MITSUBISHI CHEMICAL

Mitsubishi DIANAL™ LP-3106

Acrylic Resin Powder for Automotive Applications

Mitsubishi DIANAL™ LP Series

The Mitsubishi DIANAL™ LP series acrylic resin powders from Mitsubishi Chemical have a proprietary formulation that is ideal for production of automotive plastisols. This high performance series provides exceptional thermal properties with added lower environmental impact. In fact, Mitsubishi DIANAL™ LP series resin powders are the world's first commercially launched, ecologically friendly acrylic powder for use in the production of automotive plastisols.

- Safe incineration
- Light-weight alternative to PVC
- Thermally stable
- Interchangable on PVC plastisol production lines
- Lower temperature/shorter gelation time than PVC plastisols

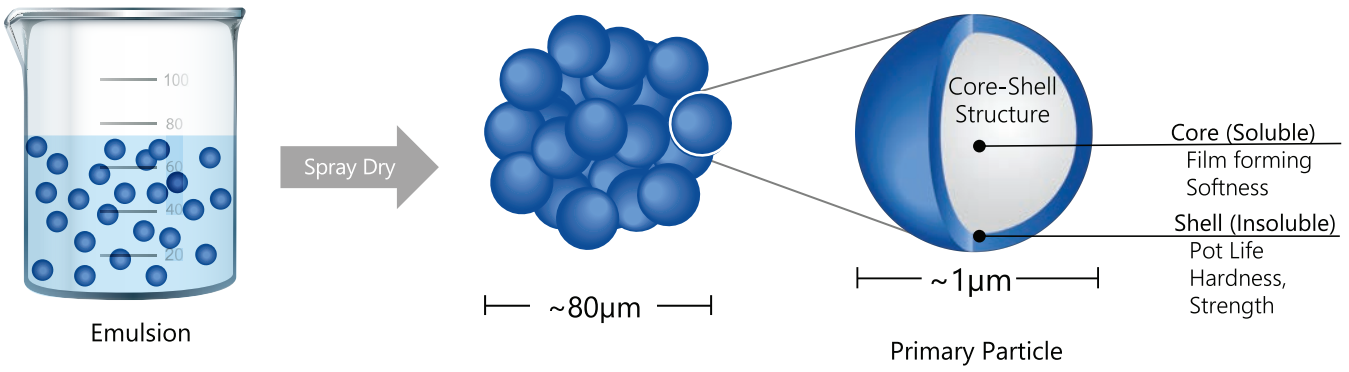
Acrylic Underbody Coatings | Body Sealers

When used in acrylic underbody coatings and body sealers, DIANAL™ LP series acrylic resin powders have a lower density than PVC, creating a light-weight material that enables better fuel efficiency of the vehicle, producing less greenhouse gas emissions. In addition to being thermally stable and producing fewer thermal decompositions at high temperatures, DIALAN LP series does not emit harmful gas during incineration, creating a more safe and healthy working environment.

Acrylic Plastisol Raw Material

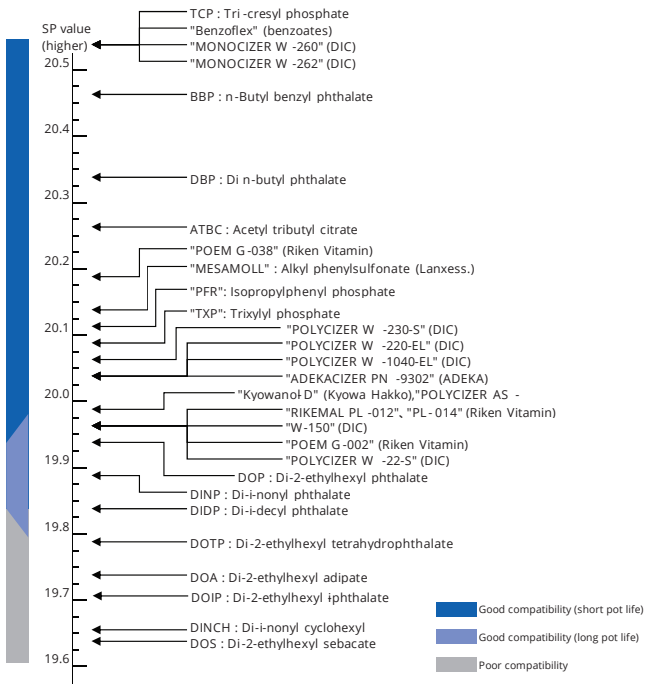
DIANAL™ LP series acrylic resin powders, when used as a raw material for acrylic plastisol, can be produced by the same production line as PVC plastisols. This ensures efficiency and flexibility for manufactuers. In addtion, they require less heat time for gelation than PVS plastisols, producing compatible material at lower temperatures or in a shorter gelation time.

Acrylic Powder Design | Core-Shell Structure



Chipping Resistance | Test Formula and Properties

Plasticizer Selection



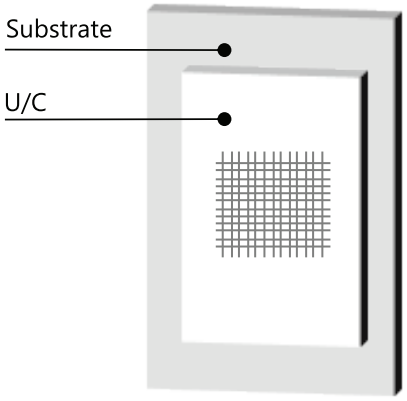
Formula		A	B
Acrylic Resin		100	100
Plasticizers	DINP	180	100
	Mesamoll	20	-
Additive Adhesive	Takenate B-7040	40	-
Hardening Agent	ADH	1.76	-
Filler (CaCo3)	CCR	150	-
	NS200	10	-
Desiccant (Calcium Oxide)		3	-

(Wt. parts)

Takenate B-7040: Block Isocyanate resin (Mitsui Chemicals, Inc.)
ADH: Adipic acid dihydrazide
Mesamoll: Alkylsulphonic phenyl ester (LANXESS K.K.) CCR: Particle size 0.12μm (Shiraishi calcium kaisha,ltd.)
NS200: Particle size 1.85μm (Nitto funka kougyou K.K.)

