

Test Report

No. TDB 0563 dated 26.11.98

for application of Annex VII Directive 71/320/EEC

1 IDENTIFICATION

1.1 Axle

Manufacturer: BPW Bergische Achsen
Kommanditgesellschaft
D-51674 Wiehl

Make: BPW

Type: ES 45

Model: -

Technically permissible axle load P_e ¹⁾: 5400 daN

1.2 Brake

Manufacturer: See 1.1

Make: BPW

Type: FL 3008

Model: -

Technically permissible camshaft
input torque $C_{max,e}$: 2200 Nm
(for calculation: 1650 Nm at 6,5 bar)

Brake drum - Internal diameter: 300 mm

- Mass: 17,5 kg

- Material: Cast iron (grey cast iron)

Brake lining - Manufacturer: BBA Friction GmbH
D-51375 Leverkusen

- Make: Textar

- Type: T 090

- Identification: Type indication at front

- Width: 80 mm

- Thickness: 9...13 mm (sickle-shaped)

- Surface area: 480 cm²

- Method of attachment: Rivited

Brake geometry: See appendix 1 dated 30.10.98
See appendix 2 dated 31.07.96

1.3 Wheel (Single/twin):

Rim diameter D_e : See appendix 1 dated 30.10.98

Dimensions: See appendix 1 dated 30.10.98

¹⁾ See sheet 3/3



Test Report No. : TDB 0563
 Sheet : 2 / 3
 Date : 26.11.98

Manufacturer : BPW
 Type of axle : ES 45

1.4 Tyres

Dynamic rolling radius R_e
 at reference load P_e : See appendix 1 dated 30.10.98

1.5 Actuation

Brake actuator -Manufacturer: GRAU
 - Type: Diaphragm brake actuator
 - Model: 24 (120 351 101)
 Lever length l_e : 180 mm

2 RECORD OF TEST RESULTS ²⁾

(corrected to take account of rolling resistance $\hat{=} 0,01P_e$)

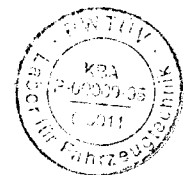
2.1 In the case of vehicles of categories O₂ and O₃

Test type:		0	I	
Annex VII, Appendix 1, point:		3.5.1.2	3.5.2.2/3	3.5.2.4
Test speed	km/h	40	40	40
Brake actuator pressure p_e	bar	4,5	-	4,5
Braking time	min	-	2,55	-
Brake force developed T_e	daN	3256	426	2832
Brake efficiency T_e/P_e	-	0,60	0,08	0,52
Actuator stroke s_e	mm	37	-	39
Camshaft input torque C_e	Nm	1107	-	1107
$C_{0,e}$	Nm	30	-	30

2.2 In the case of vehicles of category O₄

Test type:		0	III	
Annex VII, Appendix 1, point:		3.5.1.2	3.5.3.1.2	3.5.3.2
Test speed				
initial	km/h	60	60	60
final	km/h	0	30	0
Brake actuator pressure p_e	bar	5,9	-	5,9
Number of brake applications	-	-	20	-
Duration of braking cycle	s	-	60	-
Brake force developed T_e	daN	3325	1845	2165
Brake efficiency T_e/P_e	-	0,62	0,34	0,40
Actuator stroke s_e	mm	52	-	58
Camshaft input torque C_e	Nm	1467	-	1467
$C_{0,e}$	Nm	30	-	30

²⁾ See sheet 3/3



Test Report No. : TDB 0563
Sheet : 3 / 3
Date : 26.11.98

Manufacturer : BPW
Type of axle : ES 45

3 NAME OF TECHNICAL SERVICE CONDUCTING THE TEST

RWTÜV Fahrzeug GmbH
Technischer Dienst für Bremsanlagen
D-45307 Essen

4 DATE OF TEST: 13.02.98**5** This test has been carried out and the result reported in accordance with Directive 71/320/EEC as last amended by Directive 98/12/EC and Annex VII, Appendix 1.

