GRE Task Force on Substitutes / Retrofits (TF S/R)

9th meeting
17 January 2020, 10:30 – 16:00 CET

By telephone / Skype

Conference ID: 994397923

DRAFT REPORT

		Documents
1	Welcome and opening remarks	
	The chairman opened the meeting and welcomed the participants.	
2	Organisational issues	
	A screen-sharing was set-up using Skype.	
2.1	Introduction of participants	
	The participants were noted by the secretary, see Annex 1. Apologies were received from: D. Rovers, NL W. van Laarhoven, NL	
3	Adoption of the agenda	TFSR-09-01
	The agenda, TFSR-09-01, was approved.	
4	Approval of the report of the previous meeting	TFSR-08-04
	The report, TFSR-08-04, was approved.	
5	LED Substitutes for road illumination application	
5.0	Review of the discussion at GRE82	GRE-82-17rev2 Report GRE-82: item 23, 24, 25
	The outcome of the GRE82-discussions was noted.	
5.1	Demonstration of halogen headlamps equipped with LED prototypes	TFSR-05-10
	noted	
5.2	R.E.5 H11/LED	(TFSR-05-06, H7/LED) TFSR-06-02 TFSR-07-02 GRE/2019/21
5.2.1	Sheet H11/LED/2 Footnote 3 – Temperature testing	GRE/2019/21 GRE-82-45 TFSR-09-02

		TFSR-09-03rev1
	Mr. Schlager introduced document TFSR-09-03, with proposed changes to the H11/LED sheet (GRE/2019/21) based on the outcome of the TFSR-08 meeting. There followed a discussion about how to handle additional temperature levels in future and how the consumer could identify different temperature categories. Document TFSR-09-03 was edited on the screen together, amending the sheet structure and category-naming to be prepared for a future version with e.g. 80°C test temperature. As a consequence, the naming of the category was changed from "H11/LED" to "H11/LED/6". The amended document was distributed after the meeting with document number TFSR-09-03rev1. It was agreed to complete the editing of the proposal accordingly. The secretary was asked to distribute to the TFSR the edited proposal for final comments and then submit a formal document to GRE83.	
	Mr. Schlager then introduced document TFSR-09-02, showing a possible future interlock solution to realise different "thermal grades". The systematic was explained and it was confirmed that this visualisation did solve the targeted interlock.	
5.3	Mechanical keying, Interlock IEC 60061 H11/LED	(TFSR-05-05 H7/LED) TFSR-06-03 GRE-82-12
	noted	
5.4	Equivalence Criteria	TFSR-05-04 TFSR-06-04 TFSR-06-07 (rev of TFSR-05-04) TFSR-07-04 GRE-82-03
	noted	
5.5	Changes to Device Regulations – R149 (RID)	TFSR-05-03 TFSR-07-03 TFSR-07-03rev1 GRE/2019/19
	noted	
6	Introducing LED technology into R37	
6.0	Review the discussion at GRE-82	GRE-82-17rev2 GRE82 report: item 21, 22
	The outcome of the GRE82-discussions was noted.	
6.1	Changes to R37 – administrative items	TFSR-06-05rev1

		TFSR-08-02
	As agreed in the TFSR-08 meeting, there was no detailed discussion on this item in this meeting. The chairman asked for a detailed proposal of the R37 amendment to be prepared for the TFSR-10 meeting and Mr. De Visser offered to take this action item.	
6.2	Changes to R37 – technical items	**TFSR-08-03rev2**
	The secretary summarised the outcome of the discussion during TFSR-08 meeting, based on the slides in document TFSR-08-03rev1 (slides 1 to 12). The outcome, as shown in these slides, was briefly reviewed and confirmed. Mr. Schlager then introduced the slides 14ff, which had not been discussed during the TFSR-08. The outcome of the discussion is summarized in the revised document TFSR-08-03rev2, which was partly edited on the shared screen during the meeting. The main points of the discussion are captured below: Electrical #4 EMC: confirmed Electrical #5 Electrical Robustness: confirmed after some discussion; confirmed that the electrical robustness is considered a performance aspect, not a safety aspect Electrical #5A: polarity: This aspect was raised additionally, and after some discussion it was proposed to insert a test requirement in R37, where both polarities would be tested and - Either the LEDr works in both directions - Or only in the correct direction is giving light, and not destroyed when inserted reversely. Accordingly a new slide “Electrical 5A polarity” was inserted into the document TFSR-08-03rev2”. There was no final conclusion on this discussion, and Mr. Böttcher stated that consumers would expect the LEDr to work in both polarity-directions. Mechanical #1 Vibration / Mass: confirmed Mechanical #2 Maximum geometry: confirmed with a clarification of the text explanation in TFSR-08-03rev2. Thermal #1 1min/30min ratio: confirmed with a clarification of the text explanation in TFSR-08-03rev2. Thermal #2 High ambient temperature Mr. Schlager explained that an elevated temperature is not a simple “fixed” value, but that it was a topic of “temperature profile” with related statistical occurrence.	

