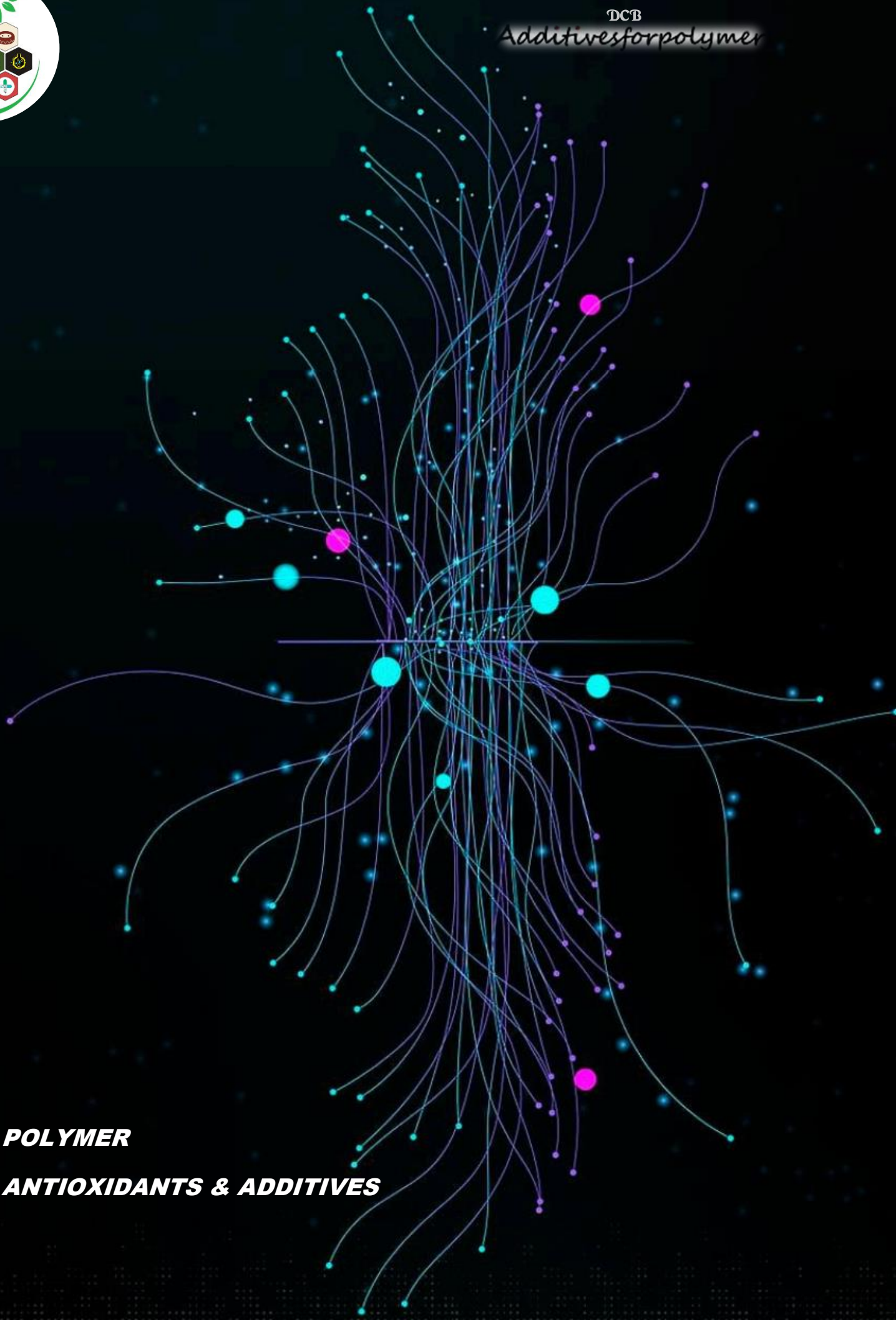
DCB
Additivesforpolymer

ANCC& DCB ANTIOXIDANTS & ADDITIVES



POLYMER

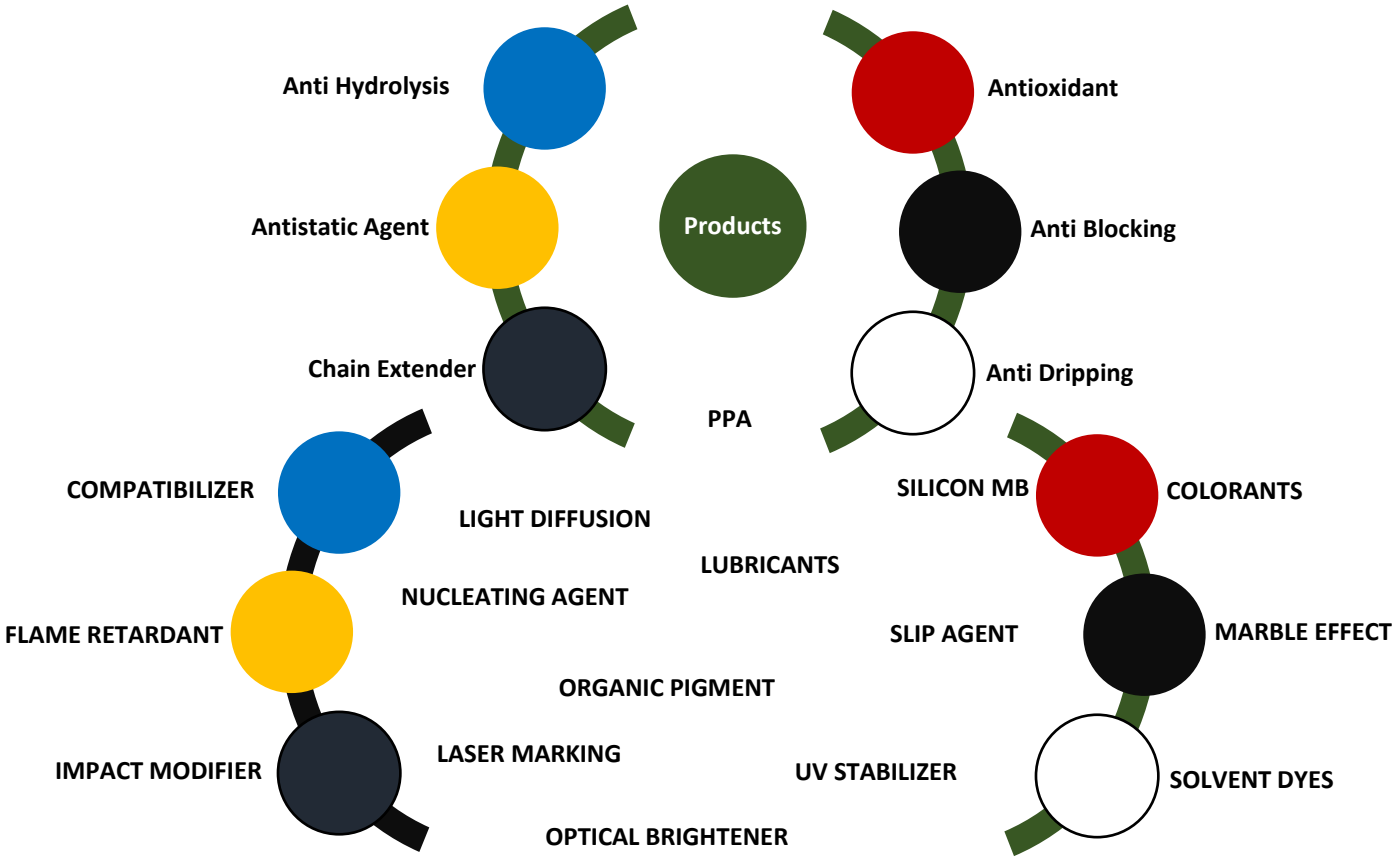
ANTIOXIDANTS & ADDITIVES

INTRODUCTION

ANCC, IN COLLABORATION WITH THE DCB CHEMICAL GROUP, IS PROUD TO INTRODUCE A GROUNDBREAKING OPPORTUNITY FOR DELIVERING HIGH-QUALITY, COMPETITIVELY PRICED ANTIOXIDANTS AND ADDITIVES TAILORED FOR THE POLYMER AND PLASTIC INDUSTRIES. OUR CUTTING-EDGE PRODUCTS ARE DESIGNED TO OPTIMIZE PRODUCTION PROCESSES ACROSS DIVERSE CHEMICAL SECTORS. NOT ONLY DO OUR OFFERINGS MATCH THE PERFORMANCE OF RENOWNED BRANDS SUCH AS BASF GRADES, BUT THEY ARE ALSO TAILORED TO ENSURE SEAMLESS COMPATIBILITY WITH LICENSED PROCESSES, INCLUDING THOSE FROM SERVE PETRO, COMPOUNDING, AND MASTERBATCH.

AT ANCC AND DCB GROUP, WE EXCEL IN SIMPLIFYING POLYMER AND PLASTIC COMPOUNDING THROUGH OUR DEEP MARKET KNOWLEDGE AND PRODUCT EXPERTISE. WE POSITION OURSELVES AS YOUR COMPREHENSIVE SOLUTION PROVIDER, COMMITTED TO STREAMLINING AND ENHANCING YOUR PRODUCTION CAPABILITIES WITH OUR INNOVATIVE OFFERINGS.

DISCOVER HOW OUR ADVANCED SOLUTIONS CAN TRANSFORM YOUR PRODUCTION PROCESS AND PROPEL YOUR BUSINESS FORWARD.



POLYMER ANTIOXIDANTS & ADDITIVES

1. ANTIOXIDANT

Antioxidants are compounds that are used to inhibit or delay the oxidation of materials, particularly in industrial processes where materials are exposed to oxidative conditions. Antioxidants play a crucial role in preventing the degradation of materials, such as polymers, oils, and other substances, due to oxidation. Here's a classification of industrial antioxidants based on their chemical nature. It's important to note that many industrial antioxidant formulations are often blends of different types of antioxidants to achieve a more comprehensive and synergistic protection against oxidation. The choice of antioxidant depends on the specific material being protected, the processing conditions, and the desired properties of the final product.

Phenolic Antioxidants are based on phenols and hinder the oxidation process by donating hydrogen atoms to free radicals. Examples include butylated hydroxytoluene (BHT) and butylated hydroxy anisole (BHA).

Aminic Antioxidants are derived from amines and act by scavenging free radicals. Some common aminic antioxidants include hindered amine light stabilizers (HALS) and secondary amines.

Phosphite Antioxidants are often used in combination with phenolic or aminic antioxidants to provide a synergistic effect. They are effective in protecting polymers during processing and against thermal degradation.

Thioester Antioxidants contain sulfur in their structure and function by breaking the oxidative chain reaction. Dilauryl thiodipropionate (DTP) is an example of a thioester antioxidant.

