for Protective Helmets under UN Regulation No. 22 (APH-UNREG22):

11<sup>th</sup> June 2021 - First AHG meeting after the GRSP session in May 2021.

28<sup>th</sup> June 2021

22<sup>nd</sup> July 2021

2<sup>nd</sup> September 2021 - At this meeting, the (APH-UNREG22) should consider a consolidated proposal for Supplement 2 to the 06 series of amendments to UN Regulation No. 22 and transmit it to GRSP as an official proposal for its consideration at its December 2021 session.

21<sup>st</sup> October 2021

18<sup>th</sup> November 2021

\* Meetings data, reports and all documents were available in the AHG web site:

[Ad-hoc Group of Interested Experts on Accessories for Protective Helmets under UN Regulation No. 22 \(APH-UNREG22\)](#)

# SCOPE: Communication System - Technical performance consequences related to Regulation ECE 22

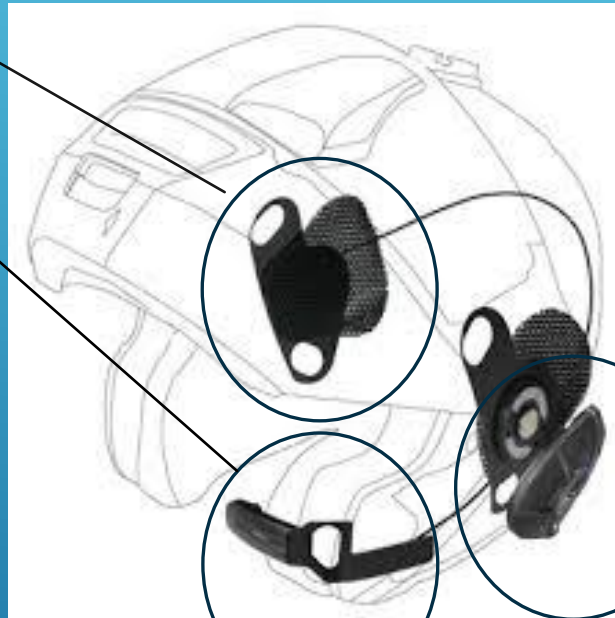
7.3. Linear Impact  
Energy absorption tests X point

7.3. Linear Impact  
Energy absorption tests S point

General

Helmet mass and distribution / inertia for rotational

7.13. Oblique impact test method of measuring rotational acceleration



7.4 Test for projections and surface friction

Other aspect

Installation, partial disassembly of helmet if not predisposed.  
Installation made by the final user

All the prescriptions in the paragraphs 7.3, 7.4 and 7.13 are verified in type approval process, the modification have affect on the performance of the helmet

