Kraftfahrt-
Bundesamt

Information Sheet

concerning the preparation of expert opinions for special wheels, identical wheels and replica wheels for passenger cars (MR)

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Vehicle Technology

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Information sheet concerning the preparation of expert opinions for special wheels, identical wheels and replica wheels for passenger cars

1 Introduction

This information sheet should help to treat all issues uniformly which arise in connection with the preparation of expert opinions to grant *Allgemeine Betriebserlaubnisse (ABE)* [general operating licences] for special, identical and replica wheels to be primarily used in passenger cars and their trailers. Furthermore, it is intended to facilitate the induction of employees of technical services or the type-approval authority who, for the first time, deal with the processing of *ABE* expert opinions for these wheels.

As a guideline for the preparation of test reports for an international type-approval for identical replacement wheels, replica replacement wheels or replacement wheels with the same dimension according to UN/EVE-R 124, the model test report is stored in the technology portal on the website of the *Kraftfahrt-Bundesamt (KBA)* [Federal Motor Transport Authority] (www.kba.de).

2 Definitions

2.1 Definitions in connection with special wheels, identical wheels and replica wheels

Nationale Räderrichtlinie (RäderRili) **[National Wheel Directive]**

National guideline for the testing of special wheels for passenger cars and their trailers BMW/StV 13/36.25.07-20.01 dated 25 November 1998, *Verkehrsblatt* [German Transport Gazette] p. 1377. This guideline is the testing specification to grant a national type-approval for the wheels described below.

Special wheels
"Special wheels" means wheels which can be used for a vehicle subject to certain conditions but which are not included in the operating licence of the vehicle.

Identical wheels
"Identical wheels" means wheels which are produced using the same manufacturing equipment as the wheels mounted as standard by the vehicle manufacturer and approved together the operating licence of the vehicle; they only differ from wheels mounted as standard in terms of the vehicle manufacturer's missing trademark and/or part number and the additional labelling pursuant to Item 3.3. of the *Nationale Räderrichtlinie.*
Identical wheels may be subject to a simplified procedure for testing and type-approval. This procedure is described in Annex 1 of the *Nationale Räderrichtlinie.*

Replica wheels
"Replica wheels" are steel disc wheels which are built as a copy of the wheels mounted as standard and approved together the operating licence of the vehicle; with regard to all their dimensions, the material and stability, they correspond to the wheels mounted as standard by the vehicle manufacturer. Replica wheels may be subject to a simplified procedure for testing and type-approval. This procedure is described in Annex 1 of the *Nationale Räderrichtlinie.*

Wheel body of special wheels
A mechanically reworked or unworked casting of a wheel. A centring ring or a centring flange may be inserted in the wheel body so that another variant is produced alongside the variant with the permanently drilled centre hole.

Wheel family
A wheel family is formed by special wheels having identically cast wheel bodies and the same contour of which the designs may differ in terms of their pitch circle diameters (PCDs), number of boltholes, insets, centre hole diameters and spigot mounting diameters.

One-piece special wheels
Wheels of which the wheel body consists of one part.

Composite structure
Wheels of which the wheel body was composed of several parts or of various materials.

Type mark
Term used in the *Räderrichtlinie* which refers to the type-approval mark or the *KBA* number.

2.2 Definitions in connection with accessories

The term “accessory” encompasses caps, spigot mounting rings and centring flanges, mounting parts to change the wheel styling as well as, if applicable, special valves if their use is prescribed in the expert opinion and if they also supplied by the type-approval holder.

Rim end caps
Rim end caps (brake dust disks) can be defined as accessories for special wheels.

In this case, they shall be documented as a drawing (with material specification) in the annexes of the expert opinion. The usability of rim end caps may be described either using special stipulations for the individual wheel/tyre combinations or an independent table which is encompassed in the annex concerning the range of applications.

Spigot mounting rings
The wall thickness of spigot mounting rings made of plastics must never be less than 1mm. For centring rings with a thinner wall thickness, sufficient stability shall be evidenced by way of repeated assembly tests and shall be confirmed in the expert opinion.

Centring flanges/spacer discs/spacer rings
The above designations describe the same component. Using such a component makes it possible to adjust the inset and, if applicable, the centre hole diameter of a wheel body of an intended application. A separate general operating licence may be issued stating “spacer disc” as the device name. In combination with a general operating licence for a wheel, these components must be specified in the expert opinion.

3 Distinguishing characteristics

3.1 Type of special light alloy wheels

Special wheels which do not differ in the following characteristics shall be treated as one type as part of an expert opinion or a type-approval:

- Rim size and rim contour,

  The size of a special wheel is always type-defining even if it has demonstrably been manufactured from a blank or as a result of the manufacturing procedure (e.g. flow forming).

- Functional dimensions, unless they are considered to be design characteristics,
- Design of the visible area (styling area) of the wheel,

  The design of the visible area is also deemed to be identical under the following conditions:

  When using various hub caps in the event of the visible area being otherwise identical and an identical geometric shape in the area of the wheel connection.

  Special wheels with a varied number and form of holes drilled for the mounting elements and, as a result of it, lightening pockets may be recorded as various designs of a wheel type as part of a type-approval.

- Type of surface treatment unless it might possibly have an impact on the stability or the corrosion protection of special wheels,
- Type of connection (screwed, adhesive-bonded, welded) for composite structures,
- Materials, manufacturing procedures and heat treatment of the individual parts for composite structures,
- Casting procedures, material and type of heat treatment in the event of one-piece special wheels and in the event of casted components of multi-piece special wheels.

  If the compliance with all relevant requirements set out in the current version of the *Räderrichtlinie* concerning the various casting procedures applied is confirmed in the expert opinion for the granting of a general operating licence, any blanks manufactured in various casing procedures shall also be considered to be identical. Blanks manufactured in various casting procedures may be treated as one wheel design subject to this condition.

  Differences in terms of the materials and the heat treatment procedures concerning these blanks are permitted if they are based on differences in the casting procedures.

Other technical differences which are not mentioned here or are unclear with regard to the type definition shall be coordinated with the *KBA* in advance. In these individual cases, the consent of the *KBA* is required before submitting the application documents.

3.2 Design of special light alloy wheels

Various wheels of the same type which can be manufactured from an identical (cast) blank using metal cutting shall be considered to be variants of a special wheel. The variant parameters may be changed by using inlays, e.g. to change the inset.

