



SPECIFICATION OF HEW502N TYPE SOLVENTLESS EPOXY RESIN

1. Scope

This specification describes HEW502N Type Solventless Epoxy Resin (hereafter abbreviated as HEW502N) to be used for adhesives of electrical machines.

2. Ingredients

This product consists of main resin, hardener and accelerator. The mixing ratio and curing ratio are given in Table 1.

Table 1

Component	Model	Mixing ratio (wt)	Shelf life (months)
Main resin	HEW502NA	100	12
Hardener	HEW502NB	80	12
Accelerator	HEW502NC	2	12

If the components are used separately, they have a shelf life of 12 months.

The curing ratio is given in Table 1. The curing ratio is 100%.

The curing ratio is 100%.

3. Test

Item	Method	Result
Shelf life	12 months	100%
Curing ratio	100%	100%
Adhesive strength	100%	100%

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12-02-93

Checked

12-02-93



SPECIFICATION OF HEW821 TYPE EPOXY COMPOUND

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1. Scope

This specification describes HEW 821 Type Epoxy Compound (hereafter abbreviated as compound) to be used for adhesion of coil and core for electrical machines.

2. Ingredient

2.1 This compound consists of main resin, hardener and filler. The composition and mixing ratio are given in Table 1.

Table 1

Composition	Symbol	Mixing Ratio (wt)
Main resin	HEW 821A	100
Main resin	HEW 821B	20
Hardener	HEW 821C	87
Filler	HEW 821D	110.5

2.2 As each composition will be delivered with separated containers. They have to be mixed before using.

3. Quality

3.1 Quality of each component of this compound is given in Table 2.

Revision: 02
Table 2, Clause 4 added
Date: 06/09 / 2010

Distribution

Qty.

Approved:
(S.P. Singh)

Prepared:
Shishu pal
DE/TME

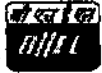
Checked:
V. Rawtiya
Sr. Engr./TME

Date:
06/09/2010

TME
TXM
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QMX

1
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(Signature)
6/9/10



PRODUCT STANDARD
TME DIVISION, BHOPAL

TM 88079

PAGE 02 OF 02

TME 2011

Table 2

Item	HEW 821A	HEW 821B	HEW 821C	HEW 821D
Specific gravity (25°C)	1.167 - 1.182	1.08 - 1.10	1.22 - 1.24	—
Viscosity(Poise at 25°C)	3.0 - 6.0	0.06 - 0.09	1.5 - 3.0	—
Water Content (%)	≤ 0.25	≤ 0.5	≤ 0.2	≤ 0.03
Grading	—	—	—	≥ 78% pass for 300 mesh
PH	—	—	—	7 ± 0.5
Shelf life (months) (after mfg. date)	12	12	12	36

3.2 Quality of this compound is given in Table 3.

Table 3

No.	Item	Unit	Quality	Remarks	
1	Viscosity	25°C	Poise	50 - 150	—
		60°C	Poise	2 - 4	
2	Gelation time at	160°C	hours	4 - 6	—
3	Adhesive strength with iron plate	25°C	kg/cm ²	≥ 50	Curing condition : 160°C for 20 hours.
		150°C	kg/cm ²	≥ 40	
4	Flexural strength	25°C	kg/cm ²	≥ 1000	Curing condition : 160°C for 20 hours
		150°C	kg/cm ²	≥ 400	
5	Thermal weight loss	%	≤ 4	at 200°C, 140 days	

4. This specification is equivalent to CLW spec no. A0116 Alt. ""

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TM 88060

TME 2011

PAGE 01 OF 01

SPECIFICATION OF LUBRICANT (KS707)

1. Scope

This specification describes Lubricant (KS707) sourced from "SEIYETSU JAPAN/WACKER CHEMIE (GERMANY)/DOW CORNING (USA)" (hereafter abbreviated as KS707) used for mold releasing of jig.

2. Quality

Quality of KS707 is given in Table 1.

Table 1

NO	Item	Property
1	Color	Light yellow
2	Non volatile content (%) - 3hrs at 105°C	48 - 52
3	Specific gravity at 25°C	0.95 - 1.05
4	Main component	Silicone
5	Shelf life	6 months at 50°C

3. Package

Standard package of KS707 is 1 kg (net wt.)