Essen, 26.11.98




Dipl.-Ing. Kaesler



LABORATORY FOR VEHICLE TECHNOLOGY
Testing Laboratory for Braking Systems
according to Directive 71/320/EEC in the
version of Directive 98/12/EC

6 APPROVAL AUTHORITY, if different from the technical service

Flensburg, 27. JAN. 1999

i. A. **7 TEST DOCUMENTS**

- / Appendix 1: Dimensions brake drum/wheel/tyre (3 sheet)
- / Appendix 2: Brake geometry

1) Calculation with $g = 10 \text{ m/s}^2$

2) Inertia dynamometer test; single, $R_e = 433 \text{ mm}$



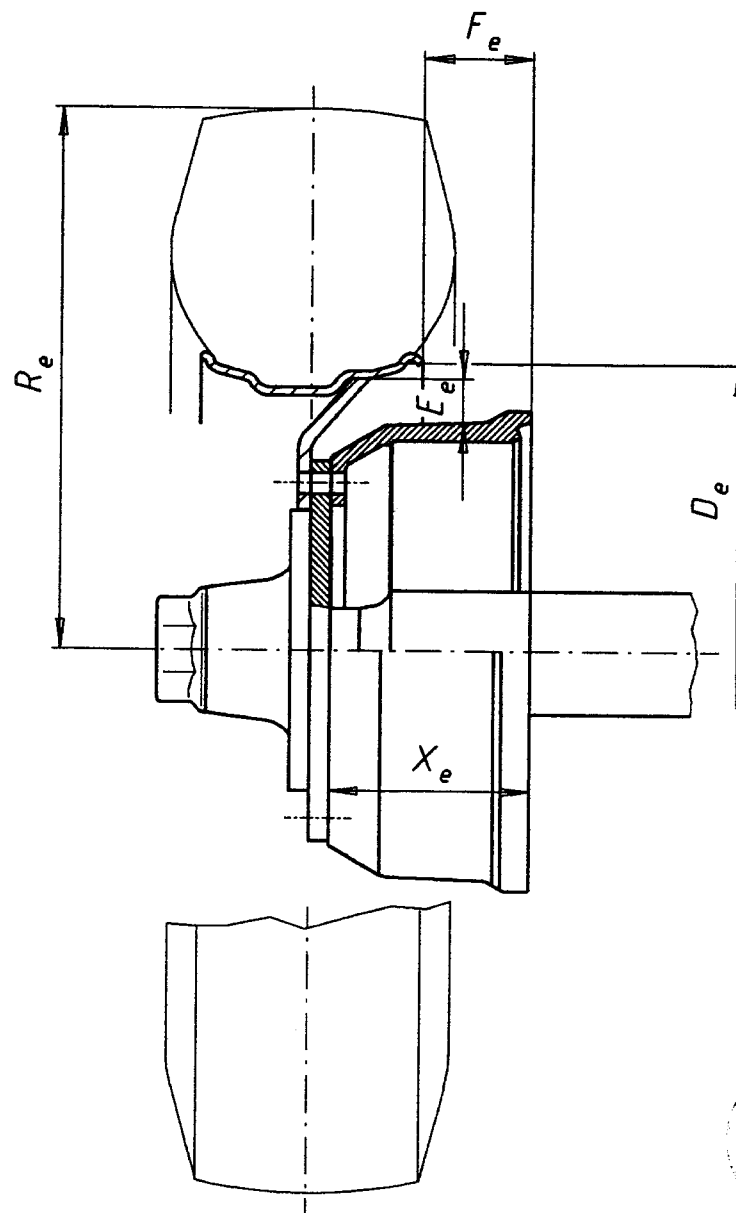
BPW-Brake FL 3008 appendix 1
to TEST REPORT NO. TDB 0563

