Test-Report

Electrical Market Laboratory

No.: TR-003481

Subject: Electrical Resins Scotchcast 1402 FR and Scotchcast 1400U for cable joints

Type of Test: Test according to ISO175 and IEC 60455-2

Date of Test: February to May 2009

Test Summary: The weight change of the test resins during the immersion in different test liquids have been determined

Date: August 21, 2009

J. Weichold
Development Specialist
Electrical Products

M. Gravermann
Development Engineer
Electrical Products

3M Deutschland GmbH
Carl-Schurz-Str. 1
D-41453 Neuss

Telephone 02131/14-2449
Fax 02131/14-3897
VAT-ID-No.: DE 120679179

1. Description of samples

The resins Scotchcast 1402 FR and Scotchcast 1400U for cable joints have been tested according to ISO 175. The reason for this test was to determine the effects of liquid chemicals to the resins.

Three test specimens were immersed to each test liquid. The specimens were square and have an edge length of 50 mm and a thickness of 3 mm. The test liquids were Super unleaded with an octane rating of 95, Diesel, insulating oil shell diala d, hydraulic oil shell tellus d 46 and a salt solution of 10%.

1.1 Definition of the test procedure

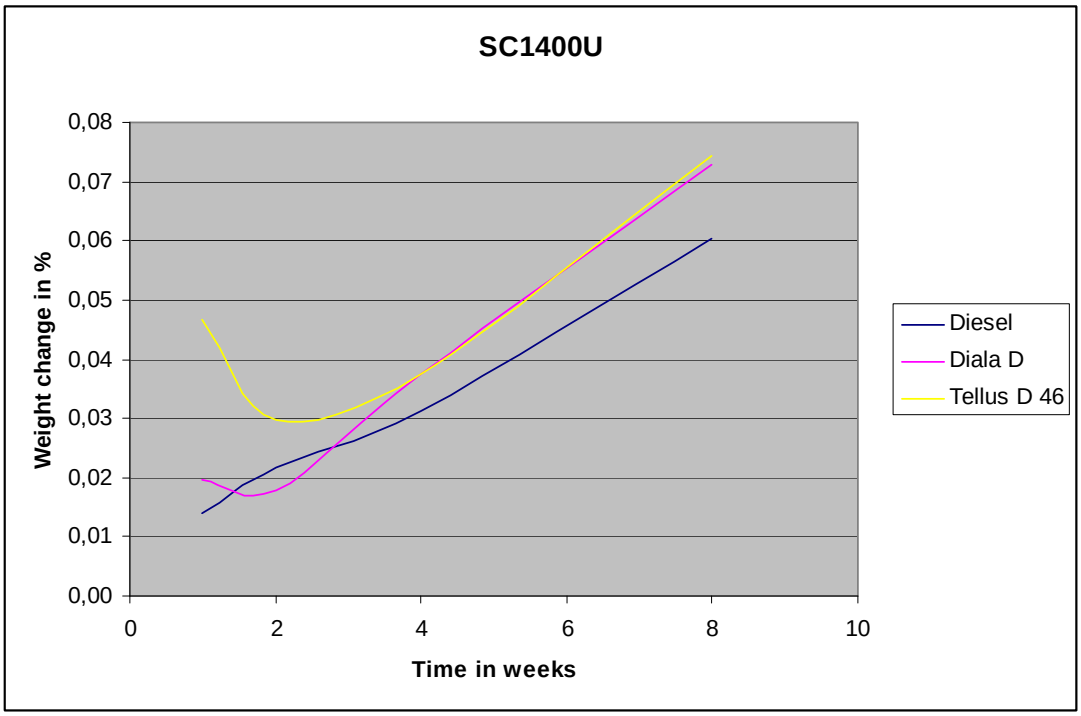
The test was carried out at ambient temperature. Before the test the specimens were conditioned 24 hours at ambient temperature. The specimens were immersed in the test liquids for 8 respectively 16 weeks. After 1, 2, 4, 8 and 16 weeks the specimens were weighed. For that purpose the specimens were cleaned with a paper towel. The increase in weight was determined as a percentage value of the initial value. The arithmetic mean was calculated out of the three individual values of each specimen triple. After that these values were plotted.