4. This specification is equivalent to CLW specification no. AD119 rev 01.

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Revision: 02
SCOPE modified

Date: 27/09/2010

Distribution

Qty.

Approved:
(M.Bhakta)

TME
TXM
TNX
QMX

1
1
1
2

Prepared:
Shishu pal
DE/TME

Checked:
A. Kaidare
Mgr./TME

Date:
27/09/2010



SPECIFICATION OF ALKYD VARNISH (VI-294)

1. Scope

This specification describes Alkyd Varnish (VI-294) (hereafter abbreviated as varnish) to be used for adhesion and impregnation of coil.

2. Quality

Quality of this varnish is given in table 1.

3. Package

Standard package of this varnish is following. (net wt.

4Kg, 16Kg

Table 1 (Testing method : JISC2103)

NO	Item	Property	
1	Color	Amber	
2	Specific gravity (25°C)	0.92±0.03	
3	Viscosity (25°C poise)	1.0 -3.0	
4	Non volatile content (%)	45±3	
5	Drying time on plate surface	<2hrs at 120°C	
6	Film thickness covered on plate surface	Central part(mm)	>0.03
		Lower part(%)	<130
7	Volume resistivity (ρ - cm)	Normal (25°C)	>1 X 10 ¹⁴
		Moistened (25°C)	>1 X 10 ¹³
8	Dielectric strength (KV/0.1mm)	Normal (25°C)	>9.0
		Moistened (25°C)	>8.0
9	Oil proofness	24hrs at 100°C	
10	Weight loss (%)	<7 (48hrs at 150°C)	
11	Thinner	S-30	
12	Shelf life (after mfg. date)	12 months at 30°C	

5. This specification is equivalent to CLW specification no. A0175 rev 01.

Revision: 02 Table 1 modified	Distribution	Qty.	Approved: (M.Bhakta)		
Date: 27/09/2010	TME	1	Prepared:	Checked:	Date:
	TXM	1	Shishu pal	A. Kishore	27/09/2010
	TNX	1	DE/TME	Mgr/TME	
	QMX	2			

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SPECIFICATION OF FINISHING VARNISH (WSY101)

1. **Scope**
This specification describes Finishing Varnish (WSY101) (hereafter abbreviated as varnish) to be used for finishing of surface of electrical machines.

2. **Quality**

Quality of this varnish is given in Table 1.

Table 1

No.	Item	Property	
1.	Color	Black	
2.	Specific gravity (25°C)	0.90 ± 0.03	
3.	Viscosity (25°C poise)	1.0 - 3.0	
4.	Non volatile content (%)	50 ± 3	
5.	Drying time on plate surface	< 1.5hrs at roomtemp	
6.	Film thickness covered on plate surface	Central part (mm)	>0.03
		Lower part (2)	< 130
7.	Volume resistivity (Ω-cm)	Normal (25°C)	> 10 ¹⁴
		Moistened (25°C)	> 10 ¹³
8.	Dielectric strength (kV/0.1mm)	Normal (25°C)	> 5
		Moistened (25°C)	> 4
9.	Oil proofness	24hrs at 80°C	
10.	-	-	
11.	Thinner	S-20	
12.	Shelf life (after mfg. date)	10 months at < 30°C	
13.	Type	Synthetic varnish	

3. **Package**
Standard package of this varnish is following. (net wt.)
4kg, 16kg

4 This specification is equivalent to CLW specification no. A0201 rev 01.

Revision: 02
Table modified

Date: 27/09/2010

Distribution

Qty.

Approved:
(M.Bhakta)

Prepared:
Shishu pal
DE/TME

Checked:
A. Kantare
Mgr./TME

Date:
27/09/2010

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TM 88095

TME 2011

PAGE 01 OF 01

SPECIFICATION OF SYNTHETIC VARNISH (VSY285)

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- Scope**
This specification describes Synthetic Varnish (VSY285) (hereafter abbreviated as varnish) to be used for adhesion and impregnation of coil.
- Quality**
Quality of this varnish is given in Table 1.

