



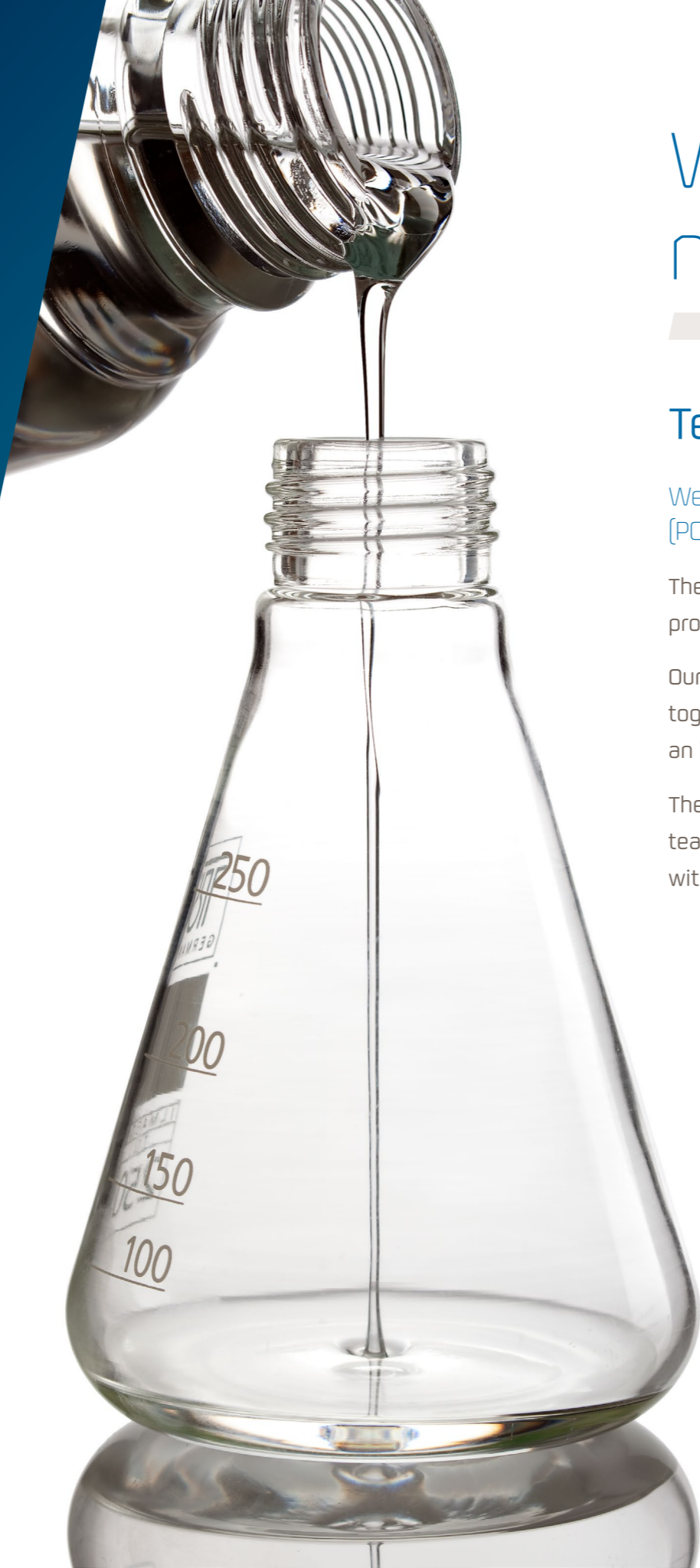
Polyether polyols

Alcupol[®]

Flexible slabstock & moulding;
rigid foams and CASE applications



Polyether polyols



Where innovation meets excellence

Technological strength

We use our technology in the production of propylene oxide/styrene monomer (POSM) and new polyol developments.

The implementation of our technical solutions and our long experience in the polyol production since the '70s, allows us to offer outstanding products and services.

Our Technology Centre is a recognized innovation model in Europe. This leading site together with our continuous industrial developments have enabled us to become an international reference in the POSM sector.

These infrastructures, together with our highly qualified technical and development teams, always equipped with the latest technologies, guarantee our commitment with product innovation.

Polyether polyols



Safety & Sustainability

Our numerous certificates & awards confirm Repsol as a model in safety and transparency.

