

# CHEMICAL PRODUCTS GUIDE



In responding to customer needs, ADEKA has developed a wide range of products. We are able to supply brochures for any of the products listed below.

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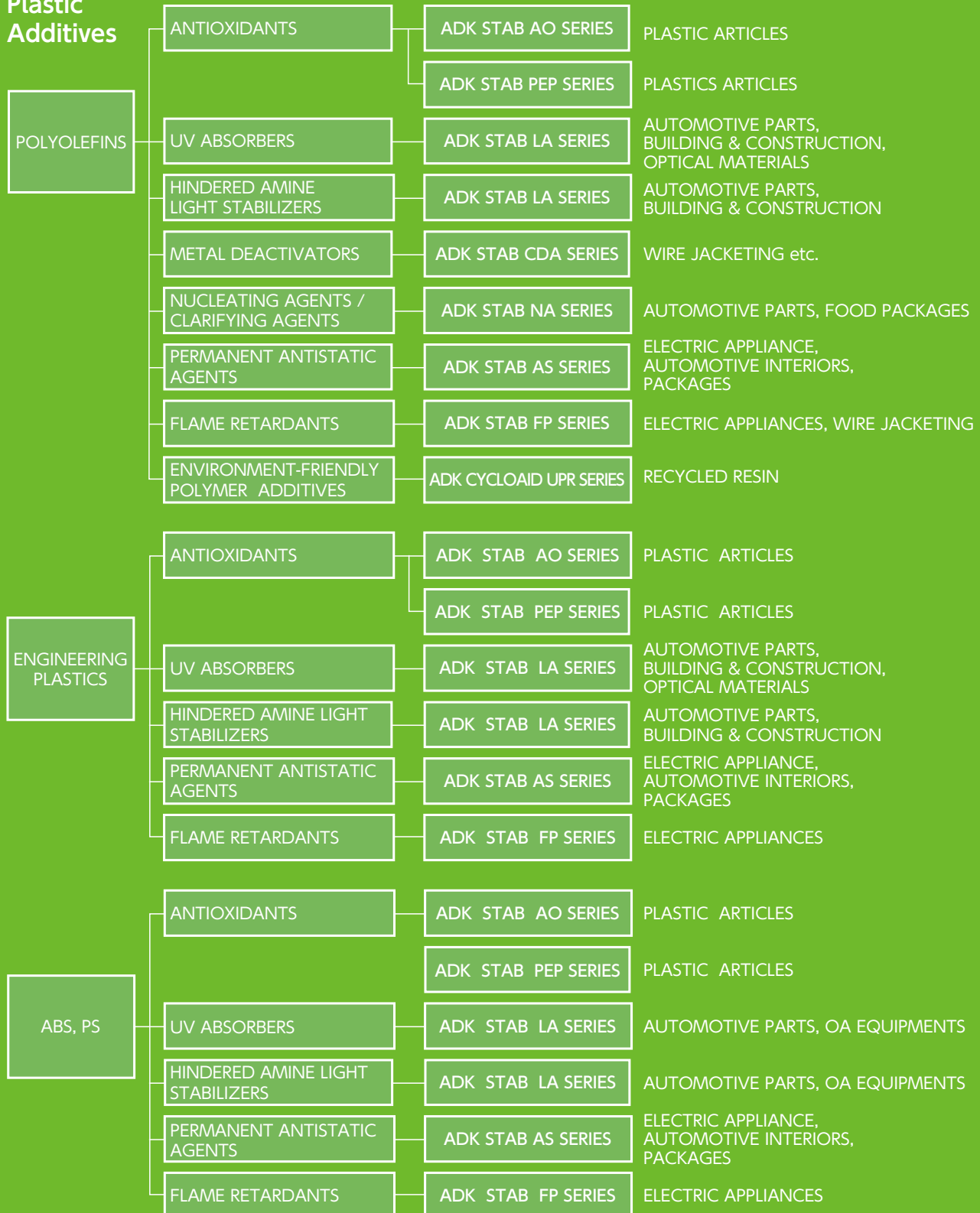
ADEKA ULTRA RING

# Polymer Additives

Polymer additives are essential material for plastic products, which are the most common and fundamental material for the society.

ADEKA is the 2nd largest polymer additives manufacturer in the world, with a wide variety of products portfolio. Our strength is that we can offer the best solution to each customers from the portfolio, covering from commodity products such as polyolefin antioxidants and PVC stabilizers, to specialty chemicals such as nucleating agents and light stabilizers.

## Plastic Additives



## ANTIOXIDANTS



Antioxidants scavenge peroxy radicals and decompose hydroperoxides to prevent thermal degradation of polymers. Combined use of antioxidants and light stabilizers provides protection against photo degradation.

CLASSIFICATION	PRODUCT NAME	APPEARANCE	APPLICATIONS	CHARACTERISTICS
Phenolics	<b>ADK STAB AO series</b>	White powder, White granule	All plastics, elastomers and fibers	Effective antioxidant, excellent synergism with phosphites or thioethers
Phosphites	<b>ADK STAB PEP series</b>	White powder, Liquid	All plastics, elastomers and fibers	Provide excellent process and color stability, excellent synergism with phenolics
Thioethers	<b>ADK STAB AO series</b>	White powder, Liquid	All plastics and elastomers	Provide excellent long-term thermal stability, excellent synergism with phenolics
Blend type	<b>ADK STAB A series</b>	White powder, Liquid	All plastics, elastomers and fibers	Provide excellent heat, process and color stability and simplify manufacturing operations

## LIGHT STABILIZERS



There are two types of light stabilizer: Ultraviolet Absorbers (UVA) and Hindered Amine Light Stabilizers (HALS). UVA converts harmful ultraviolet into harmless thermal energy and exerts outstanding effect in preventing photo degradation. Especially, when used in combination with HALS, UVA exhibits synergistic effect, providing polymers with excellent weatherability.

CLASSIFICATION	PRODUCT NAME	APPEARANCE	APPLICATIONS	CHARACTERISTICS
UVA	<b>ADK STAB LA series</b>	Pale yellow powder	All plastics and coatings	Provide excellent light stability, excellent synergism with HALS
HALS	<b>ADK STAB LA series</b>	Powder, liquid, pellets	Polyolefins, styrenics, polyamides, coatings and PVC	Provide excellent light stability, excellent synergism with UVA

## NUCLEATING AGENTS / CLARIFYING AGENTS



ADK STAB Nucleating agents and Clarifying agents accelerate crystallization process of crystalline polymers and improve mechanical properties and clarity. Also, ADK STAB Nucleating agents and Clarifying agents can shorten processing cycle time and thus improve productivity by enhancing crystallization rate.

Nucleating agents and Clarifying agents enhance crystallization rate, result in improvement of mechanical properties, heat distortion temperature and transparency.

Additionally, they achieve energy saving through shortening of molding cycle time, as they improve the crystallization temperature of the polymers.