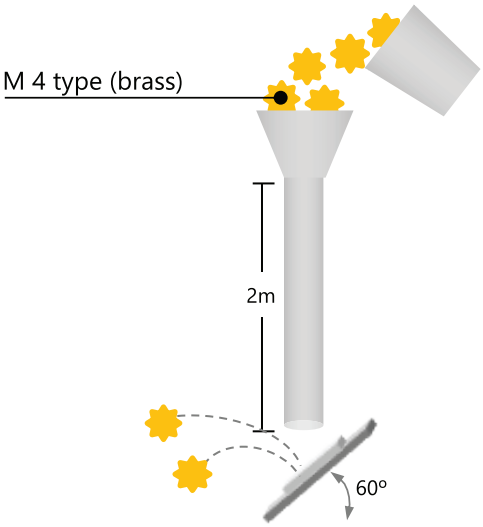
Item	Detail		Equipment
Chipping resistance (Nut drop test)	Film thickness: 1.0mm Dropping height: 2m	Screw nut: M 4 type (brass) Test frequency: 2x	See next page
Adhesive strength	Test Pieces:  Sol 3 x 25 x 25mm	Tensile speed: 50mm/min	Autograph AG-5KNNIS: Shimadzu Corp.
Tensile strength	Test Pieces: Dumbbell type II (JIS standard)	Film thickness: 2mm Tensile speed: 200mm/min	
Viscosity	Viscosity of 20rpm at room temperature		BH type viscometer (No. 7 rotor): TOKYO KEIKI, Ltd.
Pot Life	Viscosity change after 10 days (at 20rpm)	Storage Temp: 40 °C	

Sample



Film Thickness: 1mm
Cross Cut: 2 x 4mm

Test



Acrylic Resin	LP-3106
Adhesive Strength (Mpa)	1.0 (TCF)
Chipping resistance (kg)	15
Tensile strength (Mpa)	1.1
Elongation (%)	141
Initial modulus (hardness) (Mpa)	5.2
Initial viscosity (Pa・s)	122
Increase of viscosity (%)	134

Increase of viscosity: Formula B; The others: Formula A

Adhesive Additive Effects

Adhesive Additive	Adhesive Strength (Mpa)	Chipping Resistance (kg)	Tensile Strength (Mpa)	Elongation (%)	Initial Modulus (hardness) (Mpa)	Initial Viscosity	Increase of Viscosity (%)
B-7040	1.0 (TCF)	15	1.1	141	5.2	122	-36
B-7030	1.1 (TCF)	23	1.4	160	9.5	112	-44
B-7010S	1.4 (AF)	18	1.7	304	50	93	-75
B-7005	1.3 (TCF)	21	1.7	254	7.3	100	-39
B-7105	0.6 (TCF)	8	0.6	66	4.6	118	-8

All adhesive additives from Mitsui Chemicals, Inc.

Foaming | Test Formula and Properties

Foaming Test Formula

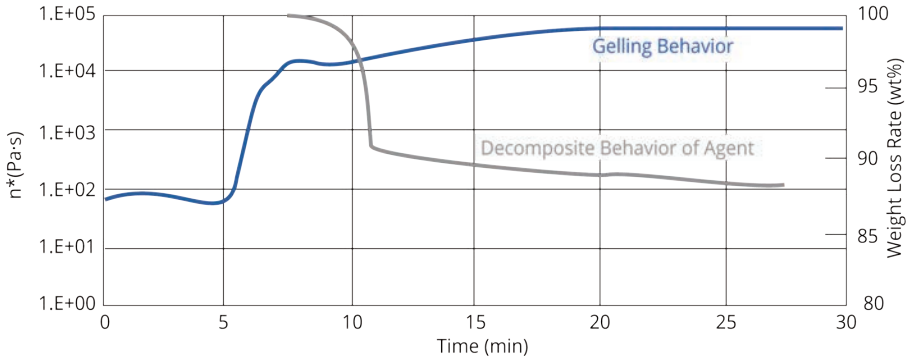
Acrylic Resin	Plasticizers		Additive Adhesive	Hardening Agent	Filler (CaCo3)		Foaming Agent	
	DINP	Mesamoll	Takenate B-7040	ADH	CCR	NS200	Finyfor ST#70	Zinc oxide
100	180	20	40	1.76	150	100	6	0.6

Vinyfor-ST#70: Azodicarbonamide (EIWA CHEMICAL IND.CO., LTD.)

Foaming Properties

Thickness (mm)		Foaming Rate (%)
Before Baking	After Baking	
1.02	1.79	+75

Baking Condition: 150 °C x 30mins



Recommended Diluents

Name	Category	Manufacturer	Notes
Isopar G	Isoparaffin	ExxonMobil	Odorless
Isopar H	Isoparaffin	ExxonMobil	Odorless
Exxsol D40	Naphtha	ExxonMobil	

- Low polarity solvent like aliphatic hydrocarbon can be used as diluent.
- Aromatic hydrocarbon is not suitable in the point of the pot life.