

OFFICIAL CHEMICALS CLASSIFICATION

PST CHEMICAL Company

Application-Based Categorization Including Catalysts, Drilling Chemicals, Pressurized Delivery Items, and Dangerous Goods

This document provides a preliminary application-based classification of the listed chemicals and materials for commercial, technical, procurement, and logistics review. Final classification for transport, storage, customs, rail acceptance, and dangerous goods handling must be confirmed against each product SDS/MSDS, UN Number, DG Class, Packing Group, packaging certificate, and route-specific carrier rules.

Executive Summary

Classification Area	Key Items
Catalysts & catalyst-related chemicals	TEAL, Precious Metal Compounds Ag/Pd/Pt, Sodium Methoxide, N-Butyl Lithium, AIBN, DBP, DCP, DLP, Potassium Persulfate, Activated Alumina, Activated Carbon, Silica Gel, Carbon Molecular Sieve, Amberjet/Lewatit resins, DMDS, TBC
Drilling & oilfield chemicals/materials	Barite, Bentonite, Calcium Carbonate, Calcium Chloride, Calcium Bromide, PAC, CMC, Xanthan Gum, Guar Gum, H ₂ S Scavenger, Corrosion Inhibitor, Scale Inhibitor, Ceramic Proppant, Frac Sand, LCM materials, Formate/Bromide brines
Pressurized delivery chemicals	Ammonia Liquid / Anhydrous Ammonia and Butene are the main items clearly requiring pressurized cylinder, pressure tank, tube trailer, or pressurized ISO tank review.
Dangerous goods review required	Peroxides, pyrophoric organometallics, cyanides, oxidizers, corrosive acids/alkalis, flammable solvents, toxic liquids, and reactive monomers require formal DG review before rail/road/sea transport.

1. Catalysts, Co-Catalysts, Catalyst Supports & Catalyst-Related Chemicals

No.	Chemical / Material	Application	Remarks
1	TEAL / Triethyl Aluminum	Co-catalyst	Used in polyolefin catalyst systems, especially PE/PP. Highly pyrophoric and moisture-sensitive.
2	Precious Metal Compounds - Ag / Pd / Pt	Catalyst / catalyst precursor	Used in petrochemical, hydrogenation, oxidation, and specialty catalyst systems.
3	Sodium Methoxide	Chemical catalyst	Base catalyst for chemical synthesis and transesterification.
4	N-Butyl Lithium / NBL	Polymerization initiator / catalyst-type reagent	Highly reactive organolithium reagent; sensitive to air and moisture.
5	AIBN	Polymerization initiator	Radical initiator for polymerization; not a catalyst in the strict sense.
6	Dibenzoyl Peroxide / DBP	Polymerization initiator	Organic peroxide; dangerous goods controls apply.
7	Dicumyl Peroxide / DCP	Crosslinking / polymerization initiator	Used for polymer crosslinking and initiation.
8	Dilauroyl Peroxide / DLP	Polymerization initiator	Organic peroxide initiator.
9	Potassium Persulfate	Polymerization initiator / oxidizing initiator	Used in emulsion polymerization and radical systems.
10	Antimony Trioxide	Catalyst / flame-retardant synergist	May act as polyester catalyst or flame-retardant synergist depending on application.
11	Activated Alumina	Catalyst support / adsorbent	Support material and drying/adsorption medium.
12	Activated Carbon	Catalyst support / adsorbent	Support or purification adsorbent.
13	Carbon Molecular Sieve	Adsorbent / catalyst-support type	Primarily gas-separation adsorbent; can be associated with catalyst/support systems.
14	Silica Gel	Catalyst support / adsorbent	Moisture adsorbent and possible support.
15	Resins - Amberjet / Lewatit	Ion-exchange resin / possible catalytic resin	Some grades are used as catalytic resins; exact grade must be confirmed.
16	DMDS / Dimethyl Disulfide	Catalyst sulfiding agent	Used to sulfide/activate hydrotreating catalysts; not a catalyst itself.
17	TBC / Tert-Butyl Catechol	Polymerization inhibitor	Stabilizer/inhibitor for reactive monomers such as styrene.