2. Results

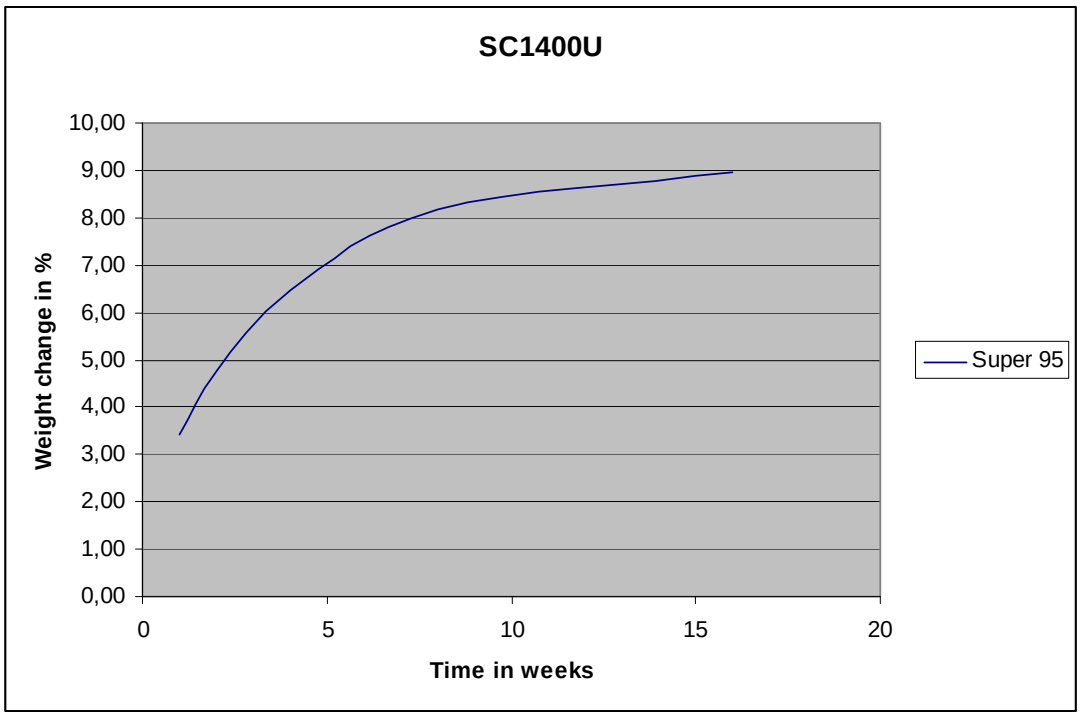
Test resin	Test liquid	Weight 1 week [Δ%]	Weight 2 weeks [Δ%]	Weight 4 weeks [Δ%]	Weight 8 weeks [Δ%]	Weight 16 weeks [Δ%]
SC1402FR	Super 95	6,08 %	6,72 %	4,65 %	3,81 %	3,5 %
SC1400U	Super 95	3,42 %	4,75 %	6,46 %	8,19 %	8,96 %
SC1402FR	Diesel	-0,04 %	-0,04 %	-0,04 %	-0,02 %	
SC1400U	Diesel	0,01 %	0,02 %	0,03 %	0,06 %	
SC1402FR	Diala D	-0,05 %	-0,07 %	-0,08 %	-0,08 %	
SC1400U	Diala D	0,02 %	0,02 %	0,04 %	0,07 %	
SC1402FR	Tellus D46	-0,04 %	-0,05 %	-0,08 %	-0,08 %	
SC1400U	Tellus D46	0,05 %	0,03 %	0,04 %	0,07 %	
SC1402FR	Salt 10%	0,13 %	0,18 %	0,23 %	0,26 %	0,27 %
SC1400U	Salt 10%	0,19 %	0,27 %	0,4 %	0,58 %	0,81 %