Variants may differ in the following points:

- Inset,
- Centre hole diameter,
- Pitch circle diameter of the mounting holes,

  Type-approvals for special wheels may also be granted with regard to which holes for mounting elements are drilled in a wheel body on two clearly different pitch circles (e.g. 2 x 4 hole or 2 x 5 hole).
- Diameter of the holes for mounting elements,
- Seat form of the holes for mounting elements,
- Number of holes for mounting elements,
- Number and form of lightening pockets available between the holes for the mounting elements,
- Hump forms H2, EH2, EH2+. Other hump forms cannot be dealt with as designs as part of a type.
- Dimensions of the centring rings or centring flanges,
- Casting procedure, the material and the heat treatment if the conditions described in Section 3.1 are met.

  As an option, the cast blanks for a special wheel design may also be manufactured by various foundries named in the wheel description.
- Changes in the inner contour of the wheel by means of which a sufficient clearance is created for larger brakes.

  Such changes may be necessary in order to be able to extend the range of applications of special wheels to other vehicles and/or to account for technical changes in vehicles which have already been reviewed

positively. When including such changes in a stipulation, it must be stated that only special wheels as from a specific foundry date are suitable for the use in vehicles with larger brakes. Following the test, the technical service has to decide as to whether or not a repeated examination of the stability is required. The decision shall be substantiated in the expert opinion.

- Minor structural changes to increase wheel stability.

  By including the foundry date, it must be ensured that the wheels are not mistakenly used for vehicles which are too heavy before the change is made.

- Changes in the finishing procedure (e.g. painting method, polishing) if it does not have any impact on the stability characteristics, the styling or the corrosion behaviour of the wheel. With regard to the polishing, a maximum removal of less than 1.5mm is not considered to be a change in styling. Polishing designs shall always be included in the stability tests.

Other technical differences which are not mentioned here or are unclear with regard to the type designs shall be coordinated with the *KBA* in advance. In these individual cases, the consent of the *KBA* is required before submitting the application documents.

3.3 Designs of multi-piece wheels

The criteria for the definition of designs with regard to one-piece wheels can be applied to multi-piece wheels accordingly. Furthermore, the specifications set out in the *Räderrichtlinie* apply.

3.4 Type of identical wheels and replica wheels made of steel

For the purposes of preparing expert opinions to grant a general operating licence, a type of an identical wheel and a replica wheel means various wheel designs of a manufacturer which do not differ in their nominal rim diameter (according to the definition in 2.9 of the *Räderrichtlinie*). The criteria of type definition for special light alloy wheels do not apply for identical wheels and replica wheels made of steel.

Design of identical wheels and replica made of steel
As part of an expert opinion, both identical wheels and replica wheels may be treated as different variants of a wheel type.

The individual variants of the identical and replica wheels may differ in the following characteristics in the event of them having the same nominal rim diameter:

- External design,
- Dimensions and number of holes for mounting elements,
- Rim width of the wheels,
- Seat of the mounting elements
- Number and form of humps,
- Inset,
- Material specification,
- Manufacturing procedure,
- Welding and welding procedure,
- Corrosion protection

A specific design of an identical wheel or a replica may be manufactured in different production plants of the same manufacturer if the identification of the production plant for each individual wheel is ensured by using the documents available to the *KBA.*

4 Labelling

4.1 Labelling area and labelling procedure

The following prescribed elements for the labelling of wheels must be indicated clearly legible and indelibly at a protected place which is visible without demounting the wheel.

- Manufacturer or registered manufacturer`s trademark
- Rim size according to standard
- Type and/or variant designation
- Manufacturing date (at least month and year)
- Type mark *(KBA number)* following the issue of a general operating licence. The labeling must be affixed to the visible side of the wheel.
- Inset or half centre distance (for HGVs with wheels for twin arrangement).

More detailed provisions concerning the parts of the labelling referred to above are specified as follows:

Labelling area

With the exception of the type mark, all prescribed information may be affixed to the side of the wheel connection. It is not permitted to affix the prescribed labelling parts in the lightening pockets or on the wheel connection area.

Labelling procedure

Labelling may be done by way of:

- Casting,
- Stamping,
- Etching,
- Engraving,
- Adhesive labels which were affixed to the wheel body prior to painting are protected by the transparent painting of the wheel and are resistant to the chemical impact of paint components

Several procedures may be designated in an expert opinion combination with one another or as options.

In the event of a wheel type having previously been placed on the market by using a part certificate and is to receive a national type-approval from now on, prescribed labelling of the wheels with the type mark may temporarily be met by affixing adhesive labels to the ready-painted wheels. The part certificate number shall be specified in the application documentation. The requirements for the adhesive labels can be found in Annex 2 of this information sheet. In any case, the fatigue durability shall be confirmed by the technical service in the expert opinion. Unless an internal test was carried out, a corresponding test certificate of a body as prescribed in Annex 2, Item 4 shall be enclosed. In the event of any other reasons for labelling a type mark using adhesive labels, the consent of the *KBA* shall be obtained in advance. Labelling ready-painted wheels using adhesive labels cannot be scheduled for any series production but must be restricted to exceptional cases of subsequent labelling.

This labelling procedure must not be applied to other prescribed elements of labelling. Additional or duplicate labelling of prescribed labelling elements using adhesive labels is permitted.

4.2 Labelling of special wheels, identical wheels and replica wheels

The type mark

The type mark shall always be affixed and arranged as follows

KBA ?????

Where there is a lack of space, the following arrangements are also possible:

KBA
?????

below one another or

KBA and ?????

in two immediately adjacent depressions of the closely subdivided styling area of a wheel.

Only the type mark must be affixed to the side of the wheel which is visible following the mounting procedure (styling side). Where necessary, in exceptional cases due to the design and the resulting lack of space it is permitted to affix the mark under an easily to remove centre cover.

It is considered to be appropriate if the type mark is visible from the outside - e.g. through the existing ventilation holes - without demounting the wheel. The question as to whether or not another way of labelling in the flange area is permitted shall be decided by the *KBA* on a case-by-case basis. Labelling in the drop centre, in particular in the rear area, is not acceptable for the type-approval.

