

Full Width Deformable Barrier Face Specification

Crash Protection

Technical Bulletin 042

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PREFACE

During the test preparation, vehicle manufacturers are encouraged to liaise with the laboratory and to check that they are satisfied with the way cars are set up for testing. Where a manufacturer feels that a particular item should be altered, they should ask the laboratory staff to make any necessary changes. Manufacturers are forbidden from making changes to any parameter that will influence the test, such as dummy positioning, vehicle setting, laboratory environment etc.

It is the responsibility of the test laboratory to ensure that any requested changes satisfy the requirements of Euro NCAP. Where a disagreement exists between the laboratory and manufacturer, the Euro NCAP secretariat should be informed immediately to pass final judgment. Where the laboratory staff suspect that a manufacturer has interfered with any of the set up, the manufacturer's representative should be warned that they are not allowed to do so themselves. They should also be informed that if another incident occurs, they will be asked to leave the test site.

Where there is a recurrence of the problem, the manufacturer's representative will be told to leave the test site and the Secretary General should be immediately informed. Any such incident may be reported by the Secretary General to the manufacturer and the person concerned may not be allowed to attend further Euro NCAP tests.

DISCLAIMER: Euro NCAP has taken all reasonable care to ensure that the information published in this protocol is accurate and reflects the technical decisions taken by the organisation. In the unlikely event that this protocol contains a typographical error or any other inaccuracy, Euro NCAP reserves the right to make corrections and determine the assessment and subsequent result of the affected requirement(s).

CONTENTS

1.	BARRIER CHARACTERISTICS	1
2.	DESIGN OF THE IMPACTOR	3
3.	CONFORMITY OF PRODUCTION	5
4.	STATIC TESTS	6

1. BARRIER CHARACTERISTICS

1.1. Honeycomb blocks

1.1.1. Geometric characteristics

The impactor consists of two layers of honeycomb as shown in Figure 1. The principal dimensions of both blocks have an overall depth of 300mm in the T direction, a height of 1000mm in the L direction and a width of 2000mm in the W direction as shown in Figure 2 & Figure 3.

1.2. Front honeycomb layer

Height: 1000mm -5mm / +15mm in direction of honeycomb ribbon axis (L)
Width: 2000mm -5mm / +15mm (W)
Depth: 150mm ± 1.0mm in direction of honeycomb cell axes (T)
Material: Aluminium 3003 (ISO 209, part 1)
Crush strength: 0.342 MPa +0% -10%

1.3. Rear honeycomb layer

Height: 1000mm ± 5.0mm in direction of honeycomb ribbon axis (L)
Width: 2000mm ± 5.0mm (W)
Depth: 150mm ± 1.0mm in direction of honeycomb cell axis (T)
Material: Aluminium 3003 (ISO 209, part 1)
Crush strength: 1.711 MPa +0% -10%

1.4. Backing sheet

Height: 1080mm ±2.5mm
Width: 2000mm ±2.5mm
Thickness: 2.0mm ±0.1mm
Material: Aluminium 5251/5052

1.5. Interlayer

1.5.1. White Muslin 100% Cotton – 55g/m² impregnated with adhesive.

1.6. Location of the honeycomb blocks

1.6.1. The honeycomb blocks shall be aligned with each other and centred on the back plate.

1.6.2. The main honeycomb blocks shall be bonded to the sheets with adhesive such that the cell axes are perpendicular to the sheets.

1.7. Bonding

- 1.7.1. Adhesive shall be applied to the surfaces as illustrated in Figure 1. The adhesive to be used throughout should be a two-part polyurethane or equivalent.
- 1.7.2. The adhesive should be applied to one surface only. In cases where honeycomb is to be bonded to aluminium sheet, the adhesive should be applied to the aluminium sheet only. A maximum of 0.5kg/m^2 shall be applied evenly over the surface, giving a maximum film thickness of 0.5mm. See Figure 1.
- 1.7.3. Care should be taken to ensure that adhesive does not run into the honeycomb cells, causing an increase in crush strength of the honeycomb core.
- 1.7.4. For the back plate, the minimum bonding strength shall be 0.6MPa (87psi), tested according to Section 1.7.5.
- 1.7.5. Bonding strength tests
 - 1.7.5.1. Flatwise tensile testing is used to measure bond strength of adhesives according to ASTM C297-61.
 - 1.7.5.2. The test piece should be 100mm x 100mm x 15mm, bonded to a sample of the back plate material. The honeycomb used should be representative of that in the impactor.

