

VESTENAMER®

trans-Polyoctenamer

Bitumen Modification with GTR/VESTENAMER

Basic testing with Abadan Refinery Bitumen

Frank Lindner – August 2017

Heiden Labor – Test 6474 / 09/2006

Abadan Refinery Bitumen Test (Tars Liquid, UN.1999, DJ No. 11092)



The sample's were prepared according to European Standard DIN EN 12594.

Lab.-No.	Property		Unit	Testing Standard	Original Bitumen	7,5 % GTR/TOR	15,0 % GTR/TOR
	Viscosity at 177 °C		[mPa s]	House Method	- ¹	~ 600	~ 1150
	Penetration		[1/10 mm]	EN 1426	65	50	39
	Softening Point Ring & Ball		[°C]	EN 1427	47,6	55,6	62,2
	Breaking Point (Fraas)		[°C]	EN 12593	-12	- ²	- ³
	Bending Beam Rheom. (BBR) at -16 °C	Stiffness S	[MPa]	AASHTO TP 1	137	122	110
		m-Value	[-]		0,274	0,286	0,294
	Dynamic Shear Rheom. (DSR) at +60 °C	G*	[Pa]	AASHTO TP 5, TL PmB 2001, Attachment C	1707	6989	12382
		Phase lag δ	[°]		85,9	69,2	56,5

The Tests were conducted on the original bitumen and on GTR/TOR modified bitumen. The modification was performed with the Laboratory-wet-process. The reaction time was 2 hours at 185 °C. The following samples were tested:

¹ Viscosity too low to conduct a measurement (< 250 mPa S).

² Test stopped at -38 °C.

³ Test stopped at -36 °C.

The Challenger can beat the Specs

Sample	Properties	Unit	Test according	50/70	50/70 + 10% GTR/TOR	50/70 + 15% GTR/TOR	TL PmB PmB 45
Needlepenetration (100 g, 5s, 25 C°)	Softening point Ring and Ball	0,1 mm	DIN EN 1426	55	41	34	20-60
				49,6	56,2	64,2	55-63
Elastic Recovery (after ripping)	Stiffness S	%	DIN V 52021-1	.	65	78	>=50
				142	128	120	<=300
BBR -16 C°	m-value	Mpa	AASHTO TP1	0,38	0,363	0,341	.
				.	0,231	0,524	>=1
Ductility under load	distortion till min. ductility	J	DIN 52013 and TL PmB appendix B	2916	8768	13753	>=7000
				82,1	59,6	53,5	<=75
Dynamic Sheartheometer	complex shear modulus	Pa	AASHTO TP 5 and TL PmB appendix C	2916	8768	13753	>=7000
				82,1	59,6	53,5	<=75
Dynamic Sheartheometer	displacement angle	°	AASHTO TP 5 and TL PmB appendix C	82,1	59,6	53,5	<=75
				82,1	59,6	53,5	<=75