

IMIDAZOLINE

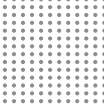


901 SERIES

- Organic Corrosion Inhibitor for Oil & Gas
- Acid Corrosion Inhibitor
- Lubricant Rust Preventive Additive
- Emulsification and Cleaning
- De-watering and Flocculation



chemtəx



KEY FEATURES AND BENEFITS

Imidazolines are thermally stable, organic, nitrogenous bases which form the basic constituent of corrosion inhibitors for all upstream, midstream and downstream processes. The film forming and corrosion inhibition properties make Imidazolines one of the key intermediates for a variety of industrial applications. They can be used as emulsifiers and co-emulsifiers for both oil-in-water and water-in-oil systems.

Chemtex 901 Series of Imidazoline surfactants of cationic nature are derived from fatty acids and amines. Their lipophilic nature allows them to solubilize in nonpolar solvents, and to disperse in aqueous systems.

- Makes an **excellent base for corrosion inhibitor** formulations
- High active matter content
- Good **lubricity improver**
- Thermally stable
- **Soluble** in both non-polar solvents and mineral oils
- **Strongly cationic** in acidic medium, adsorbing onto metal surfaces
- Can be **solubilized in the aqueous medium**
- **Corrosion inhibitor for lubricants**
- **Hydrophobic**; Water repelling agent
- **Easy to handle**, clear liquid at room temperature
- **Excellent sour corrosion inhibition performance** for low salinity brines and moderate temperature
- Good wetting agents
- **Mild on eyes and skin**

CHEMISTRY BEHIND IMIDAZOLINE

Imidazoline adherents to heterocyclic group of compounds which has five membered rings with two nitrogen atoms.

Classified into two groups, Cationic & Amphoteric Imidazolines, the former is the Ammonium Mono Quaternary Salts with asymmetrical structure determined by cations, optically functioning in the aqueous solution where ionized.

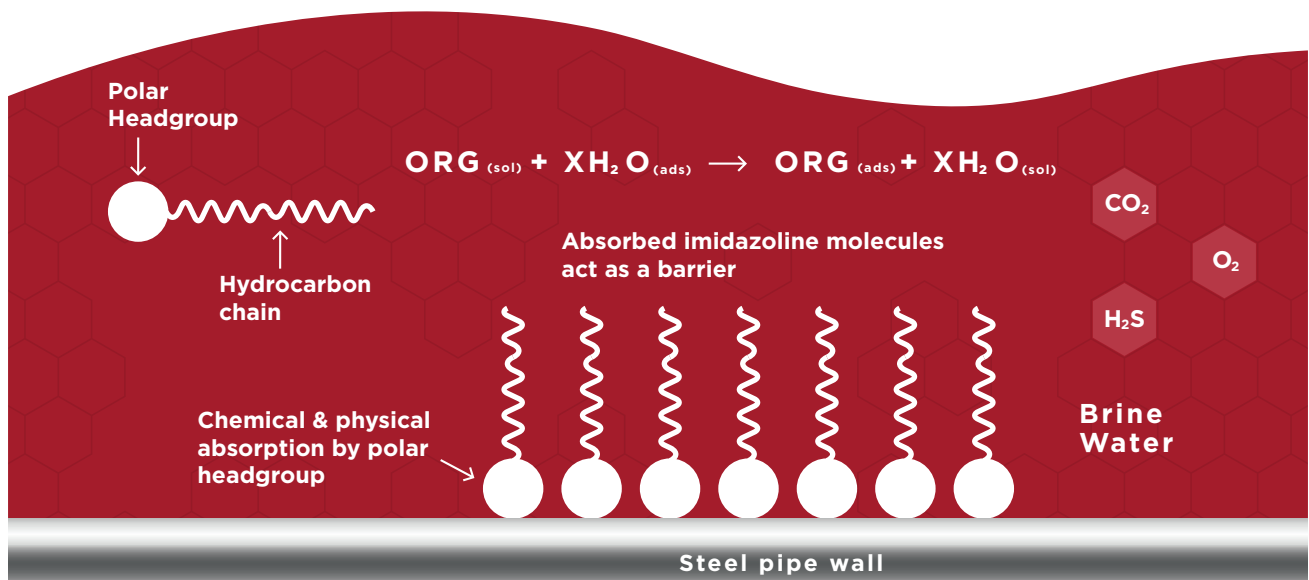
The most widely used representative of this group is the tallow alkyl derivative. The unsaturated C₁₈ consists of one

double bond in a CIS isomer configuration which helps in lowering its melting point and is the sole reason behind its liquid state at room temperature. The saturated C₁₈ has no double bonds, providing rigidity to the molecule and raising the melting point with reduced flow ability.

