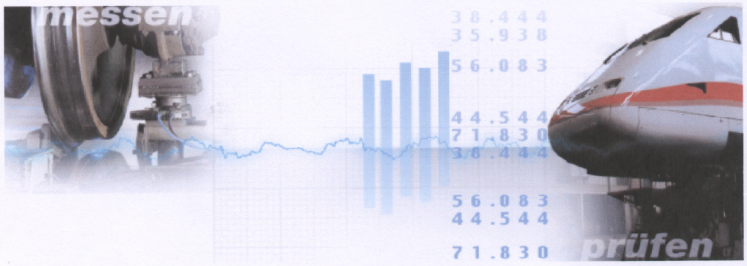
Die Bahn DB

The testing division is associated partner
of the nominated body for interoperability
of railway-systems.

Deutsche Bahn AG
Technik / Beschaffung
DB Systemtechnik
Prüfstelle
Pionierstraße 10
D – 32423 Minden

Test Report

Fire Testing pursuant to DIN 54 837



Test Report: 06-P-4010-TZF91-PR-127/03
Date: 27.04.06

Department: DB Systemtechnik
Instandhaltung, Betriebsfestigkeit,
Regelwerke
Instandhaltung, RAMS
Bahntechnikerring 74
14774 Brandenburg-Kirchmöser

249966 QM

Anwendung eines durch die DQS GmbH
Deutsche Gesellschaft zur Zertifizierung von Managementsystemen
zertifizierten Qualitätsmanagementsystems

Contens

1 Details of the remit

- Assignment: Performance of fire-testing
- Reference: Your order N°: 030945/MB from 05.04.06
- Commissioning party: Adaptaflex Ltd.
  Station Road Coleshill
  Birmingham
  B46 1 HT
- Testing department: DB Systemtechnik
  Instandhaltung, Betriebsfestigkeit, Regelwerke
  Instandhaltung, RAMS
  Bahntechnikerring 74
  D-14774 Brandenburg - Kirchmöser
- Pages: 6 pages of test Report
- Distribution list: 1 original Adaptaflex Ltd.
  1 copy TZF 91

2 Description of the test object

- Reference number: 06-127-05/1273 (samples 1-5)
- Date of receipt: 10.04.2006
- Materal designation: conduit **PAFS 10**
- Dimensions: length: 500 mm
  outer diameter: 10,1 mm
  inner diameter: 6,1 mm
- Retention time of the test samples: 1 year from date of this report on

3 Testing

3.1 Details of testing

• Test procedure:	**DIN 54 837 (draft 09/2003)** Testing of materials, small components and component sections for rail vehicles Determination of burning behaviour using a gas burner
• Evaluation:	**DIN 5510 part 2 (draft 09/2003)** Preventive fire protection in railway vehicles Part 2: Fire behaviour and fire side effects of materials and parts; Classifications, requirements and test methods

3.2 Performance of testing

• Conditioning:	> 48h at 23°C ± 3°C / 50% rel. humidity
• Inflaming side:	outside
• Date of testing:	21.04.2006
• Tester:	Schiller

4 Results

Sample number			Einzelwert für Probe Nr. 1	2	3	4	5	**Mean value**
Inflaming of the sample point of time in		[s]	9	9	8	9	9	**9**
Duration of burning in		[s]	171	171	172	171	171	**171**
Duration of afterburn in after removal of external flame		[s]	0	0	0	0	0	**0**
Duration of afterglow in after removal of external flame		[s]	0	0	0	0	0	**0**
Maximum flame height in		[cm]	13	13	13	13	13	**13**
Specimen parts falling off	not burning	[yes/no]	yes	yes	yes	yes	yes	**yes**
	burning	[yes/no]	yes	yes	yes	yes	yes	**yes**
	time	[s]	2	2	2	3	2	**2**
Optical density of smoke	maximum in	[%]	2	2	1	1	2	**2**
	reached after	[s]	37	28	23	30	33	**30**
	integral in	{%*min}	2,2	2,0	1,9	1,9	2,0	**2,0**
Destroyed area length in		[cm]	19	19	17	17	16	**18**
Specimen extinguished		[yes/no]	no	no	no	no	no	**no**
burn through		[yes/no]	yes	yes	yes	yes	yes	**yes**
after		[s]	26	19	20	21	25	**22**

- Observation: not one

- Assessment pursuant to DIN 5510, part 2:

