Baustofflabor
Hamburg
Dipl.-Ing. Labryga GmbH

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Fa.
ORGKHIM CJSC
Management Company Trade House
Herrn Dr. Ilichev
29-d Gagarin Av.
603057 Nizhny Novgorod
Russina Federation

Anerkannt nach RAP Stra 10
für die Fachgebiete
A1, A3, A4, B2, B3, B4, D3, D4, F2,
F3, F4, G3, G4, I1, I2, I3, I4
Anerkennung als Prüfstelle gemäß
ZTV M 02, Stufe 1 und 2
NB 1742

Laboratory number 671/13-phase 2 Hamburg 23.07.2013

Client: ORGKHIM CJSC
29-d Gagarin Av.
603057 Nizhny Novgorod
Russian Federation

Order: Testing of bitumen samples with and without addition of AFTISOTDOR according to order

Material: 50/70 ex German refinery and AFTISOTDOR (adhesion agent)

Entrance of material: 10.04.2013

1. Generell information to the Test Order

Company ORGKHIM CJSC ordered the Baustofflabor Hamburg with the modification of a german 50/70 paving bitumen with 0.4% AFTISOTDOR and to test this sample in comparison to the same paving bitumen 50/70 without AFTISOTDOR according to the offer and the order from ORGKHIM company. The ordered tests includes the test of adhesion between aggregates and bitumen with and without AFTISOTDOR.

2. Test Results

The following tables show the test results of the tested 50/70 bitumen with and without addition of 0.4 m.-%% AFTISOTDOR.

Table 1: Test Results 50/70 with and without AFTISOTDOR and quarzite

Properties	Unit	Testmethod	**50/70 + 0.4 m.-% AFTISOT-DOR** Actual Value	**50/70 without AFTISOT-DOR** Actual Value	Specified Value
EMPA test at 80°C, 1 h	%	-	**90**	**75**	≥ 70*
Rolling bottle test, 6h	%	DIN EN 12697-11	80	70	-
Rolling bottle test, 24h	%	DIN EN 12697-11	**65**	15	≥ 60**
difference of contact angle before and after wet storage for 24h at +45°C	°	-	**7,2**	65,7	≤ 10***

* Specified values are based on standards or on empirical datas.
** Recommendations from government.
*** Recommendation for pure bitumen.

Table 2: Test Results 50/70 with and without AFTISOTDOR and quarzporhyrite

Properties	Unit	Testmethod	**50/70 + 0.4 m.-% AFTISOT-DOR** Actual Value	**50/70 without AFTISOT-DOR** Actual Value	Specified Value*
EMPA test at 80°C, 1 h	%	-	**75**	45	≥ 70*
Rolling bottle test, 6h	%	DIN EN 12697-11	70	45	-
Rolling bottle test, 24h	%	DIN EN 12697-11	**60**	10	≥ 60**
difference of contact angle before and after wet storage for 24h at +45°C	°	-	**9,4**	62,5	≤ 10***

* Specified values are based on standards or on empirical datas.
** Recommendations from government.
*** Recommendation for pure bitumen.

Table 3: Test Results of indirect tensile test, used aggregates quarzpophyrite and limestone filler

Properties	Unit	Testmethod	50/70 + 0.4 m.-% AFTISOTDOR Actual Value	50/70 without AFTISOTDOR Actual Value	Specified Value
indirect tensile stiffness, dry storage	MPa	DIN EN 12697-30,-23,-12	2,662	2,856	-
indirect tensile stiffness, wet storage	MPa	DIN EN 12697-30,-23,-12	2,652	2,585	-
indirect tensile stiffness ratio	%	DIN EN 12697-30,-23,-12	**99,6**	**90,5**	≥ 80

Bald printed numbers fulfill the limits.

3. Evaluation of the test results of phase 2

The conducted tests show clearly, that the addition of the product AFTISOTDOR increases the adhesion between aggregate and bitumen. The testing of the water sensitivity of Marshallspecimen with and without addition AFTISOTDOR in the used 50/70 bitumen increases the adehsion to nearly 100%. The testing of the adhesion via covering tests like EMPA or the rolling bottle test shows a very good influence of AFTISOTDOR to the test results.
The testing of the difference contact angle before and after water storage shows depending on the 2 used aggregates a very good increase in the adhesion between the bitumen with AFTISOTDOR compared to the bitumen without the additive. The bitumen without the additive has a tremendous loss in the adhesion, expressed via the change of contact angle with more than 60°. At this moment the test results let the observer look positive in the usage of AFTISOTDOR in bitumen to improve the adhesion between aggregate and bitumen.

Prüfstellenleiter

Dr.-Ing. Burghard Herr