

# Regulation 95 Front Plate Elongation Requirement Review

Presented to GRSP 6 December 2021  
By Plascore, Inc.



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# Background of Regulation 95 Amendment

Current Regulation 95, Para 2.2 Front plate states:

- Front Plates shall have a thickness of 0.5 +/- 0.06 mm;
- “...aluminum of series AlMg<sub>2</sub> to AlMg<sub>3</sub> with Elongation ≥ 12%”
- UTS ≥ 175 N/mm<sup>2</sup>

The Regulation does not explicitly state:

- temper;
- thickness at which elongation at break is measured.

# Purpose of GRSP Request

In order to meet Regulation 95 faceplate elongation at break requirement, an uncommon temper, H111, for the alloy AlMg3 is required.

At quantities less than coil quantity, AlMg3, at H111, is difficult to procure in North America.

This request is to approve alloy 5052 with H32 temper, as an alternate to AlMg3 H111 with the objective of improving supply chain issues and cost.

# Comparing AlMg<sub>3</sub> H111 to 5052-H32

Temper	Thickness (mm)	Yield Strength (Mpa)	Tensile Strength (Mpa)	Elongation (%)
AlMg3 H111 <sup>A</sup>	0.5	80	190-240	12
AlMg2.5 5052-H32 <sup>AB</sup>	0.5	193	214-262	5
AlMg3 H111 <sup>A</sup>	3.0-12.0	80	190-240	18
AlMg2.5 5052-H32 <sup>AB</sup>	12.7-50.8	193	214-262	12

<sup>A</sup> From Thyssenkrupp Material Services

<sup>B</sup> From AMS-QQ-A-250/8C

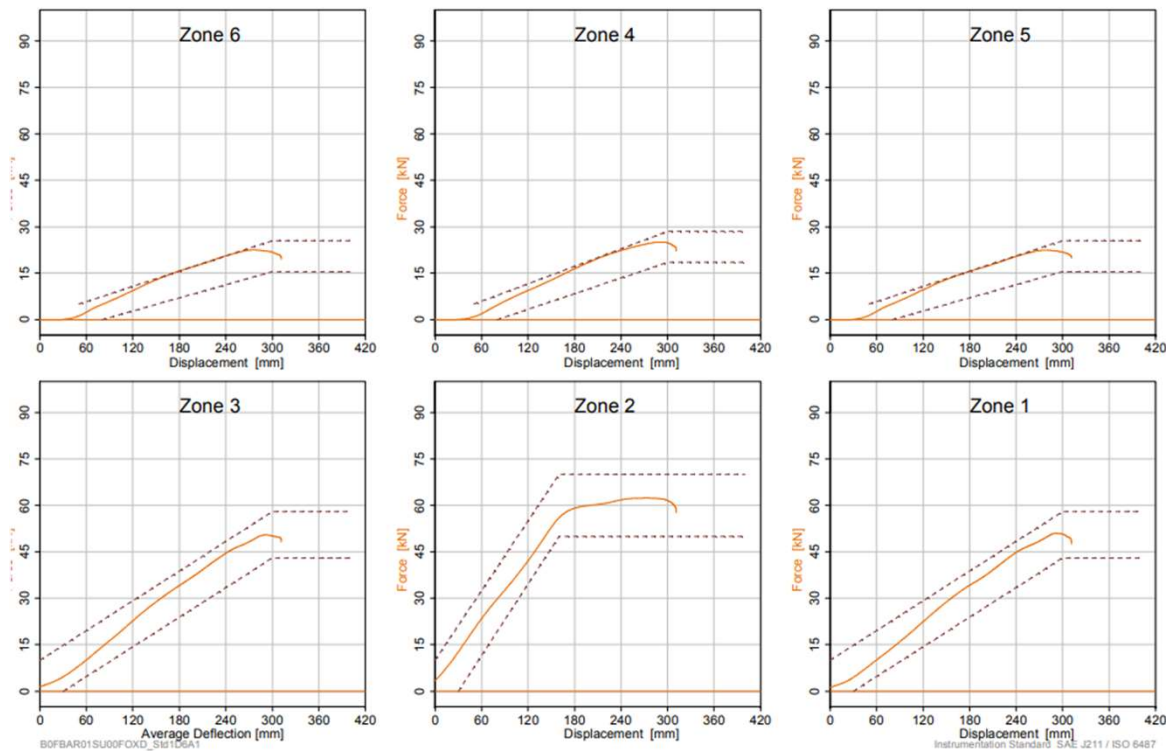
5052 is considered an equivalent to AlMg<sub>2.5</sub>. 5052-H32 is readily available in small quantities in North America.

In our opinion, the lower elongation at break % for 5052-H32 should not be considered to disqualify 5052-H32 as an equivalent front plate material to AlMg<sub>3</sub>.

During verification testing of the barrier, the front plate is not subjected to any significant distortion as it is projected against a flat surface.

# Results of 5052-H32 Testing

Data Timestamp 2021-11-17 17:00:00		Interval evaluation: 0.00 - 120.00 ms		Page 045	
Plascore Cust.Ref.No. F21460202 Test Object No. [N]	Side Impact Barrier Velocity 9.75 m/s Mass 948.5 kg	Barrier calibration test according ECE-R95 35±0.5 kph Barrier Calibration ECE R95 Barrier Zones Total Forces		TASS International Lab.Ref.No. F21460202 Date of Test 2021-11-17	<b>tass</b> international A Siemens Business



3<sup>rd</sup> Party Testing of ECE-R95 WG13 Barrier with 5052-H32 Front Plate and 6.4% Elongation passes all barrier level testing.

Testing: 2021-11-17

# Proposed Revision to Regulation 95

We request a change in Regulation 95 paragraph 2.2.2.1 front plate elongation at break requirement from  $\geq 12\%$  to  $\geq 5\%$  for material at 0.5mm thickness.

# Additional Info

Since 1999, over 2300 barriers have been produced with AlMg2.5 faceplates. These have had elongation <12% but consistently passed barrier test requirements.

