
Contract Conditions for Participation in Type Approvals of Road Marking Systems on the Wear Simulator (RPA) of the Federal Highway Research Institute (BASt)

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1 Object of the contract and application procedure

1.1

The object of this contract are type approvals of road marking systems in accordance with the “Technical Test Conditions for Road Marking Systems (TP M 18)” and DIN EN 13 197 (December 2011 edition + A1:2014) respectively. Among other things the type approval contains the determination of the traffic-related properties (skid resistance, daytime and night-time visibility) following DIN EN 1436 (March 2018 edition) and the “Additional Technical Contract Conditions and Guidelines for Road Markings (ZTV M 13)” respectively. The wear resistance is determined according to ZTV M 13 and - if necessary – chemical analyses of road marking materials and additives following TP M 18.

1.2

Type approvals will be conducted on the wear simulator of BAST separately for each group of road marking materials. After invitation from BAST to each test run the applicant transmits the “Application Form for Conducting Type Approvals of Road Marking Systems (Application)” for registration. Applicants can either be manufacturers themselves or a representative. Such a representative needs to be appointed by a manufacturer through written power of attorney. Additionally, to the Application sending the safety data sheets for the appropriate road marking material is necessary for registration. The assignment of an approval number will be assigned after the deadline of application. Without safety data sheets a registration is not possible. The approval numbers are assigned exclusively by the BAST.

1.3

By transmitting the application form the applicant accepts these “Contract Conditions for Participation in Type Approvals of Road Marking Systems on the Wear Simulator (RPA) of the Federal Highway Research Institute (BAST)”.

1.4

BAST informs the applicant after receiving all required documents and expiry of the announced deadline, if and how many testing places are available at what time. BAST informs the applicant about the expected period for the application process. The exact date of the application process will be fixed by the applicant and BAST resp. the “German Association for Road Markings (DSGS)”.

2 Client's obligations

2.1

The applicant has to complete the application form and append a legally valid signature to the application form. The applicant may submit the completed application form by facsimile or e-mail (epm@bast.de) in advance.

2.2

The applicant submits the completed material data sheets, data sheets for the road marking material and all other necessary information in German or English language (e.g. manufacturer / processing information) not later than one week before the date specified for the application process. Additionally the applicant submits a declaration of performance for the used drop-on materials according to Regulation (EU) No. 305/2011 (Construction Product Regulation) not later than one week before the date specified for the application process. Required information such as the test number, which is not part of the declaration of performance, must be added by hand. If the applicant does not submit the above listed information at least one week before the application process, BAST is entitled to claim for an adequate compensation according to §642 of the German Civil Code (BGB). The same applies in case of the applicant informing BAST in written form, that he does not use one or more approval numbers any more. The time period of one week before application process is only valid, if there is no other date written in our documents. As a rule, the compensation will not be below 500 Euro. BAST reserves the enforcement of advanced claims and rights.

2.3

To ensure a correct realisation of the application process the applicant will supply the necessary amount of road marking materials and additives in a workable condition and free-of-charge to BAST not later than the agreed application process date.

The same applies in case the application process will not take place on the premises of BAST.

If the delivery is delayed, the applicant has no title to the realization of the application process and conducting the type approval.

2.4

The applicant will provide at least the following amounts for one sample:

- in case of paints and cold plastic: a 20-liter container filled to at least three-quarters
- in case of thermoplastic: a container holding approximately 25 kg
- in case of drop-on materials (additives) at least one complete container of approx. 25 kg
- in case of tapes: a continuous piece of 2 m length and 0.3 m width

The applicant is responsible that each single container as well as the supplied amount contains material representative for the production specification. The applicant accepts the

quantities for the reserve samples specified in the next paragraph also. The delivered quantity of the drop-on materials will be prepared in a sample splitting device before taking the reserve sample.