To ensure that the labelling is visible through the ventilation holes when the wheel is mounted, a corresponding confirmation issued by the technical service in the expert opinion is required. The wording could be as follows: “The type mark affixed on the inside is legible from the outside, without any tools or other auxiliaries, through the ventilation holes in the area of the wheel flange.”

In the event of doubts, the *KBA* reserves the right to request photographs or additional evidence for the mounted state.

With regard to special wheels for HGVs of which the use is also intended in twin operation according to the approval in the expert opinion, two-sided labelling with the type mark is required.

Type, variant, variant designation
Variant designations should encompass the order of type and variant. It is also possible to use variant designations which are identical to the type or those which do not contain any information corresponding to the type.

If variant designations are used, the type does not need to be indicated separately. With regard to identical and replica wheels, the nominal diameter in inches is used as a hypothetical type. These wheels are usually labelled with the variant designation.

With regard to special wheels which are used with centring rings and/or centring flanges, the variant designation may be affixed in two separate parts. In this context, the variant is affixed to the wheel body, the inside diameter and the outside diameter on the centring ring and/or the thickness on the centring flange.

A type-approval holder must not use a type designation for two different wheels subject to approval.

Only when a type-approval for a specific type - possibly with a variant designation - has been deleted, the same type-approval holder may re-select the designations. The restriction in terms of the repeated use of the labelling must be observed particularly if the applicant has specified a name for a group of wheel types of which the individual wheel variants cannot be recorded in a general operating licence taking into account the type definition characteristics.

The labelling of centring rings

In each case, centring rings shall be labelled by indicating the inside diameter and the outside diameter.

The labelling shall always comprise the numerical value and the Ø symbol. A code letter may only be specified for the outside diameter. It is basically possible to name the colour which specifies the ring in the expert opinion.

The labelling of centring flanges (spacer discs)
Centring flanges shall be labelled indicating the following information:

- Inside diameter,
- Outside diameter in the area of the mounting point into the wheel body,
- The thickness which changes the inset.

The labelling of the diameters shall comprise the numerical value and the Ø symbol. The thickness shall be indicated in the form of “d = (numerical value)mm”.

When using centring flanges, the effective inset of a wheel variant does not need to be indicated on the wheel. It is sufficient if it can be calculated on the basis of the information provided on the wheel body and the indicated thickness on the centring flange.

The manufacturing date
With regard to special wheels, the manufacturing date shall be affixed in the form of “week/year” or “month/year”.

The manufacturer’s trademark
If a type-approval holder wants to use the manufacturer’s trademark of a third-party company to label the wheel body according to the definition set out in Item 3.3 *Räderrichtlinie*, they must submit a letter in which the owner of the manufacturer’s trademark agrees to the use. With regard to accessory such as hub caps, screws or centring rings, no confirmation is required for the use of the manufacturer’s mark.

Rim size according to standard
When labelling special wheels, the rim size according to standard, including the hump form, shall be specified. Corresponding information shall also be provided if the wheel does not meet an internationally recognised standard with regard to individual points.

When labelling identical wheels and replica wheels, it is not necessary to specify the hump form.

The foundry mark of special wheels
The type-approval holder of the wheel does not need to be identical to the production plant of the cast blanks. If the cast blanks for the wheel manufacturer are purchased parts, a foundry mark or another mark shall be affixed which allows for a finished wheel to be clearly allocated a specific foundry.

If a wheel design is manufactured from cast blanks produced in different casting procedures, a mark shall be affixed to each wheel by means of which the foundry and the cast procedure applied for the manufacture of the labelled wheel can be determined in connection with the information contained in the wheel description.

Labelling of identical wheels and replica wheels using the mark of the production plant
No information about the production plant is required on identical wheels and replica wheels if the type-approval holder can ensure traceability of the wheels without a corresponding label.

Foreign approval marks
Corresponding marks do not need to be mentioned in the expert opinion and in the type-approval wording. However, in the technical drawings of the wheels, the form, size and location of these marks must be documented.

Information about load-bearing capacity information
Providing information about the load-bearing capacity for wheels is only permitted if the corresponding information does not exceed the values which were reviewed positively.

5 Formal structure of the expert opinion

The special wheel to be approved and the intended use shall be clearly described in the expert opinion.

Technical changes to the wheel, to individual variants of the wheel, new wheel variants as well as extensions of the range of applications to new types of vehicles may be dealt with in follow-up expert opinions.

The stability test report and the annexes of the range of applications may be prepared by different technical services. If data is used by other technical services named by the *KBA*, the technical service which uses such data shall bear full responsibility. The place of the (external) test shall be specified in the test report. Documentary evidence for the stability tests shall be enclosed in each expert opinion for a new type-approval which shows which wheel variants are included in the tests according to the *Räderrichtlinie.* In addition, test-related parameters such as the tested tyres shall be specified. As part of a supplement, a stability test report only needs to be submitted if new wheel designs are added which are not already covered by any documentary stability evidence submitted.

The expert opinion shall be send together with the application for the grant of a type-approval and, if applicable, the other documents required to clarify administrative questions. The *KBA* prefers the electronic exchange of documents. Section 7.2 provides more information concerning this matter.

5.1 Expert opinion for special wheels

The structure of the expert opinion is divided into three parts:

5.1.1 General part of the expert opinion

The general part of the expert opinion encompasses the following sections:

- Description of the wheel together with a table which gives an overview of all wheel designs relating to the type,
- Description of the wheel dimensions and confirmation that the dimensions of the wheels tested match the information provided in the test documentation,
- Statement regarding the conformity of the wheels with an internationally recognised standard,
- In the event of any deviations of standards, these deviations shall be specified,
- List of the tests carried out and indication of the parameters assigned to the individual wheel designs (as an option, this may also be enclosed in the expert opinion as an annex),

- Description of the special wheel labelling, possibly using a specific wheel variant as an example,
- Summarising certification of the positive test result,
- Schedule of the annexes relating to the expert opinion which indicate the exact document designation or drawing number and the status - unless this information is already contained in the wheel description.

5.1.2 Annexes of the range of applications

Vehicles must be allocated to the wheel variants in annexes of the range of applications; this does not apply to variants for which a stability test has been carried out but for which no range of application has yet been provided.

If this increases clarity, annexes of the range of applications may be subdivided in independent annexes of the range of application for vehicles of various manufacturers or for certain mounting elements to be used.

