



HÖHERE TECHNISCHE BUNDES-LEHR-UND VERSUCHSANSTALT WIEN XX
Technologisches Gewerbemuseum
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FEDERAL TESTING CENTRE – TGM
PLASTICS TECHNOLOGY AND ENVIRONMENTAL ENGINEERING

TEST REPORT

TGM - VA KU 22 563

Fusion compatibility of PE-compound
- *PE 100 Hostalen CRP 100 RESIST CR black* -
acc. EN 1555-1 gas / EN 12201-1 water
butt fusion joint, ISO 11414:1996 Annex A
tensile strength, ISO 13953:2001
fusion compatibility (internal pressure test) ISO TR 11647:1996 Annex B

Client: Basell Polyolefine GmbH, BU Pipe, Industrial Sheet & Pipe Coating

Address: D-65926 Frankfurt am Main, Industriepark Höchst, C 657

Date of order: 2008-07-01

Sign of order: DI Werner Rothhöft

Order received: 2008-07-21

Samples received: B-3352/2008-07-02

Testing period: KW 30/08 – KW 47/08

TGM- number:



1 General

It has been ordered to test the fusion compatibility of the PE-compound

PE 100 Hostalen CRP 100 RESIST CR black

by preparing butt fusion joints according ISO 11414:1996 /Annex A at an ambient temperature of $(23 \pm 2)^\circ\text{C}$ with different welding partners (PE 80 and PE 100) and checking the requirements

“tensile strength for butt-fusion” ISO 13935:2001 and

fusion compatibility “internal pressure test” ISO TR 11647:1996 Annex B

conformable to EN 1555-1/EN 12201-1:2003.

2 Samples

From BASELL Polyolefine GmbH (D) following PE-compound samples in form of pipes have been submitted:

Table 1: Provided samples

tgm code	grade/ name	compound-producer	pipe diameter (SDR range)
1	PE 100: Hostalen CRP 100 RESIST CR black	basell	110 x10,0 (SDR11)

For the butt fusion joints the following pipe samples were used, provided by tgm.

Table 2: Partner for butt fusions

tgm code	grade/ name	compound-producer	pipe diameter (SDR range)
2	PE 100: Hostalen CRP 100 blue	basell	110 x10,0 (SDR11)
3	PE 100: ELTEX TUB 124 blue	INEOS	110 x10,0 (SDR11)
4	PE 80: Vestolen A 4062 R black	sabic	110 x10,0 (SDR11)
5	PE 100: BorSafe HE 3490-IM black	Borealis	110 x10,0 (SDR11)

3 Sample preparation

Butt fusion procedure acc. ISO 11414: 1996/Annex A (E) under ambient temperature $(23\pm 2)^\circ\text{C}$; sample preparation: type A (4 bars each); fusion beads were not removed.

Table 3: Butt fusion joints

tgm code	classification	grade
1 - 1	PE 100 – PE 100	Hostalen CRP 100 RESIST CR black - Hostalen CRP 100 RESIST CR black
1 - 2	PE 100 – PE 100	Hostalen CRP 100 RESIST CR black - Hostalen CRP 100 blue
1 - 3	PE 100 – PE 100	Hostalen CRP 100 RESIST CR black - ELTEX TUB 124 blue
1 - 4	PE 100 – PE 80	Hostalen CRP 100 RESIST CR black - Vestolen A 4062 R black
1 - 5	PE 100 – PE 100	Hostalen CRP 100 RESIST CR black - BorSafe HE 3490-IM black



4 Determination of tensile strength and failure mode of test pieces from a butt-fused joint acc. ISO 13953:2001 (E)

The tests were achieved after a minimum storage time of 48 hours in standard climate 23/50 according ÖNORM EN ISO 291 (01.1998).

Table 4: Tensile strength and failure mode of butt fusion joints

butt fusion joint (tgm code)	grade	sample No.	type of failure		tensile strength [N/mm ²]
			D... ductile	B... brittle	
1 - 1	Hostalen CRP 100 RESIST CR black	1	D		25,0
		2	D		25,0
	Hostalen CRP 100 RESIST CR black	3	D		24,9
		4	D		25,1
1 - 2	Hostalen CRP 100 RESIST CR black	1	D		24,8
		2	D		25,6
	Hostalen CRP 100 blue	3	D		25,1
		4	D		25,2
1 - 3	Hostalen CRP 100 RESIST CR black	1	D		25,7
		2	D		25,0
	ELTEX TUB 124 blue	3	D		25,2
		4	D		25,4
1 - 4	Hostalen CRP 100black	1	D		22,9
		2	D		23,5
	Vestolen A 4062 R black	3	D		22,9
		4	D		22,6
1 - 5	Hostalen CRP 100 RESIST CR black	1	D		25,3
		2	D		25,5
	BorSafe HE 3490-IM black	3	D		25,5
		4	D		25,6

Observations during test, any factors that may have influenced the results:

no special remarks, requirements acc. EN 1555-1 and 12201-1 fulfilled.



4.1 Internal pressure test acc. ISO TR 11647:1996 (Annex B)

The tests were achieved after a minimum storage time of 48 hours in standard climate 23/50 according ÖNORM EN ISO 291 (01.1998).

Table 5: Internal pressure test results of butt fusion joints

butt fusion joint (tgm code)	grade	test temperature	internal pressure (MPa)	failure time (h)
1 - 1	Hostalen CRP 100 RESIST CR black Hostalen CRP 100 RESIST CR black	80°C	5,0	> 1000
1 - 2	Hostalen CRP 100 RESIST CR black Hostalen CRP 100 blue	80°C	5,0	> 1000
1 - 3	Hostalen CRP 100 RESIST CR black ELTEX TUB 124 blue	80°C	5,0	> 1000
1 - 4	Hostalen CRP 100black Vestolen A 4062 R black	80°C	4,0	> 1000
1 - 5	Hostalen CRP 100 RESIST CR black BorSafe HE 3490-IM black	80°C	5,0	> 1000

Observations during test, any factors that may have influenced the results:

no special remarks, requirements acc. EN 1555-1 and 12201-1 fulfilled.



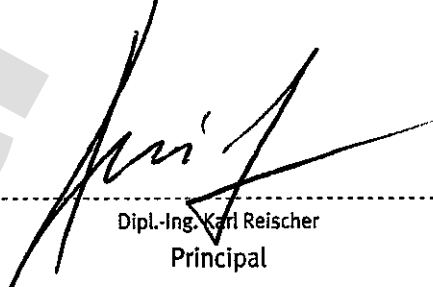
The present test report KU 22 563

consists of 5 pages with 5 tables, 0 graphics,
0 figures and 0 attachments (with - pages).

Executive officer: Dipl.-Ing. Dr. techn. Thomas Kratochvilla Vienna, 2008-11-21




Prof. Dipl.-Ing. Dr.techn. Heinz Dragaun
Head of Department and
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Dipl.-Ing. Karl Reischer
Principal



Akkreditierte Prüf- und Überwachungsstelle
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