2. DESIGN OF THE IMPACTOR

2.1. Barrier face

2.1.1. The FWDB is comprised of the following components:

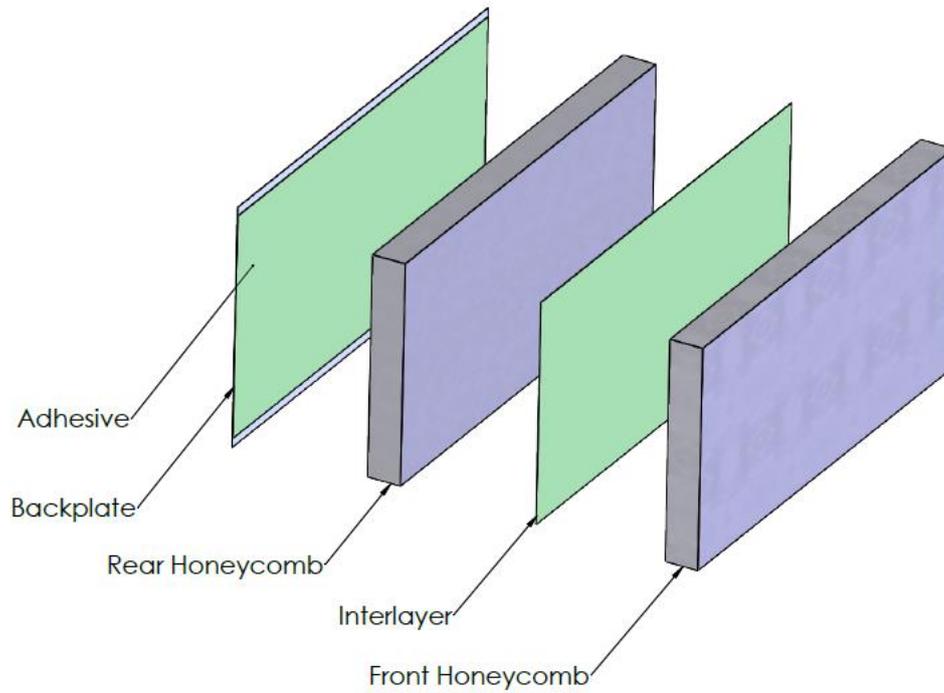


Figure 1: Exploded Isometric View

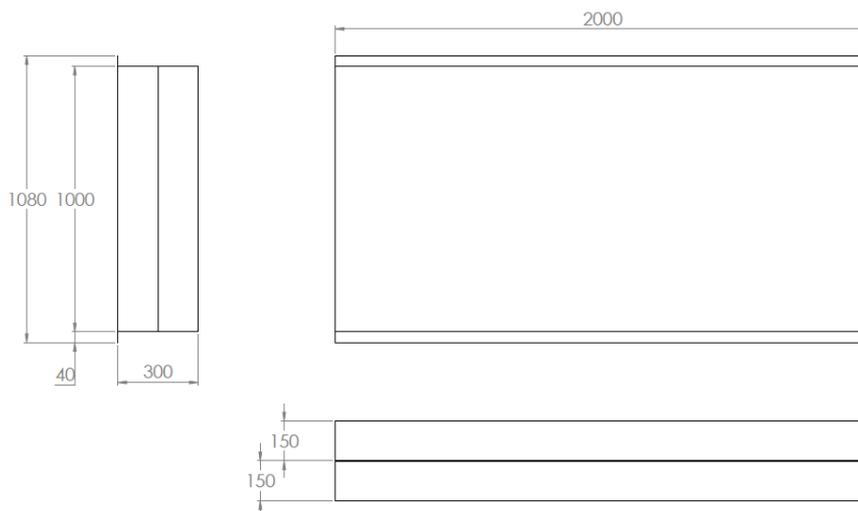


Figure 2: Dimensions (in mm)

