PRODUCT CATALOGUE

PARAMO

www.paramo.cz

Index

Introduction

PARAMO, a.s., which is a holder of certificates confirming correct aim of systems of quality management according to ČSN ISO 9001 standard and environmental standard EN ISO 14001, is a famous producer of fuels, automotive oils, metalworking fluids, technologic fluids and anti-corrosives, plastic lubricants, bitumens and road bitumens. During its producing activities, the company prefers removal or significant reduction of origins of potential risks for environment. In the case of PARAMO, responsible enterprise in chemistry is confirmed by four successful defenses of prestigious award Responsible Care.

The refinery transformed into a stock company from state enterprise PARAMO Pardubice in 1994. After the sale of a majority state share in PARAMO, a.s., to Unipetrol holding, a.s., it was integrated into the greatest petrochemical group in the Czech Republic. The year 2003 became further significant landmark for refinery in Pardubice, when PARAMO strengthened its position in the domestic and international market by merger completion with KORAMO Kolín. The year 2005 as well, because privatization of Czech petrochemistry was completed. PKN ORLEN and UNIPETROL united into one team with one goal.

The product catalogue which you have just opened presents current supply of automotive oils, industrial oils and metalworking, technologic and conservative agents. It includes also specifications of motor oils and you can also find advice how to select your oil correctly.

- ***Automotive oils***
- *Industrial oils*
- *Metal-working fluids, process oils and corrosion preventives*
- *Bituminous products for waterproofing*
- *Road bitumens*
- *Fuels*
- *Solid hydrocarbons*
- *Paramo contractual dealers*

PARAMO

MOTOR OILS SPECIFICATION

Viscosity

Viscosity is a variable magnitude which is dependent on temperature. During operation of automobile engine, among others, changes of operating temperatures take place. On behalf of a good performance of lubrication is the fact that oil viscosity should change in dependence on temperature as little as possible. This dependence is determined by so-called viscosity index. The higher the index is, the lower the dependence of viscosity on temperatures change is. The specification according to SAE (Society of Automotive Engineers, USA) is used for characteristics of viscosity attributes. For oils classification, this standard uses six winter classes labeled by a number and "W" (Winter) and five summer classes labeled by a number.

Winter classes: 0W, 5W, 10W, 15W, 20W, 25W

Summer classes: 20, 30, 40, 50, 60

The value of winter label determines oil attributes at low temperatures (e.g. SAE 15W oil has pumpability limit of -25°C).

The value of summer label determines oil use at summer temperatures. If only one class is used during labeling, it means that it concerns monograde oil (summer or winter). When the combination of summer and winter class is used (e.g. 5W-40), it concerns multigrade, or year-round oil. Presently, multigrade motor oils are nearly entirely used. SAE 15W-40 class is mostly used for our climatic zone.

Performance category

Performance category characterizes instant and long-term attributes of motor oil at various forms of operation stress. Various attributes are evaluated, e.g. oxidative stability, evaporation loss, protection against excessive wear and deposits, protection against corrosion, fuel economy, etc. The following standards are used for labeling performance category of motor oils:

a) classification API (American Petroleum Institute, USA)
b) classification ACEA (Association des Constructeurs Européens d´ Automobile, EU)
c) company standards of producers of engines and vehicles (VW, MB, MAN, VOLVO, TATRA)
d) classification MIL-L (U.S. Army standards)
e) other classifications (e.g. ILSAC))

Presently, the most significant specifications are API, ACEA and company standards of producers of engines and vehicles. CCMC classification is already obsolete and is mentioned only temporarily.

API classification

According to this standard, we distinguish motor oils according to their use to spark-ignition (gasoline) engines, labeled by the letter "S" (Service) and to compression ignition (diesel) engines, labeled by the letter "C" (Commercial). The majority of oils is usable for both types of engines and is thereafter labeled by a combination of both letters, e.g. SL/CF.