The nitrogen atom in the structure tends to provide some particular attributes like enhanced functional derivation, allowing the study of various functional group of Imidazoline radicals without effecting its paramagnetic properties.

The head and the pendant group of the molecule helps in bonding of the same to surface while the hydrocarbon tail forms a protective layer or adsorptive layer.

INHIBITION MECHANISM



The long hydrocarbon chain forms hydrophobic layers in solution that blocks any kind of reaction between the corrosive agent and the metal ions.

The pendant side with an active functional group has nitrogen, oxygen and other heteroatoms, is responsible for

chemical adsorption over the surface.

The other Imidazoline derivatives act as cationic surfactants, determined by the nature of hydrocarbon or substituent groups attached to carbon or nitrogen atom of the heterocyclic ring.

IMIDAZOLINE PRIME INGREDIENT FOR CORROSION INHIBITORS

Corrosion is referred to as the denudation of surface materials upon interaction with corrosive agents.

Corrosion complicates the overall working and operations depending upon the type of the metal and reagents used.

Corrosion increases when hydrogen ions react with the metal electrons,

damaging operational equipment and structures.

Corrosion inhibitors are widely used to control corrosion under the sweet and sour environments.

Imidazoline chemistry is the basis for one of the dominating types of film-forming organic corrosion inhibitors for oil and gas installations globally.



Industrial sectors like Automobiles, Manufacturing, Oilfields, and Processing facilities have huge involvement of metals and the most crucial problem they face is of corrosion.

Heavy Industry metals are prone to the attacks of corrosive substances like acids, bases, oxidizing agents,

caustic effects, etc., which react with the metal electrons, decreasing its metallic property and resulting in total structural damage.

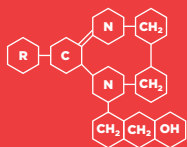
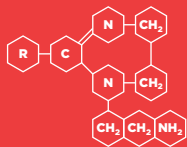
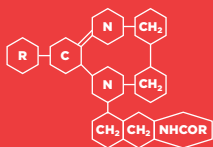
The financial loss caused due to corrosion per year is estimated in the range of thousands of crores and even causing threat to environmental balance.

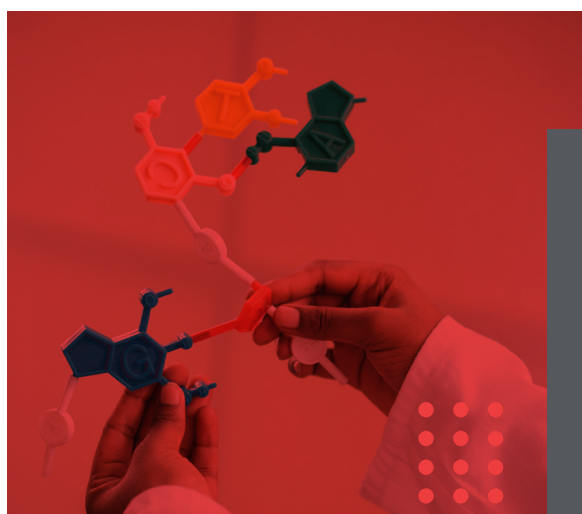
RECOMMENDED USAGE

CHEMTEX 901 SERIES meet extreme corrosion challenges for low and middle range temperature oil and gas extraction sites, downhole operations.

Depending upon the working

conditions, operating limitations and specific applications, Imidazoline can be formulated as oil soluble, oil soluble/water dispersible or water soluble/oil dispersible.

| Product Name | Molecular Structure | CAS No. | EINECS | Major Application Areas |
|---------------------------------------------------------|-------------------------------------------------------------------------------------|------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------|
| Chemtex 9010 Hydroxy Ethyl Imidazoline |  | 68937-01-9 | 273-051-1 | Metal treatment, oil/water soluble salts, enhancer and stabilizers used in lubricants, paper making process and metal working systems. |
| Chemtex 9011 Amino Ethyl Imidazoline |  | 68526-44-3 | 271-205-2 | Corrosion inhibitors, dispersants, emulsifiers, etc. |
| Chemtex 9012 Amido Ethyl Imidazoline |  | 63441-26-9 | 271-205-2 | Textile products, acid detergents, thickeners, flocculants, etc. |



Imidazoline, an effective organic corrosion inhibitor used in acidic and aggressive environment, can form an adsorption film on the surface of metal, slowing down the diffusion of ions and inhibiting the occurrence of metal corrosion.

