



CTI co., LTD.

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◆ Greeting

Established in 2005, our CTI Co., Ltd. is insulating and coating conductors in electrical and electronic technology, the characteristics that determine the system of devices,

and various coils of electrical and electronic parts.

It is a small company that produces varnish, which is a very important material in construction, and supplies it to domestic and foreign companies.

CTI Co., Ltd. aims at an environment-oriented R&D management strategy and develops insulation resins and fine chemical products that are indispensable for the development of the electric and electronic industries through continuous internal and external research and development.

We will become the world's best company by focusing on the development and production of high value-added new products and nano-hybrid new technology products.

CTI Co., Ltd. will be a true partner for the success of our customers based on high quality, price competitiveness, and trustworthy relationships.

In the future, CTI Co., Ltd. will show how it develops into a global company, and we ask for your interest and support for these hopes and challenges.

thank you.

2. Company History

2000's

Starting a varnish business

2005.08 Established CTI Co., Ltd.

2009.01 Incorporated as a subsidiary of Samdong Co., Ltd.



2009

Incorporated Samdong Co., Ltd.
as a subsidiary

2011

Building extension
(3 floors above ground, 472.m2)

2014

Acceptance of company affiliated research institute
and acquisition of certificate



2005

Established CTI Co., Ltd.

2010

Joint R&D with Korea Electric Research Institute
PAI/silica sol hybrid insulation varnish
synthesis technology

2012

PAI/silica sol hybrid insulation varnish
manufacturing technology
2012 Joint certification as new technology (NET)
(Ministry of Knowledge Economy)

2014

Solvent underground storage tanks (4 units)
and injection
Installation of automation equipment

Early 2010s (2010~2014)

Research and development of silica sol and establishment of an affiliated research institute

2010.08 Joint R&D with Korea Electric Research Institute

2011.10 Building extension (3 stories above ground, 472.m2)

2012.08 PAI/silica sol hybrid insulation varnish manufacturing technology

2014.06 Establishment of corporate affiliated research institute and acquisition of certificate

2014.09 Installation of solvent underground storage tanks (4 units) and input automation equipment

2. Company History

Mid and late 2010s (2016-2019)

Product certification and quality certification acquisition, sales growth

2016.05 Obtained PVF (105°C-Type E), PAI (240°C-Type S) Varnish UL certification

2016.10 PSM rating review completed. (M+ grade)

2018.05 Acquired IATF 16949, ISO 9001, ISO 14001 certification

2019.05 Acquired UL certification for Anti-corona AMIDE 800HB & 850HB Varnish (220°C-N type)

2019.10 As a result of off-site impact assessment review, "suitable"

2016

Completed PSM grade review(M+ grade)

2019 

Acquired anti-corona PAI Varnish UL certification
AMIDE 800HB, AMIDE 850HB (220°C-N type)

2021

Construction of an indoor
storage for dangerous goods

2022

Achieved sales of 17 billion won
(About 13.8 million dollars)

2016 

Obtained PVF, PAI UL certification

PVF: 105°C-Type E

PAI: 240°C-Type S

2018 

Acquired IATF 16949, ISO 9001,
ISO 14001 certification

2019

As a result of off-site impact
assessment review, "suitable"

2023 

Acquired PI Varnish UL certification

POLYIMIDE 890 (240°C)

2020s (2020-2023)

New product development, product certification and quality certification acquisition, sales growth