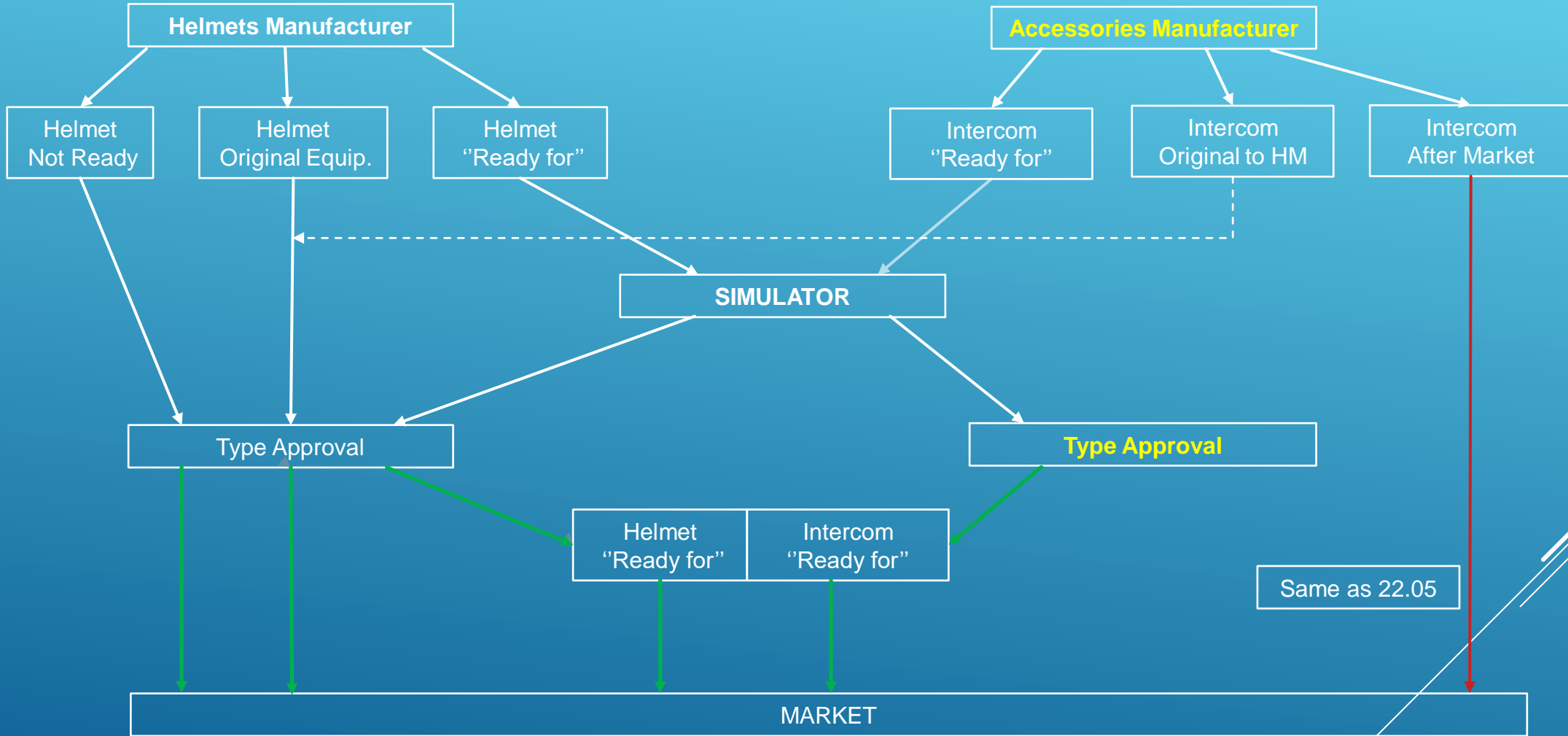
## *PHASE 1*

***ON A INTEGRATED SOLUTION ALL THIS ASPECT ARE VERIFIED AND CHECKED DURING A TYPE APPROVAL PROCESS***

On helmets with and without accessories, independently of the type of the accessories.



PHASE 2 "READY FOR" The concept .... (open to accessories approval) (\*)



## Base considerations for phase 2:

The helmet is the main safety and head protection element of the motorcycle driver and accessories can contribute but the helmet shall perform its main function with and without accessories and for this reason the legislation is constantly evolving.

As declared by the accessories Manufacturers (Doc GRSP-67-09), the market of “unverified” accessories has generated "Annual revenue turnover estimated at 150 millions of Euros" without any safety check and homologation costs in accordance with the Regulations 22 since there was not any specific applicable requirement for those systems.

In the same document They complain that "Our industry will be at the mercy of helmet manufacturers' willingness to incorporate (or not) communication products depending purely on **their commercial interests**", after the wording released by the R-22.06.

To tackle this problem, a new type approval and test procedure for accessory – so called PHASE 2 - in addition to the current procedure is needed.

In PHASE 1 the accessories are within the homologation of the helmet, the helmets are verified in terms of safety with and without accessories, and above all that the Helmet Manufacturer, IN THIS CASE, is also liable in civil and criminal matters for any non-compliance of the helmet itself.

In document GRSP-67-09, the proposal of the Accessory Manufacturer Consortium is described:

"Redefine the regulation text to overcome the trade barrier and to allow a safe way for the motorcycle rider to communicate while riding

- Particular tests for accessories
- Particular tests for "helmets ready for accessories"
- Set compatibility conditions to make sure the rider safety is ensured "

In document GRSP 68-15 the Accessory Manufacturer Consortium proposes:

- “
- Work with the IWG on defining an agreed test procedure for approving communication accessories.
  - Approval of the communication accessories independently and separately from the helmet test procedure. ”

The above inputs are take in count by the work done in the ad-hoc group of interested experts established by GRSP during its 69<sup>th</sup> session.