Performance classes for spark-ignition engines

SA Oils without additives for engines operating in moderate conditions with minimal load, produced in years 1940-1950.
SB Oils with additives against deposits creation for engines produced in years 1951-1963.
SC Oils with additives against deposits creation and low-temperature sediments for engines produced in years 1964-1967.
SD Additive oils with detergent and dispersive additives for engines produced in years 1968-1971.
SE Oils for heavy-duty engines manufactured between 1971 and 1979.
SF Oils for heavy-duty engines manufactured between 1980 and 1988.
SG Oils for engines manufactured between 1988 – 1993, which fulfill the most severe criteria to minimize wearing and creation of sludge.
SH Oils of the same attributes as SG are tested according to more demanding standards though. Designed for engines produced in 1996 and older.
SJ Oil for engines produced in 2001 and older.
SL Oils superceding API SJ by increased fuel economy and possibility of extended service intervals.
SM Oils of the highest quality superceding API SL by increased oxidative stability, higher protection against wear and deposits. It has been brought into operation since 2004.

Performance classes for compression ignition engines

CA Oils for non-turbocharged engines operating under good conditions, manufactured between 1940 and 1960.
CB Oils for non-turbocharged engines operating under moderate conditions, manufactured between 1949 and 1964.
CC Oils for moderately turbocharged engines operating under moderate conditions, manufactured between 1964 and 1970.
CD Oils for turbocharged, heavy-duty engines manufactured between 1970 and 1979. These oils contain additives against high-temperature sludge and bearing corrosion.
CD-II Oils for two-stroke engines.
CE Oils for high-performance, heavy-duty, high-speed turbocharged engines manufactured after 1983.
CF Oils with improved properties replacing CD oils for engines with indirect fuel injection.
CF-2 Oils for two-stroke engines. These oils contain additives against excessive wear and deposits.
CF-4 Oils for heavy-duty engines of very large trucks operating under extreme conditions. Introduced in 1990.
CG-4 Oils for engines produced from 1995 with emphasis to meet emission limits. Oils for heavy-duty, high-speed engines operating under extreme road and terrain conditions.
CH-4 Oils for heavy-duty, high-speed engines operating under extreme road and terrain conditions. Introduced in 1998.
CI Introduced in 2002. Oils for high speed heavy duty engines with re-circulation of exhaust fumes (EGR) meeting emission limits set from 2004.

ACEA classification

ACEA – In 1991, Association of European Automobile Designers – replaced CCMC – Committee of Automobile Designers, which originated in 1972 as a reaction against the fact that API specifications do not entirely comply with European engine types, which differ from the American ones by construction. Since 2004, ACEA classification has been dividing motor oils into three groups:

– oils for spark-ignition and light compression ignition engines labeled as "A/B";
– oils compatible with catalytic converters for spark-ignition and compression ignition engines, labeled as "C";
– oils for high-performance compression ignition engines, labeled as "E".

Performance degree is specified by a number. Presently, the following performance classes ACEA are used:

Oils for spark ignition and light compression ignition engines

A1/B1 Oils with protective additives against creation of piston deposits, sludge, excessive wear and high-temperature oxidation. These oils meet requirements on light run and economy on fuel. They are suitable only for some engines.
A3/B3 Oils for heavy-duty spark-ignition engines, compression ignition engines and for extended service intervals, as recommended by engine manufacturer.
A3/B4 Oils for heavy-duty spark-ignition engines, compression ignition engines and for extended service intervals, as recommended by engine manufacturer, also suitable for use described in B3 category.
A5/B5 Highly stable oils for extended service intervals in heavy-duty spark-ignition engines and compression ignition engines. These oils meet requirements on light run and economy on fuel. They are suitable only for specially designed engines.