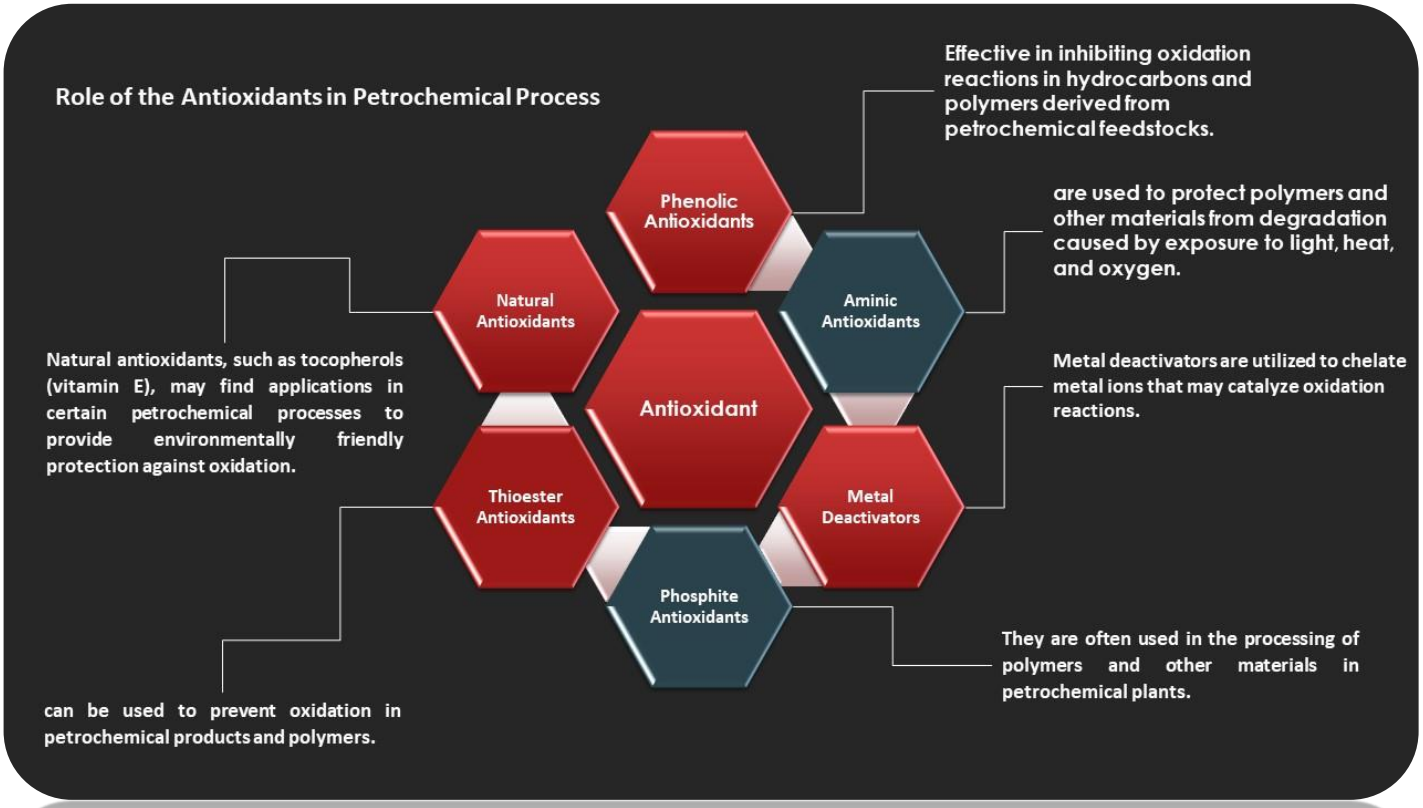
Metal Deactivators work by chelating metal ions, which can catalyze oxidation reactions. They are particularly useful in preventing oxidation in polymers that may come into contact with metal surfaces during processing.

Quinones - based antioxidants are cyclic compounds with a carbonyl group. They can act as electron acceptors and interrupt the oxidation process. Examples include p-quinone and hydroquinone.

Polymeric Antioxidants are macromolecular compounds that provide antioxidant properties. These can include polymer additives like hindered phenolic resins.

Natural Antioxidants are derived from natural sources, such as tocopherols (vitamin E), which are effective in protecting against oxidation in various materials.

Antioxidant application in petrochemical process



Polymer Antioxidants

Can be added to improve the shelf life of the product or to improve its high-temperature stability. while adding a stability margin during thermal processing. As described above, Antioxidant additives can be classified into Hindered Phenolic, Metal Deactivates, Amine, Phosphite, Thioesters and Binary blends. Hindered phenols are used as primary antioxidants. phosphites are sometimes used as secondary antioxidants. There is a synergistic effect when using different antioxidants blended together and the combination can meet heat and processing stability requirements.

Polymer Antioxidant product list

Primary antioxidant

1010, 1024, 1035, 1076, 1098, 1135, 1520, 1726, 1790, 245, 3114, 330, 445, 565, 5057, 697, 702, CPL, FS-042

Auxiliary antioxidants

168, 618, 626, DSTDP, DLTDP, 412s

Antioxidant Blend

B215, B225, B900

Type	Features	Application
Hindered phenolic	Excellent Hydrolysis resistance Extraction resistance Yellowing resistance Provide long-term stability	PE/PP pipe High crystalline PP Elastomer Nylon
Phosphites/Phosphonites	Excellent processing stability and color stability Heat stability, no residual impurity Hard precipitation, no adhere to water, No blooming, improve the transparency of article Provide processing stability	PP/PE, elastomer, transparent article, PC, PC/ABS, nylon, POM etc.
Thiosynergists	Long heat resistance better than DSTDP/ DLTDP No odor	For PP/PE need long-term stabilizing, filler-modified PP/PE, wire and cable.
Metal Deactivators	Low melting point, easy to use Good stability, strong anti-aging Extraction stability Deactivate metal ion activity to prevent it from boosting polyolefin degradation	PP/PE wire and cable Filled modified materials
Antioxidant Blends	Excellent processing and color stability Heat stability, no residual impurity Granule's form, no dust	Polyolefins, PC and PC alloy Nylon, styrenics

Amine Antioxidant

AX AO-042	Used in Polypropylene Fiber, Automotive TPO/TPE, Prevent Gas Fading Discoloration	AX AO 5057	liquid aromatic amine for processing and LTTS
		AX AO 445	non-discoloring aromatic antioxidant for rubber