ADVANTAGES from phase 2 approach:

For HELMETS Manufacturer:

The possibility of approving and placing on the market both version of helmets, with dedicated systems and designed to host “UNIVERSAL” intercom.

Maintaining control on particular products which, due to size or shape, may not meet the requirements if equipped with devices, and maintaining the possibility to approve them without declaring any compatibility.

Use only the SIMULATOR to check compatibility with multiple intercom devices, reduction of tests and type approval samples

For ACCESSORIES (as. Intercom) Manufacturer:

The possibility of separated homologation and sales “UNIVERSAL” (Ready for ..) systems that can be installed on all helmets designed to host “UNIVERSAL” intercoms.

The use of the ONLY proof of compliance with SIMULATOR for type approval will grant the compatibility of the intercom system with multiple helmet models, test reduction and type approval samples. **One time cost approval (\*)**

The possibility to continue to sell unapproved devices in a similar way to what has been done up to now.

**(\*) As considered in Informal document GRSP 67-09.**



For USER:

The opportunity to choose if buying:

- A an helmet with original intercom kit
- B an helmet approved as “ready for” and then to combine any intercom device which has been approved as “UNIVERSAL” and with the evidence that both product are tested and safe.
- C an helmet and then to combine any intercom device not homologated as in the habit of ECE22/05

Note:

**ONLY A and B solutions are checked to “ .... not cause injury and that, when it is fitted to or incorporated in the protective helmet, the helmet still complies with the requirements of this Regulation” (according § 6.3).  
Only A and B shall grant the conformity of the helmet to the type approved.**

**With C solution, any other modification which has not been verified in order to grant the absence of adverse SHALL NOT complies with the requirements of this Regulation.**

The document ECE/TRANS/WP.29/GRSP/2021/24 was developed on the basis of the document ECE/TRANS/WP.29/GRSP/69 and the document submitted by the Consortium of Accessory Manufacturers to Ad Hoc group. To complete the document, various checks and tests were carried out and information had been collected.

The paragraphs and values that remain suspended in the overall text are taken into consideration to prepare the informal document GRSP-70-XX.

In order to identify the procedure and the most significant values to be considered in the document:

**Severe tests show that NOT all the helmets can host in safe way, for dimensional and constructive reasons, a communication system. The same system installed on different helmets can produce different results, in some cases also negative.**

To better assess the correctness of these values, it has been checked the spaces and solutions currently available on the main helmets present on the market and ready for 22.06 approval including the possibility to install communication system.

Open point:

Testing procedure to be drafted. Limits to be set.

### 1.3. Mechanical characterization of the speakers

Mechanical characterization: compression tests have been carried out on the available speakers, with the dynamometer, to check the force vs displacement curves and see to what minimum thickness they are reduced in order to consider them rigid. On base of this data also define in detail the thickness of the speakers simulator. The thickness currently in brackets is parameterized to the available heights of the pockets, so be able to consider the possibility that even the EPS works, in any case, a little before having the simulator directly in contact with the headform.

