PAVEIT, Musterstraße 8a, 1187 Dresden, Germany

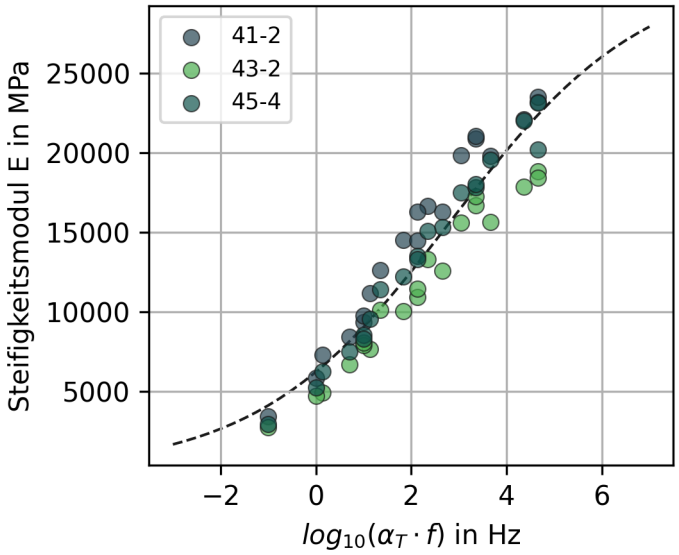
Bundesanstalt für Straßenwesen
Brüderstraße 53
51427 Bergisch Gladbach

Datum: 21.01.2024

Prüfbericht 20240409-B623

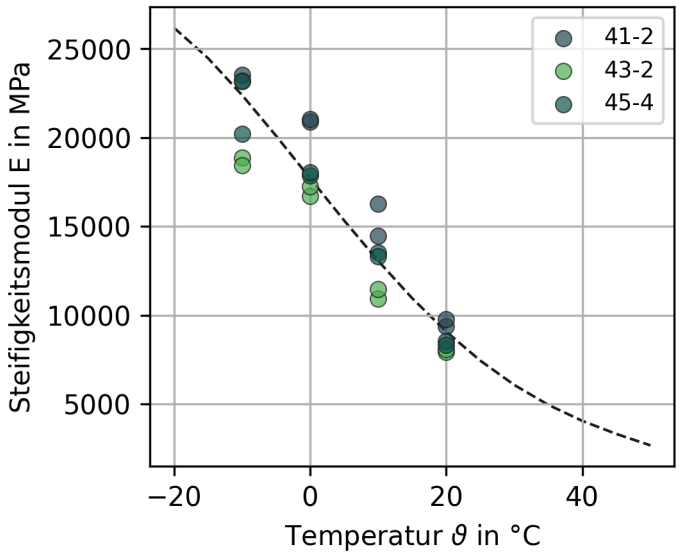
Kunde:	Bundesanstalt für Straßenwesen
Projekt:	Ringversuch SPZ
Arbeitspaket:	Asphaltbinderschicht
Serie:	Serie 01
Material:	AC 16 B S
Asphaltmischgut:	AC 16 B S
Norm:	Technische Prüfvorschrift für Asphalt Teil 26 Spaltzug-Schwellversuch - Bestimmung der Steifigkeit (2018)
Prüfbedingungen:	Temperaturen: -10.0 °C, 0.0 °C, 10.0 °C und 20.0 °C Frequenzen 10.0 Hz, 5.0 Hz, 1.0 Hz und 0.1 Hz
Projektleiter:	Dr.-Ing. Markus Clauß
Proben:	Die Asphaltproben wurden im Labor aus Mischgut hergestellt.
Komponenten:	servo. Prüfmaschine: LH 08 63/50 S - Wille Geotechnik Temperierkammer: T430 KH - Wille Geotechnik (Seriennummer: 069/08) Kraftmessdose: Kraftsensor Serie K - GTM (Seriennummer: 64666) LVDT 1: WA/2 mm - HBM (Seriennummer: 093410013) LVDT 2: WA/2 mm - HBM (Seriennummer: 093410014)
Anmerkung:	Es wurden keine Probleme bei der Prüfung festgestellt.

