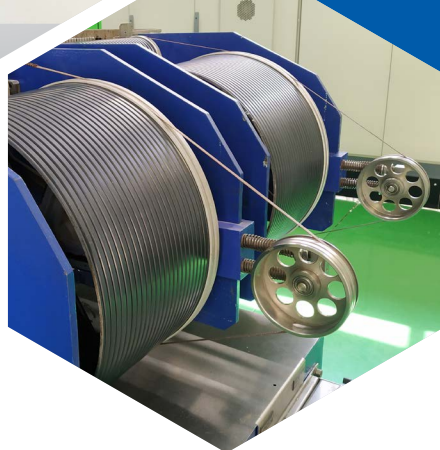
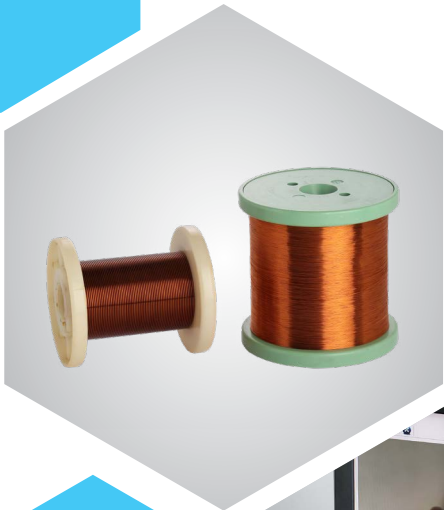


WIRE ENAMELS

Wire Enamels | Binder Varnishes
Primers | Lubricants



- ▶ Leading market position through continuous innovation
- ▶ Global portfolio offering world class technology

- ▶ Global footprint allowing fast response to customer needs
- ▶ UL recognized product listing

- ▶ Efficient, safe and modern plants leading to supply reliability
- ▶ Best team in the industry with global products, application, service & market knowledge

We offer enamels, varnishes, resins systems through our different business lines

Wire Enamels



- Wire enamels for the primary insulation of magnet wire
- Magnet wire is applied in electric motors, generators and transformers

Electricals



- Secondary insulation of winding wire after it is mounted in a device (electric motor, generator or transformer)
- Applied through various application techniques (dip, roll-dip, hot-dip, trickle, VPI etc.)

Electronics



- Resin systems for the overall protection of electronic circuits and electric devices
- Resin systems with specific functionalities in electronic components/assemblies

Engineering Materials



- Total solution from Functional flooring to waterproofing and coating
- Polyamide hardeners for varied industrial uses

