

## INTRODUCTION

UVEKOL® A is a one-component acrylic resin for the lamination of glass systems. It is cured under UV light for 20 minutes.

The UVEKOL® A interlayer produces glass laminates with excellent acoustic performance.

UVEKOL® A can be applied with nearly all kinds of glass: flat and slightly bent, tempered, coated and other types of glass.

## PHYSICAL PROPERTIES

The data below are typical values.

Refractive Index @25°C	1.4360
Colour, Apha	max. 20
Viscosity Höppler @25°C, mPa.s	190
Density, g/cm <sup>3</sup>	0.923
Shore A hardness after cure @21°C	10.5

## APPLICATION PROCEDURE

The lamination of glass with UVEKOL® resins is a simple application process, it requires no heating or pressure.

The glass panes to be laminated are cleaned and joined together with a double-sided adhesive tape, leaving a small opening. UVEKOL® A is pumped into the cavity between the panes and then the resin is cured in an UV oven for 20 minutes (standard time for most laminating applications).

Detailed information about the application procedure is available in the UVEKOL® User's Guide: Instructions for the production of UVEKOL® laminated glazing units.

## SPECIAL APPROVALS

Avis Technique France

UVEKOL® A laminates passed all required tests and were attributed Avis Technique 6/98-1217, 6/02-1418 with validity till June 30, 2005.

## ACOUSTIC PROPERTIES OF UVEKOL® A BASED GLASS LAMINATES

The composition of UVEKOL® A was designed to result in an elastic interlayer in order to dampen vibrations. UVEKOL® A has been optimized for the use in acoustic glazing.

The table below mentions some examples of the performance of laminated glass produced with UVEKOL® A resin.

The list is not exhaustive and if you are interested in a certain certificate please contact allnex.

The sound dampening was measured according to ISO 140 and similar, and evaluated as a single number rating according to ISO 717-1 ("Rw" index in dB) or according to e.g. NF S 31.045 (traffic noise RA index in dB(A)).

TYPE OF GLAZING	COMPOSITION mm	SOUND REDUCTION	
		Rw (dB) (dBA)	RA
MONOLITHIC	8	34	29
SINGLE LAMINATED	4 / 1 / 4	37	33
	4 / 2 / 4	38	34
	6 / 1 / 6	38	-
LAMINATED 3-PLY	8 / 1 / 4 / 2 / 4	41	-
INSULATING GLASS **	10 / 12 AS / 10	34	30
	8 / 9.5 AS / 4 / 1.2 / 4	40	35
	10 / 11.5 AS / 4 / 1.2 / 6	43	39
	4 / 1 / 5 / 20 AS / 4 / 2 / 5	48	-
	4 / 1 / 5 / 20 GAS / 4 / 2 / 5	52	-
I.G. WITH GAS FILLING	4 / 1 / 5 / 20 GAS / 4 / 2 / 5		
Tested By Institut Für Fenstertechnik, Rosenheim Germany Centre Experimental De Recherches Et D'etudes Du Batiment Et Des Travaux Publics, Saint-Rémy-Les-Chevreuse France Tno-Tue - Centrum Bouwonderzoek – Laboratory For Acoustics Eindhoven, The Netherlands			

\* composition 4/1/5 means the laminate is built up 4 mm glass pane / 1 mm UVEKOL® interlayer / 5 mm glass pane

\*\* AS = air space

## IMPACT PROPERTIES OF UVEKOL® A BASED GLASS LAMINATES

Thanks to the use of appropriate urethane acrylate oligomer, UVEKOL® A has excellent impact resistance.

Although the product has been optimized for the use in acoustic glazing, it offers very interesting perspectives for application in safety and security glazing as well.

Here follows an overview of the performance of laminated glass produced with the UVEKOL® A resin.

The list is not exhaustive and if you are interested in a certain test certificate please contact allnex.

Safety performance

ANSI and variants – pendulum test

The most commonly used tests for safety performance are pendulum tests. In this approach, a soft body impactor (bag, tyres) is swung from a standardized drop height against a vertically positioned test panel.

The test simulates a person slipping and falling against a safety glass: a balustrade, banister or facade.

The table below shows examples of laminate compositions that meet the respective standard.