TECHNICAL SPECIFICATIONS

| Attributes | UOM | Chemtex 9010 | Chemtex 9011 | Chemtex 9012 | Chemtex 9015 |
|---------------------------|-----|-------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------|
| Form | - | Clear Liquid | Clear Liquid | Clear Liquid | Clear Liquid |
| Appearance | - | Brown | Brown | Brown | Amber to Dark |
| Odour | - | Characteristic | Characteristic | Characteristic | Organic Acid Type |
| pH (20°C) | - | 10.5 - 11.5 | 10.5 - 11.5 | 10.5 - 11.5 | 4.0 - 6.0 |
| Specific Gravity | - | 0.95 ± 0.02 | 0.94 ± 0.02 | 0.95 ± 0.02 | 1.0 ± 0.05 |
| Equivalent Weight | - | 450 - 550 | 325 - 425 | 590 - 690 | N/A |
| Boiling Point | °C | 257 - 260 | 250 - 260 | 255 - 257 | N/A |
| Melting Point | °C | 90 | 90.5 | 90.5 | N/A |
| Flash Point (Closed Cup) | °C | ~145 | ~145 | ~145 | N/A |
| Vapour Pressure | Pa | 0.3 | 0.31 | 0.34 | N/A |
| Auto Ignition Temperature | °C | 480 | 480 | 480 | N/A |
| Solubility | - | Soluble in water with acetates; Soluble in hydrocarbons, alcohols and ketones | Soluble in hydrocarbons, alcohols and ketones | Soluble in hydrocarbons, alcohols and ketones | Soluble in water |

SOLUBILITY

| Attributes | Chemtex 9010 | Chemtex 9011 | Chemtex 9012 | Chemtex 9015 |
|-------------------|--------------|--------------|--------------|--------------|
| Mineral Oil | ✓ | ✓ | ✓ | Dispersible |
| Xylene | ✓ | ✓ | ✓ | Dispersible |
| PET Ether | ✓ | ✓ | ✓ | Dispersible |
| Propan - 2 - ol | ✓ | ✓ | ✓ | ✓ |
| Hydrochloric Acid | ✓ | Dispersible | Dispersible | ✓ |
| Phosphoric Acid | ✓ | Dispersible | Dispersible | ✓ |
| Acetic Acid | ✓ | Dispersible | ✓ | ✓ |
| Water | Dispersible | Dispersible | Dispersible | ✓ |

EFFICACY REPORT

Following data have been recorded, determining the % weight loss on mild steel coupons when immersed in various acid (20% solution) and dosed with Chemtex 9015.

| Products | Phosphoric Acid | | Hydrochloric Acid | | Sulphuric Acid | | Acetic Acid | |
|--------------|-----------------|------|-------------------|------|----------------|------|-------------|------|
| | 20°C | 80°C | 20°C | 40°C | 20°C | 40°C | 20°C | 80°C |
| NIL | 1.0 | 64.0 | 5.2 | 53.0 | 2.0 | 95.0 | 2.0 | 15.0 |
| Chemtex 9015 | 0.6 | 22.5 | 0.1 | 1.1 | 0.3 | 2.9 | 0.3 | 3.5 |

Dose Concentration: 0.2% | Time: 24 Hours

The data have been recorded in laboratory tests and are typical of the product. They do not however constitute sales specifications and should not be regarded as such.

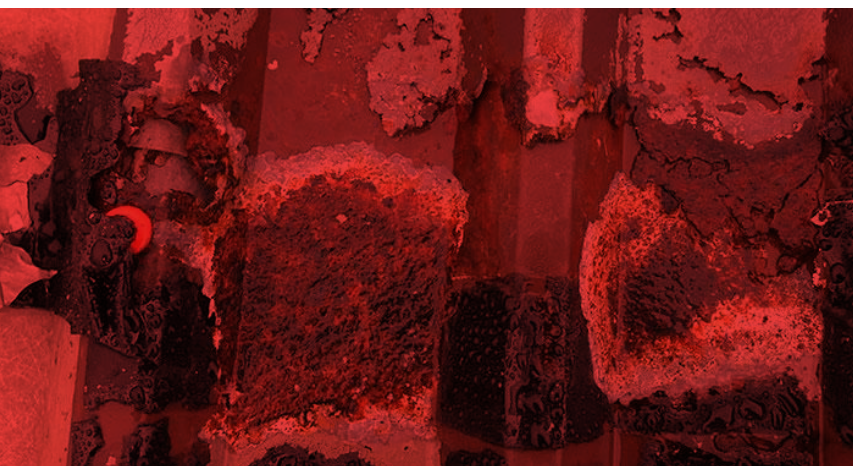
APPLICATION AREAS

OIL AND PETROCHEMICALS

Widely used in oil industries as prime ingredient of a corrosion inhibitor, Imidazoline, being organic in nature undergoes adsorption mechanism forming a thin protective film over surfaces preventing further corrosive reactions.

