

What you need to know about DENSO compressor oils!

Part 1 What exactly are ND-oil 8 & ND-oil 12?



There are many types of compressor oils offered to the Independent Aftermarket. But how do you know if the offered oil matches the requirements of the DENSO A/C compressor? In a series of publications we will explain in detail, the differences between DENSO ND-oil 8 and ND-oil 12 and -what we call- (ordinary) PAG oils. After reading these publications you will understand why it is important to choose the right type of DENSO oil.

In this first publication we will explain the basic differences between ND-oil 8, ND-oil 12 and (ordinary) PAG oils. In our next publications we will touch other important topics like;

- **Properties of ND-oil 8 and ND-oil 12**
- **Storage and Handling**
- **Comparison with other Aftermarket offers**



What exactly is ND-oil 8 and ND-oil 12?

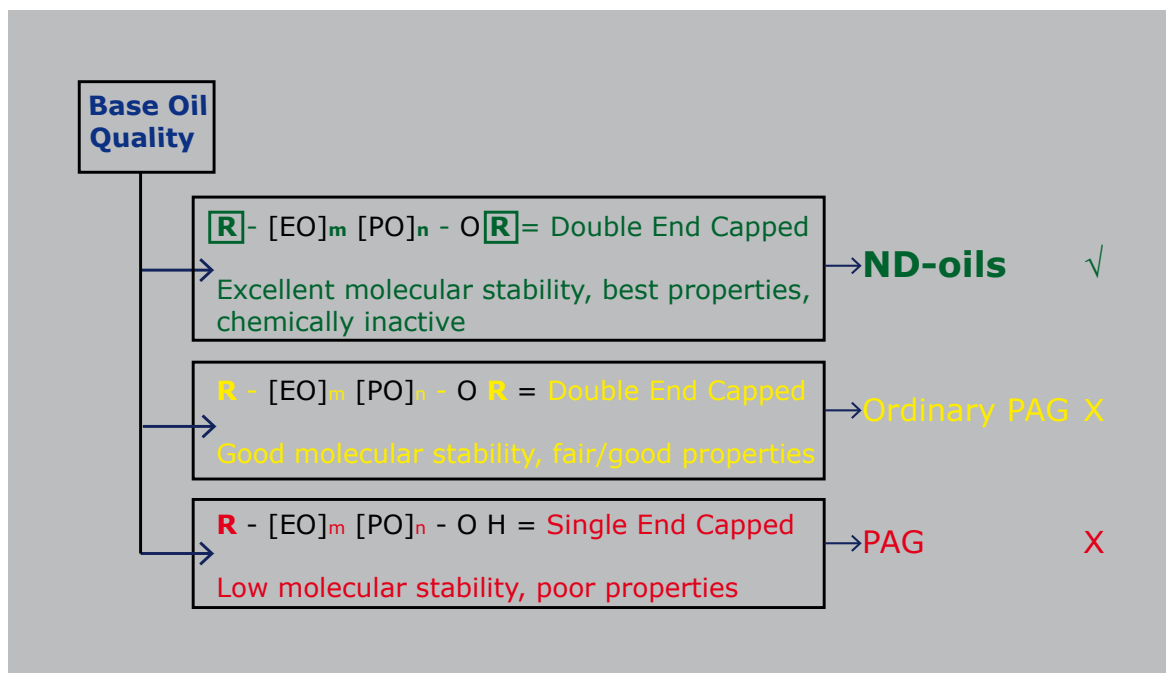
ND-oil 8 and ND-oil 12 are premium quality compressor oils, produced by Idemitsu Kosan Co., Ltd. This Japanese oil company operates on a global level and is active in different business domains like fuel, oils, basic chemicals and renewable energy. As a well-established specialist in mineral and synthetic oil based lubricants, Idemitsu ranks as the world's leading manufacturer of PAG oils for vehicle air conditioning systems.

Idemitsu developed and produces ND-oil 8 and ND-oil 12 according to the strict and specific requirements from DENSO Thermal Systems. This makes ND-oil 8 and ND-oil 12 unique and is therefore exclusively sold by DENSO.

What makes ND-oil 8 & ND-oil 12 so unique?