TE-2084.0 E

3 Blatt Bl.-Nr. 1

Abl. EZ
Tag 30.10.98
Bearb. Schöler

BPW BERGISCHE ACHSEN Kommanditgesellschaft D-51674 Wiehl



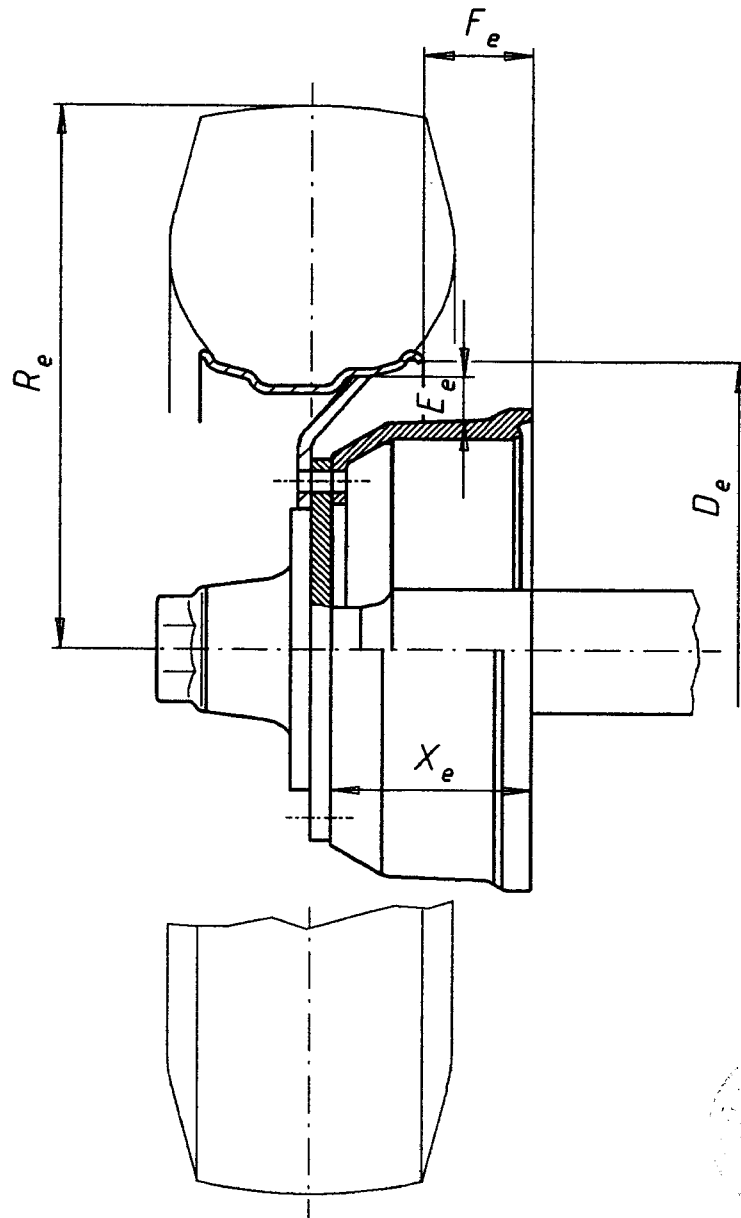
Drum- width X_e (mm)	mass (kg)	Axle load P_e (da N)	Tyre	Rim	R_e	D_e	E_e	F_e
					(mm)	(mm)	(mm)	(mm)
≥ 138	17,5	5400	205/70 R 15	6.0-15	325	381	12	58
≥ 138	17,5	5400	205/80 R 15	6.0-15	346	381	12	58
≥ 138	17,5	5400	7.50 R 15	6.0-15	371	381	12	58
≥ 138	17,5	5400	8.25 R 15	6.5-15	400	381	10	51
≥ 138	17,5	5400	10.00 R 15	7.5-15	439	381	8	36
≥ 138	17,5	5400	9.00 R 16	6.5 Jx16	455	406	22	60
≥ 138	17,5	5400	205/65 R 17.5	17.5x6.00	345	444	27	49
≥ 138	17,5	5400	215/75 R 17.5	17.5x6.75	377	444	42	39
≥ 138	17,5	5400	235/75 R 17.5	17.5x6.75	385	444	42	39
≥ 138	17,5	5400	9.5 R 17.5	17.5x6.75	408	444	42	39
≥ 138	17,5	5400	245/70 R 17.5	17.5x6.75	384	444	42	39

