EURO NCAP

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Euro NCAP Supplier List

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General

Technical Bulletin G 003-1

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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 INTRODUCTION

This Technical Bulletin provides guidance for suppliers on how to get their test equipment approved for use in official Euro NCAP testing. Euro NCAP approved equipment can be found in the supplementary file G 002-2, which is supplementary to this document.

The scope of approval applies only to official Euro NCAP tests at approved laboratories. It need not apply to development or preliminary NCAP tests (so-called pre-tests) carried out by manufacturers in-house, at approved laboratories or elsewhere. However, it is strongly recommended that equipment in accordance with this Technical Bulletin is used for this work. Data that is supplied as part of the official Euro NCAP rating, such as knee mapping and far-side data, is treated as in-house data.

G 002-2 references ATDs, targets, barriers and special instrumentation, and is structured according to the tests in which they are used. Where the type of equipment is not specifically identified in this document, all suppliers are accepted as long as the equipment meets the functional requirements.

Euro NCAP is open to add alternative suppliers at any time and for all items listed, as long as the equipment is prescribed in any of Euro NCAP's test procedures. Suppliers are requested to liaise with the Euro NCAP Secretariat directly and to follow the procedure outlined in the following sections to seek approval before making any public announcements. Suppliers not mentioned on the list (or pending approval) must refrain from making any public comments or statements referring to the Euro NCAP Suppliers List.

2 APPICATION PROCEDURE & REQUIRE DATA

2.1 Application procedure

Suppliers that wish to be added to the Euro NCAP suppliers list need to contact the Euro NCAP Secretariat to announce their interest and provide initial technical information about their equipment. After initial discussions, and any further steps identified by the Secretariat, the supplier must provide the following information as a minimum:

a) Technical system specifications including openly available drawings and list of patents, if applicable.
b) Certification data of the equipment according to required Euro NCAP or other relevant procedures (where available).
c) Repeatability and Reproducibility test results (where applicable).
d) Full scale and/or subsystem physical (performance) test data, generated in co-operation with one or multiple Euro NCAP approved Test Laboratories. This will be compared to existing 'benchmark' data (where available)*.
e) Back-to-back comparison with an official Euro NCAP test (applicable test to be agreed and data to be provided by Euro NCAP)*.
f) Where relevant, comparative data from development testing performed by or for an established vehicle manufacturer and/or tier-1 supplier. Data should preferably be based on several units and different test locations and cover a period of at least at least 6 to 12 months experience, depending on the complexity of the product or component*.
g) For products, that are (or will be) part of legislative compliance testing in Europe, USA or elsewhere or prescribed by any other NCAP, such as ATDs and crash barriers, additional compliance information with regards to those standards may have to be supplied. This also includes the relevant ISO requirements for ADAS & AD propulsion systems and targets.

*Please liaise with the secretariat in advance to ensure that data generated can be accepted.

The onus is on the equipment supplier to provide a 'dossier' that summarises all relevant data for the approval following the same order as that detailed in the requirements above. All test data (in electronic format) shall also be provided to support the application including plots, photographs, films etc. The data is not made public and is only used for the purposes of accreditation. Any confidentiality issues should be discussed with the Euro NCAP Secretariat.

Data will be reviewed by Euro NCAP, its members and laboratories in the relevant working group to which the equipment applies. For example, ATD's and barrier faces are reviewed by the Technical Working Group and AEB test equipment by the P-NCAP Technical Working Group. In some circumstances it may be necessary to provide additional data or evidence during the review process.

When approval has been granted, the Euro NCAP Secretariat will formally notify the supplier in writing and include them as an approved supplier for the equipment list of this Technical Bulletin at the next scheduled update.

Approval will be granted to equipment that is available and commonly used in the European market only. It is the supplier's responsibility to keep Euro NCAP informed about relevant specification/version changes and seek an extension of the approval, if needed. Failure to do so may result in equipment being removed from the list.

The Euro NCAP Secretariat will charge a fee for the review of equipment applications. This fee will cover costs associated with the review and will vary depending upon the item to which the application applies. Where new tools are introduced as part of a protocol update or new protocol and assessment, the Secretariat may waive the fee where the supplier has contributed to the development of the updated procedure. For example, where there is an introduction of a new ATD.

2.2 Intellectual property

Where equipment contains any patents, licenses, trademarks or Intellectual Property (IP) rights, the supplier must provide detailed information about the scope, markets, etc. to which these apply.

Patent restrictions must be removed after the date of the official publication of the Euro NCAP protocol/technical bulletin and after the patent holder is listed as an Approved Supplier to Euro NCAP.

Until the time of official publication of the Euro NCAP protocol, where the patent restrictions may be in effect, the supplier and its affiliated companies may offer a license to any interested third party wishing to obtain rights to the design.