2021.07 Construction of an indoor storage for dangerous goods

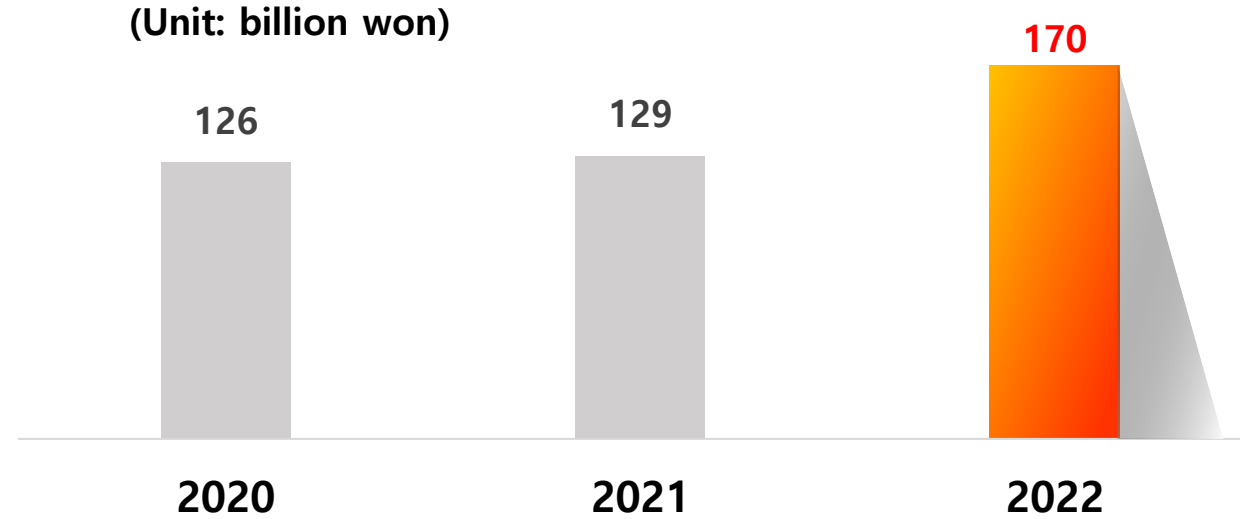
2021.11 PAI 4-ton reactor added 1

2022.12 Achieved 17 billion won in sales

2023.01 Acquired POLYIMIDE 890 UL certification (240°C)

3. Sales performance and plan

1) Results for the last 3 years



2) 2022 performance and 2023 plan

(Unit: billion won)

Division \ By factory	Sum	Sam Dong Co., Ltd.				Kukdong	Etc
		Eumseong Factory	Mungyeong Factory	SDTN (Tennessee)	SDE (Poland)		
2022 sales performance	170	50	93	7.5	1.5	18	0
2023 sales plan	182	53	100	8	2	19	0

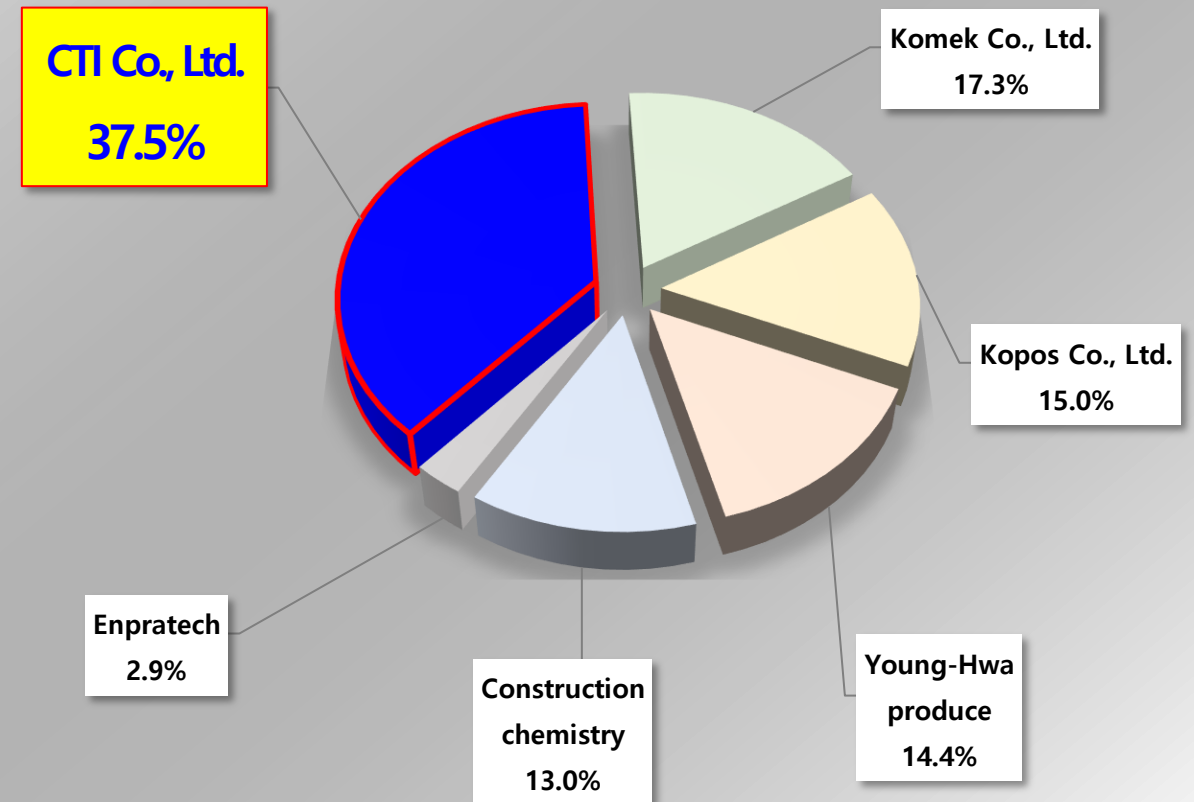
4. Domestic VARNISH Market Status

(Unit: Ton, million won)

