

Building Material Test Centre – Rhineland

Chemical & Physical Test and Research Laboratory for the construction and industrial clients.

53229 Bonn, Siebenmorgenweg 2-4
Internet: www.bzr-institut.de

Tel. 0228 / 46 95 89 • Fax. 0228 / 47 14 97
E-Mail: BZR-Institut@t-online.de



Test Report

Applicant	Leyco Chemische Leyde GmbH IndustrieStr. 155 50999 Koeln
Subject	Product ZETOLAN MEK Machine and equipment protection
Date of Test	20.02.2001
Instruction	15.01.2001
Pages	4
Appendices	./.

APPLICANT'S OBJECTIVE

On the 15.01.2001 we were asked in writing by the applicant

LEYCO CHEMISCHE LEYDE GmbH
IndustrieStrasse 155
5099 Koeln

to carry out a Material Laboratory Test and give a written result.

2. TEST ; INTRODUCTION

The under mentioned Material Test was delivered by post on the 15/01/2001 with an accompanying letter to the Test Institute.

The product was a liquid in a plastic container on which a label was attached with the following description:

“ZETOLAN-MEK. Protection for building machinery and equipment.”

Product No. 10.002 Container capacity 1 litre

3. REMARKS : GENERAL

According to the description of the applicant the product is described as a means of care and protection for concrete mixing machinery and vehicles.

The applicant wishes to test **ZETOLAN MEK** to calibrate its influence on the compressive strength and air entrainment of concrete.

The usage described in the instructions of the applicant stated that 25gr of **ZETOLAN – MEK** was needed per 1m² of container to be treated.

Taking a concrete mixer with an average volume of 9m³ thus giving an inside area of 66m² gives the following calculation of the average usage per 1m³ of concrete

15gr **ZETOLAN MEK** -> 1m² Area
66m² Area
990 gr **ZETOLAN** 9m³ Concrete
110 gr **ZETOLAN** / 1 m³ Concrete

In order to test the Air Entrainment and compressive strength of the concrete with and without **ZETOLAN MEK**, the following concrete mixes were formulated.

Mix I.	Cement CEM 1 32.5	335 kg/m ³
	Water	150 kg/m ³
	Aggregate – Sand/Gravel 0/8m	1862 kg/m ³
	Moisture content of aggregate	5%
Mix II.	Cement CEM 1 32.5	335 kg/m ³
	Water	150 kg/m ³
	Aggregate – Sand/Gravel 0/8m	1862 kg/m ³
	Moisture content of aggregate	5%
	ZETOLAN – MEK	0.11kg/m ³

4. LABORATORY INVESTIGATION

4.1 Determination of the Air Entrainment in freshly mixed concrete:

The determination of the Air Entrainment volume was calculated by an Air Entrainment Pressure Balance Meter.

The results are shown in Table 1 below

4.2 Determination of the Compressive Strength:

The compressive strength tests were carried out after 28 days curing in accordance with DIN 1164, Part 7 in the approved cube dimensions of 8cm x 4 cm x 4 cm.

The results are laid out in Table 1 below.

ID No	Mix	Air Entrainment %	Cube No.	Strength [kN]	Compressive Strength N/mm ²	Average [N/mm ²]	Variance from Average [%]
1			I.1	92.2	36.9		2.9
2			I.2	94.0	37.6		1.0
3	I	2.1	I.3	94.5	37.8	38	0.5
4			I.4	94.2	37.7		0.8
5			I.5	97.7	39.1		2.9
6			I.6	97.2	38.9		2.4
7			II.1	90.5	36.3		0.8
8			II.2	95.7	38.4		6.7
9	II	2.2	II.3	92.2	36.9	36	2.5
10			II.4	87.1	34.9		3.0
11			II.5	90.2	36.1		0.3
12			II.6	82.0	32.8		8.9

Air entrainment taken in fresh condition

5. COMBINATION:ASSESSMENT

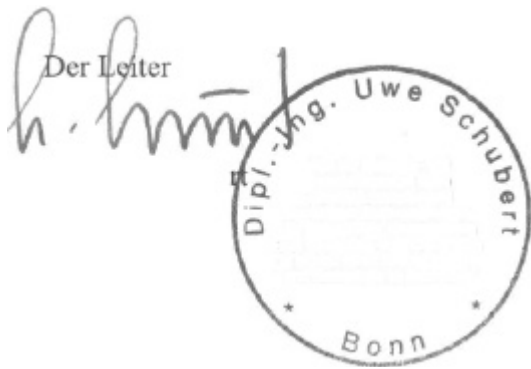
The results of the Air Entrainment in Mix II (with ZETOLAN MEK) show an increase of 0.1% in comparison with Mix I.

This difference lies within the parameters of acceptable tolerance and is considered the same value.

Although the resulting average of the compressive strength of Mix II (with ZETOLAN-MEK) at 36 N/mm^2 is around 5.3% lower than the average of Mix I, this is minimal and can be concluded that the strength of the concrete has not been influenced.

In respect of the influence of the product ZETOLAN-MEK on the quality of mixed concrete, used at a level of 15 gr/m^2 in respect of air entrainment and the expected compressive strength is trivial.

Der Leiter
h. h. h. h. h.
Dipl.-Ing. Uwe Schubert
Bonn



Dipl.Ing. U. Schube:

ö.b.u.v. Sachverständiger
von der Industrie- und
Handelskammer Bonn
öffentlich bestellter und
vereidigter Sachverständiger
für „Bauchemie. Untersuchung
von Baustoffen - Estriche, Putze,
Mörtel, deren Beschichtung und Kunststoffe im Bauwesen“