Where equipment has already been approved by Euro NCAP and/or restrictions are applied retrospectively, in any global region, Euro NCAP reserves the right to remove approval of the equipment at any time and without notice.

3 ANTHROPOMETRIC TEST DEVICES

It is important to note that all parts of Section 2 are applicable to anthropomorphic test devices (ATD).

ATD	Reference and certification
Hybrid III 5th	CFR Part 572 Subpart O & CP 025
THOR 50th	Euro NCAP CP 026
Hybrid III 50th	CFR Part 572 Subpart E, UN R94 & CP 027
Hybrid III 95th	SAE J2859 & CP 028
WorldSID 50th	ISO 15830, parts 1-5 & CP 029
BioRID UN 50th	User manual & CP 030
Q6	User manual, UN R129 & CP 031
Q10	User manual, UN R129 & CP 031
Adult headform	UN R127 Revision 2 & CP 032
Child/small adult headform	UN R127 Revision 2 & CP 032
Upper Legform	UN R127 Revision 2 & CP 032
aPLI	ISO TS20458, user manual & CP 032

3.1 Technical system specifications (Section a)

Technical drawings shall be supplied in line with relevant drawing packages, specifications, and any defining standard(s). Any patents must be open and in line with the details of Section 2.2.

3.2 Certification data (Section b)

Certification of multiple devices (dummies and impactors) shall be performed at different laboratories. For example, this shall include at least three different dummies at a minimum of three different laboratories. Certification must be performed in certified in accordance with the relevant requirements defined in Regulation and, in some cases, additional requirements detailed in Euro NCAP protocols. Compliance with all corridors/requirements is required along with full certification reports and ISO mme data files.

3.3 Repeatability and Reproducibility (Section c)

A series of testing is required to demonstrate repeatability and reproducibility (R&R). For dummies, this will require both sled and full-scale testing to be performed and must be accompanied by all supporting data. This aspect covers not only the dummy outputs, but also the R&R of H-point setting, joint stiffnesses and any other relevant pre-test procedures.

For sub-system impactors, such as pedestrian test equipment and the aPLI, this testing may be done with the use of the Generic Vehicle Test Rig (GVTR – defined in https://www-esv.nhtsa.dot.gov/Proceedings/26/26ESV-000254.pdf).

3.4 Full-scale & back-to-back testing (Sections d & e)

For any type of ATD, this may only be performed by a limited number of approved Euro NCAP laboratories. The Euro NCAP Secretariat will provide further details of where the test shall be performed and which vehicle is to be used upon application.

3.4.1 Dummies

Hybrid III (AM50/AF05) and WorldSID shall undergo a full-scale vehicle test as a repeat of a published Euro NCAP official test. The test shall be performed according to the Euro NCAP AE-MDB test procedure in force at the time of the official vehicle test. The test mode shall be relevant to the dummy, i.e. an AE-MDB or pole impact for WorldSID. Q6 and Q10 child dummies require testing in both front and side impact configurations of a published Euro NCAP official test.

THOR (AM50) requires a comparative full scale MPDB to vehicle test to replicate the round robin work undertaken the by the Euro NCAP Frontal Impact Working Group. This requires the use of a Ford Fiesta (2017 model year); exact details of the model and specification will be provided by the Euro NCAP Secretariat upon application.

3.4.2 Sub-system impactors

A repetition of impacts performed during a published Euro NCAP official test rating is required.

3.4.3 Full-scale test data – ATD

The data required for the testing will be as detailed in the relevant Euro NCAP testing protocols including data, film photographs and reporting. Some exceptions regarding instrumentation may be permitted, but this shall be discussed with the Euro NCAP Secretariat upon application.

3.5 Additional system testing with OEM or Tier-1 supplier (Section f)

Test data from and OEM or Tier-1 may be full scale or sled testing.

A full set of test data is not required, but a statement from the chosen partner shall be supplied to detail what testing took place and that there were no issues with the ATD and performance was as expected within normal test variability.

3.6 Legislative or ISO compliance (Section g)

For the THOR and WorldSID this section is currently not applicable.

For all other dummies and ATDs, this is applicable. A certificate of conformity shall be supplied in addition to the relevant certification data detailed previously in part b.

4 BARRIER FACES

This section details the parts of Section 2 that are applicable to the deformable barrier faces used by Euro NCAP. The barrier face specifications document for the AE-MDB, MPDB and FWDB are detailed in their respective Technical Bulletins.

4.1 Technical system specifications (Section a)

Technical drawings shall be supplied in line with specifications of the barrier face(s) defined in the barrier specification documents.

4.2 Certification data (Section b)

Conformity of production requirements are detailed in the barrier specifications; data shall be provided to show compliance and traceability. The dynamic certification testing may only be performed by a limited number of approved Euro NCAP laboratories, the Euro NCAP Secretariat will provide further details upon application.