Hauptkurve:



Parameter	Wert	Einheit
Emax	31542.0	MPa
Emin	0.0	MPa
phi	21671.1094	-
z0	1.4011	-
z1	-0.4928	-
r2	0.9108	-

Steifigkeitsmodul-Temperaturfunktion für 10,0 Hz:



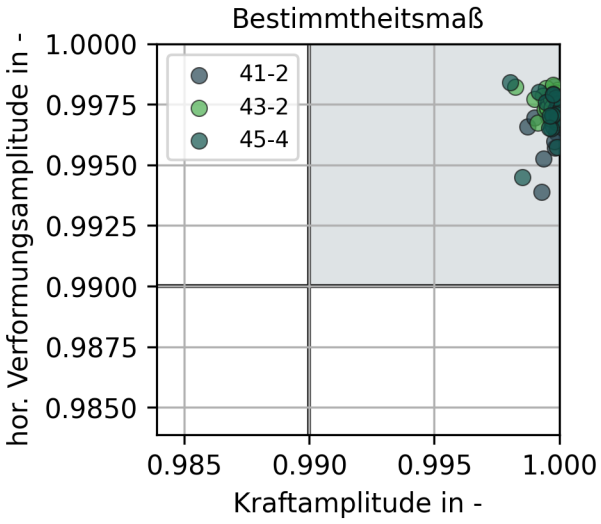
Temperatur	Steifigkeit
-20	26207
-15	24446
-10	22396
-5	20125
0	17734
5	15337
10	13043
15	10934
20	9064
25	7450
30	6090
35	4962
40	4037
45	3286
50	2679

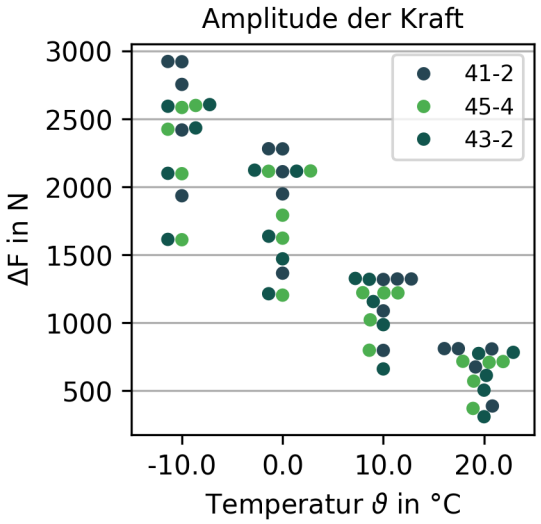
Einzelergebnisse:

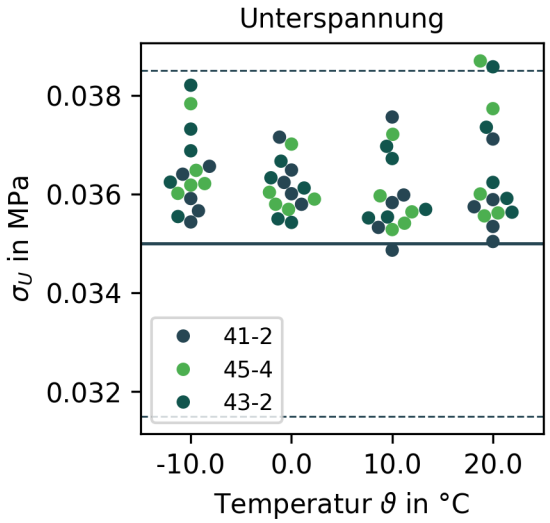
Probe	Dichte	Durchm.	Höhe	Temp.	Freq.	Untersp.	Obersp.	el. Anfangsdeh.	Phasenw.	Steifigkeit
41-2	2.417	100.6	40.6	-10.0	10.0	0.036	0.947	0.0603	0.175	23204
41-2	2.417	100.6	40.6	-10.0	10.0	0.035	0.948	0.0594	0.183	23520
43-2	2.393	100.6	41.4	-10.0	10.0	0.037	0.849	0.0658	0.180	18860
43-2	2.393	100.6	41.4	-10.0	10.0	0.036	0.850	0.0676	0.206	18438
45-4	2.407	100.6	39.9	-10.0	10.0	0.036	0.849	0.0535	0.154	23165
45-4	2.407	100.6	39.9	-10.0	10.0	0.036	0.849	0.0617	0.191	20195
41-2	2.417	100.6	40.6	-10.0	5.0	0.036	0.899	0.0596	0.195	22115
43-2	2.393	100.6	41.4	-10.0	5.0	0.036	0.800	0.0651	0.181	17879
45-4	2.407	100.6	39.9	-10.0	5.0	0.036	0.801	0.0528	0.173	22025
41-2	2.417	100.6	40.6	-10.0	1.0	0.036	0.798	0.0584	0.197	19814
43-2	2.393	100.6	41.4	-10.0	1.0	0.037	0.697	0.0642	0.193	15647
45-4	2.407	100.6	39.9	-10.0	1.0	0.036	0.698	0.0514	0.165	19560
41-2	2.417	100.6	40.6	-10.0	0.1	0.037	0.646	0.0567	0.236	16313
43-2	2.393	100.6	41.4	-10.0	0.1	0.038	0.545	0.0613	0.234	12583
45-4	2.407	100.6	39.9	-10.0	0.1	0.038	0.547	0.0504	0.225	15339
41-2	2.417	100.6	40.6	0.0	10.0	0.036	0.749	0.0547	0.222	20893
41-2	2.417	100.6	40.6	0.0	10.0	0.036	0.750	0.0543	0.198	21046
43-2	2.393	100.6	41.4	0.0	10.0	0.036	0.698	0.0635	0.229	16697
43-2	2.393	100.6	41.4	0.0	10.0	0.035	0.699	0.0617	0.232	17251
45-4	2.407	100.6	39.9	0.0	10.0	0.036	0.698	0.0596	0.211	17847
45-4	2.407	100.6	39.9	0.0	10.0	0.036	0.699	0.0589	0.222	18028
41-2	2.417	100.6	40.6	0.0	5.0	0.036	0.700	0.0532	0.214	19869
43-2	2.393	100.6	41.4	0.0	5.0	0.035	0.549	0.0525	0.248	15633
45-4	2.407	100.6	39.9	0.0	5.0	0.036	0.599	0.0514	0.203	17514
41-2	2.417	100.6	40.6	0.0	1.0	0.036	0.649	0.0586	0.220	16670
43-2	2.393	100.6	41.4	0.0	1.0	0.036	0.498	0.0554	0.244	13299
45-4	2.407	100.6	39.9	0.0	1.0	0.036	0.548	0.0540	0.225	15084
41-2	2.417	100.6	40.6	0.0	0.1	0.037	0.467	0.0541	0.261	12643
43-2	2.393	100.6	41.4	0.0	0.1	0.037	0.418	0.0599	0.274	10151
45-4	2.407	100.6	39.9	0.0	0.1	0.037	0.418	0.0528	0.250	11435
41-2	2.417	100.6	40.6	10.0	10.0	0.035	0.448	0.0493	0.311	14466
41-2	2.417	100.6	40.6	10.0	10.0	0.036	0.450	0.0438	0.311	16289
43-2	2.393	100.6	41.4	10.0	10.0	0.036	0.450	0.0655	0.293	10922
43-2	2.393	100.6	41.4	10.0	10.0	0.036	0.449	0.0621	0.318	11472
45-4	2.407	100.6	39.9	10.0	10.0	0.035	0.419	0.0489	0.289	13518
45-4	2.407	100.6	39.9	10.0	10.0	0.036	0.419	0.0496	0.297	13304
41-2	2.417	100.6	40.6	10.0	5.0	0.035	0.450	0.0490	0.309	14523
43-2	2.393	100.6	41.4	10.0	5.0	0.036	0.399	0.0620	0.326	10056
45-4	2.407	100.6	39.9	10.0	5.0	0.035	0.420	0.0540	0.301	12223
41-2	2.417	100.6	40.6	10.0	1.0	0.036	0.379	0.0526	0.313	11168
43-2	2.393	100.6	41.4	10.0	1.0	0.037	0.349	0.0694	0.340	7665
45-4	2.407	100.6	39.9	10.0	1.0	0.036	0.359	0.0577	0.315	9574

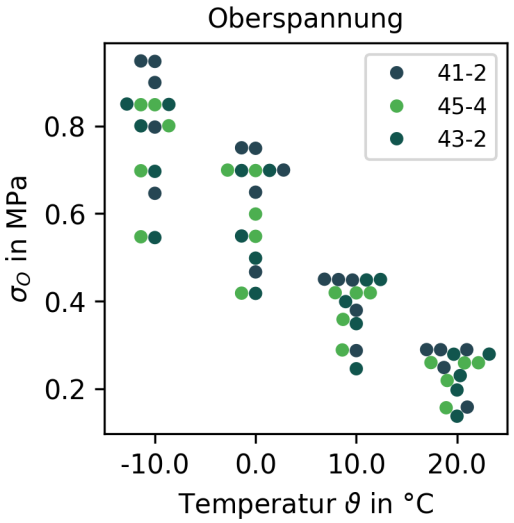
41-2	2.417	100.6	40.6	10.0	0.1	0.038	0.287	0.0590	0.371	7288
43-2	2.393	100.6	41.4	10.0	0.1	0.037	0.246	0.0720	0.403	4946
45-4	2.407	100.6	39.9	10.0	0.1	0.037	0.289	0.0688	0.387	6270
41-2	2.417	100.6	40.6	20.0	10.0	0.035	0.289	0.0514	0.369	9381
41-2	2.417	100.6	40.6	20.0	10.0	0.036	0.290	0.0494	0.374	9762
43-2	2.393	100.6	41.4	20.0	10.0	0.036	0.279	0.0581	0.377	7931
43-2	2.393	100.6	41.4	20.0	10.0	0.036	0.279	0.0578	0.375	8057
45-4	2.407	100.6	39.9	20.0	10.0	0.036	0.259	0.0500	0.345	8547
45-4	2.407	100.6	39.9	20.0	10.0	0.036	0.260	0.0512	0.361	8324
41-2	2.417	100.6	40.6	20.0	5.0	0.035	0.289	0.0571	0.384	8420
43-2	2.393	100.6	41.4	20.0	5.0	0.036	0.230	0.0542	0.383	6722
45-4	2.407	100.6	39.9	20.0	5.0	0.036	0.260	0.0564	0.356	7497
41-2	2.417	100.6	40.6	20.0	1.0	0.036	0.249	0.0687	0.423	5842
43-2	2.393	100.6	41.4	20.0	1.0	0.037	0.197	0.0637	0.416	4710
45-4	2.407	100.6	39.9	20.0	1.0	0.038	0.219	0.0648	0.411	5255
41-2	2.417	100.6	40.6	20.0	0.1	0.037	0.158	0.0671	0.495	3434
43-2	2.393	100.6	41.4	20.0	0.1	0.039	0.138	0.0669	0.467	2743
45-4	2.407	100.6	39.9	20.0	0.1	0.039	0.157	0.0746	0.485	2955