Rank	Company name	Main supplier	Monthly (estimated)		
			Output (ton)	Take (won)	Ratio(%)
<u>1</u>	<u>CTI Co., Ltd.</u>	<u>Samdong, Kukdong</u>	<u>230~260</u>	<u>1,300</u>	<u>37.5</u>
2	Komek Co., Ltd.	LS, TCT, CNI, etc.	140~170	600	17.3
3	Kopos Co., Ltd.	Changchunsa, LS, Hwail, TCT, etc.	130~160	520	15.0
4	Young-Hwa produce	Sang-nong, Hwa-il	120~150	500	14.4
5	Construction chemistry	LS etc.	110~140	450	13.0
6	Enpratech	TCT, Samjin	50~70	100	2.9
Sum			780~950	3,470	100.0

- 1) (5) Paint manufacturer.
- 2) As of the end of December 2021.

Domestic market share



5. Product items and production capacity

No.	Reactor Name	Production item	Abbreviation	Reactor capacity (ton)	Production Capa (month)
1	R-101	Polyester	PE	4	42
2	R-301	Polyester-Imide	PEI	6	60
3	R-401	Polyamide, Epoxy (Self Bonding)	SB	6	60
4	R-501	Semi-manufactures	-	2	18
5	R-601	Diluent	-	2	11
6	R-701	Polyamide-Imide	PAI	4	48
7	R-702	Polyamide-Imide	PAI	4	40
8	R-801	Polyvinyl formal	PVF	13	140
9	R-901	POLYIMIDE, Hybrid Silica-sol	PI, Sol	1	15
10	R-902	POLYIMIDE, Hybrid Silica-sol	PI, Sol	1	15
11	PILOT	POLYIMIDE	PI	0.2	4
Total production capacity 5,436 TON / year				43.2	453 ton/month



6. Main products

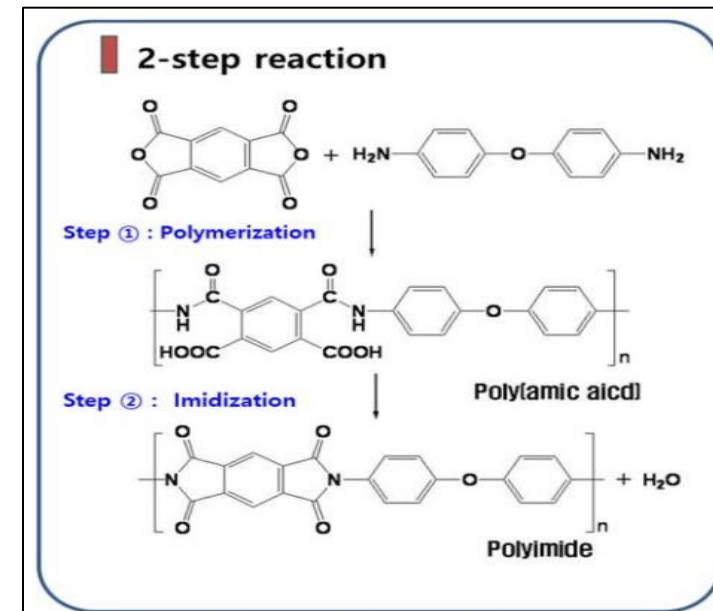
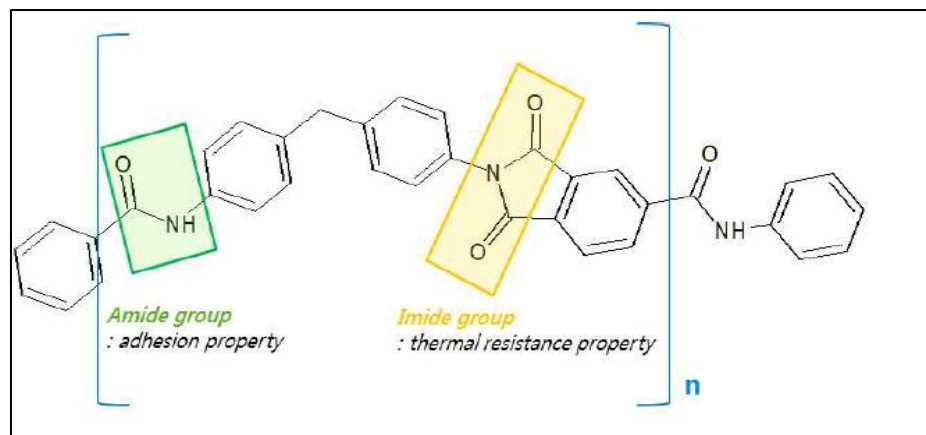