CLASSIFICATION	PRODUCT NAME	APPEARANCE	APPLICATIONS	CHARACTERISTICS
Nucleators	<b>ADK STAB NA series</b>	White powder	Polyolefins	Improve stiffness, strength and heat distortion temperature. Enhance crystallization rate
Clarifiers	<b>ADK STAB NA series</b>	White powder	Polyolefins	Improve both clarity and mechanical properties. Enhance crystallization rate

## FLAME RETARDANTS & OTHERS



Plastics are used for various applications and therefore require all kinds of properties. Among them is the requirement for flame retardancy which is increasingly needed for plastics used for electronic applications and building materials. ADEKA's flame retardants are all halogen free, therefore have less impact on environment. Additionally, they cause less contamination problem due to their higher heat stability. Besides, ADEKA has several unique product lines such as Metal Deactivators, Permanent antistatic agents, etc.

### HALOGEN-FREE FLAME RETARDANTS

PRODUCT NAME	APPEARANCE	APPLICATIONS	CHARACTERISTICS
ADK STAB FP series (Phosphate type)	Pale Yellow Liquid	Engineering Plastics	Provide high level flame retardancy. Low volatility and less deposit.
ADK STAB FP series (Intumescent type)	White powder	Polyolefins, TPE	Provide high level flame retardancy. Low smoke and excellent heat stability.

### METAL DEACTIVATORS

PRODUCT NAME	APPEARANCE	APPLICATIONS	CHARACTERISTICS
ADK STAB ZS series	White powder	All plastics, elastomers and fibers	Provide excellent long-term thermal stability for filled polymers.
ADK STAB CDA series	White powder	All plastics, elastomers and fibers	Deactivate heavy metals.

### PERMANENT ANTISTATIC AGENTS

PRODUCT NAME	APPEARANCE	APPLICATIONS	CHARACTERISTICS
ADK STAB AS series	Pale yellow pellets	Polyolefins, Engineering Plastics	Provide antistatic effects immediately and last long term

## PVC Plasticizers & Stabilizers



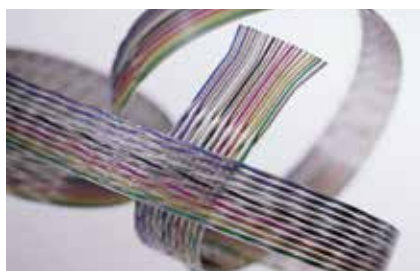
## PLASTICIZERS



Plasticizers give useful properties such as flexibility to PVC and rubbers. These properties generally cannot be realized by themselves alone. ADEKA's plasticizers show excellent performance such as low migration to other polymers and heat resistance and so on. We have a variety of plasticizers that surely meet customer's needs.

CLASSIFICATION	PRODUCT NAME	COMPOSITION	CHARACTERISTICS AND APPLICATIONS
Epoxy type plasticizers	<b>ADK CIZER O series</b>	Poxidized soybean oil, Epoxidized linseed oil	For general purpose
Polymeric	<b>ADK CIZER P series</b>	Adipic acid polyester	Excellent resistance to migration in contact with other plastics, oil resistant hose
	<b>ADK CIZER PN series</b>	Adipic acid polyester	
Heat resistant plasticizers	<b>ADK CIZER C series</b>	Trimellitate	For heat-resistant cables and automotive upholstery
	<b>ADK CIZER UL series</b>	Pyromellitate	
Antistatic plasticizers	<b>ADK CIZER LV series</b>	Phthalate type Adipate type	For film, sheet, floorings footwear and others
For rubbers	<b>ADK CIZER RS series</b>	Ether-ester	For NBR, CR and acrylic rubbers

## PVC STABILIZERS



Though lead stabilizers are still often used for rigid PVC, demands for heavy metal free materials are growing more and more, based on the environment consciousness. ADEKA provides Ca-Zn and Ba-Zn stabilizers that excel in heat stability and molding workability.

CLASSIFICATION	PRODUCT NAME	COMPOSITION	APPEARANCE	CHARACTERISTICS AND APPLICATIONS
General purpose stabilizers	<b>ADK STAB AC series</b>	Ba-Zn	Liquid	Available for transparent applications to CaCO <sub>3</sub> filled formulations
	<b>ADK STAB AP series</b>	Ba-Zn	Powder	
Stabilizers for electric wires	<b>ADK STAB RUP series</b>	Ba-Zn	Powder	For wires requiring excellent migration resistance using polyester plasticizer
Stabilizers for automotive upholstery	<b>ADK STAB CPL series</b>		Liquid	Improving of long term heat stability at moderate temperature
	<b>ADK STAB CPS series</b>		Powder	
Environmentally friendly stabilizers	<b>ADK STAB RUP series</b>	Ca-Mg-Zn	Powder	For wire and cables, excellent electrical properties and superior heat stability to lead stabilizer
	<b>ADK STAB RX series</b>	Ca-Zn	Powder	For rigid PVC by extrusion, good heat stability as lead stabilizers
	<b>ADK STAB SC series</b>	Ca-Zn	Liquid, Paste	For general purpose, excellent performance as Ba-Zn stabilizers
	<b>ADK STAB SP series</b>	Mg-Zn	Powder	
Stabilizers for PVC foam	<b>ADK STAB OF series</b>	Ba-Zn	Powder	For general purpose
	<b>ADK STAB FL series</b>	Ba-Zn	Liquid	
	<b>ADK STAB BAP series</b>			
Stabilizers for dispersion PVC for wall paper	<b>ADK STAB FL series</b>	Ba-Zn	Liquid	Quick expansion and excellent color (whiteness)
Stabilizers for dispersion PVC for floorings	<b>ADK STAB AC series</b>	Ba-Zn	Liquid	Excellent weatherability and prevent losing transparency in water absorption
Stabilizers for food-approved & Medical applications	<b>ADK STAB SC series</b>	Ca-Zn	Liquid	Excellent initial color and transparency for general plastcized formulation
	<b>ADK STAB 30 series</b>	Ca-Zn	Paste	



# ENVIRONMENT - FRIENDLY POLYMER ADDITIVES

## - ADK CYCLOAID -



“ADK CYCLOAID” the brand of products to ensure that environment-friendly plastics have functionality equal to or better than conventional plastics, but also place a minimal burden on the environment and help increase people’s prosperity.

There are two types of ADK CYCLOAID: Additive packages for recycled resins and Bio-based plasticizers for PVC.

CLASSIFICATION	PRODUCT NAME	APPEARANCE	APPLICATION	CHARACTERISTICS
Additive package for recycled resin	<b>ADK CYCLOAID UPR-001 series</b>	White powder, Pale yellow PE pellet	Packaging (none-food contact application) Automotive interior and exterior parts	Improves the thermal stability of the recycled resin which makes it possible to apply for application with higher requirement Enables to increase the ratio of the recycled PP while maintaining the properties of the compound
	<b>ADK CYCLOAID UPR-011 series</b>	White powder, Pale yellow PP pellet	Industrial materials, etc.	Provides recycled PP a superior mechanical properties Enables to increase the ratio of the recycled PP while maintaining the properties of the compound
Bio-based polymeric plasticizer	<b>ADK CYCLOAID PNB series</b>	Liquid	PVC Film, Sheet, and daily-use industrial products, etc.	Performs better oil resistance, heat aging stability and less-migration compared to other general plasticizers
Bio-based epoxidized plasticizer	<b>ADK CYCLOAID O series</b>	Liquid	General film, food film, agricultural film, electric cable, medicinal product, rigid PVC, blown bottle, gasket, hose/tube, injection mold product, etc.	Performs excellent water and oil resistance Can be used for food contact application

# IT Related Chemicals

Electronics offers people a new world of unlimited dreams. Such products are realized through the best use of cutting-edge technology, materials and devices. They increase convenience and promote comfortable lifestyles. ADEKA technology is making an indispensable contribution to such products. Utilizing synthesizing and refining technology built upon years of research, we are able to supply key materials for them. The future of electronic materials begins with ADEKA.