Two solution are now considered in the proposal

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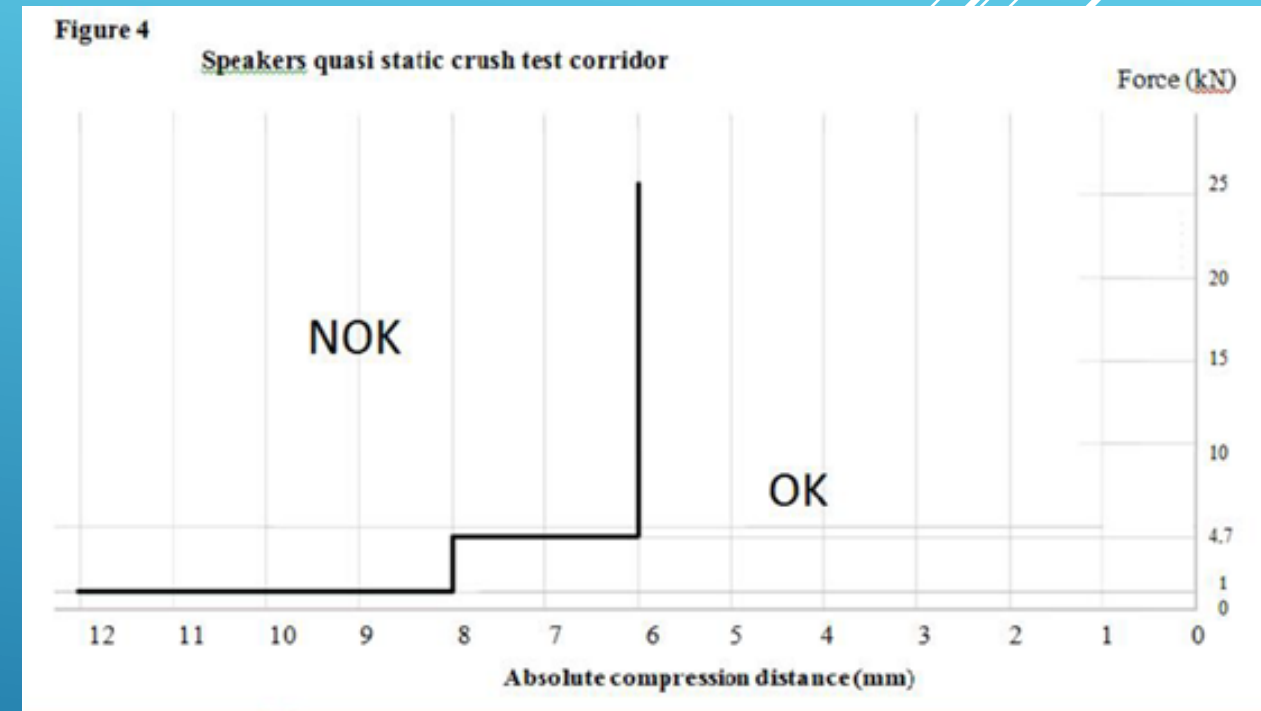
### 1.3.1 Solution A

The speaker, with a height of more than [5] mm, shall be placed between two parallel plates by means of which a known load can be applied, the surface of the plates shall be large enough to contain a circle of at least 65 mm in diameter.

Bring the upper plate of the universal traction machine into contact with the speaker until the force reaches a value of 0.1 kN.

Start the crush test at a constant speed of 20 mm/min. Record force vs distance at a minimum sampling rate of 10 Hz. **The test ends when the force reaches 10 kN.**

The obtained chart for the speakers shall fall below the line defining the upper corridor limit.