Wire enamels – Product selection guide

Product Name	Chemical base	Viscosity	Solid content (% by wt.)	Recommended for wire size (mm dia.)	Class of wire	Distinctive properties of wire enamel / enameled wire	Relevant specification for wires
POLYESTER WIRE ENAMELS							
Terebec F 35 A	Polyester	90-110 s	34-36	0.05-1.0	130L	Wide curing range	IS 13730-34 / IEC 60317-34
Terebec F 215-35	Polyester	90-110 s	34-36	0.05-1.0	130L	High cut through	IS 13730-34 / IEC 60317-34
Terebec 216-35	Polyester	80-100 s	34-36	0.05-1.0	130L	High processing speed, high cut through	IS 13730-34 / IEC 60317-34
Terebec 218-35 HS	Polyester	80-100 s	34 -36	0.05 -1.0	130L	For high speed enamelling machines having Vxd > 100	IS 13730-34 / IEC 60317-34
Terebec 220-40	Polyester	125-145 s	38-41	0.3-1.00	130L	Excellent runnability on high speed machines. high solids give high enamel gain. Excellent flexibility and adhesion	IS 13730-34 / IEC 60317-34
Terebec 232-35 YG	Polyester	90-110 s	34-36	0.3 -1.6	130L	Yellowish golden colored wire, high processing speed	IS 13730-34 / IEC 60317-34
Terebec G 250-35	Polyester	90-110 s	34-36	0.05-1.6	130L	Reddish brown colored wire, high processing speed	IS 13730-34 / IEC 60317-34
Mitshine RH	Polyester	80-100 s ⁽¹⁾	34-36 ⁽²⁾	0.05 -1.6	130L	Reddish golden colored wire, high processing speed. Balanced chemical, electrical and mechanical properties.	IS 13730-34 / IEC 60317-34
Mitester M/M	Polyester	80-100 s ⁽¹⁾	34-36 ⁽²⁾	0.2 -2.0	130L	THEIC modified wire enamel with excellent heat shock & flexibility performance. Wide curing range on thicker wires.	IS 13730-34 / IEC 60317-34
Mitcut F	Polyester	70-90 s ⁽¹⁾	34-36 ⁽²⁾	0.05 -1.0	130L	High processing speed. Excellent cut through with balanced mechanical and electrical properties.	IS 13730-34 / IEC 60317-34
Mitsuper Shock M	Polyester	70-90 s ⁽¹⁾	34-36 ⁽²⁾	0.05 -1.0	130L	Excellent flexibility. Wide curing range on thicker wires.	IS 13730-34 / IEC 60317-34
MODIFIED POLYESTER WIRE ENAMELS							
Terebec 227-35	Modified polyester	110-135 s	34-36	0.2-5.0	130L	Excellent flexibility & adherence	IS 13730-34 / IEC 60317-34
Terebec 235-35 U	Modified polyester	80-100 s	34-36	0.05-2.5	130L	High processing speed, higher tan δ , excellent flexibility	IS 13730-34 / IEC 60317-34
Mitshock G	Modified polyester	85-115 s ⁽¹⁾	34-36 ⁽²⁾	0.05 -1.6	130L	Excellent shine with attractive yellowish golden colour & suitable for thicker to medium wires	IS 13730-34 / IEC 60317-34
Terebec 251-35 F	Modified polyester	80-100 s	34-36	0.05-1.0	155	Excelling runnability on all horizontal machines, appealing wire colour	IS 13730-3 / IEC 60317-3
Terebec 251-38 F	Modified polyester	110-140 s	37-39	0.3-2.0	155	Excelling runnability on all vertical machines, appealing wire colour	IS 13730-3 / IEC 60317-3
Terebec 256-40	Modified polyester	600-800 mPa.s	39-41	0.05-2.0	155	Lower viscosity, excellent heat shock	IS 13730-3 / IEC 60317-3
Terebec 257-38	Modified polyester	750-850 mPa.s	37-39	0.05-2.0	155	For high speed enamelling m/c having Vxd > 100	IS 13730-3 / IEC 60317-3
Terebec 257-35	Modified polyester	80-100 s	34-36	0.05-1.0	155	For high speed enamelling m/c having Vxd > 100 felt wiping	IS 13730-3 / IEC 60317-3
Mitsuper F 39	Modified polyester	120-140 ⁽¹⁾	38-40 ⁽²⁾	0.05 -2.00	155	Reddish brown coloured enameled wire & suitable for medium to thicker wires.	IS 13730-3 / IEC 60317-3
POLYURETHANE WIRE ENAMELS							
Tongsold 240/25 R	Polyurethane	16-20 s at 20°C	20-23	0.05-0.30	155	Higher cut through, good solderability, pinhole resistant, wide curing range	IS 13730-20 / IEC 60317-20
Tongsold 240/35 R	Polyurethane	55-65 s at 20°C	34-36 3g/1h/180°C	0.10-0.80	155	Higher cut through, good solderability, pinhole resistant, wide curing range	IS 13730-20 / IEC 60317-20