2.5

In all cases the applicant has to provide suitable empty containers including the necessary empty containers for the reserve samples of the road marking materials (3 x 1 kg for paints and for thermoplastics and for reactive systems 3 x 1 kg for each component, bottles made of polyethylene for liquid hardener) and the drop-on materials (2 x 1 kg) and 5 – 10 l of solvent for cleaning the application machine. Tests have shown that reactive systems with a mixing ratio of 1:1 + x (base component: accelerated component + hardener in the mixing ratio specified by the manufacturer) or 98:2 / 100:1 (base component incl. accelerated component + hardener) achieve comparable results in terms of traffic-related properties. Depending on the application method used and the external application boundary conditions (e.g. temperature), liquid or powder hardener can be selected in the mixing ratio specified by the manufacturer. If the applicant does not provide any other information, it is assumed that the marking material can be applied in both variants and with different hardeners (liquid or powder hardener) without resulting in differences in the chemical composition (mixing ratio of master component / hardener). Test certificates lose their validity immediately if the aforementioned requirements are no longer met. This is not valid for systems with reactive glass beads. For the use in Germany all road marking materials as well as all additives must fulfil the requirements of the “Technical Test Requirements for road markings (TP M 18)”. No test certificate will be issued for road marking materials which do not fulfil these requirements.

2.6

If a supplied road marking substance or additive cannot be processed to form a testable road marking sample for reasons falling under the responsibility of the client, this will lead to exclusion from the type approval. Any costs arising in this process will be paid by the client.

2.7

Clients are obliged to dispose of all residual quantities at their own expense immediately after the application process.

2.8

In case of a self-application process, monitored by DSGS or BAST clauses 1 to 7 apply correspondingly.

3 Application procedure

3.1

Application process dates and dates for type approval as well as the sequences related to the types of road marking systems to be approved will be specified by BAST.

3.2

The application process of road marking materials and additives to the test plates of the RPA – hereafter referred to as samples - will take place exclusively under the supervision of the DSGS and/ or BAST. The applicant selects the roughness class of the test plates with the application. Test plates of roughness class RG1 and RG 2 in accordance with DIN EN 13197 are available for selection. The costs for the different test plates can be found in Appendix 2. The selected roughness class is documented with the test results (table of measured values, test confirmation, test certificate). The application generally takes place on the premises of the BAST. External applications will only be arranged in case the desired procedure cannot be carried out at BAST, because of a special kind of application process.

3.3

For external applications the applicant is obliged to organize the transport of the test plates from BAST to the place of the application process and back to BAST on his own account. Additionally requested test plates should also be sent back irrespective of their use. The monitored application process will take place at a suitable location (monitored self-application process, see §2 clause 8). Directly after the application process the samples should be stored under supervision (see above) in locked containers provided for this purpose by BAST and delivered directly to BAST within 3 working days. All test plates should be clearly labelled so that they can be differentiated from the plates where application is not correct. All costs arising in this process will be paid by the applicant. The applied samples (and also additional ordered reserve samples) must be delivered to BAST within one week after the application process to avoid exclusion from the related type approval. BAST reserves the enforcement of rights, such as compensation for damages. In consultation with BAST, DSGS reserves the right to charge for the additional expenditure (at least travel expenses) for road markings that cannot be applied at BAST.

3.4

The drop-on materials delivered for the application process must dispose of a declaration of performance and a prefabricated label containing all information regarding the CE-marking and must be representative for the production. Drop-on materials will be analyzed by Camsizer within the identification analyses and the results will be compared to the declaration of performance. Exclusively the delivered drop-on materials (granulometry, mixing ratio) will be used in the application process, i.e. later mixtures by hand are not allowed.

3.5

If a road marking system should be tested with drop-on materials which do not yet have a CE-marking and the system passes the test, the applicant will subsequently apply for the CE-marking, and present this as well as the declaration of performance to BAST no later than 6 months after the end of the test. Only then the applicant will receive the test certificate or the confirmation for his road marking system.

3.6

If more than two application process attempts are necessary to produce the road marking system with the same parameters (road marking substance, drop-on material, layer thickness) to the satisfaction of the applicant and these attempts have not been caused by technical mistakes of the DSGS, BAST will charge the applicant for additionally required test plates and after consultation with the DSGS the additionally required time. If upon request of the client the application process is repeated with different parameters (road marking substance, drop-on material, layer thickness), BAST will charge the additionally required test plates and after consultation with the DSGS the additionally required time (fees see appendix 2). Therefore, however, the applicant should know at the time of application the composition (layer thickness, bead quantity and size etc.) in which his road marking system should be applied. For systems, which have to be applied in several steps, the BAST reserves the right to charge the applicant after consultation with the DSGS the additionally required effort.

