

## 2. IMPREGNATING RESINS **VUDAP**/ Polyesterimide in diallylphtalate/ NH 91/u, NH 91 MV/u, NH 91 LV/u



CABLES



IMPREGNANTS



WIRES



RESEARCH



### Application:

Impregnating resins NH 91/... are suitable for vacuum pressure impregnation or for dipping and flooding impregnation of

- form wound stators, armatures and deep section windings

- explosion proof electrical machines

- standard motors, special machines and transformers

up to thermal class H (180°C) according to IEC - Publication 216.

Windings impregnated with impregnating resins NH 91/... provide good reliability of machines in reversing operation, good resistance to tropical climates, and good resistance to solvents, acids, oils, freons and radioactivity.

### Description:

Chemical base of impregnating resins is unsaturated polyester resin diluted in diallylphtalate. Their cure time is 2 h at 130 °C.

### Processing data:

			NH 91/u	NH 91 LV/u	NH 91 MV/u
Density (DIN 53 217)	25°C	[kg/m <sup>3</sup> ]	1130 – 1150	1130 - 1140	1150-1180
Flow time( DIN Cup 4 )	25°C	[s]	110 – 150	50 - 80	180-280
Viscosity	25°C	[mPa.s]	550 – 750	240 - 400	900-1400
Shelf- life	max. 25°C	[months]	min. 12	min. 12	min.12
Flash point (Cleveland)		[°C]	145	145	145
Vapour pressure	25°C 100°C	[mbar]	0,0013 0,26	0,0013 0,26	0,0013 0,26
Gel-time <sup>1</sup>	130°C	[min]	10 – 17	10 - 17	10 -17
Pot- life (Criterion : double increase of viscosity)	50°C	[days]	50	50	50
Effect of varnish on enamelled wires <sup>2,3</sup> after 60 min at 70 °C		Decrease of pencil hardness	0-1	0-1	0-1

Polyesterimide in diallylphtalate



**VUKI**  
SINCE 1950

F-11.1.22-11-2/11en

## 2. IMPREGNATING RESINS Polyesterimide in diallylphthalate/ NH 91/u, NH 91 MV/u, NH 91 LV/u



CABLES



IMPREGNANTS



WIRES



RESEARCH

### Properties after cure:

			NH 91u	NH 91LV/u	NH 91 MV/u
Ability to cure in considerable thickness <sup>4,5</sup>		[degree °]	S 1 U 1 I 1.1	S 1 U 1 I 1.1	S 1 U 1 I 1.1
Curing of test specimen	130°C	[h]	4	4	4
Dielectric strength <sup>6</sup>	23 °C	[kV/mm]	120 – 150	120 - 150	120-150
Volume resistivity <sup>5</sup>	23 °C	[Ω .m]	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>
	155 °C	[Ω .m]	10 <sup>11</sup>	10 <sup>11</sup>	10 <sup>11</sup>
	180 °C	[Ω .m]	10 <sup>10</sup>	10 <sup>10</sup>	10 <sup>10</sup>
	after immersion in water for 4 days	[Ω .m]	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>
Twisted coil test <sup>7</sup>	23 °C	[N]	350 – 400	300 - 350	300-350
	155 °C	[N]	120 – 150	130 - 160	120-150
	180 °C	[N]	80 – 100	90 - 120	80-100
Helical coil test <sup>7</sup>	23 °C	[N]	200 – 250	200 - 250	180-200
	155 °C	[N]	100 – 120	100 - 120	100-120
	180 °C	[N]	60 – 90	60 - 90	60-80
Glass transition temperature (Tg)		[°C]	140	140	
Thermal endurance <sup>8</sup> , Test criterion:	Bond strength 22 N (Helical coil)	[°C]	183	183	188
	Breakdown voltage 700 V (Twist)	[°C]	181	181	185
Thermal endurance <sup>10</sup> Test criterion:	Breakdown voltage 1500 V (Twisted pairs)	[°C]	180	180	180

1. DIN 16 945 Method A

2. IEC 60464-2

3. Polyesterimid, Polyesterimid + amidimid

4. 2 h at 100 °C and 2 h at 130 °C

5. DIN 46 448 Blatt 1

6. NEMA Standard RE 2-1987

7. Bond strength IEC 61033

8. IEC 60216

9. Interior :rigid, no voids

10. Top side:Smooth, non- tacky

11. UL test 1446 File E233982

### Packing a storage:

Impregnating resins are delivered in drums. They have to be stored in tightly closed drums at temperature max. +25°C.



**VUKI**  
SINCE 1950

F-11.1.22-11-2/1en