In 2016 EuPC (European Plastics Converters Association) awarded us the Best Polymer Producers Award for Europe and the Global Innovation prize for our quality standards, regulation compliance, efficiency, communication and innovation values.

Through multiple projects and research we are committed to increasing the circularity and life cycle of plastics. Among the actions taken we signed the “Plastics 2030” Voluntary Commitment presented by PlasticsEurope to increase the efficient use of resources.

True partners

We work hand in hand at our customers' sites to optimize product performance. We take into consideration the different standards and the specific requirements of each application.

Where others only see a client we see a partner to keep improving. This is how our technical service turns into a competitive advantage to help you offer better solutions.

Repsol

Over **8** decades of experience
in the world of energy

One of the largest energy companies worldwide
and one of the biggest private oil & gas companies.

Repsol is committed to our customers' global strategy putting our entire organization at their disposal to achieve a common goal: to create long-term relationships which enable us to rise to the common challenges our business presents.



Repsol Campus, Corporate Headquarters in Madrid

LEED® Platinum certificate, awarded by the prestigious US Green Building Council (USGBC), for new buildings construction

Chemicals

Over **95** countries
where we market our products

Added value

Repsol's Chemicals Division, with a high degree of integration, focuses its strategy in the constant **generation of value** through **differentiated products and services**.

Over **1,500** references

Repsol manufactures a wide variety of products, ranging from base petrochemicals to derivatives.

Base petrochemicals: ethylene, propylene, butadiene and benzene.

Intermediate products: styrene, propylene oxide, polyether polyols, and propylene glycols.

Polyolefins: polypropylene (PP) and PP compounds, both high and low-density polyethylene (HDPE and LDPE), metallocene linear low density polyethylene (mLLDPE), ethylene vinyl acetate (EVA) and ethylene butyl acrylate (EBA) copolymers.

Over **100** scientists and researchers
working for you

We focus all our resources to reach our most important goal: to develop innovative solutions. Our Technology Centre in sync with our steady plant improvements and our development of Industrial Sites, has steered **Repsol's leadership in POSM** production. An international reference to offer you always the latest solutions.

Chemicals



Understanding your needs

At Repsol we are committed with the development of new products for our clients. We are in constant search of **innovative solutions to meet all your needs**. Our goal is to develop cutting-edge products to offer **reliable and quality solutions** to enhance your business.

Due to this vision Repsol displays one of the widest ranges of polyether polyols in the market.

Over **45** years of experience
in polyols

Over the years we have developed an **integrated chemical business** controlling all key factors of the value chain: research, development, manufacturing and distribution.

This **unique vision** enables us to understand our customers needs and requirements. A valuable experience that led us to build the first POSM plant in Europe in the early '70s. An insight that continues today to drive our search for excellence.

Polyether polyols for **flexible slabstock & moulding** >

Polyether polyols for **rigid foams** >

Polyether polyols for **CASE applications** >

A full range of polyols and benefits within your reach

Over **43** grades
for polyol applications

Our versatility allows us to produce one of the most extensive ranges of polyether polyols in the market for a wide range of industrial sectors like:



Automotive



Well-being &
consumer
products



Building &
infraestructure



Packaging



Household



We create innovative solutions
and adapt them to each specific requirement.

We believe in quality and reliable products
you can trust every time.

We know every request is different,
that is why we offer a **wide product range**
for a broad variety of applications:
/ Polyether polyols for rigid foams
/ Polyether polyols for flexible slabstock & moulding
/ Polyether polyols for CASE applications

We believe in sustainable models.
Polyols for rigid foams contribute to increasing
energetic efficiency in buildings and electrical
appliances by reducing CO₂ emissions.

We are a customer-orientated company.
Always ready to listen to our customers' needs.

Our new polyol development, with very low content
of volatile organic compounds, strengthens our
commitment with safety and sustainability.