Table 1

No.	Item	Property	
1.	Color	Amber	
2.	Specific gravity (25°C)	0.94 ± 0.03	
3.	Viscosity (25°C poise)	1.0 - 3.5	
4.	Non volatile content (%)	45 ± 3	
5.	Drying time on plate surface	< 2hrs at 135°C	
6.	Film thickness covered on plate surface	Central part (mm)	> 0.03
		Lower part (%)	< 130
7.	Volume resistivity (Ω-cm)	Normal (25°C)	> 1 × 10 ¹⁵
		Moistened (25°C)	> 1 × 10 ¹⁵
8.	Dielectric strength (kV/0.1mm)	Normal (25°C)	> 9.0
		Moistened (25°C)	> 8.0
9.	Oil proofness	24hrs at 120°C	
10.	Weight loss (%)	< 10, 72hrs at 175°C	
11.	Thinner	S-30	
12.	Shelf life (after mfg. date)	12 months at < 30°C	

3. Package

Standard package of this varnish is following. (net wt.)
4kg, 16kg

5. This specification is equivalent to CLW specification no. A0205 rev 01.

Revision: 02 Table 1 modified	Distribution	Qty.	Approved: (M.Bhakta)		
Date: 27/09/2010	TME	1	Prepared:	Checked:	Date:
	TXM	1	Sbistul pal	A.katdare	27/09/2010
	TNX	1	DE/TME	Mgr./TME	
	QMX	2			



PRODUCT STANDARD
TME DIVISION, BHOPAL

TM 88098

TME 2011

PAGE 01 OF 01

SPECIFICATION OF FINISHING VARNISH (TVA1410)

1. Scope

This specification describes Finishing Varnish (TVA1410) (hereafter referred as varnish) to be used for finishing of surface of electrical machines.

2. Quality

The varnish shall be as given in table 1.

3. Packing

Standard package of varnish shall be as following. (net wt.)

5kg, 10kg, 15kg

Table 1

(Test method : IS 9210A)

Item	Property
Color	Red
Specific gravity (20°C)	1.10 ± 0.20
Viscosity (25°C)	4-10
Solids content (%)	50 ± 3
Drying time on plate surface	≤ 1 hr at room temp.
Flexibility covered on plate surface	Central part (mm)
	Lower part (mm)
Elongation (%)	Impact (20°C)
	Modulus (25°C)
Tensile strength (N/mm ²)	100°C
	25°C
Heat stability (hrs)	200°C
	300°C
Storage stability (months)	5-10
	5 months at < 10°C
	Modified epoxy varnish

5. This specification is equivalent to CLW specification no. A0209 Alt 00.

Revision: 00
Date: 14/09/2010

Distribution

Qty.

Approved:
(M.Bhukta)

Prepared:
Shishu pal
DE/TME

Checked:
A. Kaldare
Mgr./TME

Date:
14/09/2010

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PAGE 01 OF 01

SPECIFICATION OF HEW823 TYPE EPOXY COMPOUND

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1. Scope

This specification describes HEW823 type epoxy compound (hereafter abbreviated as HEW823) to be used for adhesion and filler of electrical machines.

2. Ingredient

2.1 HEW823 consists of main resin and hardener.

The composition and mixing ratio are given in Table 1.

Table 1

Composition	Symbol	Color	Mixing ratio (wt)	Shelf life
Main resin	HEW823A	Gray	100	18 months
Hardener	HEW823B	Red	90	at 30°C

2.2 As each composition will be sent separately, they have to be mixed before using.

3. Quality

3.1 Quality of HEW823 before curing which is mixed by Table 1 is given in Table 2 (before curing).

3.2 When HEW823 is cured at 130°C 15hrs., quality of HEW823 is given in Table 2 (after curing).

Table 2 (Testing method - JIS C2103)

Before curing (liquid)		After curing (solid)		
Consistency	Pot life (hrs) at 25°C	Adhesive strength (kgf/cm^2) with SUS plate		Weight loss (%) ($300^{\circ}\text{C}/72\text{hrs}$)
at 25°C	at 25°C	at 25°C	at 130°C	
220±40	≤36	≥50	≥20	≤2

5. This specification is equivalent to CLW specification no. A0256 AR 02.

Revision: 02
Table 1 modified
Date: 14/09/2010

Distribution

Qty.