	Consequently, a solution with more-than-one test temperature level could be targeted, with related flux requirements at each temperature level. Mr. Böttcher stated that for signal lights a 70% flux limit is sufficient based on human perception tests. Mr. De Visser replied that also for headlamps a 70% flux limit should be acceptable because this is generally known in lighting and results from the non-linear response of the human eye. Mr. Bailey asked about the deviation for filament lamps. Mr. Schlager replied that filament lamps loose about 20 to 30% of light (luminous flux maintenance) before catastrophic failure. Based on a question from Mr. Goldbach, it was confirmed that filament light sources usually do not have a temperature dependency of the luminous flux, but LED components have such a dependency, due to the underlying physics. There followed a general discussion on “real world” flux levels, where also voltage variations and ageing would be taken into account. Mr. Böttcher asked about typical temperature specification for LED CHMSL (= Center high mounted stop lamp). Mr. Manz replied that in the UNECE lighting regulations, only the 1min / 30min ratio at room temperature was tested. Mr. Manz and Mr. Böttcher asked Mr. Goldbach for a typical OEM specification with regards to LED CHMSL and other LED functions. Mr. Goldbach offered to check about possible input for the next meeting. Mr. Manz noted that for the whole vehicle there were test conditions specified in an ISO standard, where maybe a range from -40°C to 80°C or 100°C was used. Mr. Böttcher added that he had received input from an OEM development contact that 80°C in the LED headlamp is a value being used in today designs. Mr. Schlager came back to his initial topic of using a “statistical approach”, rather than a single value. Mr. Böttcher replied and highlighted that the temperature requirements for LED headlamps and LED luminaires	

	which are being specified today by OEMs should provide a good basis for this discussion. Mr. Manz agreed to Mr. Boettcher and added that consumer information should be given for exceptional temperature cases. Mr. Schlager pointed out that there were different influencing factors on the "real-world" temperatures ➔ Vehicle moving or stationary ➔ Vehicle ambient air temperature and sun-load ➔ Close to the engine or far away ➔ Light-source self-heating ➔ Heated by other light sources or not The chairman thanked the participants for the discussion and exchange on this agenda item and it was agreed to continue in the next meeting. All experts were asked to provide further input in order to come to a conclusion in the next meeting. Thermal #3 de-fogging / de-icing Mr. Schlager introduced the slide. Mr. Manz explained that in USA the word "de-fogging" is used to describe the removal or avoidance of humidity accumulation inside the device. Mr. De Visser explained that a device in a climate cycle, where the light source power is lower, will face a smaller "pumping-effect" and less of humid air "sucked in". Mr. Manz confirmed that "temperature pumping" was a cause for humidity inside the device and that a lower pumping activity will result in less humidity ingress. He informed that in USA, in FMVSS regulation, there was a de-fogging test required. Mr. Manz added that there was also an SAE standard for de-fogging. Mr. Terburg suggested that "de-icing" needed to be treated separately. It was agreed to treat de-fogging and de-icing separately. As a consequence the slide Thermal #3 was split into Thermal #3A de-fogging and Thermal #3B de-icing in document TFSR-08-03rev2. Thermal #3B de-icing It was noted that there was no de-icing test defined in any of the known regulatory or standardization organizations.	

	It was questioned whether “de-icing” was referring to melting of “frozen fog” in the morning or to melting / removal of snow / ice during driving on snowy / icy roads or during snow fall. There was no conclusion on the definition, and no conclusion on any test conditions, such as test temperature, amount of ice, time-to-remove ice, criteria for “ice-free”. Mr. Manz suggested to remove de-icing from the list of LEDr specific requirements Thermal #4: cap temperature: agreed after a short discussion	
6.3	Changes to R128 (if any)	
	No discussion	
6.4	Changes to RE5, first category	
	No discussion	
7	Next meeting(s)	
	A face-to-face meeting was agreed for March 2020. Note by the secretary: after the meeting confirmed for 12 March in Aachen	
8	Closure	
	The chairman thanked the participants and closed the meeting.	

K. Manz, P. Plathner

Annex 1: Participants by telephone

Name	**CP / NGO**
P. Plathner (secretary)	IEC
K. Manz (chairman)	DE
A.De Visser	IEC
C. Versluijs	IEC
D. Kooss	GTB
B. Terburg	GTB / SAE
W. Schlager	IEC
T. Torma	GTB
B. Böttcher	FIA
Th. Goldbach	OICA
Ph. Bailey	UK
L. Schwenkschuster	GTB
E. Blusseau	CLEPA