Polyols for slabstock and moulding applications

Flexible polyols

Grade	Hydroxyl number mg KOH/g	Viscosity 25°C , cP	Description
F-4811	48	560	Non reactive triol 3,500 g/mol molecular weight used in the production of conventional foams for the comfort market
F-5511	55	490	Non reactive triol 3,000 g/mol molecular weight used in the production of conventional foams for the comfort market
F-5611	56	470	Non reactive triol 3,000 g/mol molecular weight, 100% propylene oxide designed to produce conventional CME foams for the comfort market
F-2831	28	1,100	Reactive triol 6,000 g/mol molecular weight used in the production of high resilience and moulded foams for the comfort market, including furniture and automotive
F-3231	32	1,350	Triol 5,000 g/mol molecular weight and high ethylene oxide content used as cell opener and in the production of hypersoft foams
F-1251	125	359	Triol 1,300 g/mol molecular weight, 100% ethylene oxide used as cell opener and in the production of hypersoft foams
F-3531	35	800	Reactive triol 4,800 g/mol molecular weight used in the production of high resilience and moulded foams for the comfort market, including furniture and automotive
F-3011	31	1,250	High functionality reactive polyol and high molecular weight used in the production of high resilience and moulded foams for the comfort market, including furniture and automotive
F-5521	55	500	Medium reactive triol 3,000 g/mol molecular weight used in the production of hot moulding foams for the automotive comfort market
X-1950	190	350	Polyether polyol specially designed for the production of MDI slabstock and moulded viscoelastic foams for the comfort market
X-1550	163	300	Polyether polyol designed for the production of T65 and T80 viscoelastic foams for the comfort market
X-1450	154	300	Polyether polyol designed for the production of T65 and T80 viscoelastic foams for the comfort market
X-7510	250	260	Triol 700 g/mol molecular weight specially designed for the production of T80 viscoelastic foams for the comfort market

Polyols make it possible to obtain foams to suit the specific needs of the different comfort and vehicle applications



The information contained herein is based on REPSOL QUIMICA's current knowledge and experience and is presented in good faith for guidance only. Although REPSOL QUIMICA declares to have been most diligent when including the information contained herein, taking into account that several and different factors may affect the processing, application or use of the products, the convertor shall be responsible in every case for the conditions under which the products are transformed as well as for the final use given to them. REPSOL QUIMICA warns that this information may undergo variations or improvements; therefore REPSOL QUIMICA is not obliged to reflect these in this document or to communicate them to whomever may have access to it. Moreover, these readers should be aware that some or all of the products might be protected by intellectual property rights.