## SEMICONDUCTOR MATERIALS



Evaluation of ALD with 300mm wafer.



Quality requirements for semiconductor materials are getting higher with the progress of the process nodes miniaturization.

ADEKA SUPER TEOS is manufactured in clean room (class 1000). To keep the excellent quality, we implement the thorough quality control on both products and canisters.

ADEKA enhances its quality management to support the innovation of ALD/CVD process.

ADEKA produces high-purity etching gases and ALD/CVD precursors for the semiconductor devices. All products are manufactured using leading-edge technologies and under conditions of strict quality control. Also, ADEKA develops new ALD/CVD precursors and plating materials next generation semiconductor.

### [ETCHING GASES]

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION
ADEKA HIGH-PURITY Chlorine	Cl <sub>2</sub>	Semiconductor, LCD
ADEKA HIGH-PURITY Hydrogen Bromide	HBr	Semiconductor
ADEKA HIGH-PURITY Boron Trichloride	BCl <sub>3</sub>	Semiconductor

### [ALD/CVD PRECURSORS]

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION
ADEKA SUPER TEOS	Si(OC <sub>2</sub> H <sub>5</sub> ) <sub>4</sub>	Dielectric film/Semiconductor
ADEKA HIGH-PURITY TEOP	PO(OC <sub>2</sub> H <sub>5</sub> ) <sub>3</sub>	Dopant/Semiconductor
ADEKA HIGH-PURITY TEB	B(OC <sub>2</sub> H <sub>5</sub> ) <sub>3</sub>	Dopant/Semiconductor
ADEKA HIGH-PURITY TiCl <sub>4</sub>	TiCl <sub>4</sub>	Electrode/Semiconductor
ADEKA SUPER TMA	Al(CH <sub>3</sub> ) <sub>3</sub>	High-k material/Semiconductor
ADEKA ORCERA TDMAH	Hf[N(CH <sub>3</sub> ) <sub>2</sub> ] <sub>4</sub>	High-k material/Semiconductor
ADEKA SUPER TMCTS	[OSiH(CH <sub>3</sub> ) <sub>3</sub> ] <sub>4</sub>	low-k material/Semiconductor
ADEKA ORCERA TDMAS	HSi[N(CH <sub>3</sub> ) <sub>2</sub> ] <sub>3</sub>	SiO <sub>2</sub> , SiN material/Semiconductor

Other : precursors of Ru, Cu(Electrode, Wire material), High purity organic solvent.

### [COPPER PLATING MATERIALS for semiconductor]

TSV electrode (Through silicon via) and copper bump are considered as key technologies for semiconductor devices. We are developing and manufacturing copper plating materials for next generation.

Base solution (VMS)	High purity copper sulfate solution	
Accelerator	Application of high current density is possible by original composition	
Additives	Suppressor	The various surfactants of ADEKA possession are used
	Leveler	It can efficiently plate TSV of a high aspect

### [PEROXYGEN CHEMICALS for semiconductor materials]

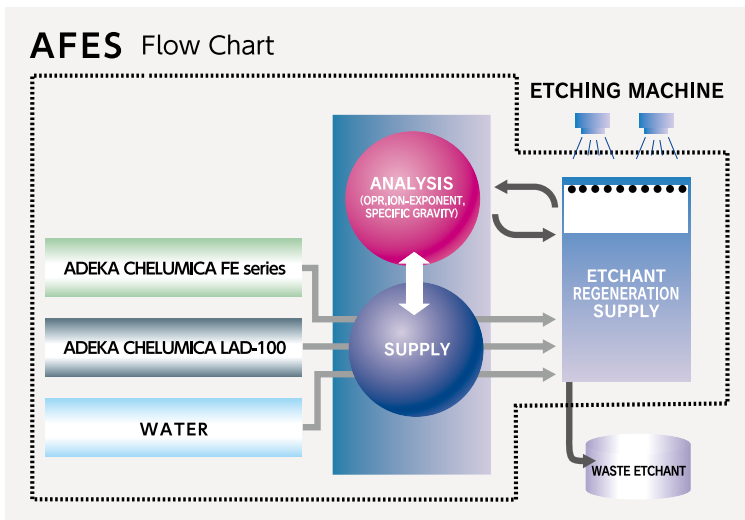
PRODUCT NAME	GENERAL NAME	APPLICATION
ADEKA SUPER EL	High Purity Hydrogen Peroxide	Water Preparation, Device Fabrication
ADEKA SUPER HP		

# CIRCUIT MATERIALS

## [AFES (Etching Controllers and Etchants)]

"AFES" is an automatic controller that regularly analyzes etching solutions and automatically feeds separately-prepared reactivating agents and water in necessary quantities based on ORP (oxidation-reduction potential), ion index (concentration of free hydrochloric acids) and specific gravity. This offers the user a number of positive outcomes including stable production of fine patterns and marked improvements in yields, etc.

"ADEKA CHELUMICA" is an acidic etching solution prepared by adding certain chemicals to an ADEKA-developed ferric chloride compound. It provides the user with three major merits. Namely, high etching factors, high etching rates and high yields.



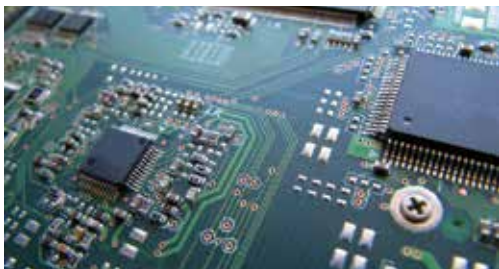
"AFES" can be applied not only to printed circuit board but also to copper substrates including BGA, TAB, FPC, copper alloy for lead frames and nickel alloys and stainless steel for precision parts.



"AFES" Controller

ITEMS	PRODUCT NAME	APPLICATIONS
Controller	AFES	Fine etching control system
Etchants	ADEKA CHELUMICA FE series	PWB, FPC, TAB, Lead frame (Copper alloy) etchant
	ADEKA CHELUMICA ST series	Chemical milling (Stainless steel) etchant
	ADEKA CHELUMICA AL series	RFID and Power Module Substrates. Aluminum etchant.
	ADEKA CHELUMICA LAD 100	PWB, FPC, TAB, Chemical milling (Etchant regenerator)

## [PEROXYGEN CHEMICALS for circuit materials]



Among our functional products are metal surface treatment agents for electronic components and stabilizers for alkaline hydrogen peroxide solution.