2. Drilling Chemicals, Completion Fluids & Oilfield Materials

No.	Chemical / Material	Application	Remarks
1	Barite	Weighting agent	Increases drilling mud density for well-pressure control.
2	Bentonite	Viscosifier	Improves viscosity and suspension in water-based drilling mud.
3	Calcium Carbonate	Bridging agent / LCM	Controls fluid loss and lost circulation through bridging.
4	Calcium Chloride	Completion fluid / brine	Used in brines and completion/workover fluids.
5	Calcium Bromide	Completion fluid / heavy clear brine	Heavy clear brine for completion and workover; normally drums, IBC, tank, or ISO tank, not pressure cylinder.
6	Sodium Bromide	Completion fluid / brine	Completion/workover brine; supplied as solid or solution.
7	Zinc Bromide	Heavy brine	High-density completion brine; corrosive and requires SDS-based packaging controls.
8	Potassium Formate	High-performance brine	Premium drilling/completion brine, often used where environmental/performance profile is important.
9	Sodium Formate	Brine additive	Water-based drilling and completion fluid additive.
10	Cesium Formate	Premium heavy brine	Specialized high-density brine for HPHT wells.
11	CMC / Carboxymethyl Cellulose	Fluid-loss control / viscosifier	Controls filtration and improves rheology.
12	PAC LV / PAC HV / Poly Anionic Cellulose	Fluid-loss control	Controls filtration in water-based mud; LV/HV grades have different rheology effects.
13	Guar Gum	Viscosifier / fracturing fluid additive	Used in drilling and hydraulic fracturing fluids.
14	Xanthan Gum	Rheology modifier	Improves low-shear rheology and suspension.
15	Polyacrylamide	Flocculant / shale stabilizer	Solid control, flocculation, and some stabilization applications.
16	Polyelectrolyte - Anionic / Cationic	Flocculant / water treatment	Treats drilling wastewater and suspended solids.
17	Soda Ash / Sodium Carbonate	Hardness control / pH control	Controls calcium hardness and mud chemistry.
18	Caustic Soda	pH control	Adjusts alkalinity in drilling fluids.
19	Potassium Chloride / KCl	Shale inhibitor	Inhibits swelling of reactive shales in water-based mud.
20	Potassium Hydroxide / KOH	Alkalinity agent	pH and alkalinity control.
21	Sodium Bicarbonate	Cement contamination treatment	Treats cement contamination in drilling mud.
22	O ₂ Scavenger	Oxygen scavenger	Reduces oxygen-related corrosion.
23	Sodium Sulfite	Oxygen scavenger	Removes dissolved oxygen.
24	H ₂ S Scavenger	H ₂ S control	Controls or removes hydrogen sulfide in oilfield operations.
25	Corrosion Inhibitor	Corrosion control	Protects tubulars, equipment, and process systems.
26	Scale Inhibitor / Antiscale	Scale control	Prevents mineral scale formation.
27	De-Emulsifier	Emulsion breaking	Separates water/oil emulsions.
28	Emulsifiers	Emulsion system additive	Stabilizes oil-based or emulsion fluids.
29	Drilling Detergent	Cleaning agent	Assists hole cleaning and fluid performance.
30	Foam Agent	Foaming agent	Used in foam drilling or specialty operations.
31	Surfactant	Surface active agent	Reduces surface/interfacial tension and improves fluid performance.
32	Iron Control Agent	Iron control	Prevents iron precipitation and related problems.
33	DRA / Drag Reducing Agent	Drag reduction	Reduces pressure drop in pipelines and high-flow systems.
34	Flocculants	Solid control / water treatment	Flocculates suspended solids.
35	Dispersant	Dispersion control	Disperses particles in fluid systems.
36	Cross Linker	Fracturing fluid additive	Crosslinks gels used in fracturing fluids.
37	Ceramic Proppant	Hydraulic fracturing proppant	Granular solid used to keep fractures open; usually bulk bags/jumbo bags, not pressure cylinder.
38	Frac Sand	Proppant	Economical proppant for hydraulic fracturing.
39	Resin Coated Sand	Proppant	Resin-coated proppant with improved stability.
40	Walnut Shell	LCM / lost circulation material	Bridging material for lost circulation control.
41	Mica	LCM	Flake bridging material for lost circulation.
42	Cellulose Fiber	LCM / bridging agent	Controls losses and assists bridging.
43	Graphite	Lubricant / LCM	Lubricity and lost-circulation applications.
44	Gilsonite	Fluid-loss control / shale stabilizer	Used in water- and oil-based mud systems.
45	Lubricant Additive	Lubricity agent	Reduces torque and drag, especially in directional/horizontal wells.
46	Biocide	Bacteria control	Controls microbial growth in fluids.
47	Shale Inhibitor	Shale stabilization	Prevents shale swelling and sloughing.
48	Clay Stabilizer	Clay control	Stabilizes clays during drilling, completion, or stimulation.
49	Friction Reducer	Fracturing additive	Reduces friction at high pumping rates.