Hindered Phenolic Antioxidant

AX AO 1010	general phenolic antioxidant	AX AO 245	phenolic AO for styrene polymers, adhesives, sealants, coatings
AX AO 1024	phenolic AO and metal deactivator, wire cable	AX AO 3114	non-discoloring phenolic AO; high extraction resistance
AX AO 1035	sulfur-containing phenolic AO for wire and cable	AX AO 330	for PE/PP wire, cable, film, hot water pipe
AX AO 1076	low color, general phenolic antioxidant	AX AO 565	AO for BR, IR, SBR, NBR, Adhesive, Tackifier Resin
AX AO 1098	the best antioxidant for PA	AX AO 697	sterically phenolic AO and metal deactivator
AX AO 1135	liquid phenolic AO, specifically for PUR	AX AO 702	excellent oil AO, for PP/PE/ABS and rubber
AX AO 136	radical scavenger for PP, PE, etc.	AX AO BHT	General Phenolic AO For Rubber, Oil, Cosmetic, Food Contact
AX AO 1520	synergistic, multifunctional AO for elastomers and TPE	AX AO CPL	non-discoloring or pinking, AO for rubber, latex, SBR, ABS
AX AO 1790	sterically phenolic AO for PUR, PP, PET, gas fading & high extraction resistance	AX AO GA 80	Low Color Phenolic AO for Low Gas Fading Discoloration

Phosphite Antioxidant

AX AO 1081	Antioxidant for Rubber, Latex	**AX AO DPP**	unsaturated polyesters, PVC
AX AO 1500	For PVC, PP, PE	**AX AO H10**	PVC, Polymers
AX AO 168	hydrolytically stable phosphite, most widely used	**AX AO PEPQ**	For Engineering plastics
AX AO 618	ABS, Styrenics	**AX AO PDDP**	PVC, Polymers
AX AO 626	high-performance phosphite antioxidant for engineering plastics	**AX AO PDP**	PVC, Polymers
AX AO 9228	For Engineering plastics	**BA AO TDD**	PVC, Polymers
AX AO DHOP	For PVC	**AX AO TDP**	PVC, ABS, Polymers
AX AO DPDP	PVC, Resins	**AX AO TLP**	PVC, Polymers
AX AO DPOP	PVC, Polymers, PP	**AX AO TPPI**	PVC, Polymers
AX AO DPD	PVC, Polymers	**AX AO TTDP**	PVC, Rubber, Polymers

Thioester Antioxidant

AX AO 1726	for adhesives, elastomers and related products	**AX AO DSTDP**	thioester AO with a low melting point, for polyolefin, PS, ABS
AX AO 412s	sulfur ester AO, higher stability than dltp/dstp	**AX AO PDP**	liquid phosphite antioxidant for many dispersed polymer
AX AO DLTDP	thioester AO with a low melting point, for polyolefin, PS, ABS		

Antioxidant Blends

AX AO B210	synergistic phenol/phosphite blend, low phosphate content	**AX AO B900**	Synergistic phenol/phosphite blend, high phosphate content
AX AO 225	synergistic phenol/phosphite blend, low phosphate content	**AX AO FS**	210/301/410/811
AX AO 215	phenol/phosphite blend, medium phosphite content		

ANTIOXIDANTS EQUIVALENTS

Type Item	Name	CAS No.	MR ℃	Physical Form	Compare As	Application
Amine	AX 042	143925-92-2	≥ 90	White Powder	Irgastab FS 042	PP fiber, TPO
	AX 445	10081-67-1	≥ 98.5	White Powder	Naugard 445	Rubber
	AX 5057	68411-46-1	-	Yellow Liquid	Irganox 5057	PU
Phenolic	AX 1010	6683-19-8	110-125	White Powder	Irganox 1010	General application
	AX 1024	32687-78-8	221-232	White Powder	Irganox MD 1024	General application
	AX 1035	41484-35-9	63-68	White Powder	Irganox 1035	Wire & cable
	AX 1076	2082-79-3	50-55	White Powder	Irganox 1076	General application
	AX 1098	23128-74-7	155-161	White Powder	Irganox 1098	PA
	AX 1135	125643-61-0	-	Light Yellow Liquid	Irganox 1135	PU
	AX 1520	110553-27-0	14		Irganox 1520	ABS/Adhesive
	AX 1790	40601-76-1	159-163	White Powder	Songnox 1790	Spandex
	AX 245	36443-68-2	77-81	Powder/Liquid	Irganox 245	Styrenics
	AX 3114	27676-62-6	218-223	White Powder	Irganox 3114	General application
	AX 300	96-69-5	158-164	White Powder	Lowinox TBM-6	Wire & Cable
	AX 330	1709-70-2	240-245	White Powder	Irganox 1330	TPO/PP/PE
	AX 565	991-84-4	94.5-96.5	White Powder	Irganox 565	Rubber
	AX 697	70331-94-1	174-180	White Powder	Irganox MD 697	Wire & Cable
	AX 702	118-82-1	154-159	White Powder	Ethanox 702	Oil
	AX BHT	128-37-0	≥ 69	White Powder	Vulkanox BHT	General application
	AX CPL	68610-51-5	≥ 115	Powder/Liquid	Lowinox CPL	Rubber
Phosphite	AX 168	31570-04-4	183.5-185.6	White Powder	Irgafos 168	General application
	AX 619	3806-34-6	37-46	White Flake	Weston 619F	ABS
	AX 626	26741-53-7	170-180	White Powder	Ultranox 626	Engineerings
Thioester	AX 412s	29598-76-3	48-54	White Powder	Lowinox 412s	Engineerings
	AX DLTP	123-28-4	39.5-42.5	White Powder	Irganox PS 800	General application
	AX DSTP	693-36-7	63.5-68.5	White Powder	Irganox PS 802	General application
Blends	AX 225	31570-04-4/ 6683-19-8	-	White Powder	Irganox B 225	General application
	AX 215		-	White Powder	Irganox B 215	General application
	AX B900	-	-	White Powder	Irganox B 900	General application

2. Anti Dripping Agent

Anti-dripping-agents (ADA) are effective auxiliary flame retardants against dripping during burning of plastics and polymers. It prevents burning plastic from dripping off and thus meet the requirements of UL 94. Anti-dripping agent is a kind of polymer with a coating on the surface of PTFE particles. The outer coated polymer is generally polyacrylonitrile, polystyrene and polymethyl methacrylate.