Polyols for slabstock and moulding applications

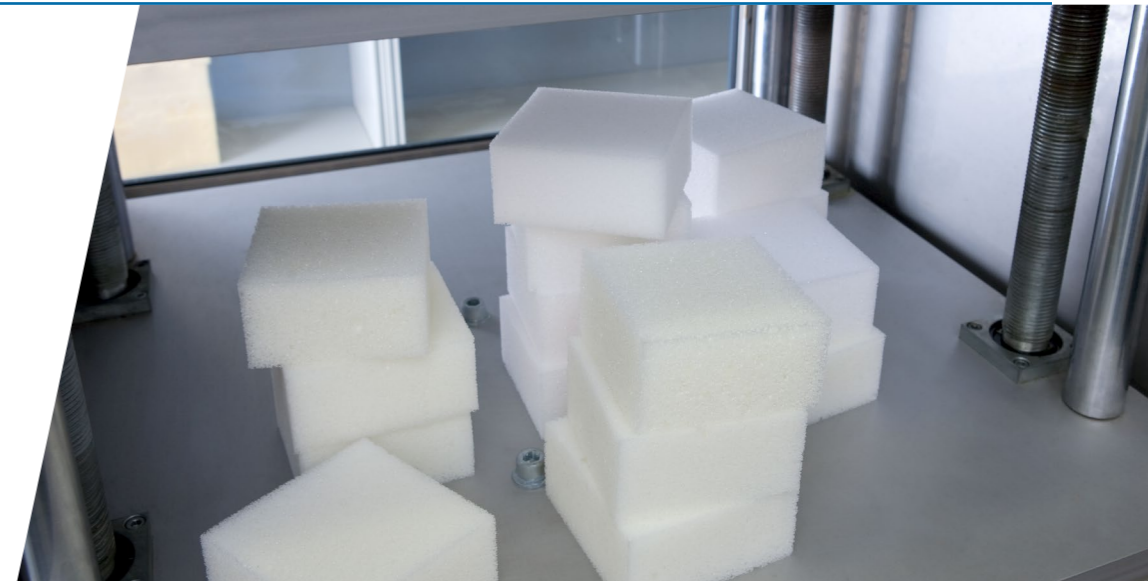
Polymeric polyols

Grade	Hydroxyl number mg KOH/g	Solid content	Viscosity 25°C , cP	Description
P-3091	32.5	42	4,500	Styrene and acrylonitrile graft non reactive polyether polyol 42% solid content and low free styrene content used in the production of very high hardness slabstock foams
P-3041	32.5	42	4,500	Styrene and acrylonitrile graft non reactive polyether polyol 42% solid content used in the production of very high hardness slabstock foams
P-3621	38.5	25	1,400	Styrene and acrylonitrile graft non reactive polyether polyol 25% solid content used in the production of very high hardness slabstock foams
P-3921	40.5	20	1,200	Styrene and acrylonitrile graft non reactive polyether polyol 20% solid content used in the production of medium hardness slabstock foams
P-4181	42.5	15	950	Styrene and acrylonitrile graft non reactive polyether polyol 15% solid content used in the production of medium hardness slabstock foams
P-4311	44.0	10	780	Styrene and acrylonitrile graft non reactive polyether polyol 10% solid content used in the production of medium hardness slabstock foams
P-3811	40.0	27	1,350	Styrene and acrylonitrile graft medium reactivity polyether polyol 27% solid content used in the production of hot moulded foams for the automotive comfort market
P-2621	26.0	25	2,800	Styrene and acrylonitrile graft reactive polyether polyol 25% solid content used in the production of high resilience slabstock and moulded foams for the comfort market, including furniture and automotive
P-2921	28.0	20	1,800	Styrene and acrylonitrile graft reactive polyether polyol 20% solid content used in the production of high resilience slabstock and moulded foams for the comfort market, including furniture and automotive
P-3021	30.0	15	1,450	Styrene and acrylonitrile graft reactive polyether polyol 15% solid content used in the production of high resilience slabstock foams for the comfort market

Polymeric polyols make it possible to obtain foams that meet the most demanding market requirements