Approved:
(M. Bhakta)

Prepared:

Shishu pal
DE/TME

Checked:
A. K. S. D. S.
Mgr./TME

Date:
14/09/2010

TME
TXM
TNX
QMX

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SPECIFICATION OF FINISHING VARNISH (USY195R)

- Scope**
This specification describes Finishing Varnish (USY195R) (hereafter abbreviated as varnish) to be used for finishing of surface of electrical machines.
- Quality**
Quality of this varnish is given in Table 1.

No.	Item	Property	
1.	Color	Red	
2.	Specific gravity (25°C)	1.15 ± 0.30	
3.	Viscosity (25°C poise)	6 - 22	
4.	Non volatile content (%)	55 ± 5	
5.	Drying time on plate surface	< 2hrs at room temp.	
6.	Film thickness covered on plate surface	Central part (mm)	> 0.05
		Lower part (%)	< 140
7.	Volume resistivity (12 - cm)	Normal (25°C)	> 1 × 10 ¹³
		Moistened (25°C)	> 1 × 10 ¹²
8.	Dielectric strength (kV/0.1mm)	Normal (25°C)	> 5.0
		Moistened (25°C)	> 4.0
9.	Oil proofness	24hrs at 185°C.	
10.	Weight loss (%)	< 15, 72hrs at 135°C	
11.	Thinner	S-110	
12.	Shelf life (after mfg. date)	10 months at < 10°C	
13.	Type	Modified epoxy varnish	

- Package**
Standard package of this varnish is following. (net wt.)
4kg, 16kg; *Preferable package is 0.5 Kg.*

- The supplier shall also quote separately for the required quantity of suitable thinner for the product Offered. Required quantity shall, however, be decided & ordered by the purchaser at his option.
- This specification is equivalent to CLW specification no. A0204 rev 02.

Revision: 02
Tablet modified

Date: 27/09/2010

Distribution

Qty.

Approved:
(M.Bhakta)

Prepared:
Shishu'pai
DE/TME

Checked:
A.katdare
Mgr./TME

Date:
27/09/2010

TME
TXM
TNX
QMX

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SPECIFICATION OF CATALYST (P-200)

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1. Scope

This specification describes Catalyst (P-200) (hereafter abbreviated P-200) to be used for hardener of multifunctional epoxy resin (NEWEPD).

2. Quality

Quality of P-200 is given in Table 1.

Table 1

No.	Item	Unit	Quality	Remarks
1	Melting point	°C	170±10	Check material
2	Alkalinity	mg/g	2.0~3.5	Check material
3	Water content	wt%	±1.0	Check material
4	Solubility in methanol	-	To melt completely	Check material

3. Shelf life

Shelf life of P-200 is 10 months when kept in sealed container at normal condition (20±15°C, 65±20% RH).

4. Package

Standard package of P-200 is 10 kg.

5. This specification is equivalent to CLW specification no. A0271 rev 01.

Revision: 01	Distribution	Qty.	Approved: (M.Bhakta)	Checked: A. Jadhav Mgr./TME	Date: 27/09/2010
Date: 27/09/2010			Prepared: Shishu pal DE/TME		
	TME	1			
	TXM	1			
	TNX	1			
	QMX	2			



SPECIFICATION OF MULTI-FUNCTIONAL EPOXY RESIN (L-2832)

1. Scope

This specification describes Multi-functional Epoxy Resin (L-2832) hereafter abbreviated as resin to be used for raw material of non-functional epoxy resin (R2290).

2. Quality

Quality of this resin is given in Table 1

Table 1

No.	Item	Unit	Quality	Remarks (Test method)	
1	Viscosity	ICI method	Poise (at 100°C)	1.2-2.6	ICI viscometer
		Control Penske method	cps (at 25°C)	10-25	JIS K 7233
2	error of specific gravity (measured with 100 ml standard cylinder)	% (at 25°C)	-0.005~+0.005	JIS K 7235	
3	Water content	%	0.010	water content method that is used	
4	Acid value	mg	10.000~0.030	JIS K 7233	
5	Free amine	mg	1.5~13.4	JIS K 7233	
6	Moisture content	%	0.010	control method	
7	Color	mg	10~180	control method	

3. Shelf life

The shelf life of this resin is 12 months when kept in sealed container at 25°C (77°F) ± 2°C (81°F).