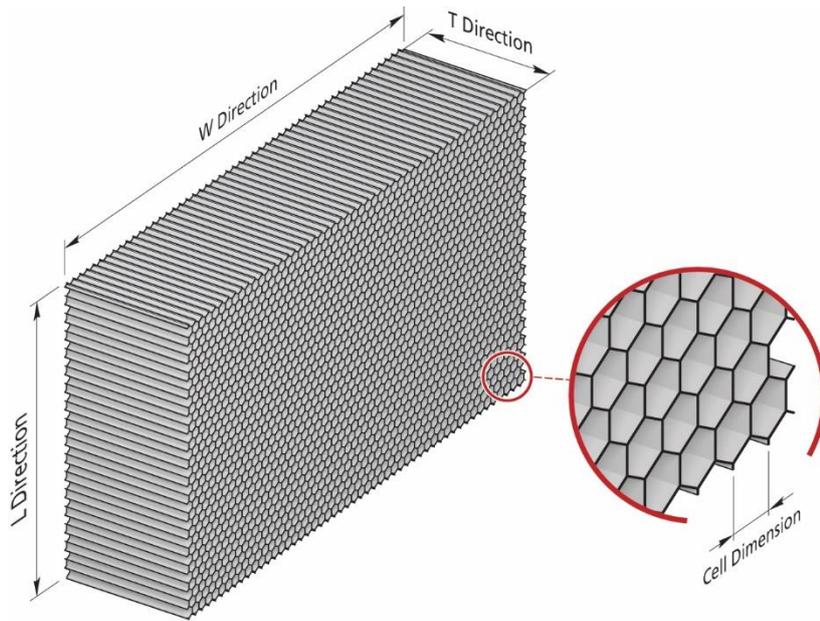
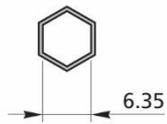
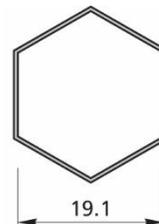


Figure 3 Aluminium Honeycomb Orientation



Rear block A



Front block B

Note:

Figure 4 Dimensions of the Honeycomb Cells (dimensions in mm +/- 10%)

3. CONFORMITY OF PRODUCTION

- 3.1. The barrier manufacturer shall be responsible for the conformity of production procedures and for that purpose must in particular:
 - 3.1.1. Ensure the existence of effective procedures so that the quality of the products can be inspected.
 - 3.1.2. Have access to the testing equipment needed to inspect the conformity of each product.
 - 3.1.3. Ensure that the test results are recorded and that the documents remain available for a time period of 10 years after testing.
 - 3.1.4. Demonstrate that the samples tested are a reliable measure of the performance of the batch (examples of sampling methods according to batch production are given below).
 - 3.1.5. Analyse results of tests in order to verify and ensure the stability of the barrier characteristics, making allowance for variations of an industrial production, such as temperature, raw materials quality, time of immersion in chemical, chemical concentration, neutralisation etc, and the control of the processed material in order to remove any residue from the processing.
 - 3.1.6. Ensure that any set of samples or test pieces giving evidence of non-conformity gives rise to a further sampling and test. All the necessary steps must be taken to restore conformity of the corresponding production.
- 3.2. The manufacturer's level of certification must be at least ISO 9001-2015 standard.
- 3.3. Minimum conditions for the control of production: the holder of an agreement will ensure the control of conformity following the methods hereunder described.
- 3.4. Traceability
 - 3.4.1. Barriers shall carry consecutive serial numbers which are stamped, etched or otherwise permanently attached, from which the batches for the individual blocks and the date of manufacture can be established.

4. STATIC TESTS

- 4.1. Static testing will be performed on all honeycomb blocks and follow the procedure detailed in this section.
- 4.2. Blocks A and B
 - 4.2.1. The aluminium honeycomb for the homogeneous block A (rear) shall be processed so that the strength is 1.540MPa to 1.711MPa when statically crushed in accordance with the procedure defined in NHTSA TP-214D.
 - 4.2.2. The aluminium honeycomb for the homogeneous block B (front) shall be processed so that the strength is 0.308MPa to 0.342MPa when statically crushed in accordance with the procedure defined in NHTSA TP-214D.