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Item 10(a) of the provisional agenda

REGULATION No. 16
(Safety-belts)

Proposal for draft amendments

Proposal submitted by the European Association of Automotive Suppliers (CLEPA) ^{*/}

The text reproduced below was prepared by the expert from CLEPA in order to align the current text of the Regulation with alternative standards ISO 139 and ISO 105-B02. It is a revision based on ECE/TRANS/WP.29/GRSP/2006/15 distributed during the fortieth session of the Working Party on Passive Safety (GRSP). The modifications to the existing text of the Regulation are marked in **bold** characters.

^{*/} In accordance with the programme of work of the Inland Transport Committee for 2006-2010 (ECE/TRANS/166/Add.1, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance performance of vehicles with respect to passive safety. The present document is submitted in conformity with that mandate.

A. PROPOSAL

Paragraph 6.3.1.2., insert the reference to a new footnote 4/ and footnote 4/ and amend to read:

"6.3.1.2. The width of the strap under load of 980 daN + **100 daN** shall be not less than 46 mm. This dimension shall be measured **according to the** test prescribed in Paragraph 7.4.3. **with stopping the machine at the above mentioned load. 4/**

4/ The test has not to be performed for woven straps in twill construction with high-tenacity polyester yarns as those webbings are getting wider under load. In that case the width without load shall be $\geq 46\text{mm}$."

Paragraph 7.4.1.1., amend to read:

"7.4.1.1. Temperature-conditioning and Hygrometrics

The strap shall be **conditioned in accordance with ISO 139 (2005), using the alternative standard atmosphere**. If the test is not carried out immediately after conditioning, the specimen shall be placed in a hermetically-closed receptacle until the test begins. The breaking load shall be determined within 5 minutes after removal of the strap from the conditioning atmosphere or from the receptacle."

Paragraph 7.4.1.2.1., amend to read:

"7.4.1.2.1. The provisions of Recommendation ISO 105-B02 (**2002**) shall apply. The strap shall be exposed to light for the time necessary to produce a contrast equal to Grade 4 on the grey scale on Standard Blue Dye No. 7."

Paragraph 7.4.1.3., insert the reference to a new footnote 5/ and footnote 5/ to read:

"7.4.1.3. Cold-conditioning 5/

.....

5/ This test may not be required when the applicant for approval demonstrates, to the satisfaction of the Technical Service, that the webbing material is inherently resistant to cold conditioning."

Paragraph 7.4.1.4., insert the reference to a new footnote 6/ and footnote 6/ to read:

"7.4.1.4. Heat-conditioning 6/

.....

6/ This test may not be required when the applicant for approval demonstrates, to the satisfaction of the Technical Service, that the webbing material is inherently resistant to cold conditioning."

Paragraph 7.4.1.5., insert the reference to a new footnote 7/ and footnote 7/ to read:

"7.4.1.5. Exposure to water 7/

.....

7/ This test may not be required when the applicant for approval demonstrates, to the satisfaction of the Technical Service, that the webbing material is inherently resistant to cold conditioning."

Paragraph 7.4.2.3., should be deleted.

Paragraph 7.4.2.4., renumber as 7.4.2.3.

Paragraph 7.4.2.5., renumber as 7.4.2.4.

Insert new paragraphs 7.4.3. to 7.4.3.3., to read:

"7.4.3. Width under load

7.4.3.1. The test shall be carried out each time on two new samples of strap, of sufficient length conditioned in conformity with the provisions of paragraph 7.4.1.

7.4.3.2. Each strap shall be gripped between the clamps of a tensile-testing machine. The clamps shall be so designed as to avoid breaking of the strap at or near them. The speed of traverse shall be about 100 mm/min. The free length of the specimen between the clamps of the machine at the start of the test shall be 200 mm ± 40 mm.

7.4.3.3. When the load reaches 980 daN + 100 daN, the machine shall be stopped and the measurement shall be completed within 5 seconds. The test has do be performed separately from the tensile test."

Paragraph 7.6.2.2., the reference to footnote 4/ and footnote 4/, renumber as footnote 8/.

B. JUSTIFICATION

Ad paragraph 6.3.1.2.:

Exact measurement of width under load is not feasible without tolerance of reference force (980 daN). In addition the width-under-load-measurement for safety reasons should not be performed during a breaking strength test but in a separate test rather which is respected by reference to a new paragraph 7.4.3. (see below).