PRODUCT NAME	APPLICATIONS
ADEKA TEC A series	Copper surface treatment. (Micro etchant)
ADEKA TEC CL series	Copper surface treatment. (Micro etchant)
ADEKA TEC CAP	Copper/copper alloy chemical polishing agent for brass and copper
ADEKA PAOTIZER RA series	Pickling agent for SUS, Regenerator for Ferrous Chloride type Etchant
ADEKA TEC ND series	Cleaning agent for DFR, PSR developing /stripping equipment
ADEKA TEC HES series (Isethionic acid)	Metal Plating Assistant, Metal Finishing Agent, Raw Material of Surfactant

## INSULATION MATERIALS for substrate



BUR series have excellent performance for high thermal conductivity substrate. Our materials enable unique properties which are 200-300°C at Tg, 20ppm/K in CTE, and good process ability for low temperature curing.

CLASSIFICATION	PRODUCT NAME	COMPOSITION	APPLICATION
DRY FILM TYPE INSULATION MATERIAL	<b>ADEKA FILTERA BUR 5000, 6000 series</b>	Thermosetting composite	Low CTE, high Tg, low Ra, low tan $\delta$ , low modulus, high thermal conductivity and good adhesion

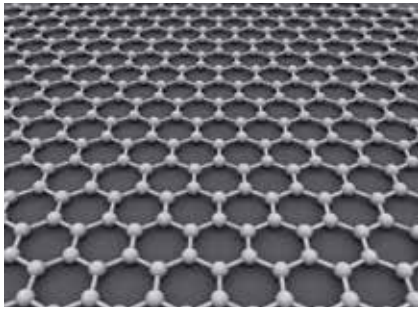
## PHOTO (LIGHT) / THERMAL-CURING MATERIALS & PHOTOINITIATORS



Unlike conventional curing, you can obtain an instant cure through the application of ultraviolet radiation to light curing resins. Such processes result in productivity and yield increases. Our no-solvent system products will make a marked contribution to improvements in the workplace in terms of environment, disaster prevention and sanitation.

PRODUCT NAME	COMPONENT/CURING	APPLICATIONS
<b>ADEKA ARKLS KR series</b>	Photocurable resin, UV/heat curing	Functional coating / For optical film and container
		Scratch resistant, anti-static, high-refractive index stretchable with high hard property, non-solvent
		Adhesive / For optical film and electronic parts High durability, good adhesion
<b>ADEKA ARKLS NCI series</b>	photo radical initiators	Mold / For prism sheet and lenses Good adhesion to plastic film, good molding
		Photoinitiators for radically curable resins
<b>ADEKA ARKLS GPA series</b>	latert additives	Antioxidant and UVabsorber for photo (light) curing materials

## ENERGY RELATED MATERIALS [Under Development]



We are developing the following materials required for energy storage devices.

PRODUCT NAME	CLASSIFICATION	APPLICATIONS	FEATURES
ADEKA AMERANSA CMG series	Graphene	Conductive materials for rechargeable batteries	Improve rate and cycle performances
ADEKA AMERANSA SAM series	SPAN	Sulfur based active materials for rechargeable batteries	High energy density, Long life, High safety in the short circuit

## LOW CHLORINE EPOXY RESINS & LATENT HARDENERS for electronics use



Designing low chlorine type special epoxy resins and latent hardeners, we supply them to customers for electronics use.

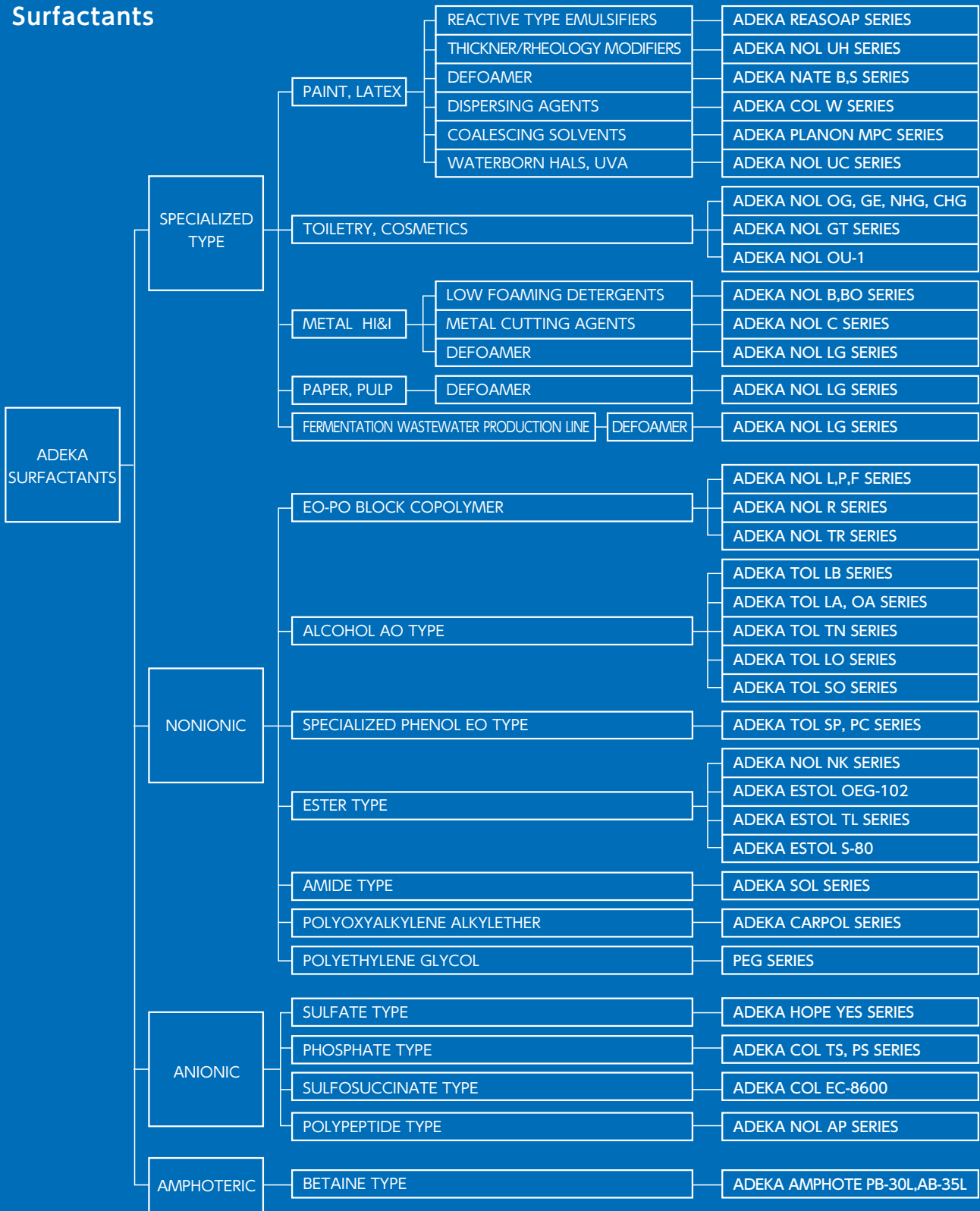
These materials enable to realize high performances, such as good adhesion property to non-ferrous metals, Polyimide substrates, and low temp.(80°C ) curability.