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CTI CO., LTD

PI Varnish Polyimide Varnish

■ Characteristics (Excellent Characteristics)

- Heat resistance (240°C ↑)
- Electrical insulation
- Flame Retardant (V-0)
- Machinability
- Disadvantages: Short storage period, requires careful storage and handling



PAI Varnish Polyamide-Imide Varnish

■ Characteristics (Excellent Characteristics)

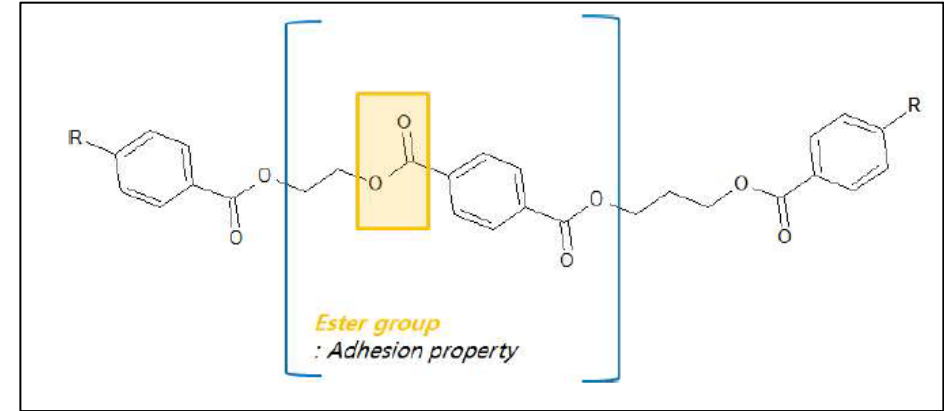
- Heat resistance (240°C ↑)
- Mechanical properties
- Low coefficient of friction
- Chemical resistance
- Suitable for single coating or double coating

6. Main products

PE Varnish Polyester Varnish

■ Characteristics (Excellent Characteristics)

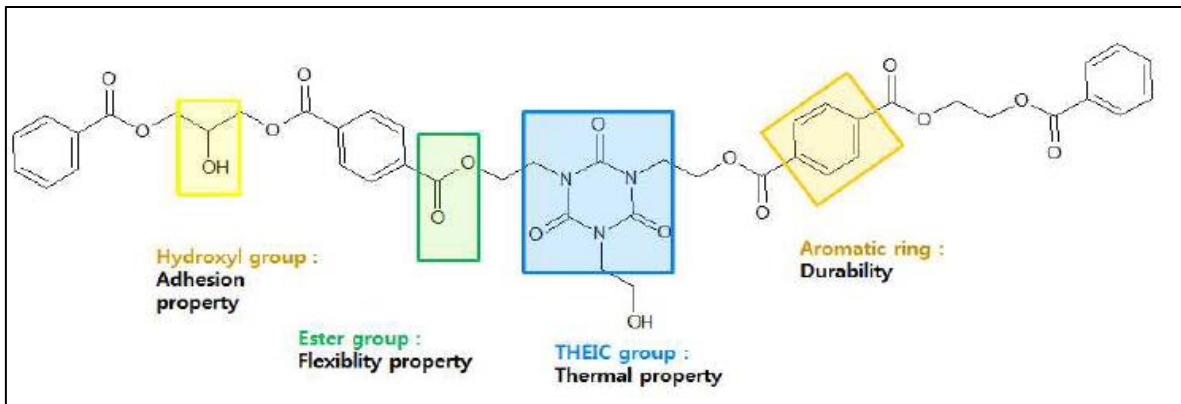
- Adhesive properties
- Electrical characteristics
- Mechanical strength
- Disadvantages: Low thermal shock resistance and moisture resistance.