Adsorption is a process by which atom or ions of a matter gets adhered into the surface forming an adsorptive film or protective film. The adsorption of Imidazoline salts over application metal displaces H₂O molecule and form a monomolecular hydrophobic layer over the same.

The best results are quantified if Chemtex 9010 and Chemtex 9012 are synthesized together with added enhancers. The coating has the ability to withstand any type of water induced breakdown and acid corrosion.



ACID CORROSION INHIBITOR

Acid Corrosion Inhibitors are used in various acid cleaning and metal pickling applications with various acids such as HCl, Phosphoric, Sulfuric etc. Imidazoline are used for formulating such Acid Corrosion Inhibitors. The most ideal product for such water-soluble application is Chemtex 9015.

METALLIC SURFACE TREATMENT

Imidazolines are considered as excellent metallic surface cleaners with phosphoric acid and kerosene, antiscalant and corrosion preventive measures.

Even at lower concentrations, Chemtex 901 Series effectively removes hydrogen ions (during acidic cleaning) from the metal surfaces and rendering a thin protective film.





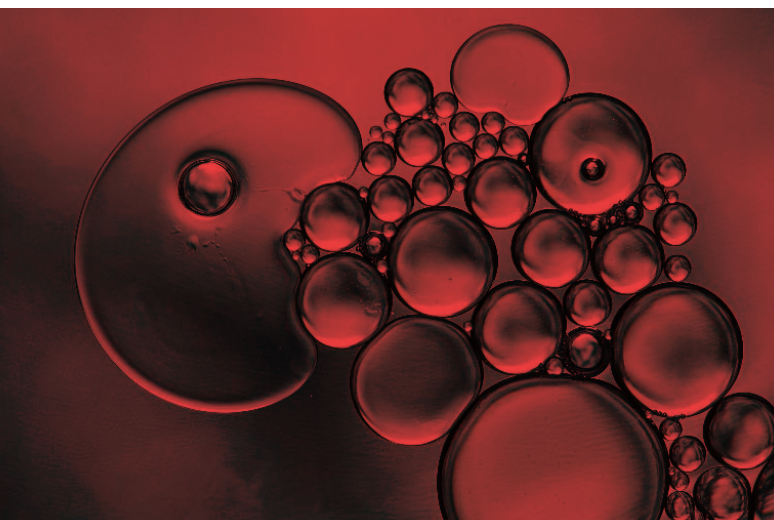
THICKENERS AND FLOCCULANTS

The cationic nature of Imidazoline salts enable precipitation in the presence of negatively charged certain silicates, nitrates and borates on inclusion.



PAINT AND ADHESIVES

Imidazolines when added to paint improves adhesion and stickiness to wet surfaces with increase in water proofing attributes.



LUBRICANTS AND EMULSIFIERS

Imidazolines are considered as Emulsion, Stabilizers, Lubricity Improver and Viscosifier of the highest standard, used in number of industrial applications in textile, paper, latex manufacturing, cement processing, polymerization reactions and others

The salts of Imidazolines have good utilization in wire and tube drawing. Metal surfaces treated with Imidazoline salts are also resistant to corrosive reactions.

Recommended as oil and wax emulsifiers in paper, textiles and metal working industries.