3. Polymers, Resins, Rubbers & Plastic Raw Materials

No.	Chemical / Material	Application	Remarks
1	ABS / Acrylonitrile Butadiene Styrene	Engineering polymer	Plastic raw material.
2	EPS / Expanded Polystyrene	Foam polymer	Insulation/packaging.
3	GPPS	General purpose polystyrene	Plastic resin.
4	HIPS	High-impact polystyrene	Impact-resistant plastic resin.
5	HDPE-7000F	HDPE film grade	Film applications.
6	HDPE-BL3	HDPE blow-molding grade	Blow-molded items.
7	PE / Polyethylene	Polymer resin	General polyolefin.
8	PP / Polypropylene	Polymer resin	General polyolefin.
9	PBR / Polybutadiene Rubber	Synthetic rubber	Tires and rubber goods.
10	Metallocene Polyethylene	Advanced polyolefin	High-performance PE grades.
11	Resins - Amberjet / Lewatit	Ion-exchange / industrial resin	Water/process treatment; some grades catalytic.
12	Sunwax P400	Polymer wax / processing additive	Processing/lubrication.
13	White Mineral Oil / WMO	Mineral oil / plasticizer/carrier	Lubricant, extender, carrier.
14	Chlorinated Paraffin	Plasticizer / flame retardant	PVC/rubber/industrial additives.
15	Calcium Stearate	Polymer lubricant/stabilizer	PVC and polymer processing.
16	Zinc Stearate	Lubricant / release agent	Rubber, plastic, coatings.
17	Sodium Stearate	Metal soap / additive	Industrial soap and additive.
18	Stearic Acid	Lubricant / additive	Rubber, plastics, surfactants.
19	Mono Glyceride	Additive / emulsifier	Plastic/food/industrial additive depending grade.

4. Monomers, Polymerization Feedstocks & Polymer Additives

No.	Chemical / Material	Application	Remarks
1	Acrylonitrile / ACN	Monomer/feedstock	For ABS, SAN, acrylic fibers.
2	Styrene Monomer	Monomer	For PS, EPS, ABS, resins; inhibitor required.
3	Butene	Comonomer / petrochemical feedstock	Also pressurized flammable gas.
4	Isophthalic Acid	Resin/polyester feedstock	For resins and polyesters.
5	Phthalic Anhydride	Resin/plasticizer feedstock	For plasticizers, alkyds, resins.
6	Antioxidant for Polymers	Polymer stabilizer	Prevents oxidative degradation.
7	Anti-Static / ASA3	Anti-static additive	Reduces static buildup.
8	TBC / Tert-Butyl Catechol	Polymerization inhibitor	Monomer stabilizer.
9	TINUVIN - all grades	UV stabilizer	Light stabilizer for polymers/coatings.
10	Topanol A	Antioxidant	Polymer/rubber antioxidant.
11	Wingstay L	Antioxidant	Rubber/polymer antioxidant.
12	Foam Agent	Foaming agent	Polymer and process foaming.
13	Cross Linker	Crosslinking agent	Polymer/gel crosslinking.
14	Dicumyl Peroxide / DCP	Polymer crosslinking agent	Crosslinking and initiation.
15	AIBN / DBP / DLP	Polymerization initiators	Radical initiators.

