

 GEMEINNÜTZIGER VEREIN FÜR BAUTECHNISCHE VERSUCHS- UND FORSCHUNGSARBEITEN SALZBURG (Non-profit organisation for construction testing and research)

State-accredited materials testing, monitoring and calibration laboratory for the construction industry
BAUTECHNISCHE VERSUCHS- UND FORSCHUNGSANSTALT SALZBURG bvfs
Austria, 5020 Salzburg, Alpenstr. 157 – Chairman of the board: Dipl.-Ing. Norbert Glantschnigg,
Director

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- Translated from German -

TEST REPORT

No. B5/226/05-3

TESTING OF FIBRE REINFORCED CONCRETE SPACERS
ACCORDING TO DBV-MERKBLATT “Abstandshalter” (Code of Practice for
spacers) (as of February, 1997)

Test specimens: fibre reinforced concrete spacers

Customer:

EXTE-EXTRUDERTECHNIK GmbH
Industriestr. 3
06429 Nienburg
GERMANY

Copies: 1

Materials and building construction department

Salzburg, this 21st November, 2005 /Te/St

No. of pages: 3
No. of annexes: 3

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1. SCOPE OF TESTING

Purpose: To test fibre reinforced concrete spacers pursuant to DBV-Merkblatt
“Abstandshalter” (Code of practice for spacers, as of February, 1997)

Test specimen: fibre reinforced concrete spacers

Order placed on: 12.07.2005

2. SPECIMEN

Specimen: three (3) series of twelve (12) fibre reinforced concrete spacers each

Date of manufacture: not specified

Packing: cardboard box

Test specimen
received: 12.07.2005

3. PROCEDURE

To test the load-carrying capacity in a static accelerated test, the test specimens were placed on the centre of the test bench. Forces were introduced via a straddle mounting arrangement as shown in Figure A.1. of the Merkblatt (Code of practice, CP) force-controlled at a rate of 1,500 N/min. Six (6) specimens each of each type of spacers were tested for a rebar diameter of 18 mm or 28 mm respectively. A load-deformation curve was plotted for each test.

4. TEST RESULTS

Test specimen		FBS 40 coil	FBEK 35 Bone 35/40/50	FBD 40 triheral	
Test room temperature (°C)		19 to 21			
Specimen age (days)		---			
Test load (N)	Individual values dia. 18 mm	3853 / 3944 2893 / 2992 4590 / 2839	4345 / 5815 4922 / 4209 4115 / 4353	7391 / 7296 6871 / 3761 9046 / 5857	
	Average	3519	4627	6704	
	Individual values dia. 28 mm	4171 / 2487 2696 / 3109 3229 / 4278	4847 / 5629 5372 / 4499 4349 / 3856	8122 / 7549 5172 / 4775 4633 / 6971	
	Average	3328	4759	6204	
	Requirements pursuant to CP Spacer Table #2 Class L2 (N)		≥ 1000 on individual value ≥ 2000 on individual value		

Comments:

Due to the uneven surface and the resulting partial hollow supporting arrangement of the spacer, a vertical crack appeared in the spacer after short load application in the area of the straddle mounting arrangement. This is reflected by a load drop in the load-deformation curve. More load drops occurred through gradual forcing of the straddle mounting arrangement into the spacer.

Force-deformation curves

Annexes # 1 through 3

5. EVALUATION

The load-carrying capacity of the subject spacers in the static accelerated test meets the requirements of DBV-Merkblatt "Abstandshalter" (Code of practice for spacers). The tested spacers, specimens titled "FBS 40, coil", "FBEK 35, bone 35/40/50" and "FBD 40, triheral" are to be rated Class L2 according to Table 2.

