INDUSTRIAL OILS
USER GUIDE

ISO Classification

What is ISO?

International Organization for Standardization (ISO) is a private NGO that has been founded in 1987 with its headquarters in Geneva. ISO members are national bodies of standardization from over 110 countries amongst which also Romania. Romania's representation in ISO is done by ASRO – the Romanian Association of Standardization, a public non-profit organization.

The ISO 3448 viscosity classification

ISO classification is recommended specifically for industrial applications. The reference temperature is of 40°C and it represents the operating temperature in machinery. Each subsequent Viscosity grade (VG) within the classification has approximately a 50% higher viscosity then that of the preceding one, and a viscosity range of ±10% from the mid-point is permitted. For example, ISO VG22 refers to a mid-point viscosity of 22 cSt at 40°C and a ±10% variation. The classification implies no quality evaluation and provides information only on the viscosity at 40°C. The viscosity at different temperatures can be calculated using the viscosity at 40°C and the viscosity index (VI), which represents the temperature dependency of the lubricant. Method descried by ASTM D2270.

ISO 3448	Kinematic viscosity @ 40°C [mm2/s]		
Viscosity grades	Middle value	Minimum	Maximum
ISOVG2	2,2	1,98	2,42
ISOVG3	3,2	2,88	3,52
ISOVG5	4,6	4,14	6,06
ISOVG7	6,8	6,12	7,48
ISOVG10	10	9,0	11,0
ISOVG15	15	13,5	16,5
ISOVG22	22	19,8	24,2
ISOVG32	32	28,8	35,2
ISOVG46	46	41,4	50,6
ISOVG68	68	31,2	74,8
ISO VG 100	100	90	110
ISO VG 150	150	135	165
ISO VG 220	220	198	242
ISO VG 320	320	288	352
ISO VG 460	460	414	506
ISO VG 680	680	612	748
ISO VG 1000	1000	900	1100
ISOVG1500	1500	1350	1650

DIN Classification

Deutsches Institut für Normung e.V (DIN) is the German organization responsible for quality classifications. It was founded in 1972 and is part of the TÜV Rheinland group as of 2005.

HYDRAULIC OILS

ISO 6743-4 CLASSIFICATION OF HYDRAULIC BASE OILS

ISO-L-HH Hydraulic oils, formulated from mineral oils without inhibitors

ISO-L-HL Standard quality oils used in oil circulation systems and in hydraulic circuits. They are formulated from paraffinic base oils with antioxidant and antirust additives

ISO-L-HM Superior quality oils used in all types of hydraulic systems formulated from paraffinic base oils with anti-wear, antirust, and antioxidant additives

ISO-L-HR HL type oils with a high viscosity index

ISO-L-HV Specially formulated oils to be used in hydraulic systems that require fluids with a high viscosity index and a low pouring point

ISO-L-HG HM type oils with shock absorption properties

ISO-L-HS Synthetic oils

DIN 51524 CLASSIFICATIONS

DIN 51524 Part 1 HL standard hydraulic oils, formulated from paraffinic base oils with antioxidant and antirust additives (ISO-L-HL)

DIN 51524 Part 2 HLP Superior quality hydraulic oils, formulated from paraffinic base oils with anti-wear, antirust, and antioxidant additives (ISO-L-HM)

DIN 51524 Part 3 HVLP (HVI) High index viscosity hydraulic oils, compatible with hydraulic systems that work in a variety of climates and temperatures (ISO-L-HV)

DIN 51524 Part HLPD High-performance hydraulic oils, formulated from base oils with anti-wear, antioxidant, antirust and detergent additives, which absorb a quantity of water without changing the properties of the oil. Recommended for use in places where oil contamination with water is possible (ISO-L-HM)

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INDUSTRIAL GEAR OILS

ISO 6743-6 CLASSIFICATION

CKB Mineral base oil that contains antioxidant, antirust and antifoaming additives
CKC CKB mineral base oils that contains anti-wear and extreme pressure additives
CKD CKC type base oil that can be used in high temperature with high degree of thermal and oxidation stability
CKE CKB type oil with a low friction coefficient
CKS Oil with anticorrosive and antifriction additives that can be used in extreme temperatures with a high degree of oxidation stability
CKT CKS type oil used in heavy-duty applications
CKG Grease with anti-wear properties that can be used in high-pressure applications
CKH bituminous oil with antirust properties
CKJ CKH type oil with anti-wear properties that can be used in high-pressure application
CKL Greases with good thermal stability and anti-wear, antirust additives that can be used in high-pressure applications
CKM Heavy-duty oils with antirust properties

DIN 51517 CLASSIFICATION

DIN 51517 Part 1 - C – Oil without additives used to lubricate through immersion
DIN 51517 Part 2 – CL- Industrial gear oil enhanced with anticorrosion, anti-wear, antirust and anti-oxidation additives
DIN 51517 Part 3 – CLP – Industrial gear oil with very good anticorrosion and anti-wear properties characteristic to friction points for continuous use and lubrication though immersion

TURBINE OIL

ISO 6743-5 CLASSIFICATION FOR STEAM TURBINES

ISO-L-TSA – highly refined mineral base oil that contains rust and oxidation inhibitors
ISO-L-TSE – TSA type oil for heavy-duty use
ISO-L-TSD – Oil based on phosphate esters that are fire retardant

ISO 6743-5 CLASSIFICATION FOR GAS TURBINES

ISO-L-TGA – Highly refined mineral base oil that contains rust and oxidation inhibitors
ISO-L-TBG – Highly refined minerals base oil that contains rust and oxidation inhibitors for turbines working at high temperatures
ISO-L-TBE – TGA type oil for heavy-duty use
ISO-L-TBF – TGB type oil for turbines that work heavy-duty at high temperatures
ISO-L-TBCH – Polyalphaolefin based turbine oil
ISO-L-TBCE – Ester based synthetic turbine oil

ISO 6743-5 CLASSIFICATION FOR TURBINES WITH COMBINED CYCLES

ISO-L-TGSB - Highly refined oil that contains rust and oxidation inhibitors that work at high temperature
ISO-L-TGSE - TGSB type oils for heavy-duty use that works at high temperatures

DIN 51515 CLASSIFICATION

DIN 51515 Part 1-L-TD- Oil for turbines operating at normal temperatures
DIN 51515 Part 2-L-TG- Oil for turbines operating at high temperatures

COMPRESSOR OIL

ISO 6743 -3A CLASSIFICATION

ISO-L-DAA- Selected paraffinic based oil for lubricating air compressors with antioxidant, antirust and anti-wear additives
ISO-L-DAB- Polyalphaolefin based oil for piston compressors enhanced with antioxidant, antirust, anti-wear additives that operate in medium loads
ISO-L-DAG- Selected paraffinic based oil specially formulated for the lubrication of air compressors with antioxidant, antirust and anti-wear additives
ISO-L-DAH- Polyalphaolefin based synthetic oil specially formulated for the lubrication of air compressors with antioxidant, antirust and anti-wear additives

DIN 51506 CLASSIFICATION

DIN 51506 VBL Oil for compressors operating at temperatures of up to 140°C
DIN 51506 VCL Oil for compressors operating at temperatures of up to 160°C
DIN 51506 VDL Oil for compressors operating at temperatures of up to 220°C