4.2.1 Quasi static certification testing

Before any dynamic testing is performed, quasi-static testing is required. This may be performed in-house by the applicant. Details of the samples to be used and the test procedures are provided in the barrier specifications. Nine samples of each block shall be tested and .xls data of the tests (MPa vs deflection) shall be provided to demonstrate compliance with the corridors.

4.2.2 Dynamic certification testing – AE-MDB

The dynamic corridors of the AE-MDB are based on a large number of vehicle to load cell wall (LCW) impacts and a series of ‘baseline’ car to car side impact tests. Stiffness profiles were proposed, and a bumper beam element was added to the barrier face to reflect the performance of typical bullet vehicles more closely in the European fleet.

Three AE-MDB to LCW tests are required. It is important to note that the dynamic LCW test procedure detailed in CP 016 be followed, specifically the trolley specifications (overall mass of 1300kg) and test speed (35km/h). All other aspects of the trolley are identical to those detailed in the AE-MDB test protocol. The LCW resolution must be such that the forces of the individual blocks can be established according to the individual block corridors.

4.2.3 Dynamic certification testing – MPDB

The tubular impactor to MPDB-LCW test is required to demonstrate compliance of the stiffness requirements and the integrity of the barrier construction.

Three dynamic tubular impactor to MPDB-LCW tests are required. It is important to note that the dynamic LCW test procedure detailed in CP 015 be followed, specifically the trolley specifications (overall mass of 1300kg) and test speed (60km/h). LCW data must be provided to demonstrate compliance with the tubular impactor corridor along with data detailed in the following list.

4.2.4 Dynamic certification test data – AE-MDB & MPDB

Regarding the dynamic certification tests, the following data is required for each of the three tests:

a) ISO mme data
b) High speed film footage (MPDB only), 3 views per test
c) Pre & post-test photographs
d) Excel version of ALL data channels including LCW force, displacement, acceleration, time etc.
e) Full test report detailing speed, alignment, trolley details etc.

4.3 Repeatability and Reproducibility (Section c)

The R&R requirements of this Technical Bulleting are applicable to barrier face approval, but this can be demonstrated using the data from testing provided according to Section b and e, (certification tests & full-scale tests).

4.4 Full-scale & back-to-back testing (Sections d & e)

This may only be performed by a limited number of approved Euro NCAP laboratories, the Euro NCAP Secretariat will provide further details of where the test shall be performed and which vehicle is to be used upon application.

Full scale vehicle testing – AE-MDB

A full-scale barrier to vehicle test is required as a repeat of a published Euro NCAP official test. The test shall be performed according to the Euro NCAP AE-MDB test procedure in force at the time of the official vehicle test. A comparison of vehicle intrusion and barrier face deformation will be made.

Full scale vehicle testing – MPDB

Ford Fiesta (2017 model year).

Full scale vehicle testing – FWDB

A full-scale barrier to vehicle test is required as a repeat of a published Euro NCAP official test. The test shall be performed according to the Euro NCAP FWDB test procedure in force at the time of the official vehicle test.

Full-scale test data – AE-MDB & MPDB

The data required for all barrier face testing will be as detailed in the relevant Euro NCAP testing protocols including data, film photographs and reporting. Some exceptions regarding instrumentation may be permitted, but this shall be discussed with the Euro NCAP Secretariat upon application.

4.5 Additional system testing with OEM or Tier-1 supplier (Section f)

It may be that other organisations have not tested with a particular barrier face that has not been approved by Euro NCAP. This data is not essential but recommended. A full set of test data is not required, but a statement from the chosen partner shall be supplied to detail what testing took place and that there were no issues with the barrier face and performance was as expected within normal test variability.

4.6 Legislative or ISO compliance (Section g)

Currently not applicable.

5 PROPULSION & TARGET SYSTEMS

It is important to note that all parts of Section 2 are applicable to propulsion systems and target approval.

In order to be used in official testing, it is the combination of the propulsion platform and target that must both be approved together as a 'system'. Each system must be in accordance with the relevant ISO 19206 requirements and all sections detailed in Section 2. Therefore, where a propulsion system can be used with multiple targets, each combination of platform and target must be tested to show that the requirements (ISO & this TB) have been met.

For example, if a propulsion system is to be used with the motorcyclist (EMT), pedestrian (EPTa & EPTc) and cyclist (EBT) targets, data must be provided to demonstrate that the system can meet all protocol tolerances for those scenarios and applicable ISO requirements with each combination of propulsion system and target. Conversely, where a propulsion system is to be used with the EMT only, only the tolerances and requirements relating to this test scenario(s) need to be met. In that case, official testing may only be performed with this propulsion system and target. All propulsion systems to be used in VRU testing must be able to meet all tolerances with the EPTa, EPTc and EBT targets.