5. Solvents, Alcohols & Organic Liquids

No.	Chemical / Material	Application	Remarks
1	Ethanol 96%	Solvent / disinfectant / process liquid	Flammable liquid.
2	Isopropyl Alcohol / IPA	Industrial solvent	Flammable liquid.
3	Ethyl Acetate	Solvent	Paint, resin, adhesive solvent.
4	Hexane	Extraction/industrial solvent	Highly flammable.
5	Pentane	Solvent / blowing agent	Very volatile and flammable.
6	Xylene	Solvent	Paints, coatings, resins.
7	DMF / Dimethylformamide	Polar solvent	Specialty industrial solvent.
8	Methylene Chloride	Chlorinated solvent	Volatile toxic liquid.
9	Perchloroethylene / C2Cl4	Chlorinated solvent	Dry-cleaning/industrial solvent.
10	EDC / Ethylene Dichloride	PVC feedstock / solvent	Toxic/flammable chlorinated liquid.
11	NFM / N-Formylmorpholine	Selective solvent	Aromatics extraction.
12	DTO / Distilled Tall Oil	Organic intermediate/additive	Industrial oleochemical.
13	White Mineral Oil / WMO	Mineral oil/carrier	Carrier, lubricant, softener.

6. Acids, Alkalis & pH Control Chemicals

No.	Chemical / Material	Application	Remarks
1	Acetic Acid	Organic acid / pH control	Corrosive depending concentration.
2	Hydrochloric Acid / HCl	Mineral acid / cleaning / acidizing	Liquid acid is not normally cylinder; anhydrous HCl gas would be cylinder.
3	Sulfuric Acid	Mineral acid / process chemical	Corrosive.
4	Nitric Acid	Oxidizing acid	Corrosive/oxidizing.
5	Phosphoric Acid	Industrial acid / fertilizer / treatment	Corrosive.
6	Boric Acid	Weak acid / additive	Industrial/mineral use.
7	Chromic Acid	Oxidizing acid / surface treatment	Strong oxidizer/toxic/corrosive.
8	Citric Acid	Organic acid / chelating agent	pH and chelation.
9	Caustic Soda / Sodium Hydroxide	Alkali / pH control	Corrosive.
10	Potassium Hydroxide	Alkali / pH control	Corrosive.
11	Calcium Hydroxide	Alkali / neutralization	Lime/neutralizer.
12	Sodium Carbonate / Soda Ash	pH/hardness control	Industrial alkali.
13	Sodium Bicarbonate	Buffer / contamination treatment	pH buffering.
14	Potassium Carbonate	Alkali / CO2 absorption	Process chemical.
15	Trisodium Phosphate	pH control / detergent builder	Industrial cleaning/water treatment.

7. Gas Treatment, Amine Solvents & Refinery Chemicals

No.	Chemical / Material	Application	Remarks
1	MEA / Mono Ethanol Amine	CO2/H2S absorption	Gas sweetening amine.
2	DEA / Diethanolamine	Gas sweetening	Acid-gas absorption.
3	MDEA / Methyl Diethanolamine	Selective gas sweetening	Selective H2S/CO2 removal.
4	DGA / Diglycolamine	Acid-gas absorption	Amine solvent.
5	TEA / Tri Ethanol Amine	Industrial amine / pH control	Amine/additive.
6	Morpholine	Steam/corrosion control	Boiler/steam treatment.
7	Cyclohexylamine	Steam-system corrosion control	Neutralizing amine.
8	Hydroxy Ethyl Piperazine / HEP	Amine additive / process chemical	Process/gas treatment additive.
9	H2S Scavenger	H2S control	Oilfield/refinery gas treatment.
10	O2 Scavenger	Oxygen removal	Corrosion control.
11	DMDS	Catalyst sulfiding agent	Hydrotreating catalyst activation.
12	NFM	Aromatics extraction solvent	Refinery/petrochemical solvent.
13	DRA	Drag reducing agent	Pipeline and transfer systems.