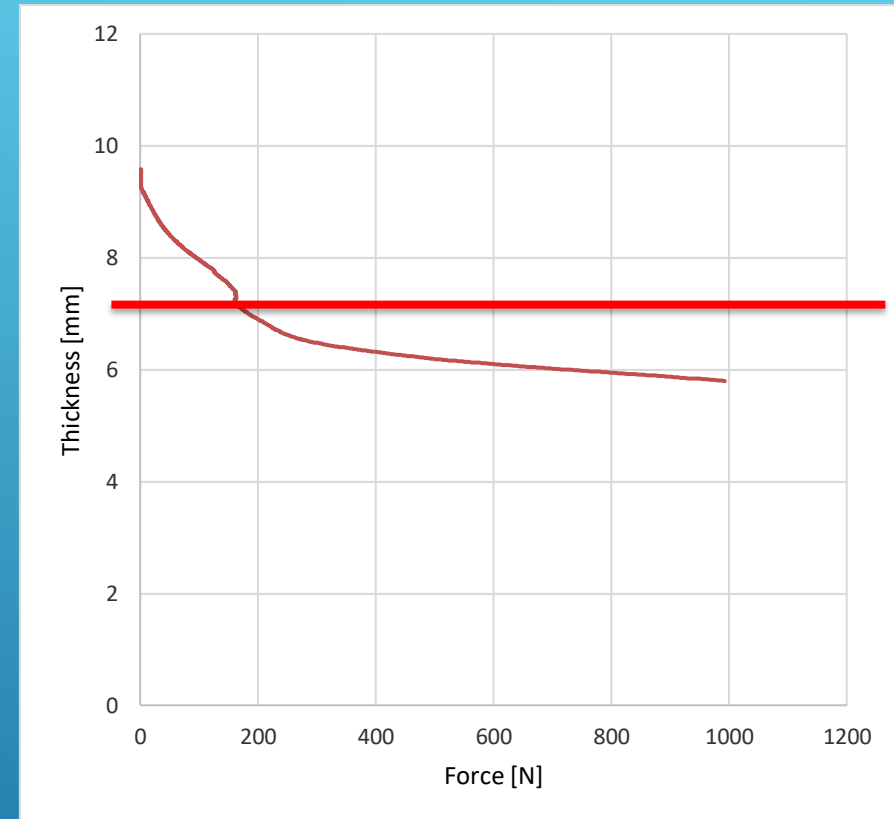


### 1.3.2. Solution B

The speaker, with a height more than 8 mm, shall be placed between two parallel plates by means of which a known load can be applied, the surface of the plates shall be large enough to contain a circle of at least 65 mm in diameter. An initial load of 10 N shall be applied, the load shall then be increased at a minimum plates speed of 5 mm/min. **until the application of a load of 1,000 N (-0+10N).**

The thickness of the speaker subjected to a load of 1,000N (-0+10N) shall be less than 8 mm.

The B solution has received the preliminary consensus from the experts of the Technical Services of D,NL,B,I, and S attending to a specific meeting.



The definition criteria of the speaker simulator to be used in helmet tests depend on the adoption of solution A or B, below what is currently reported in the proposed text:

#### 1.4. Speakers and microphone simulators for helmet testing

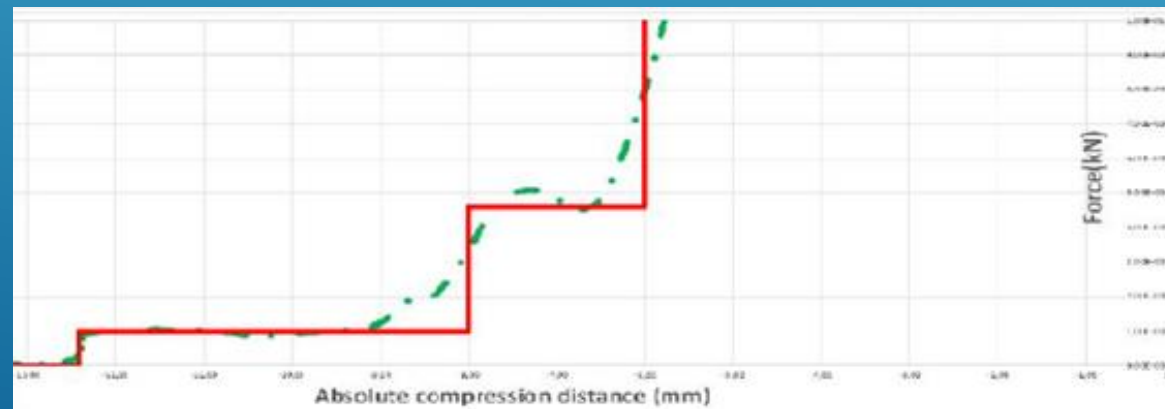
##### 1.4.1. Speakers simulator (Solution A)

The speaker simulator will be made from a combination of layer as defined in annex XX

- . Layer 1: Aluminium rigid surface . e=1 mm
- . Layer 2: Aluminium Honeycomb 120 psi (0,83 MPa). e=6 mm [With 40 mm diameter, F=1000 N]
- . Layer 3: Aluminium rigid surface . e=1 mm
- . Layer 4: Aluminium Honeycomb 535 psi (3,69 MPa). e=6 mm [With 40 mm diameter, F=4625 N]
- . Layer 5: Aluminium rigid surface . e=1 mm

Initial total thickness=12,4 mm

Deformable speaker simulator  
actual behavior (in green) vs  
upper limit for actual speaker  
characterization chart (in red)



#### 1.4.1. Speakers simulator (Solution B)

The speaker simulator will be made from rigid plastic [PA 6 Nylon 6] and will have a dimension of  $40+0-1$  mm diameter by 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.

Thanks for your attention .