The annexes of the range of applications shall be broken down into the following sections:

- Brief technical description of the wheel design (and/or the wheel variants) including the labelling parts which describe the respective variant.
- Description of the mounting elements and tightening torques to be used.
- General information about the use of special wheels.
- Table which lists the officially approved vehicles where the use of the wheels is technically sound, indicating the tyre sizes to be used and the stipulations and notes to be observed. More detailed requirements may be found in Section 5.1.2.2.
- List of the texts of the stipulations and notes stated in the annexes of the range of applications. In this context, the same facts must have the same number in all annexes of the range of applications which are part of an expert opinion.
- If necessary, a statement concerning the need for an inspection of the proper condition of the vehicle following the mounting of the wheels according to Section 19 (3) *Straßenverkehrszulassungsordnung (StVZO)* [German Road Vehicle Registration Regulation].

5.1.2.1 List of vehicles where a special wheel design may be used

The vehicles where a special wheel design may be used, the stipulations and notes to be observed and the suitable tyre sizes shall be clearly and unambiguously named in one or several tables.

As a rule, the vehicles where a special wheel design may be mounted are always described by indicating:

- Vehicle approval-type numbers and their supplement status or releases and/or constraints for other supplements
- Trade name of the vehicle,
- Official vehicle type, EBE vehicles are not permitted,
- Vehicle performance; here, vehicles may also be summarised by power range (from ...kW to ...kW).

If necessary, the following information may also be useful:

- Car-body design
- Drive concept (four-wheel drive, etc.)
- Variant designation, as from model year 20.., and/or to model year 20...
- Other technical constraints or releases which are useful for designing the range of applications.

The tables shall be preceded by the name of the vehicle manufacturer.

Technical characteristics such as tyre pressure monitoring systems, all-wheel steering, brake disc size, brake type, axle load, vehicle identification number, etc. shall usually be dealt with in stipulations and notes.

The decision as to which information is suitable for the description of the vehicles where a special wheel may be used shall be made on a case-by-case basis taking into account the technical characteristics described in the vehicle documents.

Following the granting of the type-approval, the range of applications of a wheel always extends to all supplement status of the vehicle (also to those not yet granted) which correspond to the description in the expert opinion. If any constraints for the use of the special wheel arise with regard to a supplement of a vehicle-type approval, this information shall be included in the next supplement of the type-approval for a wheel.

5.1.2.2 Requirements for stipulation texts

Stipulation texts shall always be worded in a way that any risk of misunderstanding or misinterpretation is excluded.

Where an acceptance is not required pursuant to Section 19 (3) *StVZO,* it must be assumed that the wheels were assembled by a person who has only limited technical knowledge. Accordingly, the texts shall be worded in an easily comprehensible way. In particular, the mounting elements to be used shall be described in a way that the user is able to clearly recognise the correct parts.

By way of stipulations imposed in a special wheel expert opinion, the use of parts on a vehicle cannot be allowed or prescribed which were not explicitly approved by the vehicle manufacturer or the owner of the vehicle's general operating licence for the use on the vehicle or for which no independent operating licence (design certification or international type-approval) was granted that permits the intended combination. Exceptions are rim cover discs as they may be a part of the scope of the expert opinion and/or the type-approval (cf. Section 2.2).

The stipulation texts shall be assigned to the respective vehicles and wheel/tyre combinations via a clear, easily legible numerical and/or alphabetical key.

Alongside the stipulations encoded by numbers and/or letters, brief indications e.g. of admissible wheel loads or car-body designs may also be recorded in the tables of the range of applications exclusively.

With regard to the wording of individual stipulation texts concerning the requirements set out in IST 01-08 (wheel cover, clearance and tyre brand retention), the arrangements which were made as part of the test laboratory conference 2008 amongst others can be found in Annex 3; it contains examples for stipulations which are no longer admissible and for arrangements concerning wordings to replace such stipulations.

5.1.3 Further annexes

Documents and technical drawings as indicated in Item 5 *Räderrichtlinie*.

Annex 1 of the information sheet comprises an example of a wheel description. The *KBA* has prepared this example to optimise the workflows. The technical service should ensure that the template is used by the applicants and/or that all information required according to the *Räderrichtlinie* is contained in the applicant's wheel description.

The texts in the wheel descriptions and the drawings may only be in German or in English. Wheel drawings or other documents of the technical documentation where important information is in German or English are not accepted. Bilingual wheel drawings may be submitted, e.g. in English and in Chinese.
The annexes shall be sorted as shown in the schedule of annexes and shall be marked as annexes of the expert opinion.

The application and type-approval documents must be comprehensible as independent documents. Therefore, it is not possible to replace any information contained in the technical description of the wheels by making reference to them being available in the QM handbooks of the manufacturer or the type-approval holder.

With regard to the use of standardised materials, the standardised designation of the material shall be named. When non-standardised materials are used, a description of the material composition and the material characteristics shall be provided.

5.2 Follow-up expert opinions for special wheels

The structure of a follow-up expert opinion is the same as for an original expert opinion. In particular, the same numbering of the individual sections for expert opinions and follow up expert opinions shall be observed.

The numbering of the individual stipulation and notes concerning the range of applications must also be adhered to in all follow-up expert opinions.

The follow-up expert opinion shall be preceded by a brief explanatory statement which states the reason for the preparation of the supplement. This explanatory statement makes the work easier for the *KBA*.

If the use of a wheel variant for additional vehicles has been reviewed positively, all possible uses already described in the extended annex of the range of applications shall always be relisted as well.

5.2.1 Change of the technical service in the event of a supplement

If a type-approval holder decides to change the technical services in the middle of a type-approval, the newly commissioned technical service may use the previous test data. The rules for the use of third party data shall be observed.

The newly commissioned technical service shall be responsible for the accuracy of the data and/or test reports used. They have to assess as to whether or not they can sign a technical report or an expert opinion based on the documents submitted for a supplement on their own responsibility. If they cannot take responsibility for this, new tests have to be carried out. The documents do not have to be submitted in their entirety. The scope shall be chosen as in the case of a usual supplement. An amended final certification shall be included in the follow-up expert opinion and should be worded as follows:

The expert opinion(s) no. dated ... of the technical service ... was available including all documents and measurement results required for the evaluation. The expert opinions stated continue to apply for the vehicle type/vehicle part type. This document gives a complete summary of the test report which deals with the entire scope of the type test including the documentation of the vehicle/vehicle part.