CLASSIFICATION	PRODUCT NAME	COMPOSITION	CHARACTERISTICS
SPECIAL TYPE EPOXY RESIN	ADEKA RESIN EP-4000S, L series	Special structure epoxy resin	Flexibility, good adhesion property, low chlorine
	ADEKA RESIN EP-4088 series	Special structure epoxy resin	Good adhesion, low viscosity
	ADEKA RESIN EP-3950 series	Special structure epoxy resin	High Tg
	ADEKA RESIN EP-49 series	Chelete modified epoxy resin	Good adhesion on non-ferrous metals
	ADEKA RESIN EPR series	Rubber modified epoxy resin	Flexibility good adhesion and thermostability, low chlorine
DILUENTS FOR EPOXY RESIN	ADEKA GLYCIROL ED series	Reactive epoxy diluent	Good dilution effect, low chlorine
EPOXY CURING AGENTS	ADEKA HARDENER EH series	Latent hardener	High Tg, good stability in one component, fast and low-temp. curability

## Surface Specialties

Our Surface Specialties business supplies the products consisting both of superb functionality and environment-friendly technologies for many fields, and they have greatly contributed to our affluent society. Surfactants have not only high performance but also special features in hypoallergenic, harmless and biodegradability. Those products are commonly-used in the fields of waterborne coating, industrial detergent, cosmetics and electronic industry materials. Lubricants, we supply Organic Molybdenum compounds for engine-oil. Those products provide superior friction modification which improve fuel efficiency, and excellent antioxidation ability which achieve longer drain interval.

### Surfactants



## SPECIALIZED FUNCTIONAL CHEMICALS



In recent years, our endeavors have focused on more naturally-sourced products that are environmentally sustainable. ADEKA surfactants are used in a wide variety of applications including synthetic detergents, shampoos, coatings and other industrial uses aimed at environmental hygiene and energy/resource conservation.

APPLICATIONS	PRODUCT NAME	COMPOSITION	CHARACTERISTICS / MAIN APPLICATIONS
Reactive type emulsifiers	<b>ADEKA REASOAP series</b>	Reactive type (anionic, nonionic)	Reactive type emulsifier for emulsion polymerization
Thickner/Rheology modifiers	<b>ADEKA NOL UH series</b>	Special nonionic polymer derivative	Good Leveling and Flowability. Used for synthetic resin emulsion paints.
Defoamer	<b>ADEKA NATE B,S series</b>	Special blend	Good for Foam breaking and Long-lasting effect.
	<b>ADEKA NOL LG series</b>		
Coalescing solvents	<b>ADEKA PLANON series</b>	Special nonion surfactants	Good film forming property, VOC free
Waterborne HALS, UVA	<b>ADEKA NOL UC series</b>	Emulsion	Small particle size. Excellent light stability.
	<b>ADEKA NOL OG, GE, NHG, CHG</b>	Glycol	Moisturizer, Preservation booster
	<b>ADEKA NOL GT series</b>	Hydrogelator	Elastic gel, Anti-salt
	<b>BETA-GLUCAN (GENERAL NAME)</b>		Natural moisturizer
Cosmetics	<b>MEVALONOLACTONE (GENERAL NAME)</b>		Natural moisturizer
	<b>ADEKA NOL OU-1</b>	Urethane polymer	Film former, Texture modifier
Low foaming detergents	<b>ADEKA NOL B, BO series</b>	Special nonionic	Low foaming. Good Detergency, Wetting, Penetration and Alkali stability.
Silicone/Metal cutting auxiliary agents	<b>ADEKA NOL C series</b>	Special nonionic	Low foaming. Good lubrication. Water soluble type.

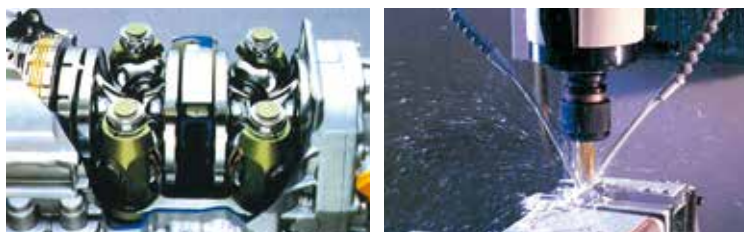
## SURFACTANTS



Through untiring R&D, we have incorporated technologies in oils and fats, soaps and synthetic detergents that have resulted in a unique range of surfactants able to be combined with petrochemicals to form raw materials.

CLASSIFICATIONS	PRODUCT NAME	COMPOSITION	CHARACTERISTICS
Nonionic	<b>ADEKA NOL L, P, F, R, TR series</b>	EO/PO block copolymer	Low foaming, Low toxicity
	<b>ADEKA TOL series</b>	Ethoxylate type	Good Penetration, Wetting, Emulsification, Dispersion, Detergency and Solubilization.
	<b>ADEKA CARPOL series</b>	Polyoxyalkyleneglycols	Detergency, Solubilization, Lubricity
	<b>ADEKA SOL series</b>	Coco-diethanolamide (1:1,1:2 type)	Good detergency. High foaming. Stable foam.
Anionic	<b>ADEKA COL PS, TS series</b>	Phosphate	Good Thermal resistance, Lubrication, Antirust and Antistatic. Stable against Acid and Alkali. Good Detergency, Emulsification and Dispersion.
	<b>ADEKA COL EC-8600</b>	Diocetyl sulfosuccinate	Good Penetration, Wetting, Emulsification, Dispersion and Detergency.
Amphoteric	<b>ADEKA AMPHOTE series</b>	Betaine type	Good Detergency. High foaming.

## LUBRICANTS



When substances come into contact with each other friction occurs. To reduce "friction" as a core theme, we have developed lubricant-related products such as characteristic synthetic lubricant, high-performance additives that can be applied to various uses. Among our products, "ADEKA SAKURA-LUBE" a superior friction reducer, has the top worldwide share among organomolybdenum additives.

CLASSIFICATIONS	PRODUCT NAME	COMPOSITION	APPLICATIONS
Lubricant additives	<b>ADEKA SAKURA-LUBE series (powder)</b>	Organic Molybdenum compounds	Grease
	<b>ADEKA SAKURA-LUBE series (liquid)</b>	Organic Molybdenum compounds	Engine oil, Gear oil, Industrial oils
Lubricant additives	<b>ADEKA KIKU-LUBE Z series</b>	Zinc dithiophosphate	Engine oil, Grease, Metal working fluid
	<b>ADEKA KIKU-LUBE FM series</b>	Ashless friction modifier	Engine oil, Gear oil, Grease, Industrial oils
	<b>ADEKA ECOROYAL AIN series</b>	Anti-oxidants	Gear oil, Industrial oils, Grease
Synthetic oils	<b>ADEKA ECOROYAL AWP series</b>	Anti-wear agents	Hydraulic fluid, Industrial oils
	<b>ADEKA CARPOL series</b>	Polyoxyalkyleneglycols	Hydraulic fluid, Heat treating oil, Metal working fluid
	<b>ADEKA PROVER series</b>	Esters	Engine oil, Heat resistant lubricating oil, Grease