3M Deutschland GmbH
Carl-Schurz-Str. 1
D-41453 Neuss

Telephone 02131/14-2449
Fax 02131/14-3897
VAT-ID-No.: DE 120679179



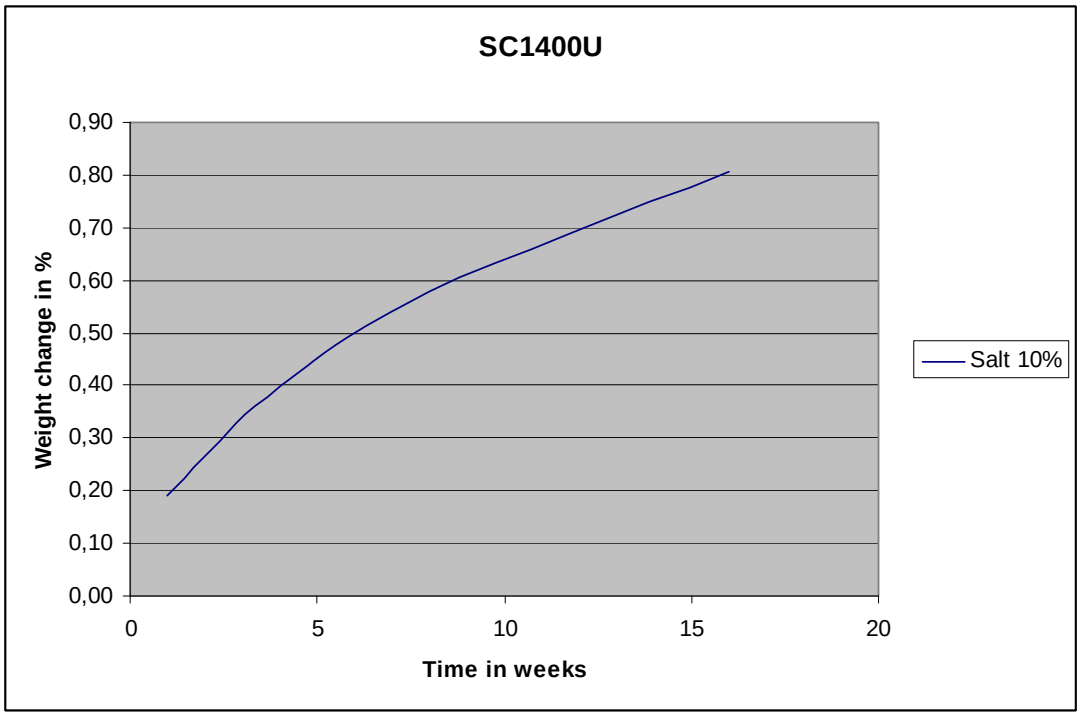
Picture 1: Weight change as a function of time of SC1400U in test liquids



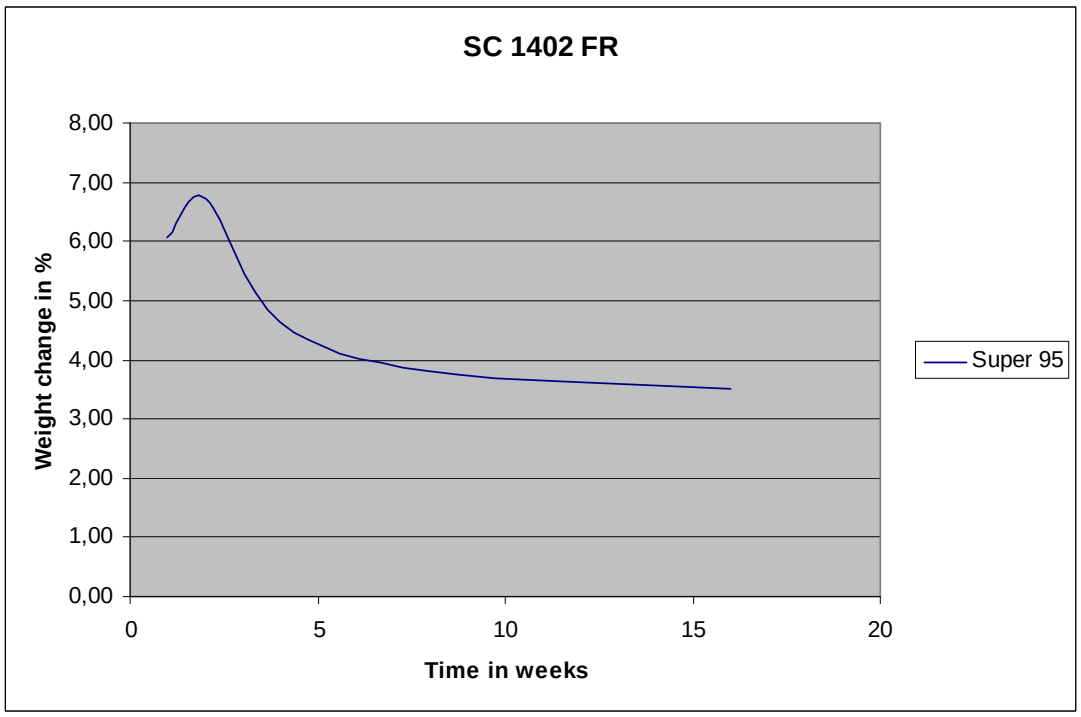
Picture 2: Weight change as a function of time of SC1400U in Super 95 test liquid