Tongsold 240/40 R	Polyurethane	350-400 mPa.s 30°C	38.5-41.5 1.2g/3h/120°C	0.20-1.00	155	Higher cut through, good solderability, pinhole resistant, wide curing range	IS 13730-20 / IEC 60317-20
Tongsold 240/45 R	Polyurethane	600-800 mPa.s 30°C	43-45 1.2g/3h/120°C	0.20-1.00	155	Higher cut through, good solderability, pinhole resistant, wide curing range	IS 13730-20 / IEC 60317-20
Elansold H-30	Polyurethane	60-90 mPa.s 30°C	23-25	0.10-0.80	180	High processing speeds, good solderability, high tan δ	IEC 60317-51
Elansold H-35	Polyurethane	120-240 mPa.s 30°C	28.5-31.5	0.10-0.80	180	High processing speeds, good solderability, high tan δ	IEC 60317-51
POLYESTERIMIDE WIRE ENAMELS							
Terebec 540-36	THEIC polyesterimide	80-90 s	35-37	0.05-1.6 & rect. cond.	180	Excellent adhesion, balanced mechanical & thermal properties. Suitable for rectangular conductor also with felt application.	IS 13730-8 / IEC 60317-8 IS 13730-28 / IEC 60317-28
Terebec 540-38	THEIC polyesterimide	750-850 mPa.s	37-39	0.05-1.6 & rect. cond.	180	Excellent adhesion, balanced mechanical & thermal properties. High speed. Suitable for rect. cond also with die application.	IS 13730-8 / IEC 60317-8 IS 13730-28 / IEC 60317-28
Terebec TR 543-32	THEIC polyesterimide	40-60 s	31-33	0.05-0.5	180	High tan δ bending point & cut through property, UL recognized as a base coat. For felt application and fine wire.	IS 13730-8 / IEC 60317-8
Terebec TR 543-35	THEIC polyesterimide	50-70 s	34-36	0.05-1	180	High tan δ bending point & cut through property, UL recognized as a base coat. For medium wire sizes.	IS 13730-8 / IEC 60317-8
Terebec TR 543-38	THEIC polyesterimide	750-850 mPa.s	37-39	0.05-1.6	180	High tan δ bending point & cut through property, UL recognized as a base coat. Excellent runnability on various speeds and wide curing range.	IS 13730-8 / IEC 60317-8
Terebec TR 543-39	THEIC polyesterimide	750-850 mPa.s	37-39	0.05-1.6	180	High tan δ bending point > 190 on 200 Vxd m/c, UL recognized as a base coat.	IS 13730-8 / IEC 60317-8
Terebec TR 543-38 FL	THEIC polyesterimide	200-300 mPa.s at 30°C	37-39	0.05-1.0	180	High solids enamel for felt application. UL recognized. High solid gives high enamel gain on fine wires	IS 13730-8 / IEC 60317-8
Terebec MT 533-39	THEIC polyesterimide	750-850 mPa.s	38-40	0.05-3.0	180	For High speed enamelling machines having Vxd > 100, UL recognized.	IS 13730-8 / IEC 60317-8
Micromid 36	THEIC polyesterimide	80-90 s ⁽¹⁾	35-37 ⁽²⁾	0.25-1.0	180	High tan δ bending point & cut through property	IS 13730-8 / IEC 60317-8
Micromid 39	THEIC polyesterimide	550-700 mPa.s ⁽³⁾	37-39 ⁽²⁾	0.5-1.6	180	High tan δ bending point & cut through property. UL recognized.	IS 13730-8 / IEC 60317-8
POLYAMIDE-IMIDE WIRE ENAMELS							
AI 1013 BV/25	Polyamide-imide	25-35 s	24-26	0.05-0.5	200	Excellent hermetic resistance, low coefficient of friction, Ideal topcoat over PE (I) base coat. For felt application and fine wire. UL recognized as a top coat.	IS 13730-26 / IEC 60317-26
AI 1013 BV/35	Polyamide-imide	700-1500 mPa.s	34-36	0.2-1.6	200	Excellent hermetic resistance, low coefficient of friction, Ideal topcoat over PE (I) base coat. UL recognized as a top coat.	IS 13730-26 / IEC 60317-26
AI 1013-27 SC	Polyamide-imide	1800-2800 mPa.s	26-28	0.2 to 3.0	220	Suitable for total coat application, excellent adhesion. Balanced thermal and mechanical properties.	IS 13730-57 / IEC 60317-57
AI 1013-33 SC	Polyamide-imide	5000-8000 mPa.s	32-34	Thicker Round conductors	220	Suitable for total coat application, excellent adhesion on thicker round conductors. Suitable for die application.	IS 13730-57 / IEC 60317-57