To provide an overview, the newly commissioned technical service has to cover the entire range of applications as a subject matter of such a supplement.

5.3 Expert opinion for identical wheels and replica wheels

Expert opinions for granting a general operating licence for identical wheels and replica must contain a statement for each wheel variant which clearly indicates that the variant described is an identical wheel and/or a replica wheel.

The formal structure of an expert opinion may be based on the structure of an expert opinion for special wheels as described in Section 5.1.

5.4 Expert opinion number

To establish a clearly comprehensible link between the expert opinion and the type-approval, an expert opinion number shall be written on all pages of the expert opinion alongside the wheel type, the type-approval holder and the name of the technical service.

With regard to expert opinions for special wheels as well as expert opinions for identical wheels and replica wheels, the expert opinion number should comprise a type-related part which is the same for expert opinions and supplements and a part which shows the number of the supplement or the summary.

In the event of expert opinions for identical wheels and replica wheels, the expert opinion number may consist of a part which relates to the design designation and a part which indicates the supplement status.

6 Wheel models and manufacturer’s declarations

6.1 Wheel models

When granting a general operating licence, the certificate for special wheels as well as identical and replica wheels imposes the requirement upon the applicant to store at least one measured model of a variant of the approved wheel type which is marked accordingly. More detailed provisions can be found in the type-approval certificate.

6.2 Particular confirmations to be only submitted when applying for a general operating licence for identical wheels and replica

In connection with the granting of type-approvals for identical and replica wheels, particular confirmations have to be submitted which cannot be found in the MAB. Corresponding text proposals are contained in 6.2.1 and 6.2.2.

6.2.1 Example for a manufacturer's confirmation and identical wheel confirmation

Manufacturer's declaration and identical wheel confirmation for granting a general operating licence

We (the company) applicant…

hereby declare that the

steel disc wheels Size designation...
of the design Design designation...
in the production plant Production plant...

are manufactured for us in series and that these wheels are identical (identical wheels) to the original wheels supplied by the vehicle manufacturer and/or their brand-related spare parts organisation for use in the vehicle types

Types of vehicles *)... .

The quality standard of these wheels corresponds to the one of the original wheels. We will promptly notify the technical service and the *KBA* of any change made by the vehicle manufacturer with regard to the release of the wheels mounted in series of which we become aware. However, the manufacturing plant referred to above supplies these wheels with a different marking than the original wheel.

Place, date Company stamp/signature

*) The official vehicle type and the trade name should usually be specified. It is not necessary to provide the general operating licence number and/or the EC type-approval number.

6.2.2 Example for a manufacturer's confirmation and replica wheel confirmation

Manufacturer's declaration and replica wheel confirmation for granting a general operating licence

We (the company) applicant…

hereby declare that the

steel disc wheels Size designation...
of the design Design designation...
in the production plant Production plant...

are manufactured for us in series and that these wheels are replica wheels of the original wheels supplied by the vehicle manufacturer and/or their brand-related spare parts organisation for use in the vehicle types

Types of vehicles *)... .

The quality standard of these wheels corresponds to the one of the original wheels. We will promptly notify the technical service and the *KBA* of any change made by the vehicle manufacturer with regard to the release of the wheels mounted in series of which we become aware.

Place, date Company stamp/signature

*) The official vehicle type and the trade name should usually be specified. It is not necessary to provide the general operating licence number and/or the EC type-approval number.

6.3 Test results of the wheel manufacturer for identical wheels and replica

As part of the simplified procedure pursuant to Annex 1 of the guideline for the testing of special wheels for passenger cars and their trailers, test results of the wheel manufacturer may be accepted by the technical services if certain prerequisites for identical and replica steel disc wheels are met. Furthermore, it is possible to take a comparative measurement of series and replica steel disc wheels or also examinations performed according to the vehicle manufacturer's test requirements as a basis for the preparation of the *ABE* expert opinion. The selected approach shall be clearly stated in the expert opinion for granting the general operating licence. If the test provisions of the vehicle manufacturer were used for the wheel manufacturer's own test results, the test requirements and/or test results do not need to be described in detail. The corresponding documentation shall be archived by the technical service and shall be submitted to the *KBA* upon request.

7 Administrative requirements

The documents to be submitted with the application are shown in the "information sheet on the initial assessment" (MAB) and in the *Räderrichtlinie*. The MAB is available for download on the homepage of the *KBA*.

7.1 Advance publication of the type-approval number

In order to be able to mark wheels with the required type mark, the moulds have to be produced accordingly. Tool making mostly take place long before the actual manufacture of the product. These circumstances shall be accounted for by publishing the type-approval numbers in advance.

Prerequisites for the advance publications of type-approval numbers are:

- The initial assessment of the type-approval holder must have a positive outcome and still be valid.
- The application for advance publication must be incorporated in the application for granting a type-approval. See Form 9 in the MAB.

Wheels with type-approval numbers which have been published in advance may only be placed on the market once the type-approval has been granted. If any products are found on the market prior to the type-approval date, type-approval numbers are no longer issued in advance to the type-approval holder concerned without any delay and until the market surveillance procedure initiated by the KBA is completed. If violations of the duties which are connected to the type-approval arise or if the type-approval holder turns out to be unreliable, further measures such as a revocation of the granted type-approvals may be taken.

7.2 Electronic document exchange

The type-approval documents should always be forward to the *KBA* by electronic means and should again be made available by the *KBA* by electronic means following the granting of the type-approval. Two procedures are available for the electronic data exchange.

7.2.1 Email

For the document exchange by email, the type-approval documents shall be sent by email to the following email address: 423@kba.de. Please note that the email including attachment must not exceed 19MB and is transmitted unencrypted.

For the further processing, the following information is required in the subject observing the following order and separated by a semi colon (;):

- Applicant
- Type
- Directives or rule
- Type-approval number (if known)

The document names should begin with an acronym (see below) for the corresponding document type. The names for the document shall be selected as follows:

Description sheet (incl. annexes):	BB_
Expert opinion (incl. annexes):	GA_
Cover letter, application:	VG_

The sender may freely choose the middle sections of the name. Documents must only be sent as PDFs. The *KBA* does not accept any other file types. The documents must not be compressed, encrypted or password protected.

Following the issue, the type-approval is sent to the email addresses stated in the application documents.