Let's start with the base oil. Polyalkylene Glycol (PAG) is a mixture of alcohol (R-OH), ethylene oxide (EO) and propylene oxide (PO). The base oil for ND-oil 8 and ND-oil 12 is a unique formulation of these three components. ND-oil 8 and ND-oil 12 differ from any other (ordinary) PAG oil due to the use of high quality alcohol (R-OH) and the specific chain structure of [EO]_n and [PO]_n components. The production process of this chain structure and premium quality alcohol used in this mixture, is more expensive when compared to (ordinary) PAG oils.

The unique formulation of the base oil (see below diagram) gives the DENSO oils the highest possible performance properties. The DENSO oils provide unsurpassed lubricity, wear protection, chemical and thermal stability and proper miscibility with R134a or R1234yf type refrigerants. In our next publication, we will further explain these unique properties, like polarity, viscosity index, etc.

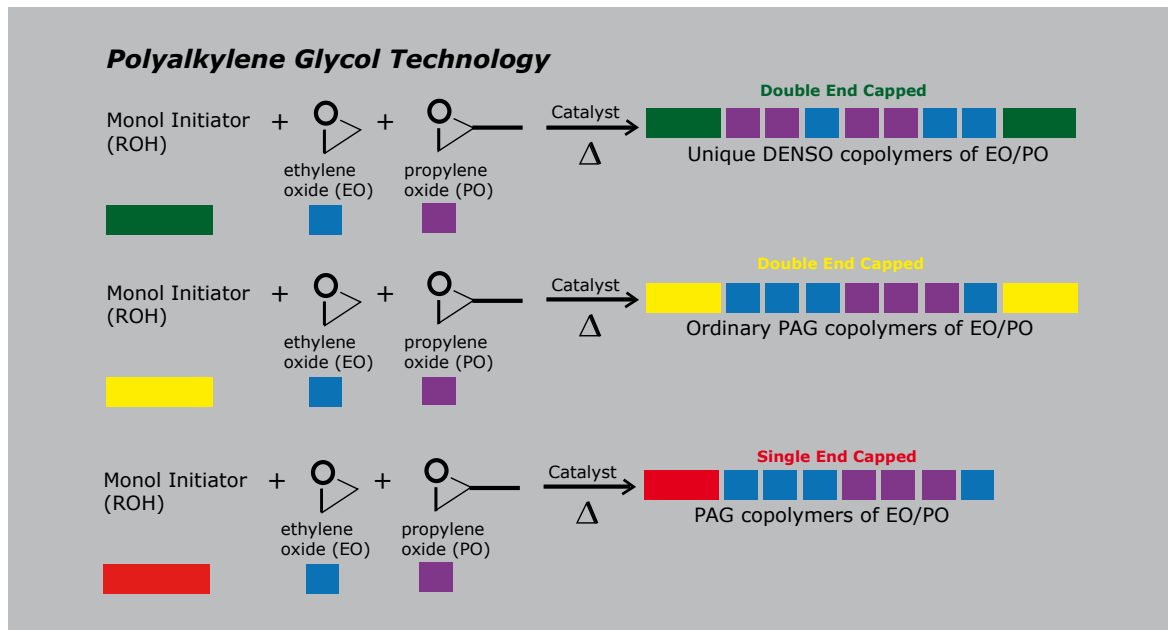


The quality of the base oil of ND-oils (green), clearly exceeds the quality of the other (ordinary) PAG oils.



The unique structure in detail explained

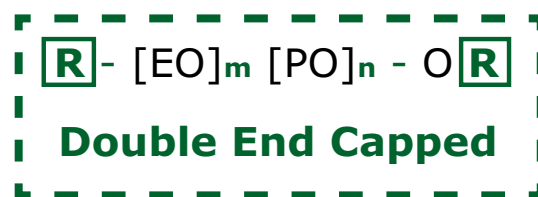
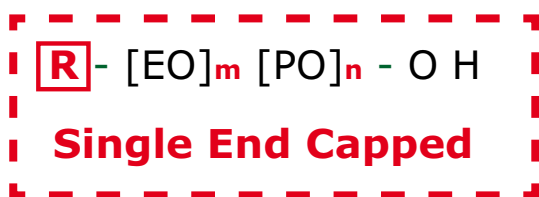
In below diagram this unique structure of the three main components (ROH / EO / PO) is visualised. The main chain of copolymers (EO/PO) of ND-oil 8 & ND-oil 12 clearly differs from the (ordinary) PAG oils. Together with the premium quality alcohol, this unique formulation requires a complex production process, which (also) explains why ND-oil 8 & ND-oil 12 are more expensive than any other (ordinary) PAG oil offered to the Independent Aftermarket.