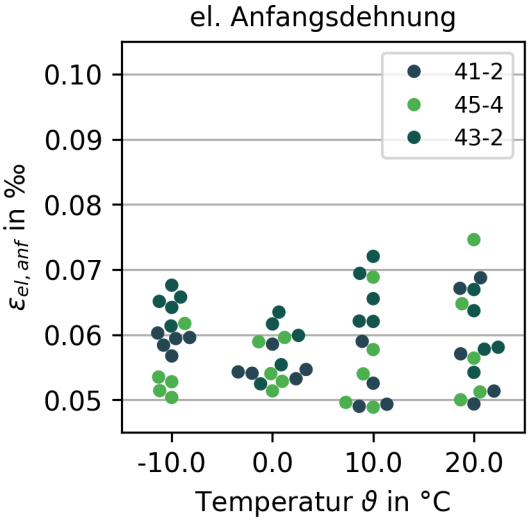
Statisik:

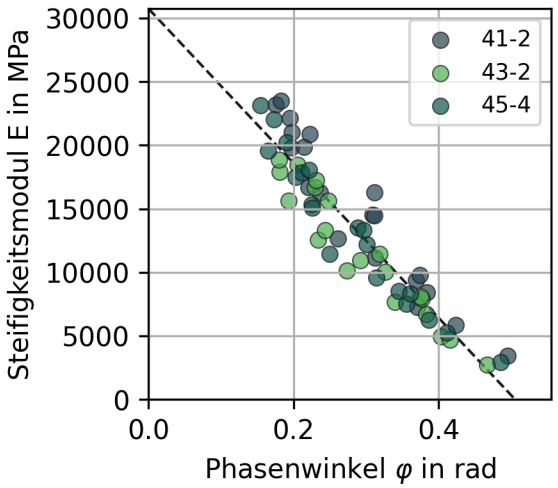

Bestimmtheitsmaß
hor. Verformungsamplitude in -
1.0000
0.9975
0.9950
0.9925
0.9900
0.9875
0.9850
0.985
0.990
0.995
1.000
Kraftamplitude in -
41-2
43-2
45-4


Amplitude der Kraft
ΔF in N
3000
2500
2000
1500
1000
500
-10.0
0.0
10.0
20.0
Temperatur ϑ in °C
41-2
45-4
43-2


Unterspannung
σU in MPa
0.038
0.036
0.034
0.032
-10.0
0.0
10.0
20.0
Temperatur ϑ in °C
41-2
45-4
43-2


Oberspannung
σO in MPa
0.8
0.6
0.4
0.2
-10.0
0.0
10.0
20.0
Temperatur ϑ in °C
41-2
45-4
43-2


el. Anfangsdehnung
εel, anf in ‰
0.10
0.09
0.08
0.07
0.06
0.05
-10.0
0.0
10.0
20.0
Temperatur ϑ in °C
41-2
45-4
43-2


Steifigkeitsmodul E in MPa
30000
25000
20000
15000
10000
5000
0
0.0
0.2
0.4
Phasenwinkel φ in rad
41-2
43-2
45-4

Wir bedanken uns für den Auftrag.

Dr.-Ing. Markus Clauß	Prof. Dr.-Ing. Daniel Düsentrieb
Mitarbeiter	Geschäftsführer