Oils compatible with catalytic converters – for spark-ignition and compression ignition engines

C1 Oils designed for use with catalytic converters DPF (Diesel Particulate Filter) and TWC (Three Way Catalyst) in highly efficient engines requiring low-viscosity oil with low SAPS (chemical limits) and with viscosity at high temperature and shear stress (HTHSV) higher than 2.9 mPa.s. Oils prolong lifetime of catalytic converters and reduce fuel consumption. They are suitable only for specially designed engines.
C2 Oils for use with catalytic converters DPF and TWC in highly efficient engines designed for low-viscosity oils with HTHSB higher than 2.9 mPa.s. Oils prolong lifetime of DPF and TWC catalytic converters and reduce fuel consumption. They are suitable only for specially designed engines.
C3 Oils for use with catalytic converters DPF and TWC in highly efficient engines. They prolong lifetime of DPF and TWC catalytic converters. They are suitable only for specially designed engines.

Oils for compression ignition engines of trucks

E2 Oils of common use for non-turbocharged and turbocharged medium-duty or heavy-duty engines, and with normal service intervals.
E4 Oils providing excellent protection of piston purity – against wear and soot. They are recommended for highly efficient engines, fulfilling emission requirements Euro 1, Euro 2, Euro 3 and Euro 4, operating in demanding conditions, e.g. extended service intervals, according to recommendation of engine producer. They are suitable for engines without filter of solid particles and for particular engines equipped with recirculation of exhaust gases, or with SCR (Selective Catalytic Reduction NOx) system, according to recommendation of engine producer.
E6 Oils providing excellent protection of piston purity – against wear and soot. They are recommended for highly efficient engines, fulfilling emission limits Euro 1, Euro 2, Euro 3 and Euro 4, operating in demanding conditions, e.g. extended service intervals, according to recommendation of engine producer. They

are suitable for engines equipped with recirculation of exhaust gases, without or with filters of solid particles and for engines with SCR systems. E6 – quality especially recommended for engines with filters of solid particles and it is qualified in a combination with fuel with low sulphur content (max. 50 ppm). Always follow recommendations of engine producer.

E7 Oils providing efficient protection of purity and against pistons smoothing. They further provide improved protection against wear, deposits and soot. They are recommended for highly efficient engines, fulfilling emission limits Euro 1, Euro 2, Euro 3 and Euro 4 operating in demanding conditions, e.g. extended exchange intervals, according to recommendation of the engine producer. They are available for engines without filter of solid particles and for majority of engines equipped with recirculation of exhaust gases, or with SCR system, according to recommendation of engine producer.

Note: Categories A2 and B2 are not included in the present issue. They are still valid in the last version till the automobiles producers will be mentioned in service books. Category E3 and E5 are replaced by categories E6 and E7.

Legend:	DPF (Diesel Particulate Filter)	– filter of solid particles
	TWC (Three Way Catalyst)	– three operation catalytic converter
	EGR (Exhaust Gas Recirculation)	– exhaust gases recirculation
	SCR (Selective Catalyst Reduction)	– selective catalyst reduction of NOx – modification of content of exhaust gases by urea (agent AdBlue = 32.5% water solution of urea

Classifications of automobile and engine manufacturers

Many automobile and engine manufacturers require from motor oils fulfillment of further requirements, which are not included in the procedures of the previous classifications.

The following procedures are best known:

VW 501.00	– light-duty motor oils for gasoline and non-turbocharged compression ignition engines;
VW 500.01	– common motor oils for gasoline and non-turbocharged compression ignition engines;
VW 502.00	– light-duty oils for gasoline engines;
VW 503.00	– light-duty and standard oils for gasoline engines with extended service intervals;
VW 505.00	– oils for non-turbocharged and turbocharged compression ignition engines;
VW 505.01	– oils for non-turbocharged and turbocharged compression ignition engines including pump-jet engines;
VW 506.00	– light-duty and standard oils for compression ignition engines with very long exchange period;
VW 506.01	– light-duty oils for diesel engines TDi (pump-jet), extended exchange intervals;
VW 504.00	– light-duty oils for gasoline engine, reduction of sulphate ash, extended service intervals;
VW 507.00	– light-duty oils for compression ignition engines, reduction of sulphate ash, extended service intervals;
MB 228.1	– oils for non-turbocharged and turbocharged compression ignition engines;
MB 228.3	– oils for non-turbocharged and turbocharged compression ignition engines of cars and trucks, suitable for long-distance transportation and extended service intervals;
MB 228.5	– for similar area of use as MB 228.3, but with higher use attributes – further possible extending of service intervals in light classes up to 45.000 km, in heavy classes up to 160.000 km (service indicator);
MB 228.51	– oils for trucks, reduction of sulphate ash, sulphur and phosphorus, approximately corresponds to ACEA E6;
MB 229.1	– oils for spark-ignition and compression ignition engines of cars (higher requirements compared to ACEA A2-96/A3-96 and B2-96/B3-96);
MB 229.3	– oils for cars with extended service intervals (30.000 km);
MAN 271	– approximately corresponds to ACEA E2;
MAN M3275	– approximately corresponds to ACEA E3;
MAN M3277	– approximately corresponds to ACEA E4; comparable with MB 228.5.
MAN M3477	– approximately corresponds to ACEA E6; comparable with MB 228.51.

Classification of oils for spark-ignition two-stroke engines

Motor oils for two-stroke engines of bikes, mopeds, scooters, mowing-machines and chainsaws are frequently classified according to standards API (USA) and JASO (Japan):

API TA	oils for mopeds and other small engines;
API TB	oils for scooters and other high-load engines between 50 and 200 ccm;
API TC	oils for high-load, high-speed engines;
JASO FA	oils for mopeds and other small engines;
JASO FB	oils for scooters and other high-load engines 50 up to 200 ccm;
JASO FC	oils for high-load, high-speed engines.

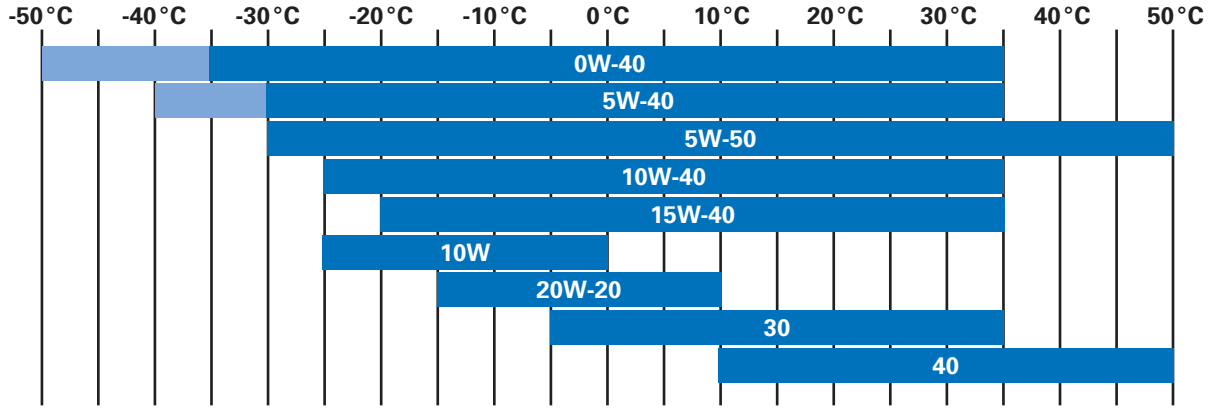
Viscosity grades of motor oils according to SAE J300 (7/2001)