CAR WASH FORMULATION

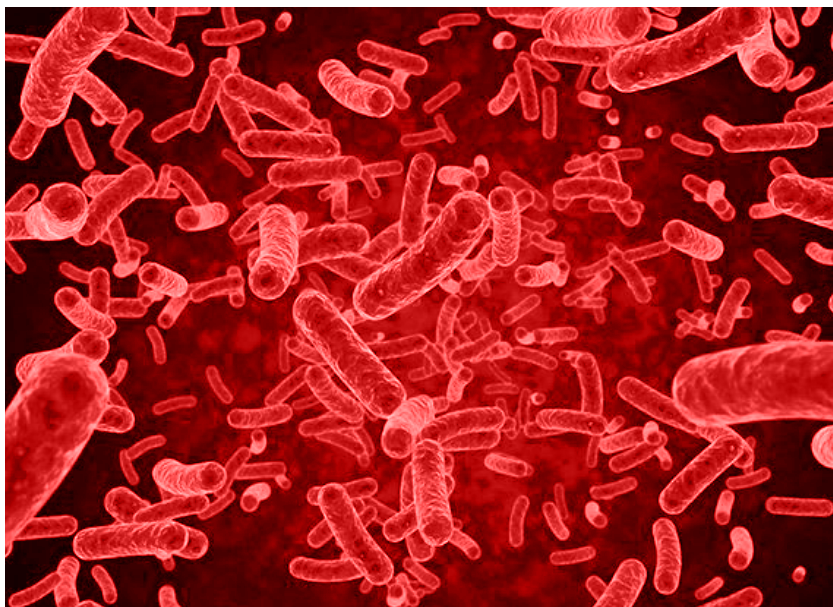
Imidazoline blend for oil/ solvent based rinse aid concentrates preparation, for use in brush wash system in 200 – 400 times dilution.

BIOCIDES

Pentachlorophenol, a key ingredient used in most of the biocides can be formulated with Imidazoline, helping in prevention of mould and mildew.

These formulated biocides ensure core prevention from fungi, spores, bacteria and other microbes which degrade operating field conditions.

Emulsification of insecticides and pesticides into aqueous solution can also be done with imidazolines.



LAUNDRY DETERGENT

Imidazolines find a range of applications as laundry detergents. They add fabric softness and resiliency in fabrics.

With their high dispersibility, they inhibit agglomeration. Detergents with Imidazolines have excellent absorbency on fabrics. They inhibit static charge build up. Mild to skin and eyes and provide excellent absorbency of fabrics.

Enhances rate of per hydrolysis and rate of diacyl peroxide formation, acting as bleach activator.

MEDICINAL AND PHARMACOLOGICAL

Imidazoline has a wide range of biological and medicinal activities, reason being its heterocyclic nature which has gained tremendous achievements in this field past decade.

Drugs having Imidazolines acts on different types of receptors, manifesting broad spectrum activities such as anti-bacterial, anti-fungal, anti-carcinogen, anti-ulcer agent, anti-allergic, anti-inflammatory, analgesic, anxiolytic, etc.



APPLICATIONS SUMMARIZED

| Usage | Chemtex 9010 | Chemtex 9011 | Chemtex 9012 | Chemtex 9015 |
|-----------------------------|--------------|--------------|--------------|--------------|
| Rust / Corrosion Inhibition | ✓ | ✓ | ✓ | ✓ |
| Acid Corrosion Inhibition | ✓ | | | ✓ |
| Cleaners and Dispersants | ✓ | | | ✓ |
| Automobile Cleaners | ✓ | | | ✓ |
| Dispersing Agents | | | ✓ | |
| Oil Fields & Petrochemicals | ✓ | ✓ | | |
| Paper and Pulp | | ✓ | | |
| Metal Processing | | ✓ | | |
| Bitumen & Constructions | ✓ | ✓ | ✓ | |
| Softener & Conditioners | ✓ | | | |
| Agriculture | | ✓ | ✓ | |
| Textile | ✓ | | | |
| Metal Part Maintenance | ✓ | | | |
| Protective Coatings | ✓ | | | |
| Gums and Adhesives | ✓ | ✓ | ✓ | |
| Lubricants | | | ✓ | |
| Rheology | ✓ | ✓ | ✓ | |

HEALTH AND SAFETY



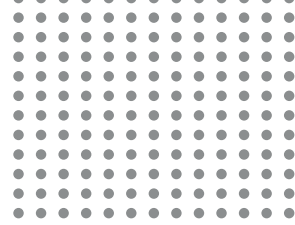
OHSAS 18001: 2007 Certified under Health & Safety Management System by OHSAS 18001:2007 certification, ensuring the company's best working environment.



ISO 9001 & EMS 14001 Certified under QMS and EMS for Quality and Environmental Safety



GMP Assessed and found working satisfactorily as per the GMP norms of "Good Manufacturing Practice"



HANDLING MEASURES & STORAGE

Proper human safety products such as splash goggles, lab coat, vapour respirator, gloves and boots should be worn while handling and applying chemicals.