Salzburg, this 21st November, 2005 /Te/St

(signed)
 Clerk in charge
 (J. Tenhalter)

(signed)
 Materials and building construction department
 (Dipl.-Ing. S. Sachße)
 Departmental Head

The Board of Directors

NÜTZIGER VEREIN FÜR BAUTECHNISCHE VERSUCHS- UND
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ISO 9001:2015 certified materials testing, monitoring and calibration laboratory for the construction industry

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p.p. (signed)

(Dipl.-Ing. N. Glantschnigg)

LOAD-CARRYING CAPACITY OF CONCRETE SPACERS

acc. to DBV-Merkblatt (Code of practice)

Annex #1

No:	B5/226/05-3	Load cell:	200 kN
Customer:	Exte-Extrudertechnik GmbH	Extensometer:	crosshead
Test standard:	DBV Merkblatt / Code of Practice	Test temperature:	19°
Material:	fibre reinforced concrete spacers	Date:	16.08.2005
Specimen title:	FBS 49 coil	Inspector:	Sch.

Test results

Legend	No.	Specimen no.	F max. N	Path at F max. Mm	Steel round bar
	1	1	3853	0.78	d = 18 mm
	2	2	3944	0.29	d = 18 mm
	3	3	2893	1.33	d = 18 mm
	4	4	2992	0.75	d = 18 mm
	5	5	4590	0.42	d = 18 mm
	6	6	2839	1.02	d = 18 mm
	7	7	4171	0.48	d = 28 mm
	8	8	2487	0.82	d = 28 mm
	9	9	2696	2.34	d = 28 mm
	10	10	3109	2.19	d = 28 mm
	11	11	3229	0.66	d = 28 mm
	12	12	4278	0.60	d = 28 mm

Diagram

Force in N

Path in mm

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LOAD-CARRYING CAPACITY OF CONCRETE SPACERS

acc. to DBV-Merkblatt (Code of practice)

Annex #2

No:	B5/226/05-3	Load cell:	200 kN
Customer:	Exte-Extrudertechnik GmbH	Extensometer:	crosshead
Test standard:	DBV Merkblatt / Code of Practice	Test temperature:	21°
Material:	fibre reinforced concrete spacers	Date:	12.08.2005
Specimen title:	FBEK 35 bone 35/40/50	Inspector:	Sch.

Test results

Legend	No.	Specimen no.	F max. N	Path at F max. Mm	Steel round bar
	1	1	4345	0.42	d = 18 mm
	2	2	5815	0.35	d = 18 mm
	3	3	4922	0.42	d = 18 mm
	4	4	4209	0.39	d = 18 mm
	5	5	4115	0.59	d = 18 mm
	6	6	4353	0.44	d = 18 mm
	7	7	4847	0.35	d = 28 mm
	8	8	5629	0.47	d = 28 mm
	9	9	5372	0.66	d = 28 mm
	10	10	4499	0.40	d = 28 mm
	11	11	4349	0.49	d = 28 mm
	12	12	3856	0.38	d = 28 mm

Diagram

Force in N

Path in mm

B5-226-05-9.ZSE

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LOAD-CARRYING CAPACITY OF CONCRETE SPACERS

acc. to DBV-Merkblatt (Code of practice)

Annex #3

No:	B5/226/05-3	Load cell:	200 kN
Customer:	Exte-Extrudertechnik GmbH	Extensometer:	crosshead
Test standard:	DBV Merkblatt / Code of Practice	Test temperature:	21°
Material:	fibre reinforced concrete spacers	Date:	12.08.2005
Specimen title:	FBD 40 trihedral	Inspector:	Sch.

Test results

Legend	No.	Specimen no.	F max. N	Path at F max. Mm	Steel round bar
	1	1	7391	6.49	d = 18 mm
	2	2	7296	6.05	d = 18 mm
	3	3	6871	4.05	d = 18 mm
	4	4	3761	1.48	d = 18 mm
	5	5	9046	7.52	d = 18 mm
	6	6	5857	5.74	d = 18 mm
	7	7	8122	4.55	d = 28 mm
	8	8	7549	5.43	d = 28 mm
	9	9	5172	3.69	d = 28 mm
	10	10	4775	4.73	d = 28 mm
	11	11	4633	3.89	d = 28 mm
	12	12	6971	5.18	d = 28 mm

Diagram

Force in N

Path in mm

B5-226-05-10.ZSE

Certified to be a true translation
 to the best of my knowledge and belief

Isolde Jahn
 Sworn translator of the English language

May 8th, 2006
 in Leipzig/Germany



Jahn