PEI Varnish Polyester-Imide Varnish

■ Characteristics (Excellent Characteristics)

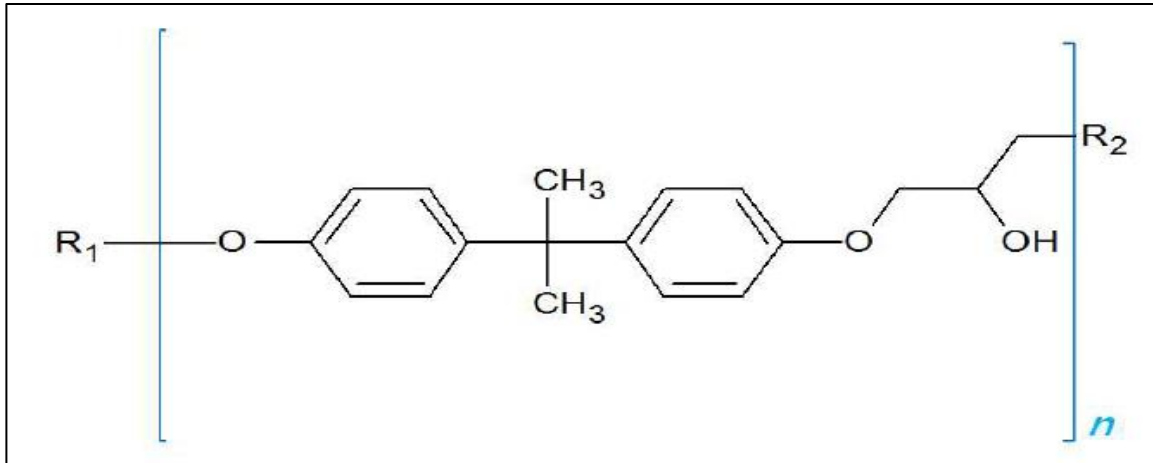
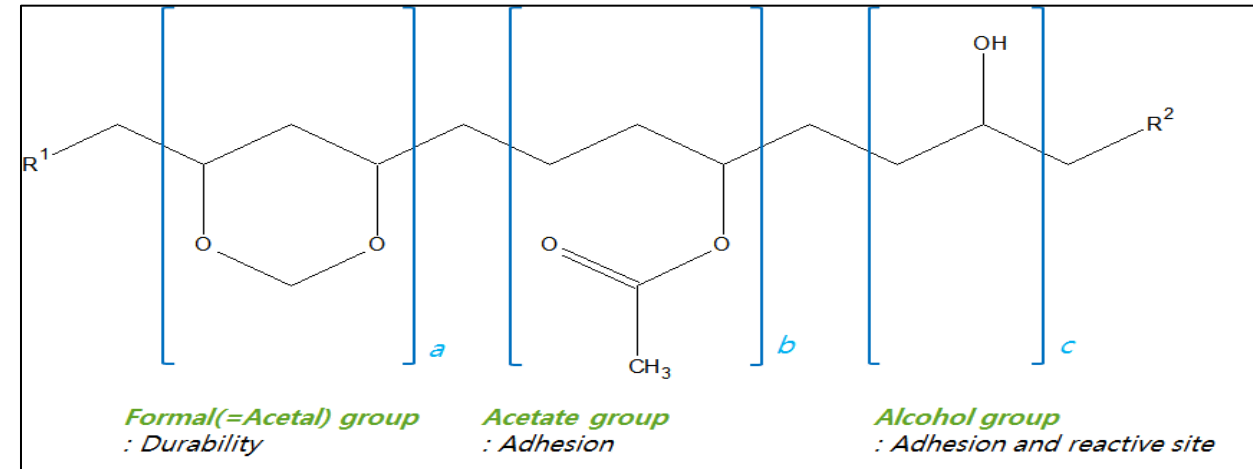
- Heat resistance
- Chemical Properties
- Mechanical properties
- Disadvantages: change over time (crazing)



6. Main products

PVF Varnish Polyvinyl-formal Varnish

Excellent abrasion resistance, chemical resistance and adhesion.