3M Deutschland GmbH
Carl-Schurz-Str. 1
D-41453 Neuss

Telephone 02131/14-2449
Fax 02131/14-3897
VAT-ID-No.: DE 120679179



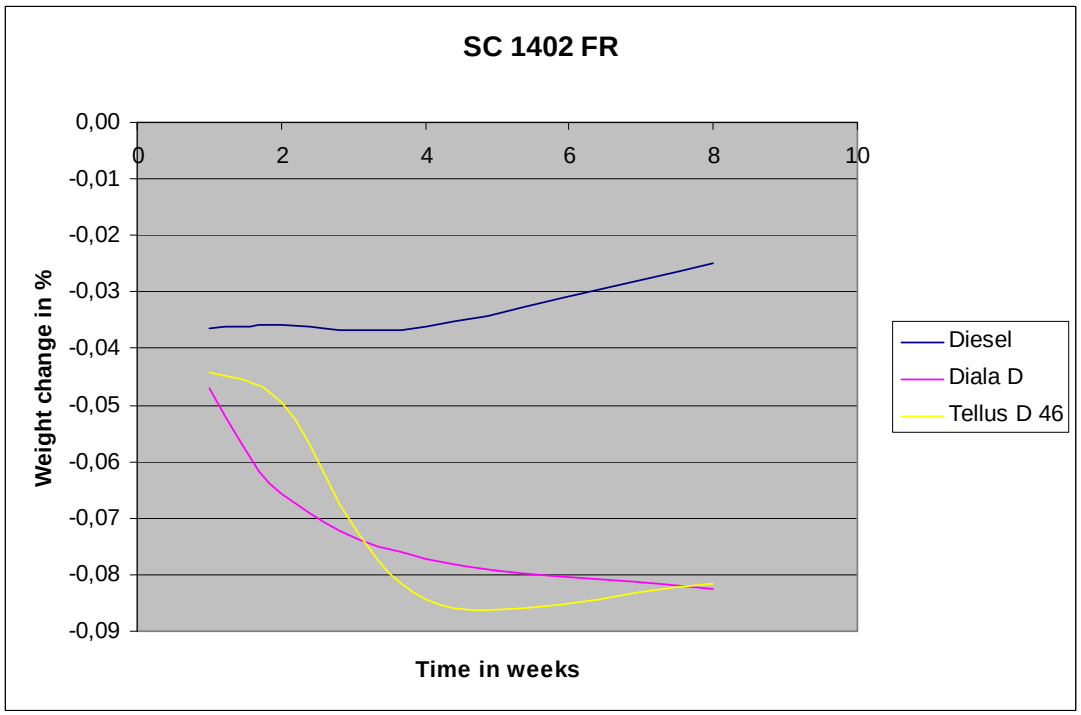
Picture 3: Weight change as a function of time of SC1400U in Salt Solution test liquid



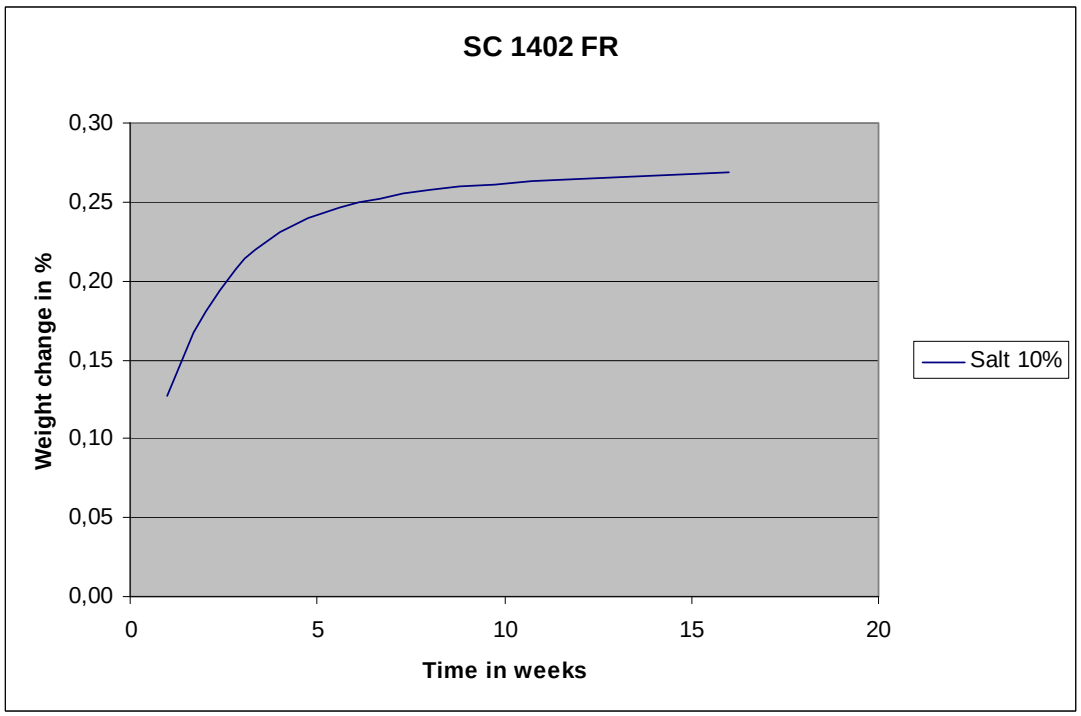
Picture 4: Weight change as a function of time of SC 1402 FR in Super 95 test liquid