7.2.2 E-Typ

With regard to the server-based electronic document exchange in the type-approval procedure, the *KBA* enables the individual users and/or the technical service to access the E-Type system upon request. Subsequently, the access data is sent to the participants.

Data is transmitted in encrypted form. It is also possible to forward very large files. If a manufacturer cooperates with various technical services in the type-approval procedure, the non-disclosure of the documents shall be ensured by assigning corresponding authorisations.

Detailed information concerning the E-Typ transmission procedure may be downloaded from the *KBA* homepage. Application documents and information concerning the participation can also be found on the homepage.

7.3 Correction of errors

7.3.1 Correction of errors which are found prior to the granting of the type-approval

If any such errors are found in expert opinions already transmitted, the type-approval authority shall be notified without delay. Upon consultation, the errors may be corrected either by adjusting the documents which are already available to the authority or by submitting replacement sheets.

It is not permitted to send replacement sheets separately from the expert opinion which can still be included in the expert opinion on the premises of the technical service.

7.3.2 Correction of errors which are only found after the type-approval has been granted

If required, the technical service creates marked replacement sheets and sends them to the *KBA*. The *KBA* corrects the type-approval and sends a revised certificate to the type-approval holder and to the technical service.

At the specific request of the authority, the technical service shall make an assessment of the risks possibly arisen due to the error. On the basis of this assessment,

the type-approval authority then, if appropriate, makes a decision with regard to any necessary measures possibly required in addition.

The incorporation of additional vehicles in the expert opinion or the follow-up expert opinion shall not be deemed to be a correction. It is not permitted to transmit replacement sheets for this purpose. In such cases, the complete documentation for the granting of a supplement shall be submitted.

Annex 1

Example for a wheel description in order to obtain a general operating licence for a special wheel pursuant to Section 22 *StVZO*

The points of the wheel description completed as an example do not serve as a substantive standard but solely for illustration purposes.

Date of description	DD/MM/YYYY
Licence holder	xxx
Address	xxx

1. General Information

Wheel type	123
Wheel size and contour	7.5 J x 17 H2
Structure	One-piece aluminium wheel
International reference standard	In line with the European Tyre and Rim Technical Organisation *(ETRTO)*
Suitable tyre type	Tubeless
Snow chains	According to the information provided by the vehicle manufacturer and in the test report

2. Range of applications

Vehicle manufacturer/type	Cf. test report
Tyre size	Cf. test report
Maximum wheel load/ allocated rolling circumference	Cf. test report
Tightening moment	Cf. test report in connection with the information provided by the vehicle manufacturer

3. Dimensions and technical details

Pitch circle diameter	100 mm, 108 mm, 112 mm, x mm
Number of boltholes	3, x
Centring method	Centring
Diameter of the centre hole	66.6mm, xmm
Suitable valve types	according to the regulations in the test report
Type of mounting of the balance weights	e.g. adhesive weights, according to the regulations in the test report

4. Design

Material	AL Si 11 Mg
Chemical analysis	Si 10.0-11.8%, Fe 0.0-0.15%, Cu 0.0-0.1%, Mn 0.0-0.3%, Mg 0.2-0.4%, Zn 0.0-0.5%, Ti 0.10-0.15%, Ni 0.0- 0.003%, Pb+Sn 0.003%, Sb 0.10%
Mechanical characteristics	Tensile strength: 160N/mm^2 Proof strength (RP): 0.2, yield limit: 80N/mm^2 Elongation at rupture: 4-12% Hardness (HB): 55-75
Information in Item 4:	Minimum values (models taken from the casting)

5. Description of the wheel production

Manufacture of the blanks	e.g. gravity die-casting in the low-pressure die casting method
Processing	e.g. metal cutting on CNC turning and drilling machines
Heat treatment	T6
Surface treatment	Chemical pre-treatment Powder priming Multi-layer stoved enamel finish
Corrosion resistance	In the event of adverse weather events: very good In the event of sea water: good

6. Quality assurance

Raw material analysis	Supply of the raw material together with the analysis certificate of the supplier, cross-check by way of an internal spectrum
Melt	Spectrum analysis for each furnace charge
Cast blanks	100% X-ray inspection
Processed parts	Reviewing the functional dimensions by means of spot checks according to the test plan
Density	100% high-pressure test
Surface treatment	Inspection of the coat thickness, adhesive strength and corrosion resistance according to the test specification
Stability	Bending fatigue test, impact test and rolling test according to the test plan

7. Conformity of production

Describe conformity of production (CoP) test and frequency.

8. Production plants

Plant 1

Plant n

9. Marking by using adhesive labels *

Paint composition	Exact names of the paint components
Label	Designation of the factory label
Adhesive	Exact name of the adhesive used

* This information is only required if the factory labels are used according to the requirements set out in the information sheet “wheels”.

10. Accessory and associated drawings

Design drawing	No. 123456789	dated 24/07/2013
Accessory drawing	No. 123456789	dated 24/07/2013
Mounting element drawing	No. 123456789	dated 24/07/2013

etc.

Annex 2

Test requirements for adhesive labels

1. Scope of application

In exceptional cases which are to be coordinated in advance, these test requirements shall be applied to special wheels which receive a general operating licence pursuant to Section 22 *StVZO* if the prescribed marking should be made by means of adhesive labels. If a wheel type has been placed on the market in advance by means of a part expert opinion and is to receive a national type-approval from now on, the wheels may temporarily be marked as prescribed with the type mark by affixing adhesive labels on the ready-painted wheels without coordinating this with the *KBA*. In this exceptional case, the enclosed requirements shall also be observed.

These test requirements shall apply to:

- Labels made of metal plates and sheet metals,
- Labels made of plastic plates,
- Labels made of metal films with a thickness of up to 0.1mm,
- Labels made of plastic films with a thickness of up to 0.15mm,
- Labels made of metal films which are laminated with plastic films with the metal film having a thickness up to 0.05mm and a total thickness of 0.15mm,
- which are mounted using two-component adhesives
- Air-hardening adhesives,
- Other adhesives.

To stick labels made of massive metal plates and sheet metals, two-component adhesives shall always be used.

2. General requirements

Adhesive labels must bear a clearly legible and indelible marking and must be durably affixed.

The information must remain legible and the label must remain permanently affixed if the labels affixed as instructed are exposed to fuels and oils as well as the liquids occurring in ordinary operation (see 3.2). The adhesive labels must be resistant to vibration, abrasion, cold and heat as well as adverse weather conditions which usually occur during operations.