Grade	PTFE (wt.%)	Encapsulated polymer	Particle size Mesh	Volatile	Bulk density	Suitable resins
AX ADA 200	43	-	≤ 10	≤ 0.5	0.86	PC, PC/ABS Alloy, Nylon
AX ADA 201	50	SAN	≤ 10	≤ 0.5	0.91	
AX ADA 202	55	MMA	10-15	-	0.95	

3. Antistatic Agent

The purpose of using antistatic agents in polymers is to reduce the static electricity build-up. Thus, avoid dust attraction, films sticking as well as safe spark-free handling of the plastic articles. They are used in polyolefin polymerization processes to reduce static build-up inside different reactor systems, also plastics like BOPP film, PVC, PP, PE, ABS, PS, PET. In agriculture, packing and petrochemical applications.

Item	Description	Form	Compare as
AX ATA 129	Glyceride	white powder	Atmer 129
AX ATA 163	Ethylamine oxide	liquid	Atmer 163
AX ATA 1800	Ethoxylated amine	white solid	Armostat 1800
AX ATA 300	Ethoxylated amine	yellow paste	Armostat 300
AX ATA 400	Ethoxylated amine	slight yellow solid	Armostat 400
AX ATA 600	Ethoxylated amine	white solid	Armostat 600
AX ATA 93	Sodium alkyl sulfate	light yellow pellets	HOSTAPUR SAS 93

4. Compatibilizer

Compatibilizer are additives, that when added to a blend of immiscible materials during extrusion, modifies their interfacial properties and stabilizes the melt blend. Immiscible blends may be mixtures of two or more dissimilar polymers or mixtures of polymer (s) and organic or inorganic components.

Item name	Grafted MAH Type	Application
AX AO CA PP B1	PP	PP
AX AO CA ABS	ABS	ABS AS
AX AO CA PE1	PE	PE
AX AO CA EPDM	EPDM	PA
AX AO CA POE	POE	PA
AX AO CA SEBS	SEBS	PP PE TPE
AX AO CA PPO	PPO	PA PPO
AX AO CA POEG	GMA POE	PBT PET

5. Impact Modifier

Impact Modifiers are substances that increase the durability of molded or extruded plastics, especially those that need to be constantly subjected to impact forces like cold weather. They are added to compounded materials to provide performance features. They provide strength and break resistance to the product for which they are added. They also provide rigidity to the product to prevent it from wrapping or sagging during everyday use. Impact Modifiers also provide various properties to the product like optical and tensile strength, weather ability, processability, flammability, and heat distortion. Impact Modifiers are of different types.

Type	Item name	Kaneka	Dow	Mitsubishi	Application	Dosage%
Acrylic	AX IM 750	B564	KM-1		Opaque PVC	4-5
	AX IM 81	PA 20/B513			Transparent PVC	4-5
MBS	AX IM 156	B622	BTA 707/717		Transparent PVC	4-8
	AX IM 126	B564	BTA 736		Opaque PVC	4-8
MBS	AX IM 225	M711/732	EXL-2690		PC、PC Alloys	3-10
	AX IM 227	M722	EXL-2616		PC、PC Alloys	1-3
Acrylic	AX IM 365	M577	EXL-2388		PC、PC/ABS	3-5
Silicone	AX IM 330			S-2501	PC、PC Alloys	3-5
	AX IM 331			S-2100	PC、PC Alloys	3-5
	AX IM 334			S-2030	PC、PC Alloys	3-5
	AX IM 335			S-2130	PC、PC Alloys	3-5
ASA	AX IM 960				ASA	3-5
Acrylic	AX IM 980			M210	PMMA	3-5

