



CHLORINATED ORGANICS

ISOFORM® ISOMERIZATION GRADE/REFORMING GRADE
REFINING GRADES OF PERCHLOROETHYLENE



ISOFORM® Isomerization Grade Perchloroethylene

Introduction

In the petroleum refining industry, most platinum-based catalysts used in catalytic reformer and isomerization units, as well as the isomerization units in natural gas liquid (NGL) plants, require small amounts of chlorine to maintain catalyst activity and stability. Regulatory requirements (like The Montreal Protocol and the U.S. Clean Air Act of 1990), as well as handling and packaging concerns, have made use of ethylene dichloride (EDC), 1,1,1-trichloroethane and carbon tetrachloride unattractive in these applications.

Olin offers two products as chlorine sources to the refinery industry: ISOFORM® Isomerization Grade Perchloroethylene and ISOFORM Reforming Grade Perchloroethylene.

Benefits of these solutions include:

- No ozone depletion
- Non-flammable
- Long-term viability
- Readily available
- No federal excise tax in some countries (e.g., United States)
- Available through approved distribution



ISOFORM® Isomerization Grade Perchloroethylene

ISOFORM® Isomerization Grade Perchloroethylene is offered as a preferred product for the isomerization process. This product contains no sulfide or nitrogen compounds and only traces of water and oxygen compounds (see specification). ISOFORM Isomerization Grade is approved on UOP's (Universal Oil Products) perchloroethylene specification for use in isomerization processes.

Manufacturing and Availability

Olin manufactures ISOFORM Isomerization Grade Perchloroethylene in Plaquemine, Louisiana (U.S.), and Stade, Germany. This product is available in bulk or drums, either directly from Olin or through an approved Olin distributor. For information about the availability of ISOFORM Perchloroethylene products in your location, please contact your Olin sales representative.

ISOFORM® Reforming Grade Perchloroethylene

ISOFORM® Reforming Grade Perchloroethylene

ISOFORM® Reforming Grade Perchloroethylene is offered as a preferred product for chloriding reforming catalyst. This product contains no sulfide compounds and only traces of water and oxygen/nitrogen-containing compounds (see specification). ISOFORM Reforming Grade is not suitable for isomerization units.

Manufacturing and Availability

ISOFORM Reforming Grade Perchloroethylene is manufactured in Plaquemine, Louisiana (U.S.), and Stade, Germany. This product is available in bulk or drums directly from Olin or from Olin-approved distributors.

Properties

Property ¹	Isomerization Grade	Reforming Grade
Purity, %	99.95	99.95
Color, Pt-Co	<10	<10
Appearance	Clear and free of suspended matter	Clear and free of suspended matter
Non-volatile residue (ppm)	<10	<10
Water (ppm)	<25	<30
Chlorides (ppm)	<1	<1
Additive stabilizer (ppm)	<10	>20
Organically bound oxygen+nitrogen (ppm)	<5	<25
Formula	Cl ₂ + CCl ₂	Cl ₂ + CCl ₂
Density, 25°C	1619 g/L (13.51 lb/gal)	1619 g/L (13.51 lb/gal)
Boiling point	121°C (250°F)	121°C (250°F)
Freezing point	-23°C (-9°F)	-23°C (-9°F)
Flammable limits	None	None
Flash point	None	None
Vapor pressure 20°C (mbar)	18.7	18.7

ISOFORM® Comparisons

Due to differences in chlorine content between formerly used chloride source and ISOFORM Perchloroethylene (either grade), some adjustment of catalyst chloriding rates will be required. The following chart helps to determine chlorine equivalencies for different products.

Chemical	Pbw ¹ Chlorine/pbw Solvent ²	Pbw Solvent/pbw Chlorine
ISOFORM ³	0.855	1.17
Carbon tetrachloride	0.922	1.08
1, 1, 1 trichloroethane	0.797	1.25
Ethylene dichloride	0.717	1.40
Trichloroethylene	0.810	1.23

¹Pbw = parts by weight.

²Theoretical limits, assuming pure chemicals.

³Isomerization Grade and Reforming Grade Perchloroethylene.

Note: Suitability of the solvent should be confirmed with the catalyst manufacturer or the process licensor.

ISOFORM® Storage and Handling

For ISOFORM® Isomerization Grade Perchloroethylene, nitrogen padding of storage tanks is recommended. For more information on the storage and handling recommendations of ISOFORM Grades Perchloroethylene and chlorinated solvents in general, as well as for information on groundwater protection and emission minimization, review the Safety Data Sheet and see the Chlorinated Solvents Product Stewardship Manual. Be sure to comply with the country-specific and local requirements.

Product Stewardship

At Olin, our Product Stewardship program is guided by our core values – Act with Integrity, Drive Innovation and Improvement, and Lift Olin People. We are committed to the safe handling and use of our products – and enabling all of our collaborators throughout the value chain to do the same. As a responsible corporate citizen and certified to RC14001®:2015, we assess our products' safety, health, and environmental information and take appropriate steps to protect employees, public health, and the environment. Ultimately, our product stewardship program's success rests with each individual involved with Olin products – from the initial concept and research to the manufacture, sale, distribution, use, disposal, and recycling of each product.

Global Contact Information

Americas

USA: +1 833 370 3737
Canada: +1 877 304 4442
Latin America: +55 11 5188 4105

Info@Olin.com

Asia

Chinese Mainland: +86 4006367896
Hong Kong: +852 58081886 **Japan:**
+81 368608305
Singapore: +65 31632006
South Korea: +82 260221296

EMEA

EMEA: +44 8000869047

Toll free service not available in all countries

www.OlinChlorinatedOrganics.com

Emergency Telephone Numbers (Chemical Incident Only)

USA: +1 800 424 93 00
Canada: +1 613 996 6666
Europe/Middle East/Africa/India: +32 3 575 55 55

Chinese Mainland: +86 532 83889090
Asia/Pacific: +65 6542 9595

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