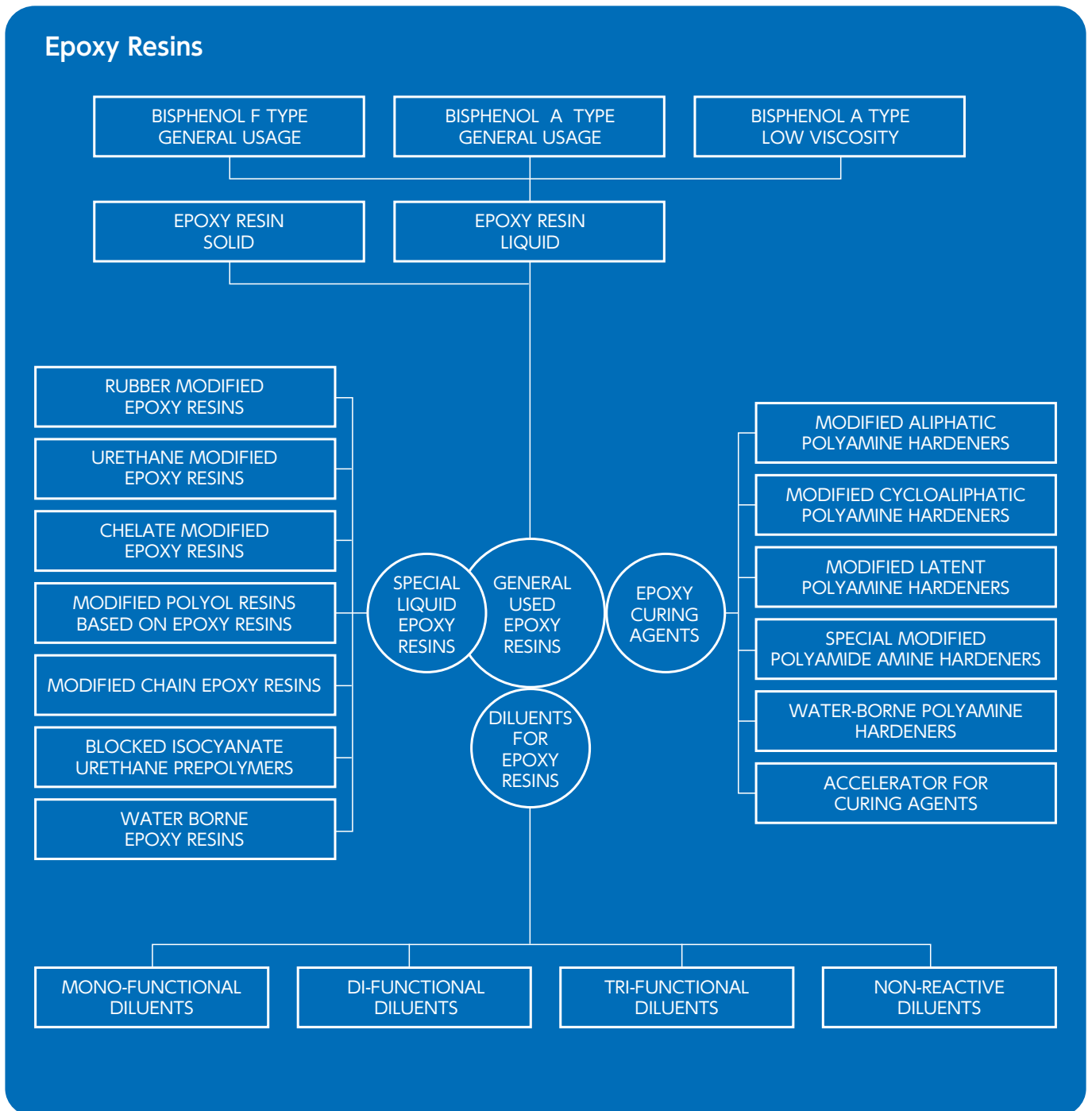


# 4

## Functional Polymers

We have an assortment of synthetic materials and processed products. Our synthetic resin are widely used for industrial applications including automobiles and household appliances. They are also used in important facets of modern life including housing-related construction materials, civil engineering and daily commodities. We continue to strive to produce stable supplies of highly functional materials and finished products in order to meet the needs of customers as their markets diversify from year to year.

### EPOXY RESINS



## EPOXY RESINS



Among thermosetting resins, epoxies combine outstanding performance/processing properties with economical efficiency. Their varied properties have been utilized in a wide variety of fields including paints, electrical parts, adhesives and civil engineering/construction. As an integrated manufacturer of epoxy resins, diluents and curing agents, we continue to develop new technologies.

### CONVENTIONAL EPOXY RESIN

PRODUCT NAME	COMPOSITION	APPLICATIONS
ADEKA RESIN EP-4100 series	Basis Bisphenol A	General used type.For adhesives and civil engineering.
ADEKA RESIN EP-4500 series	Basis Bisphenol A / low viscosity	Low viscosity.For civil engineering.
ADEKA RESIN EP-4900 series	Basis Bisphenol F	Low viscosity and general used type.For civil engineering.
ADEKA RESIN EP-5100 series	Basis Bisphenol A / low viscosity	Solvent diluted type.For coatings.

### SPECIAL TYPE EPOXY RESIN

PRODUCT NAME	PRODUCT TYPE	APPLICATIONS
ADEKA RESIN EP-4000 series	Special liquid type	Flexibility type.For adhesives and civil engineering.
ADEKA RESIN EP-49 series	Chelate modified type	For adhesives and coatings on rusted steel surfaces.
ADEKA RESIN EPU series	Urethane modified type	For adhesives and structural adhesives.
ADEKA RESIN EPR series	Rubber modified type	For structural adhesives.
ADEKA RESIN EM series	Water-borne type	Emulsion type.For coatings and architectural primers.
ADEKA RESIN QR series	Blocked isocyanate urethane type	For civil engineering and adhesives.Adhesive promoter for PVC plastisol.
ADEKA RESIN EP-6000 series	Modified polyol resin based on epoxy resin	Corrosion resistant coatings.

### EPOXY CURING AGENTS

PRODUCT NAME	PRODUCT TYPE	APPLICATIONS
ADEKA HARDENER EH series	Modified aliphatic polyamine	For civil engineering and floorings.
	Modified cycloaliphatic polyamine type	Weather resistance type.For civil engineering.
	Modified polyamide amine type	For adhesives,civil engineering and coatings.
	Water-borne polyamine type	For water-borne coatings,primers and sealers.
ADEKA HARDENER EHC -30	Latent type	Adhesives for electronics,and steel.
	Catalyst of tertiary amine type	Accelerator for curing agents.

### DILUENTS FOR EPOXY RESIN

PRODUCT NAME	COMPOSITION	APPLICATIONS
ADEKA GLYCIROL ED series	Mono-functional type	Floorings.
	Di-functional type	High reactivity,adhesives and electrical parts.
	Tri-functional type	High hardness.For coating.
	Non-reactive type	Improves surface amine-blush and gloss in cured film.floorings

# LOW CHLORINE EPOXY RESINS & LATENT HARDENERS for electronics use



Designing low chlorine type special epoxy resins and latent hardeners, we supply them to customers for electronics use. These materials enable to realize high performances, such as good adhesion property to non-ferrous metals, Polyimide substrates, and low temp.(80°C ) curability.