6. Colorants-Organic Pigments

Color	Name	C.I.No	TEMP	Light Fastness	Migration	Comparable As
	Blue 150P	PB-15:0	200	7	5	Economic Grade
Blue	Blue 151P	PB-15:1	260	7	4-5	BASF Blue K6902
	Blue 153P	PB-15:3	280	7	4-5	BASF Blue K7090
Brown	Brown 25P	PBr-25	280	7-8	4-5	Clariant Brown HFR
Green	Green 7P	PG-7	280	8	4-5	BASF K8730
	Orange 13P	PO-13	180	5	3	Clariant Orange G
	Orange 16P	PO-16	200	5-6	4	Economic Grade
Orange	Orange 34P	PO-34	200	6	5	Yellowish
	Orange 64P	PO-64	300	7	5	Ciba Orange GP
	Orange 73P	PO-73	280	7	5	BASF Orange RA
	Red 481P	PR-48:1	220	5-6	5	Ciba NBSP
	Red 482P	PR-48:2	200	5-6	5	Ciba 2BP
	Red 483P	PR-48:3	230	6	5	Ciba Red 2BSP
	Red 531P	PR-53:1	200	3-4	3-4	Clariant Red LC/LG
	Red 571P	PR-57:1	220	3-4	4	Ciba Red 4BP
	Red 122P	PR-122	280	8	5	Clariant Pink E
Red	Red 170P3	PR-170	200	6	3	Clariant Red F3RK
	Red 170P5	PR-170	200	6	4	Clariant Red F5RK
	Red 208P	PR-208	250	7	4-5	Clariant Red HF2B
	Red 242P	PR-242	250	7-8	5	Clariant Red 4RF
	Red 254P	PR-254	300	8	5	Ciba DDP Red 2030
	Red 264P	PR-264	300	8	5	Ciba DDP TR
	Red 272P	PR-272	300	7-8	5	Good Properties
	Violet 19P	PV-19	280	8	5	Clariant E5B
Violet	Violet 23PB	PV-23	260	6	3-4	Bluish
	Violet 23PR	PV-23	260	6	3-4	Reddish
	Yellow 14PG	PY-14	200	5-6	3-4	Greenish, Yellow 2GS
	Yellow 62P	PY-62	250	6-7	4	Ciba Yellow WSR
	Yellow 81P	PY-81	220	7	5	Clariant H10G
	Yellow 83PG	PY-83	220	7	5	Greenish, Clariant HR
	Yellow 83PR	PY-83	220	7	5	Reddish, Clariant HR02
	Yellow 110P	PY-110	280	7	5	Ciba 3RLP
	Yellow 138P	PY-138	280	7	5	BASF K0961HD
Yellow	Yellow 139P	PY-139	250	7	4	BASF K1841
	Yellow 150P	PY-150	260	8	5	Special Type
	Yellow 151P	PY-151	240	7	5	Clariant Yellow H4G
	Yellow 168P	PY-168	230	7	4	Ciba Yellow WGP
	Yellow 180P	PY-180	280	7	4	Clariant Yellow HG
	Yellow 181P	PY-181	300	7	4	Clariant Yellow H3R
	Yellow 183P	PY-183	270	7	4	BASF Yellow K2270
	Yellow 191PR	PY-191	260	7	5	Reddish, Clariant HGR

7. Colorants-Solvent Dyes

Product name	C.I.Index	Synonyms	CAS number
Black 3	SBL 3	Oil Black H3B	4197-25-5
Blue 104	SB 104	Blue 2B	116-75-6
Blue 122	SB 122	Blue R	67905-17-3
Blue 35	SB 35	Blue 2N	12226-78-7
Blue 36	SB 36	Blue AP	14233-37-5
Blue 67	SB 67	Blue G	12226-78-7
Blue 78	SB 78	Blue GP	2475-44-7
Blue 97	SB 97	Blue RR	70956-30-23
Green 28	SG 28	Green G	71839-01-5
Green 3	SG 3	Green 5B	128-80-3
Green 5	SG 5	Yellow 8G	128-80-5
Orange 107	SO 107	Orange R	5718-26-3
Orange 14	SO 14	Orange EP	6367-70-3
Orange 60	SO 60	Orange 3G	6925-69-5
Orange 63	SO 63	Orange GG	16294-75-0
Red 111	SR 111	Red GS	82-38-2
Red 135	SR 135	Red EG	20749-68-2
Red 146	SR 146	Red FB	70956-30-8
Red 149	SR 149	Red HFG	71902-18-6
Red 23	SR 23	Red HRR	85-86-9
Red 168	SR 168	Red KLB	71832-19-4
Red 179	SR 179	Red E2G	6829-22-7
Red 195	SR 195	Red 2B	164251-88-1
Red 196	SR 196	Red BK	52372-36-8
Red 197	SR 197	Red GK	52372-36-8
Red 207	SR 207	Red FBR, FRL	15958-68-6
Red 24	SR 24	Red BR	85-83-6

COLORANTS-SOLVENT DYES

Product name	C.I.Index	Synonyms	CAS number
Red 25	SR 25	Red B	3176-79-2
Red 41	SR 41	Red 5B	522-75-8
Red 52	SR 52	Red HL5B	81-39-0
Violet 13	SV 13	Violet B	81-48-1
Violet 26	SV 26	Violet R	61951-89-1
Violet 31	SV 31	Violet RR	70956-27-3
Violet 36	SV 36	Violet 3R	61951-89-1
Violet 37	SV 37	Violet FBL	61969-50-4
Yellow 114	SY 114	Yellow 2G, Disperse 54	75216-45-4
Yellow 14	SY 14	Yellow R	842-07-9
Yellow 16	SY 16	Yellow 4G	4314-14-1