3M Deutschland GmbH
Carl-Schurz-Str. 1
D-41453 Neuss

Telephone 02131/14-2449
Fax 02131/14-3897
VAT-ID-No.: DE 120679179



Picture 5: Weight change as a function of time of SC 1402 FR in test liquids



Picture 6: Weight change as a function of time of SC 1402 FR in Salt Solution test liquid

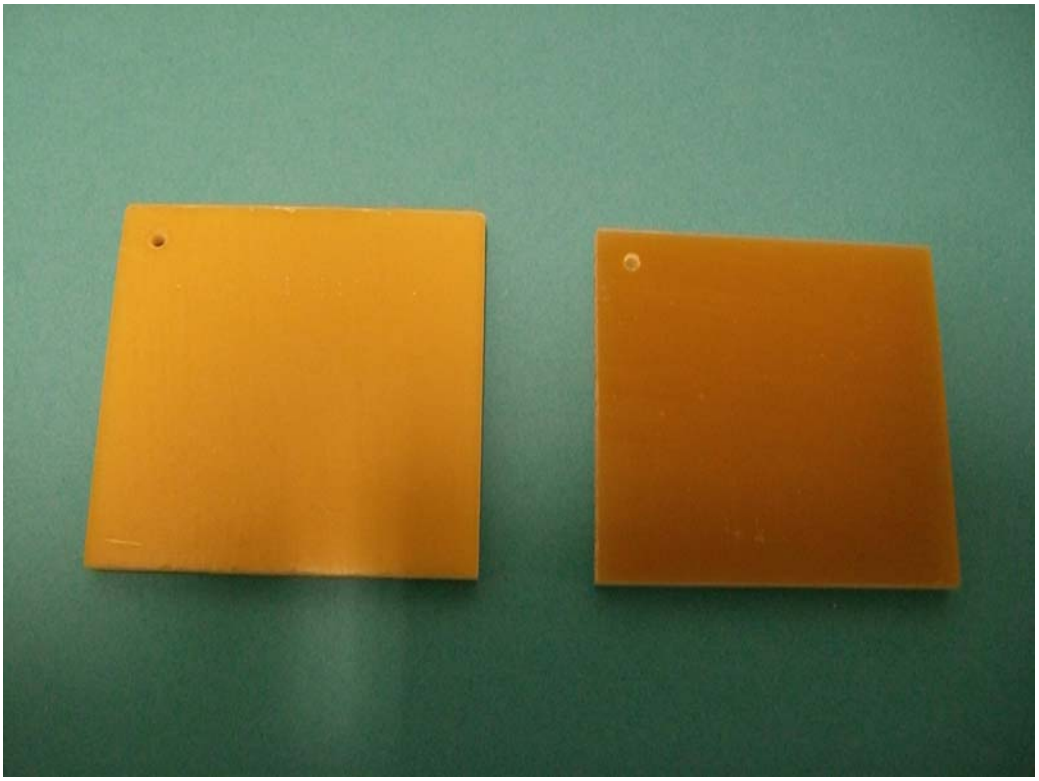
3. Visual examination

After the test a visual examination was carried out. On the surface of the resin Scotchcast 1400U, which was immersed in Super 95 for 16 weeks, little cracks were visible. In connection with the resin SC 1402 FR a change of the colour was observed after the immersion. The other specimens showed no visual change

Picture 7: SC 1400U after 16 weeks in Super 95

3M Deutschland GmbH
Carl-Schurz-Str. 1
D-41453 Neuss

Telephone 02131/14-2449
Fax 02131/14-3897
VAT-ID-No.: DE 120679179



Picture 8: SC 1402 FR with original colour and after 4 weeks in Super 95

3M Deutschland GmbH
Carl-Schurz-Str. 1
D-41453 Neuss

Telephone 02131/14-2449
Fax 02131/14-3897
VAT-ID-No.: DE 120679179