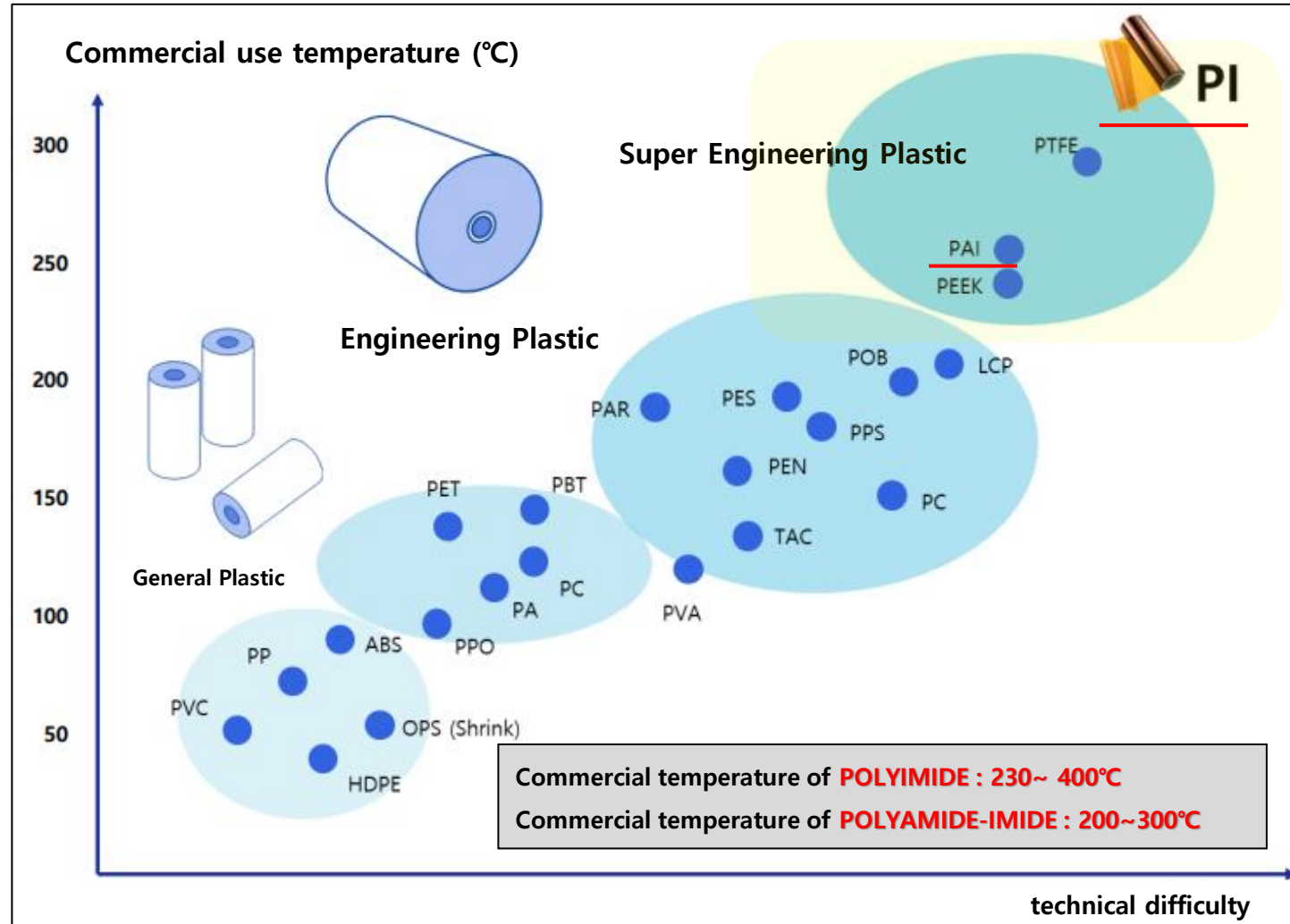
SB Varnish Self Bonding Varnish

■ Characteristics (Excellent Characteristics)

- Excellent adhesion
- Can be fused by heat
- For replacement of impregnation process
- Disadvantages: Low moisture resistance and solvent resistance.