There is no equivalent of ND-oil 8 & ND-oil 12, due to their unique formulation.

What means Double End Capped?

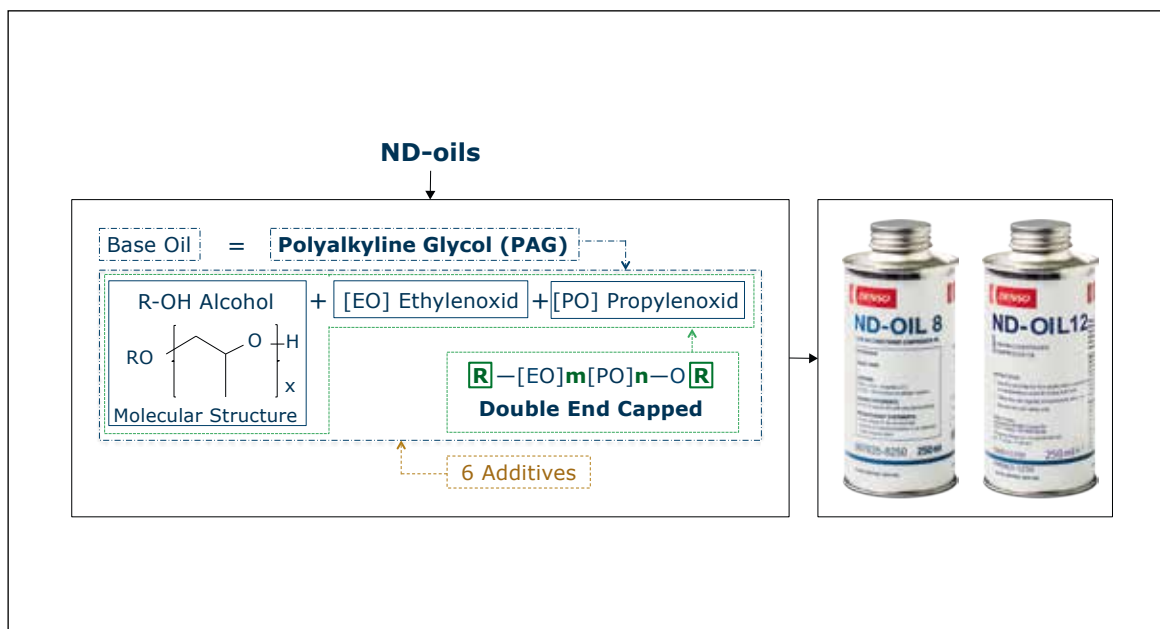
The chemical structure of this unique formulation differs from (ordinary) PAG oils. PAG oils are mostly Single End Capped oils. Denso ND-oil 8 and ND-oil 12 are Double End Capped oils. This means that the main chemical chain of the formulation is capped on both sides, while with Single End Capped oil, the main chemical chain is only closed at one side. The result is that the Single End Capped PAG oil is still chemical active, reacts with moisture, causing acid formation. This process devaluates oil performance causing earlier defect to hardware parts. While the Double-End Capped Denso ND-oil 8 and ND-oil 12 are chemically inactive and stable, resistant to moisture, keeping long-lasting lubrication performance to the highest level.



Double End Capped versus Single End Capped



Why you should choose ND-oil 8 or ND-oil 12



By adding a specific DENSO additive package, the DENSO ND-oils will then have the best possible properties and therefore maximum lubricity performance under all conditions and within a wide (extreme) temperature range. Due to this unique formulation and structure, DENSO ND-oils can't be compared with any other (ordinary) PAG oil, available on the Aftermarket.

Further details of DENSO's Thermal range are available online at www.denso-am.eu, on TecDoc or from your local DENSO Aftermarket contact.

DENSO EUROPE B.V.

Hogeweyselaan 165 | 1382 JL Weesp | The Netherlands
Tel. +31 (0)294 - 493 493 | Fax. +31 (0)294 - 417 122

www.denso-am.eu
www.denso-am.co.uk

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