Test report no.:	**96519/12**
Customer:	R&G Faserverbundwerkstoffe GmbH Im Meißel 7-13 71111 Waldenbuch
Order:	Comparative tests on CRP profiles with epoxy and vinyl ester matrix
Letter of:	2012-07-05 **Ref.:** ---
Receipt of samples:	2012-07-09 **Sampling:** ---
Test period:	2012-08-28 to 2012-11-06

This test report comprises 4 pages.

Würzburg, November 7th 2012
Krü/hn

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1. Order

By letter of July 5th 2012 the company R&G Faserverbundwerkstoffe, Im Meißel 7-13, 71111 Waldenbuch, placed an order to SKZ - TeConA GmbH to perform comparative tests on CRP profiles with epoxy and vinyl ester matrix.

2. Test material

The following test material was sent by the customer to SKZ - TeConA GmbH on July 9th:

Mat.	Nomination	Dimensions
1	VEC™-CRP square rod	(8.0 x 8.0) x 1000 mm
2	DPP™-CRP square rod	(8.0 x 8.0) x 1000 mm

SKZ - TeConA GmbH had no influence on the selection of the test material.

3. Test procedure

If not otherwise mentioned, the tests were carried out in standard atmosphere 23/50 (Class 1) acc. to DIN EN ISO 291:2008-08 "Plastics - Standard atmospheres for conditioning and testing" after a minimum of 48 hours storage in this atmosphere.

Usually we carry out tests according to standards for which we have an accreditation. The list of all standards for which we are accredited is shown on the homepage at www.skz.de.

The following tests were carried out:

3.1 Weight per meter

The weight per meter was determined on 5 profiles each. Length and weight was measured on the profiles. From these values the weight per meter was calculated.

3.2 Flexure tests

The flexural properties were determined acc. to DIN EN ISO 14125:2011-05 „Fibre-reinforced plastic composites - Determination of flexural properties".

Number of samples:	5 each
Dimensions of samples:	400 mm x 8 mm x 8 mm
Testing speed:	1 mm/min for determination of modulus 21.3 mm/min
Distance between supports:	320 mm
Position measurement:	Touching sensor
Load cell:	250 kN

3.3 Compression test

The compression properties were determined acc. to DIN EN ISO 604:2003-12 „ Plastics - Determination of compressive properties ".

Number of samples:	10 each
Dimensions of samples:	50 mm x 8 mm x 8 mm (modulus) 10 mm x 8 mm x 8 mm
Testing speed:	1 mm/min for determination of modulus 5 mm/min
Position measurement:	Touching sensor
Load cell:	50 kN

3.4 Tensile test

The tensile modulus was determined acc. to DIN EN ISO 527-5:2010-01 „ Plastics - Determination of tensile properties - Part 5: Test conditions for unidirectional fibre-reinforced plastic composites ".

Number of samples:	5 each
Dimensions of samples:	250 mm x 8 mm x 8 mm
Testing speed:	1 mm/min
Position measurement:	Touching sensor
Load cell:	250 kN

4. Test results

	Parameter	Unit	Material 1 (VEC™)		Material 2 (DPP™)	
			$\bar{x}$	s	$\bar{x}$	s
4.1	Weight per meter	g/m	92.9	0.4	98.9	0.3
4.2	Flexural modulus of elasticity	GPa	108	1	126	1
	Flexural strength	MPa	835	37	954	21
	Elongation at flexural strength	%	0.78	0.03	0.75	0.01
4.3	Compression modulus of elasticity	GPa	71.0	8.3	66.8	6.6
	Compression stress at yield	MPa	483	48	452	69
	compressive strain at yield	%	2.0	0.2	2.2	0.5
4.4	Tensile modulus of elastic	GPa	133	12	144	6

$\bar{x}$: arithmetic mean value; s: stand deviation