Splashes on skin should be washed off with water immediately. In case of splashing into the eyes, flush it with fresh water and obtain medical attention.

Should not be injected. Chemtex 901 Series should be stored in original containers in cool dry place, away from heat, direct sunlight and alkalis. Store in cool and dry place. Should not be injected.

Shelf life of 36 Months when stored properly. Refer label and SDS for details.

PACKAGING

Chemtex 901 Series is available in

200kgs
HDPE drums

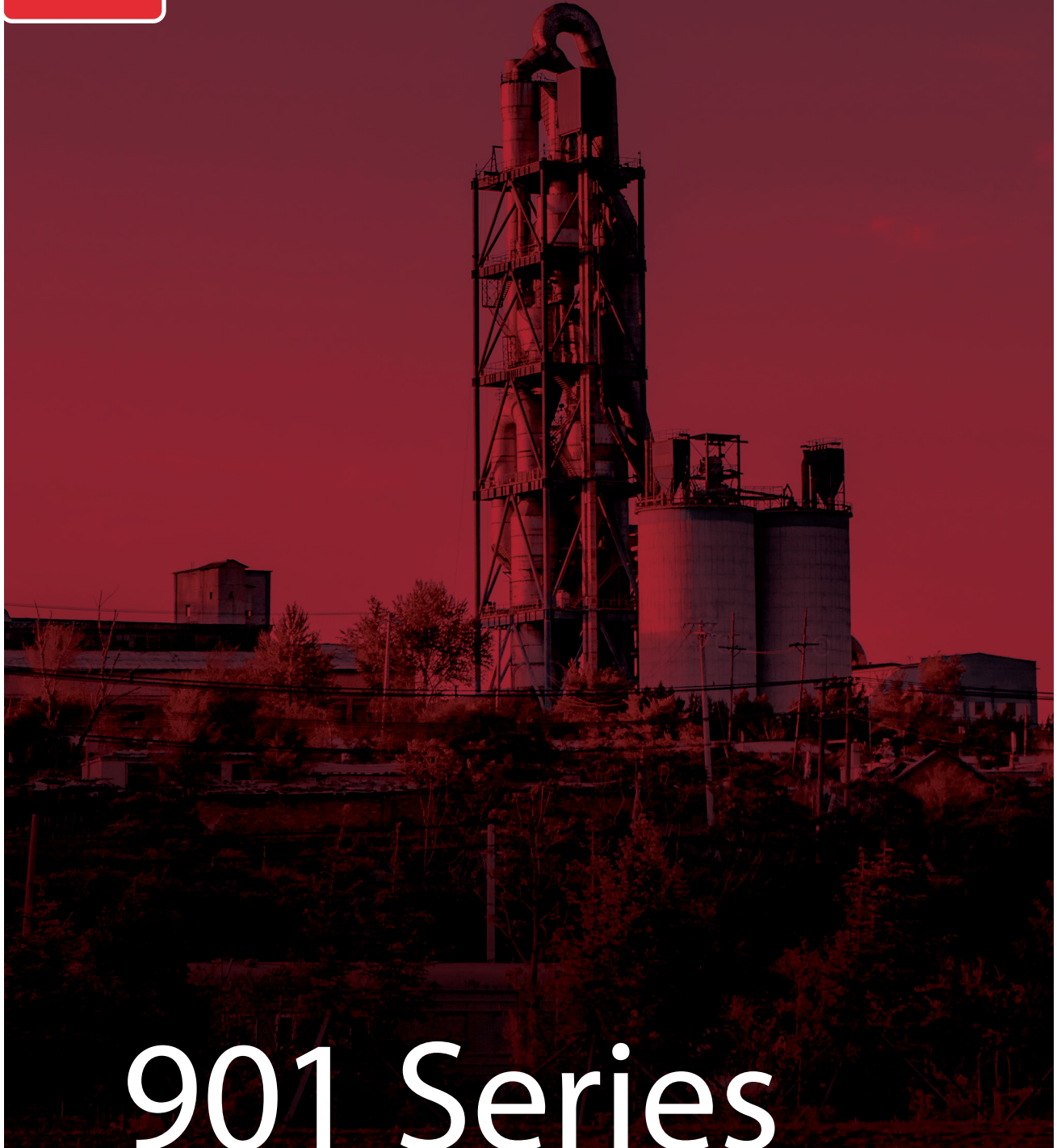


1000kgs
IBC

Celebrating

YEARS
50

OF TRUST
1970-2020



901 Series

chemtex

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