4. Package

Standard package of this resin is 200 kg.

Revised: _____ Price: 1000000 JPY
 Approved: _____
 12/02/93

Approved: *B. H. Agan*
 Checked: *[Signature]*
 R.P. T. [Signature] 12/02/93
 Date

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SPECIFICATION OF DI-FUNCTIONAL EPOXY RESIN (DER-332)

This specification describes difunctional Epoxy Resin (DER-332) (hereafter referred to as resin) to be used for raw material of multifunctional epoxy resin (DER-33).

The test methods are given in Table 1.

Table 1

Item	Unit	Quality	Remarks (Test method)
Viscosity at 25°C	Poise	40-60	Glass capillary viscousometer
Weight-average molecular weight at 25°C	-	1.15 ± 0.05	GPC
Number-average molecular weight at 25°C	-	50	GPC
Acid value	mg KOH/g	0.02-0.15	Titration method
Water content	%	0.01	Distillation method

The resin should be stored in airtight containers in a cool, dry place.

1. This specification is based on the test results of the resin.

1
TM 89139
12-02-93

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By A. J. [Signature]

Checked: [Signature] Date: 12-02-93

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1 ME, 2011

SPECIFICATION OF ACID ANHYDRIDE (MHAC-P)

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1. Scope

This specification describes Acid Anhydride (MHAC-P) (hereafter abbreviated as MHAC-P) to be used for raw material of multifunctional epoxy resin (NEW290).

2. Quality

Quality of MHAC-P is given in Table 1.

Table 1

No.	Item	Unit	Quality	Remarks (Test method)
1	Specific gravity at 25°C	-	1.23±0.01	JIS K 8006
2	Gardner colour	-	≤2	Gardner color number tube method
3	Viscosity at 25°C	Poise	1.5~3.0	Bubble time method
4	Neutralization equivalent	-	88~93	Indication titration method
5	Appearance	-	To be limpid less colour	Visual method

3. Shelf life

Shelf life of MHAC-P is 12 months when kept in sealed container at normal condition (20±15°C, 65±20%RH)

4. Package

Standard package of this hardner is 20 kg.

5. This specification is equivalent to CLW specification no. A0274 rev 01.

Revision: 02 Table 1 modified	Distribution	Qty.	Approved: (M.Bhakta)		
Date: 27/09/2010	TME	1	Prepared:	Checked:	Date:
	TNM	1	Shishu pat	Mandare	27/09/2010
	TNX	1	DE/TME	Mgr./TME	
	QMX	2			

SPECIFICATION OF PRIMER (S-30)

1. Scope

This specification describes primer (S-30) (hereafter abbreviated as S-30) as to composition of various of various.

2. Quality

Quality of S-30 is given in Table 1.

3. Package

Standard package of S-30 is following (net wt.)
4kg, 14kg.

Table 1

NO	Item	Property
1	Color	White
2	Specific gravity (20°C)	0.95 ± 0.02
3	Shelf life (after mfg. date)	12 months
4	Main component	Mineral turpentine and Xylene

4. Mixing ratio of main components :

- (a) Mineral turpene (white spirit) : 30%
Grade 145/205 to BHEL Specifications AA56701.
- (b) Xylene, industrial solvent grade to BHEL specification AA56703. 70%

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Revisions: 01
 PREPARED BY: TML SCHAID
 (14-1-57)
 Date: 10-01-58

Distribution	Qty.	Approved
TXM	2	<i>[Signature]</i>



SPECIFICATION OF THINNER (S-110)

1. Scope

This specification describes Thinner (S-110) (hereafter abbreviated as S-110) to be used for thinning of varnish.

2. Quality

Quality of S-110 is given in Table 1.

3. Package

Standard package of S-110 is following. (net wt.)

4kg, 14kg

Table 1

NO	Item	Property
1	Color	Transparent
2	Specific gravity (20°C)	0.86 ± 0.02
3	Shelf life (after mfg. date)	12 months at <
4	Main component	Toluene

4. Main Component : Industrial Toluole (Toluene) to specification AA56702.

Revisions: 0
SPEC. NO. WAS TME 9045
(10/52)

Date: 12.02.95

Distribution

Div.

Approved

TMM

2

(Signature)
Date

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