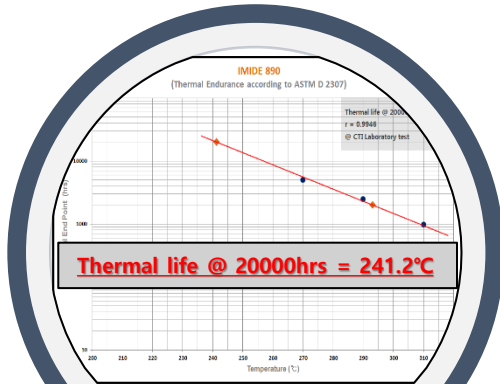
7. POLYIMIDE material for EV (400,800V System)

◆ Operating temperature of POLYMER material



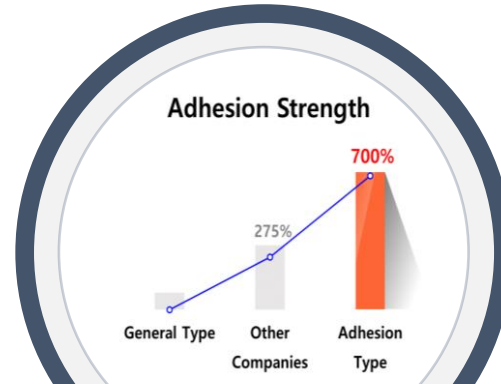
7. POLYIMIDE material for EV (800V System)

◆ Characteristics of each type of PI varnish



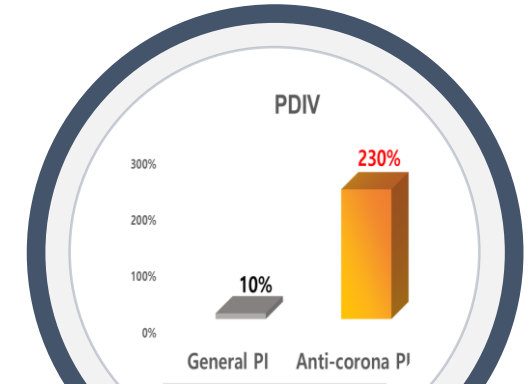
POLYIMIDE 890
(General Type)

- Heat resistance (240°C ↑)
- Excellent electrical insulation
- Excellent Flame Retardant (V-0)
- Excellent machinability



POLYIMIDE 890P
(High Adhesion Type)

- High adhesion with Cu
- Adhesion
 - Excellent compared to other companies
- Excellent Flexibility



POLYIMIDE 890HB
(Anti-corona Type)

- PDIV
 - Excellent electrical insulation and voltage durability
- Excellent dispersion stability
 - Application of organic-inorganic SOL synthesis
- Excellent compatibility with PI

7. POLYIMIDE material for EV (800V System)

◆ POLYIMIDE 890 Series Material Properties

Classification	Properties	Unit	POLYIMIDE 890 (General)	POLYIMIDE 890P (High Adhesion)	POLYIMIDE 890HB (Anti-corona)
FILM (20~25μm)	Elongation	%	74	63	65
	Tensile strength	Mpa	221	205	201
	Tg	℃	411	365	405
	Td 5%	℃	553	430	550
	CTE (100~250℃)	ppm/℃	34~35	28~29	34~35
	Dk (Dielectric constant)	-	3.30	-	3.47

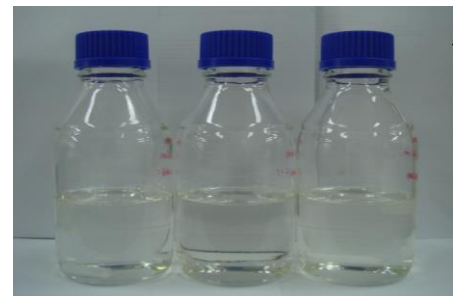
8. Insulation VARNISH material and coil coating for EV



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Water Dispersion Silica Sol
(raw material)

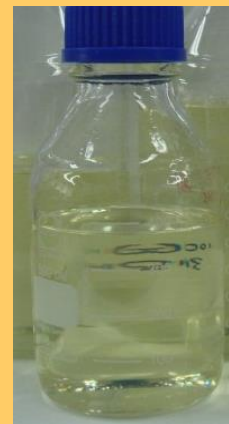


Organic Solvent Dispersed
Silica Sol (Step 1)



Organic Reactive Silica Sol
(Step 2)