8. UV Stabilizer

Type	Name	CAS No.	MR ℃	Physical Form	Compare As	Application
BZP	AX UV 531	1843-05-6	47-49	Pale yellow powder	Chimassorb 81	PVC/Coatings
Benzotriazole	AX UV P	2440-22-4	128-132	Pale yellow powder	Tinuvin P	PVC/PUR
	AX UV 234	70321-86-7	139-141	White powder	Tinuvin 234	Engineering
	AX UV 1130	104810-48-2	/	Yellow liquid	Tinuvin 1130	Coatings
	AX UV 326	3896-11-5	≥ 138	Pale yellow powder	Tinuvin 326	General application
	AX UV 327	3864-99-1	151	Pale yellow powder	Tinuvin 327	General application
	AX UV 328	25973-55-1	≥ 138	Pale yellow powder	Tinuvin 328	General application
	AX UV 329	3147-75-9	101-106	White powder	Tinuvin 329	General application
	AX UV 360	103597-45-1	194-198	Pale yellow powder	Tinuvin 360	Engineering
	AX UV 384-2	127519-17-9	/	Pale yellow liquid	Tinuvin 384-2	HP coatings
	AX UV 928	73936-91-1	108-110	Pale yellow powder	Tinuvin 928	HP coatings
Triazine and other	AX UV B75	/	/	Yellow liquid	Tinuvin B75	PU
	AX UV 1164	2725-22-6	89-91	Pale yellow powder	Tinuvin 1164	Engineering
	AX UV 1577	147315-50-2	147-151	Pale yellow powder	Tinuvin 1577	Engineering
	AX UV 2908	67845-93-6	55-65	White powder	Cyasorb UV 2908	PP/PE/PVC
	AX UV 312	23949-66-8	124-127	White powder	Tinuvin 312	PVC/UP/PUR
	AX UV 3638	18600-59-4	≥ 310	White powder	Cyasorb UV 3638	PET/PC
	AX UV 400	153519-44-9	/	Yellow liquid	Tinuvin 400	HP coatings
	AX UV 5050	127519-17-9	/	Yellow granules	Tinuvin 5050	Coatings/plastics
	AX UV 866	/	/	White powder	Tinuvin PUR 866	TPE/TPU
Light Stabilizer	AX UV 119	106990-43-6	115-150	Light yellow granule	Chimassorb 119	Agricultural films
	AX UV 123	12957-67-1	/	Light yellow liquid	Tinuvin 123	Coatings
	AX UV 292	41556-26-7/ 82919-37-7	/	Light yellow liquid	Tinuvin 292	Coatings
	AX UV 622	65447-77-0	50-70	White powder	Tinuvin 622	Polyolefins
	AX UV 770	52829-07-9	80-85	White powder	Tinuvin 770	General application
	AX UV 783	65447-77-0	55-140	White granules	Tinuvin 783	Film/tapes
	AX UV 791	70624-18-9	≥ 55	White granules	Tinuvin 791	PP thick products
	AX UV 944	70624-18-9	105-135	White granules	Chimassorb 944	Films
	AX UV 2020	192268-64-7	120-150	Light yellow granules	Chimassorb 2020	Films
	AX UV SEED	42774-15-2	268– 275	White solid	Nylostab® S-EED	Nylon

9. Flame Retardant

Group	Item Name	CAS No.	Equivalent to	Form
Bromine	AX AO FR 245	25716-60-4	FR 245	Powder
	AX AO FR 93	32588-76-4	FR 93	Powder
	AX AO FR BC 58	71342-77-3	BC 58	Powder
	AX AO FR BDDP	21850-44-2	FR 710	Powder
	AX AO FR BPS	88497-56-7	FR 803P	Powder
	AX AO FR DBDPE	84852-53-9	FR 1410	Powder
	AX AO FR DBNPG	3296-90-0	FR 522	Powder
	AX AO FR MHB	29305-12-2		Powder
	AX AO FR PHT4 Diol	77098-07-8	RB 79	Liquid
	AX AO FR TBBA	79-94-7	FR 1524	Powder
	AX AO FR TBBP DBPE	42757-55-1	FR 640	Powder
	AX AO FR TBBPA	94334-64-2		Powder
	AX AO FR TBE	25327-89-3	FR 2124	Powder
	AX AO FR TBNPA	36483-57-5	FR 513	Powder
	AX AO FR TBPA	632-79-1	RB 49	Powder
	AX AO FR TTBP	19186-97-1	FR 370	Powder
Phosphorus	AX AO FR TPP	115-86-6	Disflamoll TP	Liquid
	AX AO FR BDP	5945-33-5	FP 600	Liquid
	AX AO FR BER	68928-70-1	/	Powder
	AX AO FR BPS	88497-56-7	HP3010	Powder
	AX AO FR RDP	57583-54-7	CR-733S	Liquid
	AX AO FR TCPP	13674-84-5	/	Liquid
	AX AO FR APP	68333-79-9	484	Powder
	AX AO FR 1230	225789-38-8	OP1230/1240	Powder
	AX AO FR 930	225789-38-8	OP930/935	Powder
	AX AO FR 950	37640-57-6	OP950	Powder
	AX AO FR 2025	29420-49-3	FR-2025	Powder

FLAME RETARDANT

Group	Item Name	CAS No.	Equivalent to	Form
Nitrogen	AX AO FR MPP	218768-84-4	Melapur M 200	Powder
	AX AO FR MCA	37640-57-6	Melapur MCA	Powder
Sulfonate	AX AO FR HES	63316-46-8	HES-FR	Powder
	AX AO FR KSS	63316-43-8	KSS-FR	Powder
	AX AO FR 2025	29420-49-3	FR-2025	Powder

10. LIGHT DIFFUSION AGENT

Poly methyl silsesquioxane (Spherical Silicone Resin Powder) is widely used in the field of plastics. It offers good optical balance of transmittance, haze as well as diffusion effect, and widely used in transparent PC, PMMA, PS transparent or semi-transparent plastics

Item Name	Diameter	Density	Appearance	Refractive Index	Heat Resistance	ShinEtsu
AX LDA 100	1	1.3	Free flow white powder	1.42-1.45	>400℃	
AX LDA 150	1.5	1.3				
AX LDA 200	2	1.3				KMP 590
AX LDA 300	3	1.3				
AX LDA 500	5	1.3				KMP 600

11. LUBRICANT - PPA

Polymer Processing Aids are free-flowing additives made of modified fluoro- elastomer which improve processing of polyolefin resin at very low levels usage. AX AO Polymer Processing Aids are coated at the inside of the die wall and decrease the friction between melted resin and the die wall.

PPA item	Product Form	Bulk Density	Particle size/mesh	Application	3M
AX PPA 5911	Free- flowing Granular	1.1	50	Wire& cable	5911
AX PPA 5922		0.72	20	Blow film	5922
AX PPA 5920		0.72	25	Blow & packaging film	5920
AX PPA 5924		0.7	25	Blow film, wire & cable, cost effective	5924
AX PPA S100	MB	/	/	PFAS free PPA MB	/
AX PPA S200	Solid	/	/	PFAS free PPA powder	/

12. Silicon Masterbatch

Silicon masterbatch is pellets with 40 to 50% ultra-high molecular weight siloxane polymer dispersed in plastic like PE, PP, EVA etc. They are wildly used in elastomers like SBES, SBS, TPE, TPU and other plastics like PP, PE, PA, etc.