## SPECIAL TYPE EPOXY RESIN

PRODUCT NAME	COMPOSITION	CHARACTERISTICS
ADEKA RESIN EP-4000S, L series	Special structure epoxy resin	Flexibility, good adhesion property, low chlorine
ADEKA RESIN EP-4088 series	Special structure epoxy resin	Good adhesion, low viscosity
ADEKA RESIN EP-3950 series	Special structure epoxy resin	High Tg
ADEKA RESIN EP-49 series	Chelete modified epoxy resin	Good adhesion on non-ferrous metals
ADEKA RESIN EPR series	Rubber modified epoxy resin	Flexibility good adhesion and thermostability, low chlorine

## EPOXY CURING AGENTS

PRODUCT NAME	COMPOSITION	CHARACTERISTICS
ADEKA HARDENER EH series	Latent hardener	High Tg, good stability in one component, fast and low-temp. curability

## DILUENTS FOR EPOXY RESIN

PRODUCT NAME	COMPOSITION	CHARACTERISTICS
ADEKA GLYCIROL ED series	Reactive epoxy diluent	Good dilution effect, low chlorine

# POLYURETHANES

## Polyurethanes

WATER-BORNE POLYURETHANES

One Component Polyurethane Adhesives

POLYURETHANE RAW MATERIALS

Polyether Polyol  
Polyester Polyol



ADEKA is a diversified polyol manufacturer, supplying polyurethane-related products ranging from various raw-material polyols for polyurethanes through to polyurethane form prepolymers used in heat insulation, foam-cushioning and other applications. We also supply high-function polyurethane resins such as environmentally friendly water-borne products.

PRODUCT NAME	COMPOSITION	APPLICATIONS
ADEKA BONTIGHTER HUX series	Water-borne polyurethane	Coatings (Plastics, Metal), Adhesives
ADEKA POLYETHER P series	Polyether diol	Paints, Adhesives, Elastmers
ADEKA POLYETHER G series	Polyether triol	Foams, Paints
ADEKA POLYETHER EDP series	Polyether tetraol	Rigid foams
ADEKA POLYETHER BPX series	BPA based polyether	Paints, Adhesives
ADEKA POLYETHER FC series	Flame retardant polyol	Foams, Paints
ADEKA POLYETHER AM, CM series	PO-EO blocked polyol	Foams, Sealants, Adhesives
ADEKA POLYETHER PR, GR series	PO/EO random polyol	Foams, Sealants, Adhesives
ADEKA NEWACE series	Polyester polyol	Foams, Elastomers, Adhesives, Paints

# 5

## Comodity Chemicals

Commodity chemicals represent the core of our chemical business. This segment comprises peroxide chemicals, basic chemicals and industrial materials. Peroxide chemicals have hydrogen peroxides and persulfates. Basic chemicals have caustic soda, chloride and propylene glycols. Industrial materials have water swelling materials and grouts. They have developed a strong confidence and support among our customers.

### PEROXYGEN CHEMICALS



Among our peroxygen chemical range we offer hydrogen peroxides, persulfates, sodium percarbonate and peracetic acid. Hydrogen peroxide offers the advantageous property of being totally free of environmental pollutants. As such, it enjoys widespread application in various fields. Among our persulfate products, we have ammonium, sodium and potassium.

PRODUCT NAME	APPLICATIONS
<b>HYDROGEN PEROXIDE</b>	Pulp & Paper, Fibers, Synthetic resins, Oxygen sources, Plasticizers, Grease, Pharmaceuticals, Cosmetics, Foodstuffs, Leather, Metal finishing, Timber, Sewage disposal, Electronics, Soil improvement additives, Chemicals, etc.
<b>HIGH PURITY HYDROGEN PEROXIDE</b>	Agent for wafer-preparation process, device-fabrication process etc.
<b>AMMONIUM PERSULFATE</b>	
<b>SODIUM PERSULFATE</b>	Printed circuit boards, Metal surface treatment, Soil improvement additives, Fibers, Foodstuffs, Chemicals, etc.
<b>POTASSIUM PERSULFATE</b>	
<b>SODIUM PERCARBONATE</b>	Detergent for fibers, Deslime, Pollution, Cosmetics, etc.
<b>PERACETIC ACID</b>	Sanitizer for food and beverage processing, Germicidal agent for medical appliances

### REDUCING AGENTS



Among our functional products are metal surface treatment agents for electronic components and stabilizers for alkaline hydrogen peroxide solution.

PRODUCT NAME	APPLICATIONS
<b>DIETHYLHYDROXYLAMINE</b>	Macromolecules (Polymerization halter, Polymerization inhibitor, Popcorn polymer formation inhibitor, Hardner ingredient, etc.) Boilers, Photography, etc.

## FUNCTIONAL PRODUCTS



Among our reducing agents we offer diethylhydroxylamine.

PRODUCT NAME	APPLICATIONS
ADEKA TEC A series	Copper surface treatment (Micro etchant)
ADEKA TEC CL series	Copper surface treatment (Micro etchant)
ADEKA TEC CAP	Copper/copper alloy chemical polishing agent for brass and copper
ADEKA PAOTIZER RA series	Pickling agent for SUS, Regenerator for Ferrous Chloride type Etchant
ADEKA TEC ND series	Cleaning agent for DFR, PSR developing / stripping equipment
ADEKA TEC HES series (Isethionic acid)	Metal Plating Assistant, Metal Finishing Agent, Raw Material of Surfactant

## PROPYLENE GLYCOLS



ADEKA was the first company in Japan to produce propylene glycols. These are used in industries as an intermediate material for polyester resins, plasticizers and printing inks. They are also used in prescription medications, cosmetics and within the food industry as food additives.

PRODUCT NAME (GENERAL NAME)	GRADE	APPLICATIONS
	PG(T) Industrial grade	Unsaturated polyester resin, Antifreezing, Solvent
PROPYLENE GLYCOL	PG(P) Pharmaceutical grade	Wetting agent for cigarettes, Cosmetics, Dental cream, Medicine, Food additives
	DPG	Unsaturated polyester resin, Ink, Wetting agent for cellophane
DIPROPYLENE GLYCOL	DPG-RF Refine grade	Solvent for perfume, Moisturizer for toiletries, Cosmetics
TRIPROPYLENE GLYCOL	TPG	Unsaturated polyester resin, Ink, Brake fluid, Cosmetics

## OLEO CHEMICALS (METALLIC SOAP)



ADEKA was the first company in Japan to produce hydrogenated oils (hardened oils) utilizing the hydrogen gases generated by brine electrolysis.

PRODUCT NAME	GENERAL NAME	APPLICATIONS
AFCO CHEM ZNS series	Zinc Stearate	Plastics, Pigment color, Wood paint, Powder metallurgy
AFCO CHEM CS series	Calcium Stearate	Plastics, Pigment color, Shell mold
AFCO CHEM MGS series	Magnesium Stearate	Plastics, Pigment color

## CIVIL ENGINEERING & CONSTRUCTION MATERIALS



We have a wide range of products for civil engineering and construction that can be applied to a variety of fields. These include "ADEKA ULTRASEAL", a waterstop that utilizes the elasticity and water-swelling properties of rubber.