Relocation of
manufacturing
technology
companies

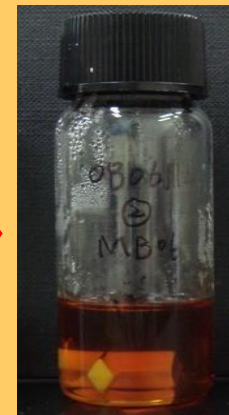


Colloidal
Silica

+

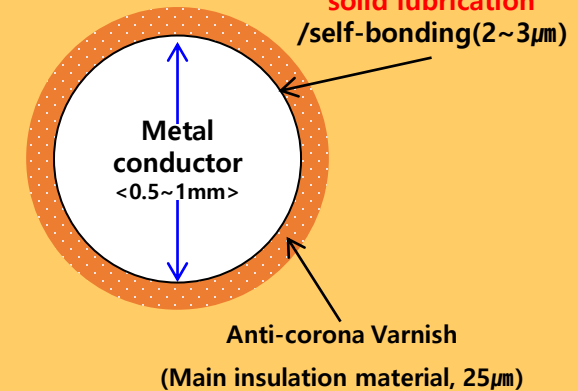


PAI



Nanohybrid
Varnish

Insulation varnish coated coil prototype



◆ Analysis Lab Analysis Equipment LIST



Infrared spectrometer
(FT-IR Spectrometer)



Thermogravimetry
(TG-DTA)



Differential Scanning Calorimetry
(DSC)



Inside the analysis room

◆ Technology research and development environment



Varnish Heat Resistance Index
Measurement Equipment



Tangent Delta Meter (TD3)



Operation of coating test facility
(2 ovens)



Research and development room

10. UL certification status



CTI CO LTD

852-13 Koryum-Li

Chungbook-Myun

Pyungtaek-Shi, Kyungki-Do 451-831 REPUBLIC OF KOREA

E215652

No.	Materia Designation	Base Coat	Top Coat	Temp (°C)
1	POLYIMIDE 890	Polyimide	-	240
2	AMIDE 800	Polyamide-imide	-	240
3	AMIDE 800HB	Polyester-imide	Polyamide-imide	220
4	AMIDE 800L	Polyamide-imide	Polyamide-imide	220
5	AMIDE 850HB	Polyamide-imide	Polyamide-imide	220
6	ESTAR620	Modified Polyester	-	180
7	FORMAL 320	Polyvinyl Formal	-	105
8	IMIDE 750A	Polyester-imide	-	200
9	OIMIDE750 / AMIDE800	Polyester-imide	Polyamide-imide	220
10	IMIDE75040 / AMIDE800	Polyester-imide	Polyamide-imide	200

11. Authentication certificate holding status

Certificate LIST

New technology
certificate

PAI/silicasol hybrid insulation varnish manufacturing
technology

Quality,
environmental
certificate

IATF 16949

ISO 9001

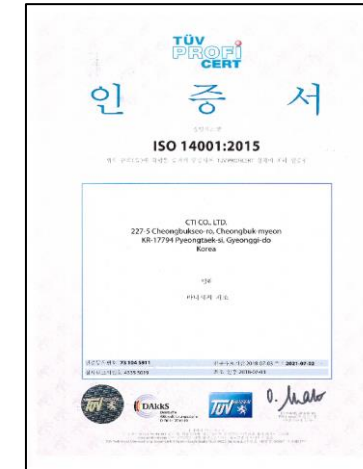
ISO 14001

Institute
establishment
certificate

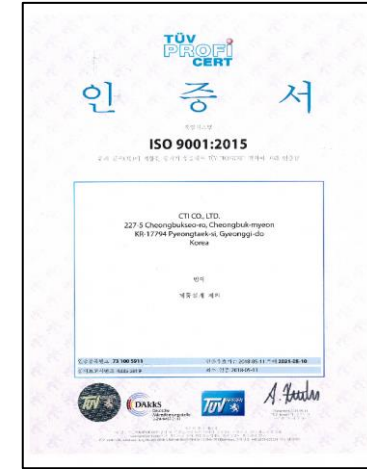
Company-affiliated research institute certificate



IATF 16949



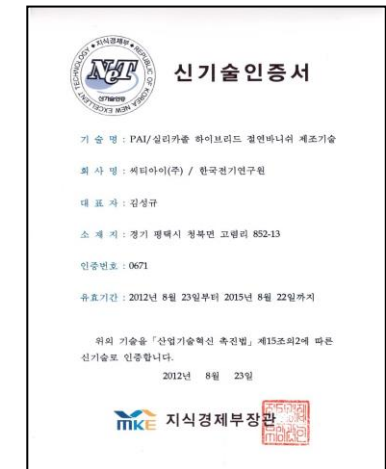
ISO 14001



ISO 9001



Institute establishment certificate



New technology certificate

Thank you