Note: Viscosity is measured at 23°C by DIN 53211/ Cup 4 or Brookfield viscometer, as indicated by (s) or (mPa.s)

(1) Viscosity is measured at 30°C by Ford B4 Cup

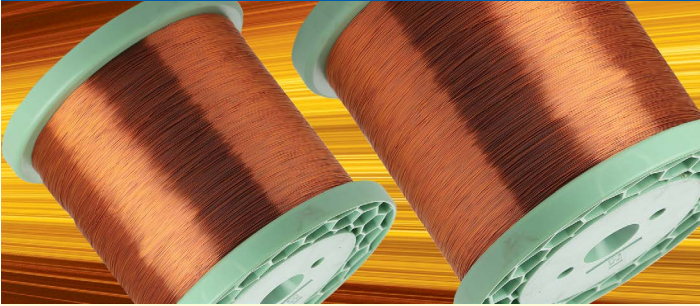
Product Name	Chemical base	Viscosity	Solid content (% by wt.)	Recommended for wire size (mm dia.)	Class of wire	Distinctive properties of wire enamel / enameled wire	Relevant specification for wires
POLYAMIDE-IMIDE WIRE ENAMELS							
Al 1013-33 SC R	Polyamide-imide	800-11000 mPa.s	32-34	Rect. conductors	220	Suitable for total coat application, excellent adhesion on rectangular conductors. Excellent runnability on solid floating dies.	IS 13730-58 / IEC 60317-58
Al 1013-30 SL	Polyamide-imide	900-1550 mPa.s	29-31	0.05-3.0	200	Self-lubricating top coat, low coefficient of friction. Suitable for hermetic applications	IS 13730-26 / IEC 60317-26
Allotherm 602L-35	Polyamide-imide	650-800 mPa.s	35-37	0.2-1.6	200	Excellent hermetic resistance, low coefficient of friction, topcoat over PE (I) base coat. UL recognized as a top coat.	IS 13730-26 / IEC 60317-26
Microtherm 35 DC	Polyamide-imide	900-1200 mPa.s ⁽³⁾	34-36 ⁽²⁾	0.5-2.0	200	Excellent hermetic resistance. UL recognized.	IS 13730-26 / IEC 60317-26 IS 13730-29 / IEC 60317-29
Sivamid 595/34 M	Polyamide-imide	800-1000 mPa.s	31-33	0.2-3.0	200	Excellent hermetic resistance, low coefficient of friction, topcoat over PEI base coat. UL recognized.	IS 13730-26 / IEC 60317-26
Wire Enamel 1823/33 MB	Polyamide-imide	700-900 mPa.s	34-33	0.2-3.0	200	Excellent hermetic resistance and improved flexibility, low coefficient of friction, topcoat over PEI base coat. UL recognized.	IS 13730-26 / IEC 60317-26
910 Nylon LS	Polyamide	50-80 sec ⁽¹⁾	7-9	0.05-1.0		Suitable as an overcoat on PE, PEI and PU based wires. Suitable for fine and superfine wires	
WIRE ENAMELS FOR DUAL COATED WIRES (BASE COAT + TOP COAT)							
Terebec TR 543-38 + Al 1013 BV/35	PEI + PAI	750-850 mPa.s 700-1500 mPa.s	37-39 34-36	0.315-1.6 & rect. cond.	200	Excellent hermetic & burnout resistance, high speed windability, UL recognized.	IS 13730-13 / IEC 60317-13
Terebec SL225-40 + Al 1013 BV/35	PEI + PAI	470-570 mPa.s 700-1500 mPa.s	38-40 34-36	0.315-3.0	200	Excellent hermetic resistance, improved mechanical properties. UL recognized.	IS 13730-13 / IEC 60317-13
Terebec TR 543-38 + Allotherm 602L-35	PEI + PAI	750-850 mPa.s 650-800 mPa.s	37-39 35-37	0.315-1.6 & rect. cond.	200	Excellent hermetic & burnout resistance, high speed windability, UL recognized.	IS 13730-13 / IEC 60317-13
Micromid 39 + Microtherm 35 DC	PEI + PAI	550-700 mPa.s 900-1200 mPa.s ⁽³⁾	37-39 34-36 ⁽²⁾	0.315-1.6 & rect. cond.	200	Excellent hermetic & burnout resistance, high speed windability, UL recognized.	IS 13730-13 / IEC 60317-13
WIRE ENAMELS FOR RECTANGULAR WIRES							
Terebec FN	Polyesterimide	85-100 s	32-34	2.0-5.0 dia. & rect. cond.	155	Good adherence for rectangular wires, felt application	IS 13730-3 / IEC 60317-3 IS 13730-16 / IEC 60317-16
Terebec TR 543-38 R	THEIC polyesterimide	7000-11000 mPa.s	36-39	1.6-5.0 dia. & rect. cond.	180	Excellent adhesion, good runnability on solid floating dies. Good heat shock & thermal resistance	IS 13730-28 / IEC 60317-28
Terebec MT 533-36 PA	THEIC polyesterimide	80-90 s	35-37	1.6-5.0 dia. & rect. cond.	180	Excellent adhesion, heat shock & thermal resistance. Suitable for felt application	IS 13730-8 / IEC 60317-8 IS 13730-28 / IEC 60317-28
Terebec MT 533-40 PA	THEIC polyesterimide	800-1000 mPa.s	39-41	1.6-5.0 dia. & rect. cond.	180	Excellent adhesion, heat shock & thermal resistance	IS 13730-8 / IEC 60317-8 IS 13730-28 / IEC 60317-28