STANDARD	IMPACTOR TYPE WEIGHT - kg	DROP HEIGHT mm	IMPACT ENERGY Joule	COMPOSITION mm
EN 12600	TWIN TYRE – 50	1200	600	4 / 1 / 4
NF P 08.301 M 50 Adapted	BAG – 50	1200 1800	600 900	4 / 1 / 4 4 / 1 / 4
ANSI Z.97	BAG – 45 BAG – 45	1200 1350	548 607	4 / 1 / 5 5 / 1 / 6
ANSI Z.97 adapted	BAG – 50	1400 THE 1800 THEN 2000	700 900 1000	ON THE SAME 5 / 2 / 4 PANEL ( 8 years old )
tested by INSTITUT FÜR FENSTERTECHNIK, Rosenheim GERMANY INSTITUT (SCIENTIFIQUE) DU VERRE, Charleroi BELGIUM CENTRE EXPERIMENTAL DE RECHERCHES ET D'ETUDES DU BATIMENT ET DES TRAVAUX PUBLICS, St Remy les Chevreuse, FRANCE				

UVEKOL® A laminate in a 4 / 1 / 4 composition passes the new EN12600 standard, it meets the class 1B.

Class 1B means: 1 = highest drop height 1,200 mm

B = mode of breakage

“ numerous cracks appear, but the fragments hold together and do not separate”

Security performance

EN 356- impact falling ball test

A steel ball of 4.11 kg is dropped from a standardized drop height onto a horizontally positioned test panel.

The test simulates impacts that glazing can undergo in cases of aggression: vandalism, burglary or manual attack.

Using UVEKOL® A it is possible to make single laminated glazing, from P1A to P3A.

EN 356 CATEGORY	DROP HEIGHT mm	NUMBER OF DROPS	COMPOSITION mm	THICKNESS mm
P1A	1500	3	3 / 1 / 3 4 / 1 / 4	7 9
P2A	3000	3	3 / 2 / 3 4 / 1.5 / 4	8 9.5
P3A	6000	3	4 / 2 / 4	10
Tested By Institut Für Fenstertechnik, Rosenheim Germany And Institut (Scientifique) Du Verre, Charleroi Belgium				

## ACCELERATED AGEING OF UVEKOL® A BASED ON GLASS LAMINATES

UVEKOL® A laminates have excellent stability, against heat, UV light and against humidity.

They have been tested intensively, using natural and accelerated ageing tests.

Some of the most relevant data are summarized below.

RESISTANCE	TEST	STANDARD	PERFORMANCE
HEAT	Oven ageing		oven ageing – 60°C 4 / 1 / 4 laminate after 600 hours: no defects delta E = 0.6 * after 1500 hours: no defects delta E = 0.9 *
	Resistance to temperature changes - Klima test cycles between –30°C and +80°C	DIN 52344 adapted	passed 100 cycles no defects
HEAT + MOISTURE	Hot boiling test, exposure to two days	EN 12543 adapted	passed – no defects, slight haze but not peeling
UV	Q-panel ageing - 3000h continuous UV irradiation	ASTM G53	4 / 1 / 4 laminate after 5,000 hours: no defects delta E = 0.33 *
	Florida natural ageing Sub-Tropical Testing Service orientation 5°, 45°	ASTM G7	after 24 months: no defects transmission loss 0.60 delta E = 0.47 *

\* delta E is a measure for a difference in colour

## PACKAGING

UVEKOL® A is available in polyethylene-lined steel drums of 180 kg net weight and Schutz containers of 950 kg net weight.

## TRANSPORT REGULATION

Flash point	UN	ADR / RID	IATA / IMCO	Tpr LABEL	WGK
72°C	1760	8, II	8, II	62	2

version 2.0

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## QUALITY CERTIFICATION

UVEKOL® products manufacturing is certified ISO 9001 and ISO 14001.

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## STORAGE AND HANDLING

UVEKOL® should be stored in a dry place, away from sources of heat, at a temperature of 15 to 30°C.  
UVEKOL® resins have a shelf life of 6 months from the date of manufacture.

## STATUTORY LABELING

For Statutory Labeling information, please refer to Safety Data Sheet.