Details of which propulsion system and target system combinations are requested for approval shall be provided by completing the propulsion & target table in G 002-2.

5.1 Technical system specifications (Section a)

Technical drawings shall be supplied illustrating the dimensions of an assembled target or platform and must include any additional attachments, for example where brackets are required to accommodate that fitment of a particular target. Electrical circuit diagrams and drawings of individual componentry are not required.

5.2 Certification data (Section b)

Conformity of production certificates and other relevant quality management system compliance shall be provided.

5.3 Repeatability and Reproducibility (Section c)

Propulsion system and target testing shall be performed to demonstrate that the Euro NCAP test protocol tolerances can be met by the target system. This testing must be performed with the propulsion system and relevant targets for approval and may be either in-house or from an approved Euro NCAP laboratory. However, vehicles (VUT) are not required for this part of the demonstration.

The tolerances are detailed in the Test Execution sections of the different testing protocols. At least nine examples of each tolerance being met shall be provided in graphical format showing recorded values and limits. For example, detailing yaw rates, lateral deviation, acceleration, and deceleration curves. Demonstrations must include the following manoeuvres as a minimum:

a) Straight path (per target)

b) Curved path (where applicable) (per target)
c) Highest velocity (per target)
d) Lowest velocity (per target)
e) All acceleration profiles (per target)

Speed limitations of some propulsions systems may preclude testing at the upper speed thresholds of certain scenarios. For example, with the EMT at 80km/h. Partial approval for these scenarios will be granted providing the speed limitation is clearly identified for the individual propulsion systems.

Speed is the only limitation permitted; all other testing aspects of each scenario must be met by the system. For example, approval will not be granted to a system that can only be used for crossing scenarios and not longitudinal scenarios.

5.4 Full-scale & Back-to-back testing (Sections d & e)

Back-to-back testing shall be performed by an approved Euro NCAP Laboratory in accordance with the testing protocols in force at the time of application. This testing will be used to make a comparison between an existing target system and a new target system(s) seeking approval. The Euro NCAP Secretariat will detail several suitable vehicles that can be used in the tests. Note, it is not the vehicle being assessed, but the propulsion system and targets. Vehicles that offer full avoidance are not essential but are preferred as this will limit propulsion system and/or target damage during testing, particularly in the CCCscp and EMT scenarios.

A full series of Euro NCAP tests is not required and to further reduce the test burden, it is acceptable to preform testing at the upper and lower test speeds only. It is not necessary to perform symmetrical scenarios, for example, where there are both nearside and farside crossing scenarios, only one is required. Testing shall include examples of each scenario relevant to the target system application.

The testing can either be done with the use of repeat back-to-back testing during official Euro NCAP testing, or at a date after the official Euro NCAP testing has already been completed. The former avoids and vehicle update problems. It is acknowledged that, in the time between official Euro NCAP testing and equipment approval, vehicles may have upgraded systems (hardware and/or software). If this is the case, it does not necessarily preclude this use of that vehicle, but it will be important to identify the differences between the vehicle specifications and where this is likely to affect the results of any testing.

The back-to-back tests to be performed for each target and propulsion system combination are detailed in are detailed in G 002-2.

Outputs shall be provided as detailed in the section above. It is necessary for the Euro NCAP laboratory to provide feedback on the practical use of all test tools as part of the approval submission and, where necessary, any issues must be reported to the Euro NCAP Secretariat detailing equipment handling, usability, stability etc. It is also necessary to demonstrate robustness of the target system to ensure that it does not suffer significant damage in the event the VUT impacts the target system.

Certain test scenarios shall be repeated by the Euro NCAP laboratory at least three times for the selected speed and with each target system combination (full scale repeatability testing, Section c). Outputs shall be provided as detailed in the section above. See G 002-2 test matrices for details.

5.5 Additional system testing with OEM or Tier-1 supplier (Section f)

The target system testing identified in Sections 5.3 and 5.4 shall be repeated in cooperation with either a vehicle manufacturer or a Tier-1 supplier. The supplier requesting approval is responsible for arranging this testing and providing the subsequent test data to Euro NCAP for approval. A statement from the chosen OEM or supplier shall be supplied to detail what testing took place and that there were no issues with the functionality of the target system.

5.6 ISO Compliance (Section g)

Documentation shall be provided to show that each system (propulsion and target combination) meets the relevant requirements laid out in the latest applicable ISO 19206 specifications. For this part of the data submission, please follow the same structure and layout as detailed in the ISO standard. In the case of the EMT, radar data shall be submitted in accordance with the specification detailed in the MUSE project.

5.7 New devices and future scenarios

For future scenarios, where there may be new targets or scenarios, there will be no official Euro NCAP test data available. In place of the back-to-back test data (Section e), workshops may be held to demonstrate that target systems are representative and acceptable for the new scenarios. Participation in such workshops is mandatory for approval.