3.7

All involved tapes will be applied by the applicant on the premises and under supervision of BAST. If necessary a monitored self-application process is also possible for tapes.

3.8

In general, an application process takes place on the premises of the BAST and involves several applicants at the same time. Consequently, the presence of representatives from competing enterprises cannot be ruled out. Third parties are obliged to stay outside the application room during the application process.

3.9

Samples will be stored for at least half a year after shipment of the test results and can be examined after appointment and collected by the client within 3 weeks after the expiry of the 6-month storage time exclusively for personal use. A written confirmation to this effect is required as well as a written application.

3.10

The duration of the type approval depends on the submitted traffic class and the type of the road marking system; the durations are specified in Appendix 1. BAST reserves the right to stop the test for one sample, if it is damaged after a few wheel passages to avoid damages at other test samples. In this case the effort arisen until then and the costs for the application will be charged.

3.11

It may be specified in the application protocol whether the applicant would like to receive photos (top view) of the development of the test samples during the test (for costs see Appendix 2).

3.12

It can also be noted in the application protocol whether one of three test plates should be taken out of the run prematurely if one of the traffic-related properties does no longer correspond to the minimum requirements following DIN EN 1436. This procedure enables the applicant to examine the state of the test samples at the beginning of the shortfall of the minimum requirements as well as the further development up to the end of the test. However, only a table of measured values will be issued in these cases. This also applies, if both test plates staying in the test run fulfil the minimum requirements again; the costs of the test are not influenced by this procedure, because the test is continued up to the submitted traffic class.

3.13

There is the additional possibility to request macro photos of the test samples in the application protocol. These photos illustrate the area of wheel passages, where the skid resistance is measured. The applicant can order all macro photos (all three test plates per measuring cycle) or only a selection (e.g., all three test plates in new state, all three test plates at the time of failure of one of the traffic-related properties, all three test plates in the final state). The costs per macro photo are specified in Appendix 2.

3.14

In addition, it can be noted in the application protocol whether a Urmusterprüfung (chemical analysis) is required if only the requirements of DIN EN 1436 are fulfilled. If the requirements of ZTV M 13 are fulfilled during the test on the wear simulator, a chemical analysis is automatically carried out. The costs of the chemical analysis shall be borne by the applicant.

4 Test and test results

4.1

Within the type approval following TP M 18 and DIN EN 1436 respectively the subsequent listed characteristics are measured:

- chromacity coordinates (x,y)
- Luminance factor (β)
- Luminance coefficient in diffuse illumination (Qd)
- coefficient of retro reflected luminance in dry (RL dry)
- coefficient of retro reflected luminance in wet (RL wet)

- skid resistance (SRT-units)

Additionally, the no pick-up time and the abrasion are measured following DIN EN 13197.

4.2

The results of the type approval tests will be compiled in a table of measured values. Should the minimum requirements following DIN EN 1436 be obtained, an additional test confirmation will be issued. If the minimum requirements according to ZTV M 13 as well as the requirements according to TP M 18 are fulfilled, a test certificate will be issued in addition. The test certificate includes information about the obtained classes according to ZTV M 13. In doing so, it is taken into account that in ZTV M 13 higher classes for the visibility properties are chosen from DIN EN 1436. For a test certificate according to ZTV M 13 the requirements for the no pick-up time (max. $T_4 \leq 30$ min.) and the abrasion (at least 90% remaining) must be fulfilled as well. If a system falls short of the minimum requirements according to DIN EN 1436, the applicant will only receive the table with the actually measured values.

4.3

Full details on the tested road marking system in the application protocol and in all the data sheet are prerequisites for the issue of a confirmation or a test certificate. With the identification the material data given by the applicants is verified. If some of the material data is not given by the applicant, the results of BAST will be effective. The result of identification – a confirmation of the material data given by the applicants - is given to the applicant together with the results of the test on the wear simulator. If the results of BAST do not confirm the material data given by the applicant, the applicant is asked to explain in written form. If a clarification is not possible in written form, the applicant is invited to a clarifying talk. If no clarification is possible, the results of BAST will be effective. At the request of the applicant, unconfirmed results of the chemical analysis can be verified by repeating the chemical analysis by BAST. If the result of the repeated chemical analysis differs from the result of the initial analysis by taking into account the measurement uncertainty, the repeated analysis is free of charge. In case the results of the initial analysis are confirmed, the costs for the repetition are to be paid by the applicant. The tolerances of DIN EN 12 802 are effective. The ration of glass beads and anti-skid aggregates can be analyzed by a particle analyzer and will be compared to the manufactures' information. As there are no tolerances in DIN EN 1423 for the ration of glass beads and anti-skid aggregates, a tolerance of $\pm 5\%$ is defined by theses contract conditions.