Formvar 2440-3500	Polyvinyl formal	3000-5300 mPa.s	20-22	0.5-4.0 dia. & rect. cond.	120	Excellent mechanical properties & transformer oil resistant, ideal for CTC	IS 60317-12 / IEC 60317-12 IEC 60317-18
Formvar 2440-3500 IN	Polyvinyl formal	5000-8000 mPa.s ⁽³⁾	24-25	0.5-4.0 dia. & rect. cond.	120	High solid content with excellent mechanical properties & transformer oil resistant, ideal for CTC	IS 60317-12 / IEC 60317-12 IEC 60317-18
Formvar 2440-3500 HS	Polyvinyl formal	15500-21500 mPa.s	24.5-26.5	0.5-4.0 dia. & rect. cond.	120	Excellent mechanical properties & transformer oil resistant, ideal for CTC	IS 60317-12 / IEC 60317-12 IEC 60317-18
Formvar C 8359-23	Polyvinyl formal	2500-5000 mPa.s ⁽³⁾	23-25 2g/2hr/200°C	0.5-4.0 dia. & rect. cond.	120	Excellent mechanical properties & transformer oil resistant, Ideal for shaped conductors	IS 60317-12 / IEC 60317-12 IEC 60317-18
Primer N 35A	Aromatic polyamide	900-1300 mPa.s ⁽³⁾	22-24	Thicker round & rect. cond.	180	Excellent adhesion to bare conductor, suitable for die application	-
Primer N 35B	Aromatic polyamide	400-600 mPa.s ⁽³⁾	19-21	Med. round & rect. cond.	180	Excellent adhesion to bare conductor, can be applied by felt application.	-
SELF BONDING MAGNET WIRE ENAMEL							
Deamelt 355/27 KF	Epoxy	5500-6500 mPa.s	28-30	0.05-1.60 & rect. cond.		Top coat over Polyvinyl formal based wire enamel for making CTC conductors	-
Deamelt 356/70	Epoxy	3000-4000 mPa.s	68-72	Rect. cond.		Better bonding strength at high temperatures. Compatible with all common impregnating materials	-
BINDER VARNISHES FOR GLASS FIBRE COVERED & BRAIDED WIRES							
Elmoglas H 69 A	Polyesterimide	50-65 s	39-41	---	180	Good bonding & flexibility, hermetic resistant	IS 13730-31 / IEC 60317-31
Elmoglas V 132-48 A	Epoxy	30-40 s	50-52	---	155	High bond strength, good flexibility	IS 13730-32 / IEC 60317-32
Elmoglas V 155	Polyurethane	45-65 s	44-46	---	155	High bond strength ratio, generally used along with Elmoglas V 172 in the ratio 60:40 pbw	IS 13730-32 / IEC 60317-32
Elmoglas V 172	Polyurethane	20-30 s	45-48	---	155	Excellent flexibility, generally used along with Elmoglas V 155 in the ratio 60:40 pbw	IS 13730-32 / IEC 60317-32
THINNERS FOR WIRE ENAMELS							
Thinner 115	Cresylic solvents based	---	---	---	---	Suitable for all Polyester, Polyesterimide, Polyurethane, PVA/PVF and Nylon wire enamels	-
Thinner 129	NMP based	---	---	---	---	Suitable for Polyamide-imide based wire enamels & Primer	-
Thinner	Cresylic solvents based	---	---	---	---	Suitable for all Polyester, Polyesterimide, Polyurethane wire enamels	-
Thinner DC	NMP based	---	---	---	---	Suitable for Polyamide-imide based wire enamels	-
Thinner 506 Bondall		---	---	---	---	Suitable for Deamelt 355 wire enamels	-
LUBRICANTS FOR MAGNET WIRES							
Lubeckan W 10	Paraffin wax based	40-50 s	---	All sizes	---	For general purpose enameled round wires, better windability	-
Lubeckan W05 SF	Paraffin wax based	40-50 s	---	0.020 to 0.150 mm	---	Suitable for superfine & ultrafine wires	-
Microlub	Paraffin wax based	---	---	All sizes	---	For general purpose enameled round wires, better windability	-
SP LUB WAX 50	Paraffin wax based	---	48-52 1.2g/3hr/120°C	All sizes	---	For general purpose enameled round wires, better windability. To be applied on enameled wires after dissolving in appropriate solvents in small percentages (0.5-3 %).	-
Lubeckan 25	Aliphatic ester based	40-50 s	2.5	All sizes	---	Specially developed for enameled wires used in hermetic compressors working with eco-friendly refrigerants, such as R 134A, better windability	-