Once removed, film labels must no longer be used.

3. Test conditions

3.1. General

The test shall be carried out using adhesive label models with complete marking on the original surface. The general notes and instructions of the label manufacturer shall be observed.

A particular specimen shall be used for each of the inspections set out below. Before the individual tests are performed, the labels stuck to the specimen must be stored at room temperature for a minimum of 72 hours.

3.2. Resistance against liquids

It must not be possible to remove the adhesive labels without damaging them and the writing must remain fully legible if the labels are exposed to the following test liquids:

Test liquid	Test temperature (°C)	Test time (h)
Water (distilled water)	50	1
Sodium hydroxide (1%)	20 ± 2	0.5
Sulphuric acid (5%)	20 ± 2	0.5
Fuel (super acc to. DIN)	20 ± 2	0.25
Motor oil (HD oil)	20 ± 2	1
Diesel fuel	20 ± 2	0.5
Surfactants (amphoteric, anionic, non-ionic) 5% in water each	20 ± 2	0.5

The specimens should be fully submerged in the liquid during the test.

3.3. Aging resistance

Following a test of 120 hours according to DIN EN 6270-2, exposed in “AHT” condensation-water atmospheres and a test of a cycle according to DIN EN 6270-2, AHT 2,0 S, testing in a condensation-water changing climate with atmosphere containing $S0_2$, it must not be possible to remove the adhesive labels without damaging them; the writing must remain fully legible.

3.4. Adhesiveness (steam blasting test)

Following a 10 minute exposure of the specimen to 40 degree water from a high-pressure cleaner with an operating pressure of 50bar, at angles of 90° +/-45° and a nozzle distance of 0.4m - 0.6m, the edges of the adhesive label must not peel off.

3.5. Temperature resistance

The specimen is exposed to temperatures of -25°C and 100°C over a 24-hour period in each case. It must not be possible to peel off the labels from the surface either at -25 °C or at 100 °C without destroying them.

3.6. Adhesive strength (Tear-resistance requirement)

Following the treatments according to 3.2 to 3.5, the adhesive labels have to be reconditioned for a minimum period of 48 hours at room temperature. After that, they shall be carefully removed from the surface starting at a corner using a suitable sharp tool (e.g. razor blade) so that security die cuts at the edge are not damaged even if they are used with the adhesive labels. If this fails, the specimen has not met the tear-resistance requirements.

If there is a specimen with an undamaged, peeled off corner, this corner shall be mounted in a way that the label can no longer be torn off with regard to security die cuts possibly available as part of the following peel test.

If this fails, the specimen has not met the tear-resistance requirements.

In the event of specimens with undamaged, peeled off corners (with or without security die cuts at the edge), the labels must not peel off under a force of 3.5N per centimetre of width of the label which is applied at the edge of the label in perpendicular direction to the adhesive surface.

Adhesive labels which can be fully removed from the surface by hand using a suitable sharp tool without damaging them fail to meet the tear-resistance requirements. Furthermore, it should only be possible to remove film labels by destroying them.

3.7. Abrasion resistance
A crock meter test shall be performed (compared to a cotton rubbing fabric pursuant to DIN EN ISO 105-X12, 100 cycles, contact force 9 ± 0.2N, stroke 104 ± 3mm, cylindrical rubbing device Ø 16mm, 1 cycle/3 seconds, adhesive label stuck on painted car-body panels). With regard to models of which the dimensions are smaller than the stroke required, several models shall be stuck edge to edge onto one another.

The marking must also resist a sand trickling test pursuant to DIN 52348 without being damaged.

3.8. UV resistance
For a period of 100 hours, the adhesive labels shall be exposed to a UV test pursuant to DIN ISO 4892-3, cycle number 1.

The information contained on the adhesive labels shall be fully legible following the treatment according to Paragraph 3.2, 3.3, 3.4, 3.5, 3.7 and 3.8.

4. Test result
In each case, the test result refers to a specific type of adhesive label (manufacturer's information) and the associated originals surface.

Suitable documentary evidence shall be submitted to the *Kraftfahrt-Bundesamt* for the test requirements having been met. This may be done as follows:

- The technical service performs the tests itself
- A test report of a material testing institute
- A test report issued by a laboratory of an adhesive label manufacturers that disposes of the necessary test equipment

In the expert opinion to obtain a general operating licence, the marking using the adhesive label must absolutely be provided. Compliance with the test requirements may be achieved either by making reference to a test report or by making use of the above possibilities or by a direct confirmation given by the technical service that prepares the expert opinion.

5. Transferability of results

The results obtained under test conditions can only be transferred to other special wheels of the same manufacturer if the components used (surface, adhesive label and type of marking) are identical. To be able to trace the materials used, they shall be listed in the manufacturer's wheel description.

Annex 3

Agreements concerning the stipulation wordings for the requirements set out in IST 01-08

Categories: I Wheel cover

I/1	The wheel cover on axle 1 is not sufficient. By way of suitable measures - bringing out the wing or mounting suitable parts (e.g. spoiler corners) - sufficient cover of the tyre tread shall be ensured.	Sample text: Create sufficient wheel cover on axle 1 in front of the wheel centre
I/2	By taking suitable measures, sufficient wheel cover shall be ensured at axle 2 rearwards (wings area); e.g. by bringing out the wings and/or by lowering or by mounting car-body components such as wheel arch corners.	The wheel cover at axle 1 shall be created by bringing out the front apron or the wing or by mounting permanently fixed car-body components in the range of 0° to 30° in front of the wheel centre.
I/3	By taking suitable measures, sufficient wheel cover shall be ensured at axle 2 rearwards (e.g. by bringing out the wing, by lowering or by mounting car-body components such as mud flaps if they are still available as a standard). One or several measures may also be required.	The total width of the wheel/tyre combination must be covered in the above area taking into account the maximum possible operating size of the tyre (1.04x nominal tyre width).
I/4	Sufficient wheel cover shall be ensured on the rear wheel housings by mounting suitable parts or taking other adequate measures. Depending on the set-up condition of the vehicle (e.g. lowering of the vehicle, broadening of the wheel cover, etc.) the wheel cover may possibly be sufficient.	*Note:* *This example should also apply as a basis for wording the necessary stipulations concerning the wheel cover rearwards (50 degree), as well as complete, - towards the front 30 degrees and towards the back 50 degrees, for axle 1 and/or axle 2.*
I/5	Sufficient wheel cover shall be ensured on the front wheel housings by mounting suitable parts or taking other adequate measures.	
I/6	Sufficient wheel cover shall be created on the front and rear wheel housings by mounting suitable parts, e.g. wheel cover assembly kit VW part no. 5N0.071.680.GRU and/or 5N0.071.680.041 or wheel cover assembly kit comprising VW part no. on the front right …… .	