Furthermore, and more importantly, certain woven textile are getting slightly wider under load due to binding structure and therefore this requirement is of no use for these kind of textiles and should not be applied to on them, which is reflected in the footnote added to this paragraph.

Ad paragraph 7.4.1.1.:

Currently, the Regulation requires 24 hours duration for conditioning of the samples. This requirement does not take into consideration the real behaviour of materials with respect to how long it takes to reach a maximum degree of saturation with water. For example for Polyethersulphone Fiber (PES), the nature of which is not to absorb a significant amount of water, conditioning is completed when the sample fabric is in balance with surrounding atmosphere. Balance is reached if subsequent weight measurements at 2 hours interval do not show difference in weight of more than 0.25 per cent. ISO 139 (2005) takes advantage of this when for the conditioning mass change of the specimen is constantly checked. Due to this conditioning in accordance with ISO 139 (2005), using the alternative standard atmosphere is current practice of most Technical Services. Hence, the amendment proposed will align today's practice with the Regulation.

The table below gives examples for duration of conditioning to reach the balance mentioned above for some webbing types.

Webbing type Sample length ~20 cm	Weight new state [g]	Weight after conditioning at 23 °C / 50 per cent [g]	Duration of conditioning [h]
piece dyed	10.02	10.02	2
spun dyed	10.04	10.04	2
piece dyed	10.03	10.03	1
spun dyed	10.56	10.56	1

Ad paragraph 7.4.1.2.1.:

The revision of ISO 105-B02 (1978) referred to in the current text of the Regulation is out of date and not even available for purchase anymore. The latest revision is ISO 105-B02 (2002)

Ad paragraphs 7.4.1.3., 7.4.1.4. and 7.4.1.5.:

Current webbing material is 100 per cent PES material.

Conditioning of PES webbing as described in paragraphs 7.4.1.3. to 7.4.1.5. has no influence on tensile strength, see exemplary test results attached.

It is moreover proven by long-time conformity of production tests of PES webbing.

Ad paragraphs 7.4.2.3., 7.4.2.4. and 7.4.2.5.:

For safety and practical reasons the measurement of the width under load shall not be performed during the tensile test without stopping the tensile testing machine at a specific load level. As mentioned above "ad paragraph 6.3.1.2.", width-under-load-measurement is suggested in a new paragraph 7.4.3.. Subsequently paragraph 7.4.2.3. should be deleted and paragraphs 7.4.2.4 and 7.4.2.5. should be renumbered accordingly.

Ad paragraph 7.4.3.:

As mentioned above a separate test is suggested for the width-under-load-measurement which is reflected in the new paragraph 7.4.3. and subsequent sub-paragraphs.

Influence of webbing conditioning according to UNECE Regulation No. 16 on webbing strength				
Webbing type	Colour / colouring method	Strength after heat-conditioning acc. to para. 7.4.1.4.	Strength after cold-conditioning acc. to para. 7.4.1.3.	Strength after exposure to water acc. to para. 7.4.1.5.
		percent of average new state	percent of average new state	percent of average new state
94207	Black / spun dyed	98.6 / 99.7 / 99.7	100 / 100 / 100	100 / 100 / 100
83041	Black / spun dyed	98.7 / 99 / 99.4	100 / 100 / 100	99.4 / 99.7 / 100
83054	Black / spun dyed	100 / 99.6 / 100	100 / 100 / 99.3	100 / 100 / 100
78057	Black / spun dyed	100 / 100 / 100	100 / 100 / 100	100 / 100 / 100
97017	Alpacagrey / piece dyed	100 / 100 / 100	100 / 100 / 100	100 / 100 / 100
87004	Kiesel / piece dyed	100 / 100 / 100	100 / 100 / 100	100 / 100 / 100
83071	Black / spun dyed	99 / 99 / 99.3	100 / 100 / 100	100 / 100 / 100
95050	Beige 3 / spun dyed	99.3 / 99.6 / 100	99.6 / 100 / 100	100 / 100 / 100
94207	Black / spun dyed	98.9 / 99.6 / 99.6	100 / 100 / 100	100 / 100 / 100
83041	Black / spun dyed	99.4 / 99.7 / 100	100 / 100 / 100	100 / 100 / 100