(2) Solids content: 1g/2hr/180°C

(3) Viscosity is measured at 25°C by brookfield viscometer

New Products

TONGSOLD 240/..R



Class 155 self-solderable polyurethane enamel

- UL approved
- Excellent runnability on fine and superfine wires
- Available in various solids: 25%, 35%, 40% & 45%
- Pinhole resistant
- High cut through > 210°C
- Solderability time < 2 sec at 375°C
- Balanced mechanical and thermal properties
- Conforms to IEC 60317-20 and IS 13730-20

ELANSOLD H-30 | ELANSOLD H-35



Class 180 self-solderable polyurethane enamel

- Excellent runnability on fine and superfine wires
- Pinhole resistant
- High cut through > 240°C
- Solderability time < 2 sec at 375°C
- Balanced mechanical and thermal properties
- Conforms to IEC 60317-51 and IS 13730-51

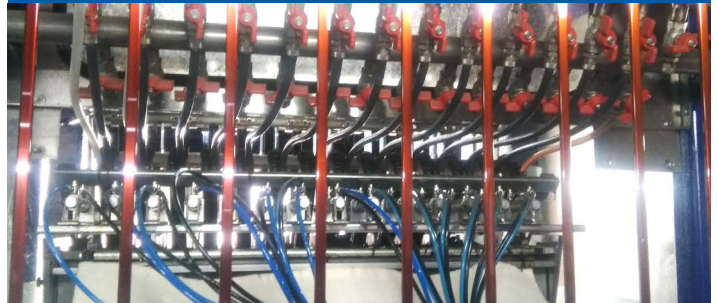
AI 1013-30 SL



Self-lubricating PAI enamel

- No need to apply external lubricant
- Suitable for high-speed winding
- To be applied as a last coat on PE/PEI + PAI combination
- Used in hermetic applications
- Good coefficient of friction: COF<0.04
- Balanced mechanical and thermal properties
- Conforms to IEC 60317-13 and IS 13730-13

AI 1013-33 SC R



Class 220 PAI enamel for rectangular conductors

- Specially designed enamel for rectangular conductors
- Solid contents 32-34% and high viscosity (8000-11000 mPa.s) making it suitable for solid die wiping application
- Excellent adhesion to bare conductor. Peel value > 150
- Good tan delta >220°C
- Conform to IEC 60317-58 and IS 13730-58