Environmental chamber for fatigue resistance testing

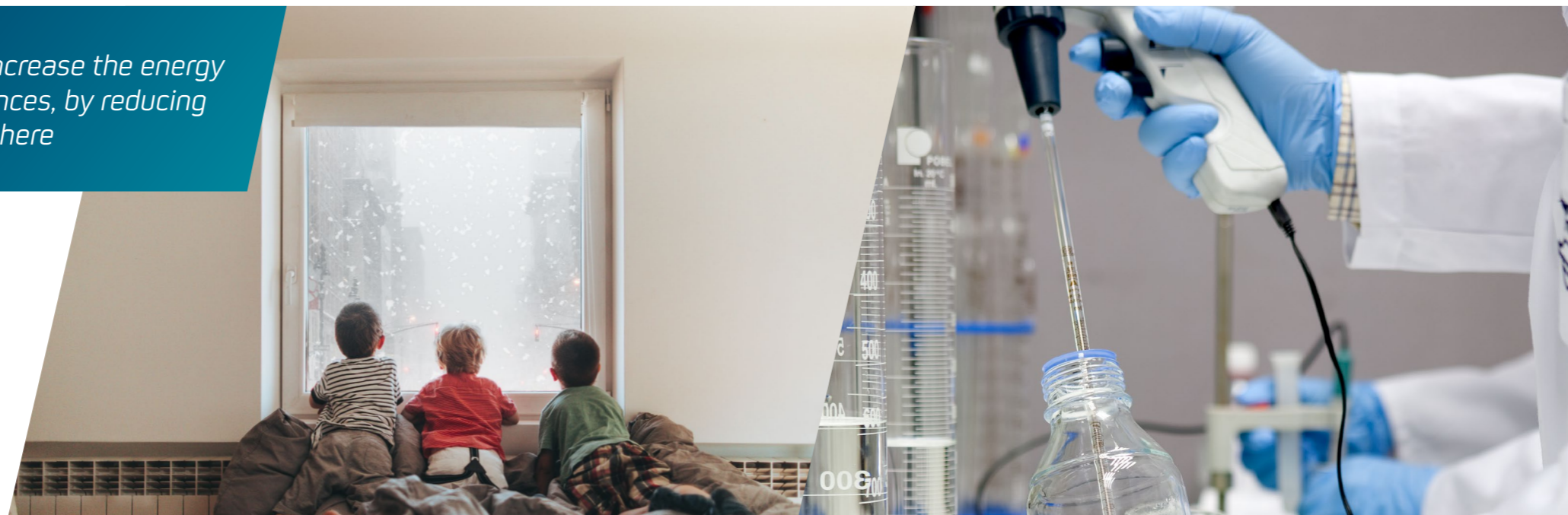


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Polyols for rigid foams

Grade	Hydroxyl number mg KOH/g	Functionality	Viscosity 25°C , cP	Description
R-1610	160	3.0	250	Non reactive triol 1,000 g/mol molecular weight, 100% propylene oxide, used in the production of OCF foams, rigid foams and non cellular polyurethanes
R-2510	250	3.0	260	Non reactive triol 700 g/mol molecular weight, 100% propylene oxide, used in the production of OCF foams, rigid foams and non cellular polyurethanes
R-3810	380	3.0	350	Non reactive triol 450 g/mol molecular weight, used in the production of rigid foams and non cellular polyurethanes
R-3600	360	4.5	2,750	High functionality sucrose-glycerol based polyol with low viscosity recommended for the production of rigid foams for the construction and isolation markets
R-4110	410	4.5	5,250	High functionality sucrose-glycerol based polyol used in the production of rigid foams for the construction and isolation markets
R-4920	490	4.5	9,500	High functionality sucrose-glycerol based polyol used in the production of rigid foams for the construction and isolation markets
R-4520	455	4.5	5,250	High functionality sorbitol-glycerol based polyol used in the production of rigid foams for the construction and isolation markets
R-4720	475	5.5	19,000	Very high functionality sorbitol-glycerol based polyol used in the production of rigid foams for the construction and isolation markets

Its insulating properties help to increase the energy efficiency of buildings and appliances, by reducing emissions of CO₂ into the atmosphere



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Polyols for CASE applications

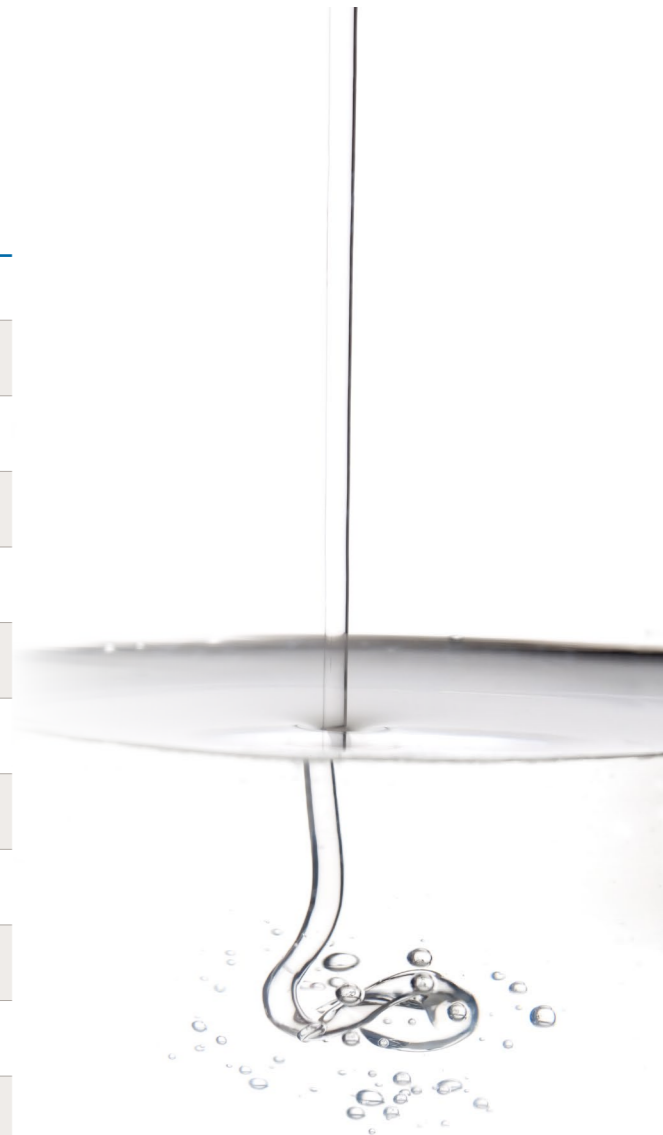
Grade	Hydroxyl number	Viscosity	Description
	mg KOH/g	25°C , cP	
C-4811*	48	560	Non reactive triol 3,500 g/mol molecular weight
C-4814	48	560	Non reactive triol 3,500 g/mol molecular weight
C-5611	56	495	Non reactive triol 3,000 g/mol molecular weight, 100% propylene oxyde
C-5710*	570	700	Non reactive triol 300 g/mol molecular weight
C-5521*	55	500	Medium reactivity triol 3,000 g/mol molecular weight
C-3531*	35	800	Reactive triol 4,800 g/mol molecular weight
C-2831	28	1,100	Reactive triol 6,000 g/mol molecular weight
D-0411*	280	65	Non reactive diol 400 g/mol molecular weight, 100% propylene oxyde
D-1011*	110	150	Non reactive diol 1,000 g/mol molecular weight, 100% propylene oxyde
D-2021*	56	300	Non reactive diol 2,000 g/mol molecular weight, 100% propylene oxyde
D-2000*	59	300	Reactive diol 2,000 g/mol molecular weight
D-4011*	28	850	Reactive diol 4,000 g/mol molecular weight