Ersatz für
Ersetzt durch



Abt. EZ
Tag 30.10.98
Bearb. Schöler

BPW BERGISCHE ACHSEN Kommanditgesellschaft D-51674 Wiehl



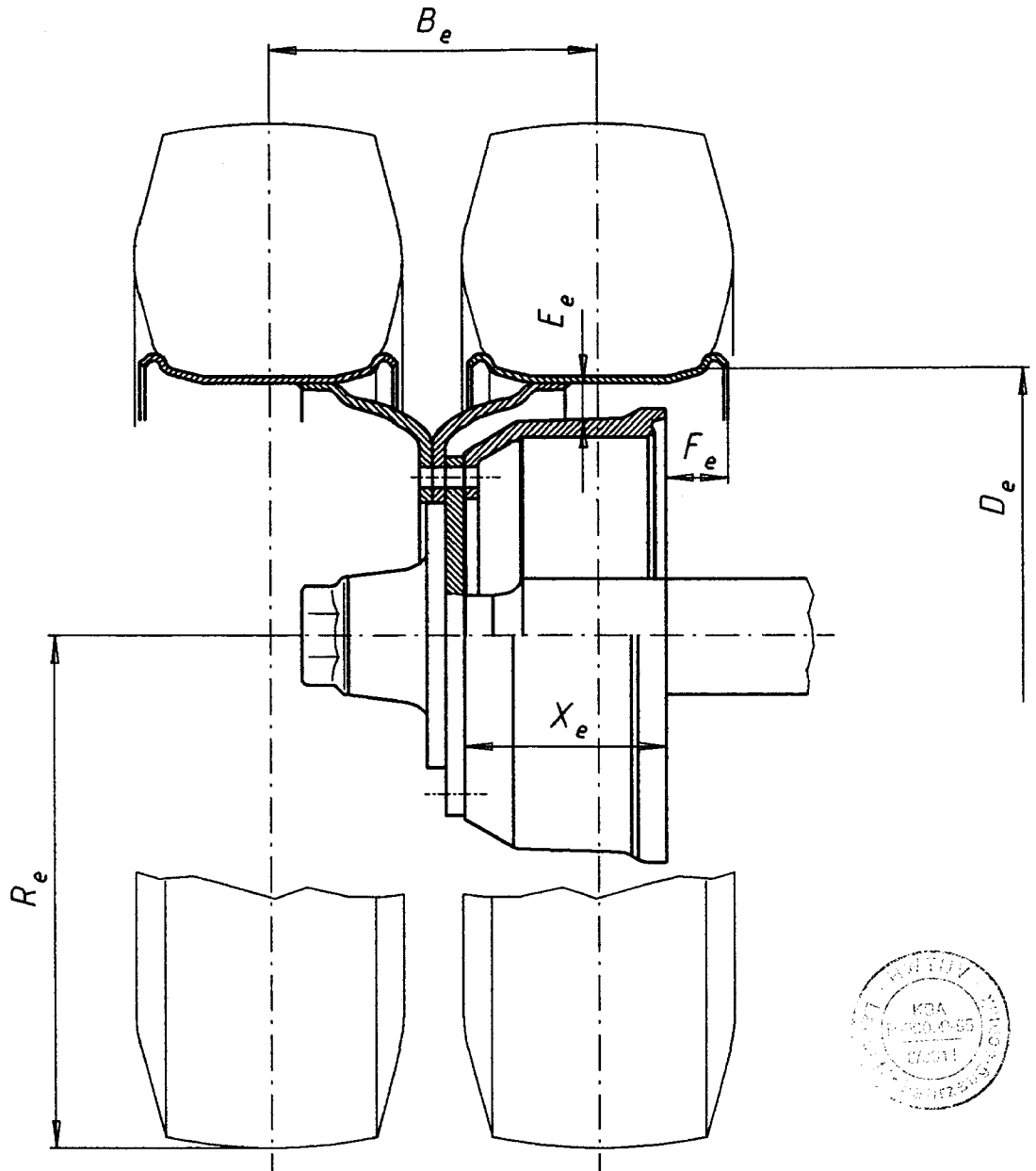
Drum- width X_e (mm)		mass (kg)	Axle load P_e (da N)	Tyre	Rim	R_e (mm)	D_e (mm)	E_e (mm)	F_e (mm)
≥ 138	17,5	17,5	5400	245/70 R 19.5	19.5x7.50	411	495	65	30
≥ 138	17,5	17,5	5400	265/70 R 19.5	19.5x7.50	420	495	65	30
≥ 138	17,5	17,5	5400	285/70 R 19.5	19.5x8.25	433	495	70	20
≥ 138	17,5	17,5	5400	9.00 R 20	7.0-20	495	508	84	44
≥ 138	17,5	17,5	5400	10.00 R 22.5	22.5x7,5	494	571	102	30