4.4

All documents are issued in German language. Issuing documents in English will incur an extra charge. The German version is binding.

4.5

Test results are submitted exclusively to the applicant, unless BAST is not obligated to submit the result to a third party because of legal requirements. In individual cases BAST reserves the right to submit test results only following payment or to conduct the type approval only against an advance payment.

4.6

If the requirements of ZTV M 13 and the TP M 18 are fulfilled, the road marking system will be added to the database of BAST, unless the applicant raises objection.

5 Payment

5.1

(1) The payment rates for the testing of one sample depend on the requested traffic class and they are specified in the appendix 2 “Payment Regulations for Type Approval of Road Marking Systems on the Wear Simulator (RPA) of the Federal Highway Research Institute (BAST)”. The chemical analyses of the road marking substrates and additives will be invoiced separately. These costs are not included in the cost for the type approval (see Appendix 2).

5.2

Payment is also indispensable on a negative outcome of tests (minimum requirements are not fulfilled).

5.3

Payment is due on receipt of the invoice. If an applicant falls behind with the payment, he owes BAST for the period of default a default interest of 4% above the respective base interest rate of the European Central Bank. BAST reserves the right to charge an advance payment on the expected costs before test commencement. All foreign applicants are generally required to make an advance payment amounting to the costs for traffic class P 4. In individual cases, the advance payment may also correspond to the amount of the fee expected to be paid.

5.4

Foreign applicants are obliged to notify BAST of their tax ID number (VAT, TVA, etc.).

6 Liability

6.1

The liability of BAST for its employees and agents of vicarious liability is restricted to intent and gross negligence. Participating representatives of the applicant who do not observe given instructions act at their own risk. Otherwise legal regulations apply.

7 Test cancellation

7.1

Cancellation or interruption of a type approval by the BAST or its agent of vicarious liability for important reasons beyond BAST's control will not entitle the client to claims for compensation for damages. Important reasons include for example the malfunctioning of the test facility (RPA). Payment is not charged in such cases, unless the applicant is responsible for the malfunction.

8 Publication

8.1

Data, records and documentation remain in the ownership and possession of the BAST.

8.2

All publications related to the tests need to be approved by the BAST. Certificates and test results may only be published in their entirety.

9 Additional regulations

9.1

Legal regulations (§631 cont. of BGB) and the specifications of the 'Cost Conditions for Services (VL-BASt)' apply additionally.

9.2

The client's business conditions do not apply.

9.3

Modifications or supplements to these contract conditions require written form. The requirement of written form can only be renounced by written agreement. Any verbal secondary agreements are excluded.

9.4

If individual clauses of these contract conditions become ineffective, the validity of the remaining clauses will remain uninfluenced.

9.5

Court of jurisdiction is Cologne.

9.6

The German version of these contract conditions is binding.

9.7

During the process of approval tests it might be necessary to save personal data. These data are used in the framework of approval tests exclusively. The regulations of the Data Protection Ordinance are respected.

https://www.bast.de/BASt_2017/DE/Service/Datenschutz/Datenschutz_node.html.

Appendix 1

Notes on conditions for type approval of road marking systems on the wear simulator (RPA) of the Federal Highway Research Institute (BAST)

Traffic-related requirements for all road marking systems are specified following DIN EN 1436 (issued in March 2018) respectively ZTV M 13. Approval conditions, especially those pertaining to rollover counts, needed to be adapted to the specifications of EN 13 197 (December 2011 edition and A1:2014) and TP M 18 respectively. The groups of road marking materials as paints (high solid and water-based paint), tapes based on aluminum and thermoplastics will until further notice be tested with 4 wheels. The groups of road marking materials as tapes and reactive systems (cold plastic and cold plastic spray) will be tested with 8 wheels.