Grade	Equal to DOW	Appearance	Silicone Content%	Carrier	Dosage	Application
AX SMB-01	MB50-002	White Pellet	50%	LDPE	0.5～5%	PP, PE, PA
AX SMB-02	MB50-320	White Pellet	50%	EVA	0.5～5%	PVC, EVA, HDPE, LDPE
AX SMB-04	MB50-314	White Pellet	50%	HDPE	0.5～5%	PP, HDPE
AX SMB-05	MB50-007	White Pellet	50%	ABS	0.5～5%	ABS, PC/ABS...
AX SMB-06	MB50-001	White Pellet	50%	PP	0.5～5%	PP, TPE
AX SMB-07	MB50-011	White Pellet	40%	PA	0.5～5%	PA6, PA66
AX SMB-08	MB50-010	White Pellet	40%	PET	0.5～5%	PET
AX SMB-09	MB50-017	White Pellet	50%	TPU	0.5～5%	TPU
AX SMB-10	MB50-004	White Pellet	50%	HIPS	0.5～5%	HIPS, ABS, SAN, SEBS
AX SMB-11	MB40-006	White Pellet	40%	POM	0.5～5%	POM
AX SMB-12	MB50-001	White Pellet	50%	LLDPE	0.5～5%	PE, PP

13. Slip Agent

Item name	Form	CAS No.	Equivalent to	Original
AX Erucamide	Beads, Power	112-84-5	Armoslip E Crodamide ER	China
AX Oleamide	Beads, Power	301-02-0	Armoslip CP Crodamid VRX	China

14. Nucleating Agent

Nucleating agent which also known as clarifying agent(clarifiers), improve the crystallization of semi-crystalline polymers.

Nucleating Agent	Milliken	ADK	Clariant
AX NA 3988	Millad 3988	/	/
AX NA 20	Hyperform HPN 20E	/	/
AX NA 900	Hyperform HPN 900ei	/	/
AX NA 11	/	Stab NA 11	
AX NA 21	/	Stab NA 21	
AX NA 101	/	/	Licomont nav 101
AX NA 102		/	Licomont CaV 102

15. Optical Brightener

Optical brighteners are used to mask yellow or increase whiteness of plastics, inks, coatings, paper, fiber.

Name	Equivalent to	CAS No.	CI Number
AX OBA OB	Uvitex/Tinopal OB	7128-64-5	FBA 184
AX OBA OB-1	Eastobrite OB-1	1533-45-5	FBA 393
AX OBA KCB	Hostalux KCB	5089-22-5	FBA 367
AX OBA KSB	Telalux KSB	7128-54-5	FBA 390
AX OBA KSN	Hostalux KSN	5242-49-9	FBA 368
AX OBA KSN P	Hostalux KSN	5242-49-9	FBA 368
AX OBA FP-127	Uvitex FP	40470-68-6	FBA 387

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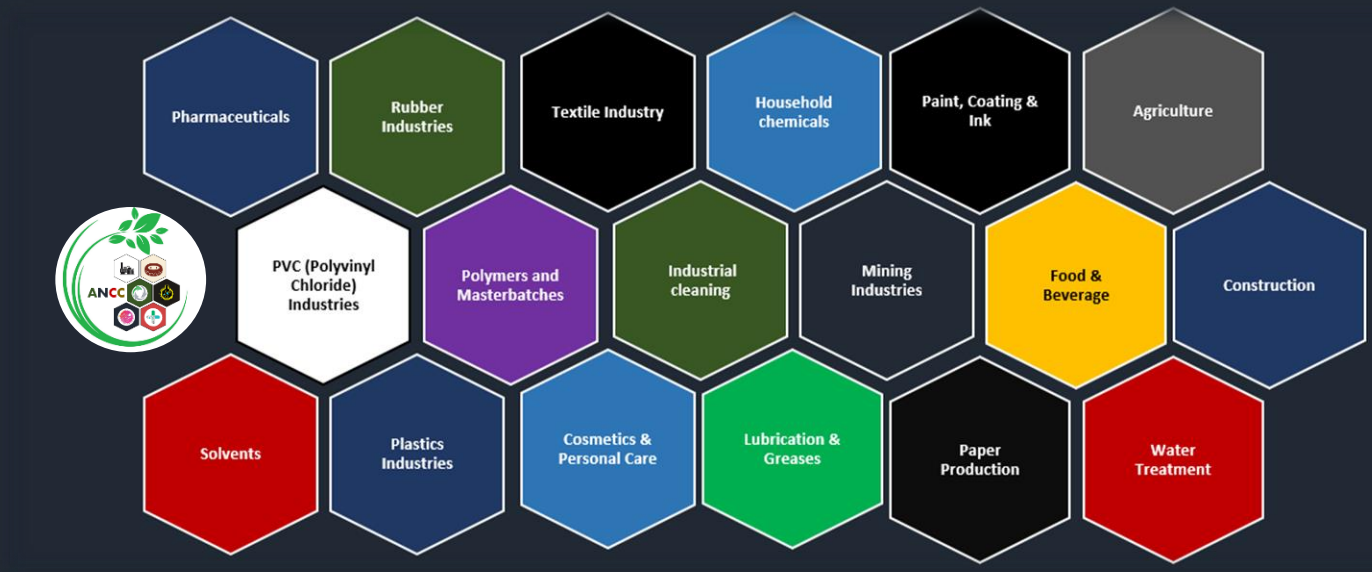
ANTIOXIDANTS & ADDITIVES



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