### WATER SWELLING MATERIALS



"ADEKA ULTRASEAL" is an innovative double-locking hydrophilic waterstop. ADEKA ULTRASEAL stops water by compression of the rubber and by hydrophilic action (expansion pressure) when it is exposed to water. "ADEKA ULTRASEAL" has various applications.

PRODUCT NAME	CHARACTERISTICS	APPLICATIONS
ADEKA ULTRASEAL MC series	Excellent ability to fill any concrete voids. 2 times expansion by volume.	Construction joint. H-pile. Piping penetrations
ADEKA ULTRASEAL KM series	Excellent tensile and compressive strength. 3 times expansion by volume.	Expansion joints. Box culvert joints
ADEKA ULTRASEAL KMU series	Excellent tensile and compressive strength. 3 times expansion by volume.	Segment joints. Expansion joints. Box culvert joints
ADEKA ULTRASEAL KBA series	Foamed rubber. Easy compressibility. 1.3 times expansion by volume.	Box culvert joints, Construction joint
ADEKA ULTRA RING	1.8 times expansion by volume.	Separator
ADEKA ULTRASEAL P-201A	Paste type in cartridge. 2 times expansion by volume.	Rough surfaces. Wire-net joints
ADEKA ULTRASEAL P-101	Paste type in cartridge. 1.3 times expansion by volume.	Rough surfaces. Ground structure
ADEKA ULTRASEAL A-50N	Pourable one component liquid waterstop. 5 times expansion by volume.	Sheetpile interlocks

# Overseas Group Companies

**ADEKA is making the utmost effort to advance product quality through our global network.**

As we expand and reinforce our production system and build our competitiveness worldwide, we also advance corporate activities with local culture and characteristics in mind, to deliver products and services that match local needs.

## Asia / Middle East



### **ADEKA (CHINA) CO., LTD.**

Rm.1006-1010, 10F Metro Plaza, No.555 Loushanguan Road, Shanghai 200051, China  
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### **ADEKA FINE CHEMICAL (ZHEJIANG) CO., LTD.**

No.189 Zhengang Road, Dushangang Town, Pinghu City, Zhejiang 314204, China  
Phone: +86-573-8581-0088



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No.101, Changchun Road, Riverside Industrial Park, Changshu Economic Development Zone, Jiangsu 215537, China  
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### **ADEKA FINE CHEMICAL TAIWAN CORP.**

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Phone:+886-6-3841-388



### **CHANG CHIANG CHEMICAL CO., LTD.**

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**ADEKA POLYMER ADDITIVES EUROPE SAS**

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Sales Office



Plant



R&D Center

## North America



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777 Terrace Avenue Suite #602A, Hasbrouck Heights, NJ 07604, USA  
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**AMFINE CHEMICAL CORP.**

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Phone:+1-201-818-0159



**AM STABILIZERS CORP.**

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## South America



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# ADEKA CORP. -Japan Offices



## Sales Offices

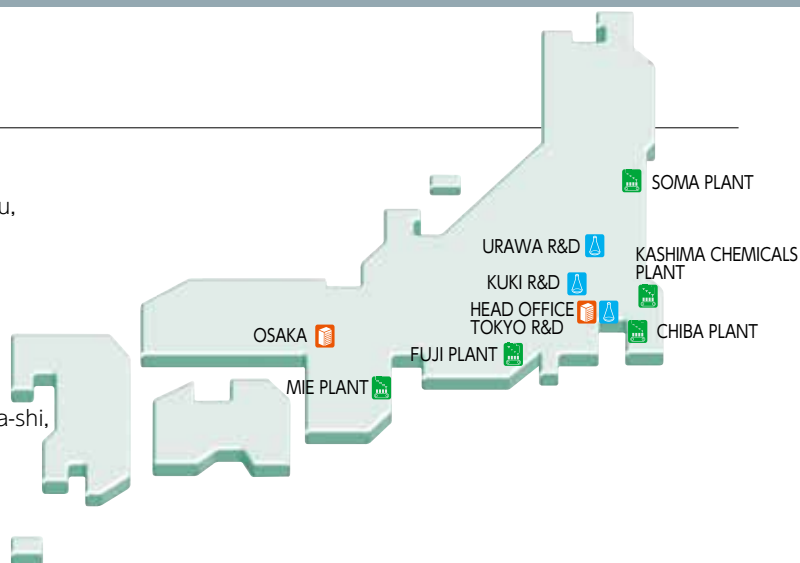


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### OSAKA MAIN BRANCH

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## R&D Centers



### TOKYO R&D CENTER

7-2-34 Higashi-ogu, Arakawa-ku, Tokyo 116-8553, Japan  
Phone:+81-3-4455-2905

Area:11,652m<sup>2</sup>

Surfactants  
Lubricants  
Electronics products  
Light curing resins



### URAWA R&D CENTER

5-2-13 Shirahata, Minami-ku, Saitama-shi, Saitama 336-0022, Japan  
Phone:+81-48-838-2222

Area:3,744m<sup>2</sup>

PVC stabilizers  
Plasticizers  
Plastic additives



### KUKI R&D CENTER

20 Showanuma, Shobu-machi, Kuki-Shi, Saitama 346-0101, Japan  
Phone:+81-480-85-5431

Area: 12,141m<sup>2</sup>

Epoxy resins  
Polyurethanes  
Civil engineering & construction materials

To the customers of our chemicals:

- Review SAFETY DATA SHEET (SDS) before using ADEKA products.
- The data contained in this brochure may be changed without notice.
- The application and the data in this brochure do not warrant final function of your application.
- Information contained in this brochure is given in good faith but no liability is assumed nor is freedom from any industrial properties owned by ADEKA Corporation or others implied.

\* If you have further questions or inquiries, please contact our sales section.

\* ADK STAB is not used as a trademark in the USA.



## Plants

Our all plants are ISO9001, 14001 and OHSAS18001 certification plant.



### **KASHIMA CHEMICALS PLANT (EAST)**

Area:186,612m<sup>2</sup>

Main products : Semiconductor materials  
Etching solutions



### **MIE PLANT**

Area:144,465m<sup>2</sup>

Main products: Plastic additives PVC stabilizers  
Plasticizers IT related chemicals



### **KASHIMA CHEMICALS PLANT (WEST)**

Area:101,000m<sup>2</sup>

Main products: Metallic soap



### **FUJI PLANT**

Area:132,644m<sup>2</sup>

Main products: Hydrogen peroxide Persulfates  
Sodium percarbonate  
Diethylhydroxylamine  
IT related chemicals



### **CHIBA PLANT**

Area:97,761m<sup>2</sup>

Main products: Propylene glycol Surfactants  
Plasticizers  
Epoxy resins  
Raw material for polyurethane  
Polyether  
IT related chemicals



### **SOMA PLANT**

Area:228,458m<sup>2</sup>

Main products: Lubricant additives  
Certification: ISO 22301  
(Business Continuity Management System)