8. Water Treatment, Wastewater & Utility Chemicals

No.	Chemical / Material	Application	Remarks
1	Activated Carbon	Adsorption	Organic removal, taste/odor, purification.
2	Activated Alumina	Adsorption/drying	Fluoride removal, drying, adsorption.
3	Silica Gel	Moisture adsorbent	Drying and humidity control.
4	Coagulant	Coagulation	Suspended solids removal.
5	Flocculants	Flocculation	Suspended solids removal.
6	Polyelectrolyte	Anionic/cationic flocculant	Water/wastewater treatment.
7	PAC / Poly Aluminum Chloride	Coagulant	Water treatment.
8	Ferric Chloride / Iron Chloride	Coagulant	Water/wastewater treatment.
9	Aluminum Sulfate	Coagulant	Water treatment.
10	Sodium Hypochlorite	Disinfectant/oxidizer	Water disinfection.
11	Calcium Hypochlorite	Disinfectant/oxidizer	Water disinfection.
12	Hydrogen Peroxide	Oxidizer/treatment chemical	Oxidation and wastewater treatment.
13	Sodium Metabisulfite	Reducing agent / dechlorination	RO and water treatment.
14	Sodium Sulfite	Oxygen removal	Boiler/water treatment.
15	Sodium Nitrite	Corrosion inhibitor	Closed-loop systems.
16	RO Chemicals	Reverse osmosis treatment	Antiscalant, cleaner, preservative depending product.
17	Antiscale / Scale Inhibitor	Scale prevention	Water/RO/process systems.
18	Corrosion Inhibitor	Corrosion control	Utility/process systems.
19	Biocide	Microbial control	Water/process systems.
20	Dispersant	Particle dispersion	Deposit control.

9. Fertilizer, Agriculture & Industrial Minerals

No.	Chemical / Material	Application	Remarks
1	Urea	Nitrogen fertilizer / chemical feedstock	Agriculture and chemical use.
2	Ammonia Liquid	Fertilizer feedstock / base chemical	Pressurized liquefied gas if anhydrous.
3	Calcium Nitrate	Fertilizer / industrial additive	Nitrate source.
4	Potassium Chloride	Potash fertilizer / chemical	Agricultural/industrial.
5	Potassium Carbonate	Industrial chemical / specialty agriculture	Alkaline potassium source.
6	Borax	Industrial mineral / detergent / agriculture	Boron source.
7	Boric Acid	Industrial mineral / agriculture / chemical	Boron source.
8	Colemanite	Boron mineral	Industrial mineral.
9	Celestine	Strontium mineral	Industrial mineral.
10	Diatomite	Filter aid / absorbent	Filtration and absorbent.
11	Anthracite	Filter media / industrial carbon	Water filtration/fuel.
12	Calcium Carbonate	Mineral filler	Filler and drilling use.
13	Zinc Oxide	Industrial additive / rubber / ceramic	Rubber activator/pigment/additive.
14	Selenite	Specialty mineral/chemical	Specific application to be confirmed.

10. Oxidizers, Reducing Agents & Reactive Chemicals

No.	Chemical / Material	Application	Remarks
1	Hydrogen Peroxide / H2O2	Oxidizer	Concentration-sensitive transport controls.
2	Calcium Hypochlorite	Oxidizer/disinfectant	Fire/reactivity risk.
3	Sodium Hypochlorite	Oxidizer/disinfectant	Corrosive/oxidizing liquid.
4	Potassium Persulfate	Oxidizer/initiator	Oxidizer and polymerization initiator.
5	Sodium Metabisulfite	Reducing agent	Dechlorination/oxygen control.
6	Sodium Sulfite	Reducing agent / oxygen scavenger	Water treatment/boiler use.
7	Sodium Nitrite	Corrosion inhibitor / mild oxidizer	Utility systems.
8	Hydrazine Hydrate	Strong reducing agent / oxygen scavenger	Toxic/corrosive; strict DG review.
9	Chromic Acid	Strong oxidizer	Toxic/corrosive/oxidizing.

No.	Chemical / Material	Application	Remarks
10	Nitric Acid	Oxidizing acid	Corrosive oxidizer.
11	DBP / DCP / DLP	Organic peroxide / initiator	Thermal decomposition/fire risk.
12	AIBN	Reactive initiator	Self-reactive decomposition risk.
13	TEAL	Highly reactive organometallic	Pyrophoric.
14	N-Butyl Lithium	Highly reactive organometallic	Pyrophoric/moisture-sensitive.

11. Pressure Cylinder / Pressurized Delivery Chemicals

No.	Chemical / Material	Application	Pressurized Transport Status
1	Ammonia Liquid / Anhydrous Ammonia	Fertilizer feedstock, petrochemical, industrial refrigeration	Normally transported as liquefied gas under pressure in cylinder, pressure tank, tube trailer, pressure rail tank where permitted, or pressurized ISO tank.
2	Butene	Petrochemical feedstock / comonomer	Liquefied flammable gas; normally requires pressure cylinder/tank; not suitable for ordinary non-DG rail cargo.