* Contains an antioxidant that has been cleared by the FDA for use in food packaging and/or other applications as an indirect food additive

Present in modern coating materials, in vehicles, cables, floors, walls, bridges, roads... they insulate safely and effectively, improving their durability and appearance



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Building trust through safety and transparency

Excellence is intrinsic to Repsol's values. It infuses our daily work and helps guide our decisions and actions, contributing to achieve the commitment made to our customers, stakeholders, employees, suppliers / partners and society to build a better future.

Safety is our priority

Petrochemical complexes, packaging facilities and logistics centres all have OHSAS 18001.2007 (Occupational Health and Safety Assessment Series) certification for their rigorous safety measures.

Petrochemical complexes,
packaging facilities
and logistics centres

OHSAS 18001.2007

Technical Data Sheets and MSDS are available on: www.repsol.com

A global company that seeks the welfare of people and is a step ahead in building a better future through the development of smart energy

Quality

All petrochemical plants are compliant with the current ISO 9001:2015 standards, for the quality of processes from manufacture to distribution, transport management and end product warehousing.

All petrochemical plants

ISO 9001:2015

Tarragona industrial complex

FSSC 22000

Environment

We set up and deploy ambitious energy efficiency programmes to reduce energy consumption and GHG emissions as one of the key elements of our strategy.

These programmes pursue long term targets which have been made public in order to facilitate their progress by the stakeholders. In this sense, Repsol Química has attained a final reduction of 0.56 million tonnes of GHG emissions at the end of the 2006-2013 period. Repsol is currently working on a new target covering the period 2014-2020, that involves an additional reduction of 0.42 million tonnes of CO₂.

All petrochemical complexes, have ISO 14001 certification for their environmental management and the reduction of the impact of their facilities; and ISO 14064 for the annual verification of greenhouse gas (GHG) emissions.

The Chemical area of our complexes in Tarragona [2015], Puertollano [2013] and Sines [2016], has implemented an Energy Management system according to the requirements indicated in the International Standard ISO 50001. This system is dedicated to developing and implementing our organization's energy policy, as well as manage the energy aspects of our activities, products or services. The objective is to increase and improve our energy efficiency, based on systems' implementation aimed at continuous energy performances improvement and thus contribute to a more efficient and sustainable use of energy.

Repsol reinforced its commitment with sustainability by signing the "Paris Pledge for Action" document. An historical agreement in which both developed countries and less developed countries and companies engaged to contribute towards a low CO₂ emission economy.

Puertollano, Tarragona and Sines

ISO 50001 / ISO 14001 / ISO 14064

Differentiation

Vision

Safety

Globalization

Efficiency



Chemicals Customer Care

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Efficiency

Vision

Responsibility

Globalization

Safety

Differentiation

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Transparency
Flexibility *Integrity*
Innovation *Responsibility*