Ersatz für
Ersetzt durch



Abt. EZ
Tag 30.10.98
Bearb. Schöler

BPW BERGISCHE ACHSEN Kommanditgesellschaft D-51674 Wiehl



Drum- width X_e (mm)	mass (kg)	Axle load P_e (da N)	Tyre	Rim	B_e (mm)	R_e (mm)	D_e (mm)	E_e (mm)	F_e (mm)
≥ 138	17,5	5400	205/70 R 15	6.0-15	244	325	381	20	-63
≥ 138	17,5	5400	205/80 R 15	6.0-15	244	346	381	20	-63
≥ 138	17,5	5400	7.50 R 15	6.0-15	244	371	381	20	-63
≥ 138	17,5	5400	8.25 R 15	6.5-15	270	400	381	21	-84
≥ 138	17,5	5400	9.00 R 16	6.5 Jx16	270	455	406	22	-75
≥ 138	17,5	5400	205/65 R 17.5	17.5x6.00	250	345	444	28	-76
≥ 138	17,5	5400	215/75 R 17.5	17.5x6.75	304	377	444	25	-113
≥ 138	17,5	5400	235/75 R 17.5	17.5x6.75	304	385	444	25	-113
≥ 138	17,5	5400	9.5 R 17.5	17.5x6.75	304	408	444	25	-113
≥ 138	17,5	5400	245/70 R 17.5	17.5x6.75	304	384	444	25	-113
≥ 138	17,5	5400	245/70 R 19.5	19.5x7.50	320	411	495	48	-130
≥ 138	17,5	5400	265/70 R 19.5	19.5x7.50	320	420	495	48	-130
≥ 138	17,5	5400	285/70 R 19.5	19.5x7.50	320	433	495	49	-130