12. General Industrial Chemicals & Process Additives

No.	Chemical / Material	Application	Remarks
1	Anti-Foam	Foam control	Process additive.
2	Anti-Icing	Anti-icing / freezing control	Utility/process additive.
3	Anti-Sludge	Sludge prevention	Process additive.
4	Fouling Inhibitor	Fouling prevention	Process/heat-transfer systems.
5	Dispersant	Particle dispersion	Process/water systems.
6	Surfactant	Surface-active agent	Wetting/emulsification/dispersion.
7	Emulsifiers	Emulsion stabilization	Process/oilfield/polymer systems.
8	De-Emulsifier	Emulsion breaking	Oil/water separation.
9	Flocculants	Flocculation	Water/process treatment.
10	Coagulant	Coagulation	Water/process treatment.
11	MYPC	Application to be confirmed	Full chemical name/grade required.
12	SDVES	Application to be confirmed	Full chemical name/grade required.
13	2EH	Likely 2-Ethylhexanol; solvent/intermediate	Confirm exact chemical identity and grade.
14	Sunwax P400	Industrial wax	Processing additive.
15	White Mineral Oil	Mineral oil	Lubricant/carrier/softener.
16	Sodium Sulfate	Industrial salt	Detergent/textile/industrial uses.
17	Potassium Silicate	Inorganic binder/additive	Adhesive, binder, process chemical.
18	Calcium Stearate	Industrial lubricant/stabilizer	Polymer and process additive.
19	Zinc Stearate	Industrial lubricant/release agent	Rubber/plastics/coatings.
20	Sodium Stearate	Industrial soap/additive	Detergent/additive use.

Transport and Documentation Requirements Before Final Approval

No.	Required Document / Check	Purpose
1	SDS/MSDS - latest revision	Mandatory for hazard, storage, incompatibility, emergency response, and transport classification.
2	UN Number	Required to determine DG classification and transport acceptance.
3	Dangerous Goods Class and Subsidiary Risk	Required for rail, road, sea, and air transport.
4	Packing Group	Defines packing severity and accepted packaging.
5	Flash Point / Auto-Ignition / Decomposition Data	Required for flammable and reactive materials.
6	Approved Packaging Type	Drum, IBC, ISO tank, pressure cylinder, pressure tank, bulk bag, jumbo bag, etc.
7	Temperature Control Requirement	Important for organic peroxides, initiators, reactive monomers, and unstable materials.
8	Rail/Road/Sea/Air Acceptance Confirmation	Carrier and country route-specific confirmation is required before shipment.
9	Pressure Vessel Requirement	Must be confirmed for liquefied gases and pressure delivery items.
10	Customs and Import Classification	HS code, import restrictions, licensing, and country-specific controls must be reviewed.

This classification is a preliminary technical and logistics register prepared from the supplied chemical list and the additional requested oilfield/drilling materials. It is intended for commercial screening, procurement categorization, and preliminary logistics planning.

The main pressure-delivery chemicals identified are Ammonia Liquid / Anhydrous Ammonia and Butene. These should not be treated as ordinary rail cargo without specific dangerous-goods and pressurized-container approval from the carrier and competent authorities.

Catalysts and catalyst-related materials include TEAL, Precious Metal Compounds Ag/Pd/Pt, Sodium Methoxide, N-Butyl Lithium, AIBN, DBP, DCP, DLP, Potassium Persulfate, Activated Alumina, Activated Carbon, Carbon Molecular Sieve, Silica Gel, Amberjet/Lewatit resins, DMDS, and TBC.

Drilling and oilfield materials include both items from the original list and proposed additions such as Calcium Bromide, Zinc Bromide, Sodium Bromide, Potassium Formate, Sodium Formate, Cesium Formate, Ceramic Proppant, Frac Sand, Resin Coated Sand, Walnut Shell, Mica, Cellulose Fiber, Graphite, Gilsonite, Lubricant Additive, Biocide, Shale Inhibitor, Clay Stabilizer, and Friction Reducer.

Final transport, customs, storage, rail acceptance, and dangerous-goods decisions must be based only on official SDS/MSDS, UN classification, packing instructions, country regulations, and carrier acceptance.