Flammability class:	S 4
Smoke-development class:	SR 2
Melt-drip class:	ST 2

- Remarks: not one

5 Signatures

Dr. Trockels, head TZF 91

Schiller, tester in charge

noticed:

testing department

Die Bahn DB

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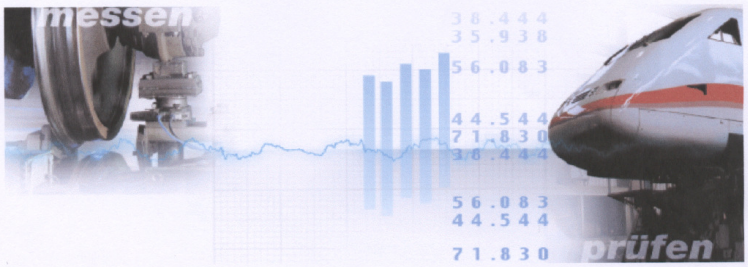
of railway-systems.

Deutsche Bahn AG
Technik / Beschaffung
DB Systemtechnik
Prüfstelle
Pionierstraße 10
D – 32423 Minden

Test Report

Fire Testing pursuant to DIN 54 837



Test Report: 06-P-4010-TZF91-PR-127/04
Date: 27.04.06

Department: DB Systemtechnik
Instandhaltung, Betriebsfestigkeit,
Regelwerke
Instandhaltung, RAMS
Bahntechnikerring 74
14774 Brandenburg-Kirchmöser

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Anwendung eines durch die DQS GmbH
Deutsche Gesellschaft zur Zertifizierung von Managementsystemen
zertifizierten Qualitätsmanagementsystems

Contens

1 Details of the remit

- Assignment: Performance of fire-testing
- Reference: Your order N°: 030945/MB from 05.04.06
- Commissioning party: Adaptaflex Ltd.
  Station Road Coleshill
  Birmingham
  B46 1 HT
- Testing department: DB Systemtechnik
  Instandhaltung, Betriebsfestigkeit, Regelwerke
  Instandhaltung, RAMS
  Bahntechnikerring 74
  D-14774 Brandenburg - Kirchmöser
- Pages: 6 pages of test Report
- Distribution list: 1 original Adaptaflex Ltd.
  1 copy TZF 91

2 Description of the test object

- Reference number: 06-127-05/1274 (samples 1-5)
- Date of receipt: 10.04.2006
- Materal designation: conduit **PACS 54**
- Dimensions: length: 500 mm
  outer diameter: 54,3 mm
  inner diameter: 47,2 mm
- Retention time of the test samples: 1 year from date of this report on

3 Testing

3.1 Details of testing

• Test procedure:	**DIN 54 837 (draft 09/2003)** Testing of materials, small components and component sections for rail vehicles Determination of burning behaviour using a gas burner
• Evaluation:	**DIN 5510 part 2 (draft 09/2003)** Preventive fire protection in railway vehicles Part 2: Fire behaviour and fire side effects of materials and parts; Classifications, requirements and test methods

3.2 Performance of testing

• Conditioning:	> 48h at 23°C ± 3°C / 50% rel. humidity
• Inflaming side:	outside
• Date of testing:	21.04.2006
• Tester:	Schiller

4 Results

			Einzelwert für Probe Nr.					
Sample number			**1**	**2**	**3**	**4**	**5**	**Mean value**
Inflaming of the sample point of time in		[s]	7	7	7	7	7	**7**
Duration of burning in		[s]	173	173	173	173	173	**173**
Duration of afterburn in after removal of external flame		[s]	0	0	0	0	0	**0**
Duration of afterglow in after removal of external flame		[s]	0	0	0	0	0	**0**
Maximum flame height in		[cm]	17	17	17	17	17	**17**
Specimen parts falling off	not burning	[yes/no]	yes	yes	yes	yes	yes	**yes**
	burning	[yes/no]	yes	yes	yes	yes	yes	**yes**
	time	[s]	3	3	1	3	2	**2**
Optical density of smoke	maximum in	[%]	2	3	2	2	3	**2**
	reached after	[s]	39	48	42	44	54	**45**
	integral in	[%*min]	2,7	3,2	2,7	3,2	3,3	**3,0**
Destroyed area length in		[cm]	13	12	9	12	12	**12**
Specimen extinguished		[yes/no]	no	no	no	no	no	**no**
burn through		[yes/no]	yes	yes	yes	yes	yes	**yes**
after		[s]	42	42	39	41	44	**42**

- Observation: not one

- Assessment pursuant to DIN 5510, part 2:

Flammability class:	S 4
Smoke-development class:	SR 2
Melt-drip class:	ST 2

- Remarks: not one

5 Signatures

Dr. Trockels, head TZF 91

Schiller, tester in charge

noticed:

testing department