Ersatz für
Ersetzt durch



Appendix 2 to
TEST REPORT NO. TDB 0563

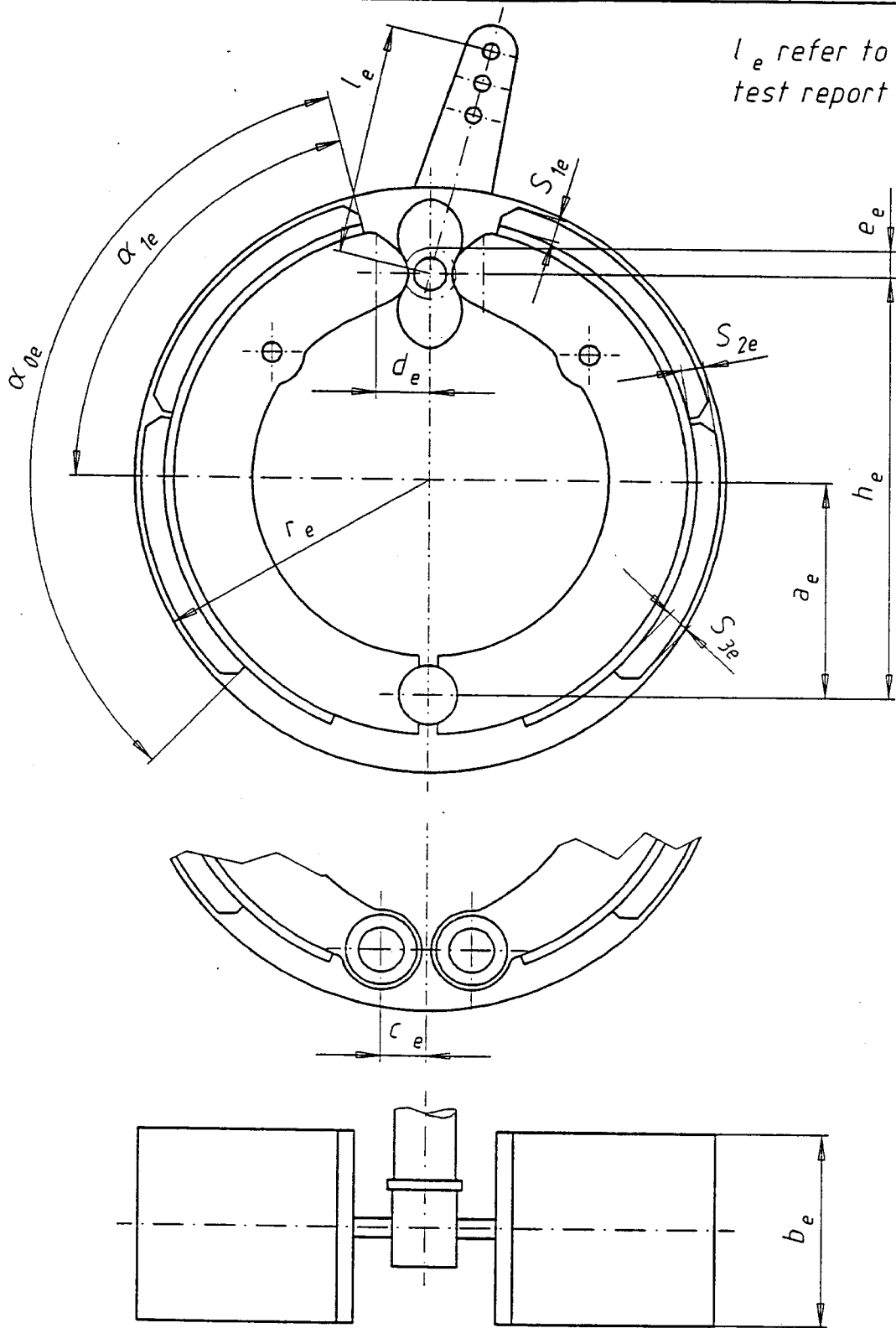
TE-2083.0

4 Blatt Bl.-Nr. 2

Abl. EE
Tag 31.07.96
Bearb. Schuster

BPW BERGISCHE ACHSEN Kommanditgesellschaft D-51674 WIEHL

l_e refer to No.15. of
test report



All dimensions except α_{0e} , α_{1e} and F_e in mm. F_e = braking surface per brake (cm²).

Type of brake	a_e	h_e	c_e	d_e	e_e	α_{0e}	α_{1e}	b_e	r_e	F_e	S_{1e}	S_{2e}	S_{3e}
FL 3008	118	226	0	27.5	17	116°	61°	80	150	480	9	13	9

Ersatz für
Ersetzt durch