The following traffic classes apply according to DIN EN 13197 (December 2011 edition and A1:2014) and ZTV M 13 respectively:

Traffic class.....	Wheel passages on RPA
P 2.....	100,000
P 4.....	500,000
P 5.....	1,000,000
P 6.....	2,000,000
P 7.....	4,000,000

The 'Additional Technical Contract Conditions and Guidelines for Road Markings (ZTV M 13)' specify that road markings are tested up to the traffic classes listed below in accordance with their intended use. ZTV M 13 also contains the applicable minimum value for wear resistance (90 % residual area).

According to ZTV M 13, the different road marking systems are approved on RPA as follows:

Permanent road markings

- Traffic classes P4 – P5 for paint road marking systems type I
- Traffic classes P6 – P7 for other road marking systems type I
- Traffic classes P6 for paint road marking systems type II
- Traffic classes P6 – P7 for other road marking systems type II

Vorübergehende Markierungen

- Traffic classes P2 for marking systems type I for short-term use
- Traffic classes P4 - P5 for paint road marking systems type I
- Traffic classes P5 und P6 for paint road marking systems type II
- Traffic classes P5 – P7 for all other marking systems

Appendix 2

Payment Regulations for Type Approval of Road Marking Systems on the Wear Simulator (RPA) of the Federal Highway Research Institute (BAST)

Costs depend on the traffic classes involved and exclude the value-added tax applicable in each case. 2. Payment rates for approval tests of road marking systems.

The payment rates for the approval test include the test plates, the execution of the test, the determination of the traffic-related properties and the wear resistance before, during and after the test on the RPA including the documentation of the results in the form of a confirmation of the testing of the road marking system on the RPA of BAST according to European standards (if the minimum requirements of the standard are fulfilled) or in the form of a table of measured values (if the minimum requirements of the standard are not fulfilled). If the requirements of ZTV M 13 are also fulfilled, taking TP M 18 into account, a certificate is also provided in accordance with ZTV M 13.

The following prices apply to all road marking systems for which the application of the road marking material and drop-on materials on test plates made of mastic asphalt (RG1) is executed by DSGS on behalf of BAST:

Traffic class	Approval test	Application	Unit	Total price in Euro
P2	2250,00 €	1100,00 €	test sample	3350,00 €
P4	2775,00 €	1100,00 €	test sample	3875,00 €
P5	3200,00 €	1100,00 €	test sample	4300,00 €
P6	3800,00 €	1100,00 €	test sample	4900,00 €
P7	5000,00 €	1100,00 €	test sample	6100,00 €

The following prices apply to tapes where the application of the tape on the test plates made of mastic asphalt (RG1) is executed by the manufacturer at BAST:

Traffic Class	Approval test	Application	Unit		
P2	2250,00 €	140,00 €	Test sample		
P4	2775,00 €	140,00 €	Test sample		
P5	3200,00 €	140,00 €	Test sample		
P6	3800,00 €	140,00 €	Test sample		
P7	5000,00 €	140,00 €	Test sample		

Additional services to be ordered separately:

Type of Service	Unit	Price in Euro
Top view photos of the test	Test sample	50,00 €
Macro photos	Photo	25,00 €
Modification of a test confirmation according to EN	Confirmation	500,00 €
Modification of a test certificate according to ZTV M 13	Certificate	500,00 €
English translation of a test confirmation according to EN	Confirmation	500,00 €
Additional costs for alternative test plates made of split mastic asphalt (RG2)	Test sample	700,00 €
Additional costs for alternative test plates made of porous asphalt (RG4), only on special request	Test sample	700,00 €
Additional test plate made of mastic asphalt (RG1)	Test plate	60,00 €
Additional test plate made of split mastic asphalt (RG 2)	Test plate	200,00 €
Additional test plate made of porous asphalt (RG4)	Test plate	200,00 €
Additional application costs (§3, Para. 6)	Hour	200,00 €

The following data for the chemical analyses are provided for orientation reasons. The actual costs are calculated on the basis of the number of executed analyses and generated reports.

Type of services	Price in Euro
Color 1K	approx. 950,00 €
Color 2K	approx. 1700,00 €
Cold plastic (Comp. A+(B) + Hardener)	approx. 1000-2000,00 €
Cold plastic spray	approx. 870,00 €
Thermoplastic	approx. 950,00 €
Tape	approx. 1300,00 €
Analyses of drop-on materials using the Camsizer, mixture of glass beads and anti-skid aggregates	approx. 200,00 €