II Tyres

II/7	The use of this tyre size is only permitted if the value does not fall below the nominal tyre width of the minimum strip size entered as standard in the vehicle documents.	*Note:* *It was discussed that stipulations of this kind may be waived in the event of a suitable design of the allocation of tyre sizes and vehicle designs. Stipulations of this kind should no longer be used.*
II/8	This tyre size is not permitted for vehicle designs which are exclusively equipped with larger and/or broader tyres as standard.	
II/9	The use of tyre size 175/50/R15 on rim size 6 ½ J x 15 H2 is only approved by the following tyre manufacturers: Manufacturer Type Hankook K406, Optimo K 406 Kumho KH 15 Solus If other tyre makes/ types are used, documentary evidence in the form of a confirmation of the individual tyre manufacturer shall be provided for the fact that the tyre can easily be mounted on rim size 6 ½ x 15 H2.	If tyres of size xx are mounted on rim yy, an approval of the tyre manufacture must be available as the requirements for a general approval of the rim size are not met. The approval shall be carried along together with the document provided for by Section 19 Para. 4 *StVZO*. *Note:* *Naming tyre makes in stipulations is generally not permitted.*
II/10	The use of this tyre combination is only permitted if documentary evidence for the ABS suitability was provided. For the following makes, such suitability was confirmed by the tyre manufacturers: front 195/50R15-82U=1760mmandrear215/45R15-84U=1755mm Manufacturer Type Dunlop SP2000 Michelin Pilot SX GT If other tyre makes/ types are used, documentary evidence in the form of a confirmation of the individual tyre manufacturer shall be provided for the ABS suitability.	*Note:* *In a stipulation to be worded, it is only permitted to name the respective tyre size for axle 1 and axle 2 but not the tyre makes and rolling circumferences.*
II/11	The following wheel/tyre combination is permitted: Manufacturer Type Dunlop D40 If tyres of other manufacturers are used, a confirmation of the tyre manufacturer concerning the sufficient load-bearing capacity shall be carried along with the vehicle documents at all times.	*Note:* *This stipulation is considered to be unnecessary and will no longer be used in future.*

III Clearance of the wheel-tyre combination

III/12	At axle 2, the mounting strap of the bumper is to be shortened and/or bent backwards/upwards in the area of the upper bumper edge.	At axle 2, the mounting strap of the bumper is to be shortened by xxmm or to be bent backwards/upwards by the same number of mm in the area of the upper bumper edge.
III/13	At axle 2, the mounting strap of the bumper is to be shortened and/or bent backwards/upwards in the area of the upper bumper edge. The fastening screw is to be moved backwards.	At axle 2, the mounting strap of the bumper is to be shortened by xxmm or to be bent backwards/upwards by the same number of mm. The fastening screw is to be moved backwards to the furthest possible extent.
III/14	By shifting the handbrake cables in the area of the longitudinal control arm, sufficient clearance is to be created for the wheel/tyre combination.	By shifting the handbrake cables in the area of the longitudinal control arm by xxmm by way of attaching a trap, sufficient clearance is to be created for the wheel/ tyre combination.
III/15	By reworking the area of the rear wheel housing cut-out edges and/or the plastic inner wings in this area, sufficient clearance is to be created for the wheel/tyre combination.	By reworking the area of the rear wheel housing cut-out edges and/or the plastic inner wings in the area of ….., sufficient clearance is to be created for the wheel/tyre combination taking into account the maximum width (1.04x nominal tyre width).
III/16	By reworking the area of the rear wheel housing cut-out edges and/or the plastic inner wings in this area, sufficient clearance is to be created for the wheel/tyre combination taking into account the maximum permissible operating width according to ETRTO and/or *Wirtschaftsverband der deutschen kautschukindustrie (Wdk)* [Association of the German rubber industry].	*Note:* *These texts shall be completed. In the stipulations, specific measures, dimensions and areas shall be named.*
III/17	By expanding and/or bringing out the rear wheel housings in the outside area of the wheel, sufficient clearance is to be created for the wheel/tyre combination.	By expanding and/or bringing out the rear wheel housings in the … outside area of the wheel, sufficient clearance is to be created for the wheel/tyre combination. Note: This text shall be completed. In the stipulation, specific measures, dimensions and areas shall be named.
III/18	By installing additional jounce bumpers Votex part no. 000 071 501 A (rubber insert, approx. 12mm thick) at the rear suspension springs, sufficient clearance is to be created for the wheel/tyre combination.	By installing additional jounce bumpers Votex part no.000 071 501 A (rubber insert, approx. 12mm thick) at the rear suspension springs, sufficient clearance is to be created for the wheel/tyre combination. *Note: This stipulation may only be used if it is ensured that the labelling allows for a clear identification of the parts to be used.*
III/19	Attention is to be paid to ensure sufficient distance between the wheel/tyre combination and the brake hose, the wear indicator cable or the ABS cable and/or their retainings.	*Note:* *In a stipulation yet to be worded, the specific measures, dimensions and areas shall be named.*
III/20	By limiting the steering angle at the front axle, sufficient clearance is to be created for the wheel/tyre combination.	*The stipulation texts must describe specific measures.*
III/21	By limiting the steering angle or by reworking the front wheel housing on the wheel inside, sufficient clearance is to be created for the wheel/tyre combination.	*When determining the requirements, the guidelines of the system approval for the steering system of a vehicle shall be taken into account. Any components of which the use is mandatory according to a stipulation must be approved by the vehicle manufacturer.*
Other/ 24	The special wheels must lie flush against the wheel mounting surface. Protruding parts which are an obstacle to this must be replaced by suitable parts.	*Note:* *If this content requires a stipulation in future, the measures provided for and the required parts must be clearly stated in a newly worded text.*

Legal notice

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We score with road safety!