Viscosity class SAE	Attributes at low temperatures				High temperature properties		
	Dynamic viscosity		Pump. limit		Kinematic viscosity at 100°C		HTHS viscosity*
	(mPa.s)	Max. at °C	(mPa.s)	Max. at °C §	Min. ($mm^2.s^{-1}$)	Max.($mm^2.s^{-1}$)	Min.($mm^2.s^{-1}$)
0W	6 200	-35	60 000	-40	3,8		
5W	6 600	-30	60 000	-35	3,8		
10W	7 000	-25	60 000	-30	4,1		
15W	7 000	-20	60 000	-25	5,6		
20W	9 500	-15	60 000	-20	5,6		
25W	13 000	-10	60 000	-15	9,3		
20					5,6	< 9,3	2,6
30					9,3	< 12,5	2,9
40a					12,5	< 16,3	2,9
40b					12,5	< 16,3	3,7
50					16,3	< 21,9	3,7
60					21,9	< 26,1	3,7

a) = 0W-40, 5W-40 a 10W-40
b) = 15W-40, 20W-40, 25W-40 a 40

§ = limit temperature of pumpability *) = at 150 °C

Recommended viscosity SAE motor oils classes based on outside temperature.



How to select the right motor oil?

1. First principle during selection of motor oil is to follow recommendations of automobile producer, included in a manual in every car. Only the producer of engine (of automobile) can responsibly say which oil can be used. Practically no producer recommends certain oil brand (it contradicts the economic competition in European Union acts). Producers (of automobiles) recommend oils according to so-called performance specification, e.g. API SH/CD, ACEA A3, VW 505.00, MB 229.1 and viscosity specification SAE, e.g. 15W-40, 10W-40. Service intervals are specified for these recommended oils.
2. For oils of the same performance specification, there is the same exchange period recommended (for gasoline engines mainly 15 000km, for personal compression ignition engines mainly between 8 – 15 000 km).
3. If you do not have car owner's manual, ask the producer (in the Czech head office of automobile importer). Remember, the automobile producer does not recommend oil brand, only performance and viscosity specification.
4. If the oil does not fulfill performance and viscosity specification (or higher specification) it can be used. Higher performance level does not matter, but it is mainly more expensive and doesn't bring much.
5. If you change oil of low performance specification (M5AD, M6AD) for new oil with high-performance, shorten the first oil service interval in order to cleanse the engine and remove deposits.
6. Do not mix mineral oils ((SAE 15W-40, 15W-50, 20W-30, 40) with synthetic oils (SAE 0W a 5W-30,40, 50).

Our oils offer you excellent quality for very beneficial price. Spend your money wisely!

TRYSK RACING

TRYSK RACING

Year-round fully synthetic oil of excellent performance. It is designed for lubrication of most modern gasoline and compression ignition engines of cars, including sport and racing modification, equipped with multi-valve technology and catalytic converters.

SAE	API	ACEA	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
5W - 40	SL/CF	A3, B3, B4	14,2	–40	855

Corresponds to performance specifications: VW 502.00/505.00, MB 229.3.

Advantages of use:

- carefree startability also at temperatures around -35°C;
- instant lubrication of all engine parts;
- fuel economy, emissions reduction;
- extending of catalytic converter lifetime;
- excellent resistance against formation of deposits and sludge;
- high thermal stability.

TRYSK SPEED

SAE	API	ACEA	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
10W - 40	SL/CF	A3, B3	14,5	–33	876

Corresponds to performance specifications: VW 500.00/505.00, MB 229.1.

Advantages of use:

- carefree startability also at temperatures around -30°C;
- instant lubrication of all engine parts;
- fuel economy, emissions reduction;
- extending of catalytic converter lifetime;
- excellent resistance against formation of deposits and sludge;
- high thermal stability.

TRYSK SUPER TURBO

Year-round motor oils of a type "mixed fleet" of the highest performance. It is extremely suitable not only for lubrication of modern gasoline and compression ignition engines of cars, but also for highly turbocharged engines of trucks.

SAE	API	ACEA	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
15W - 40	CG-4/SJ	A2, B3, E2	13,5	–30	885

Corresponds to performance specifications: VW 505.00, MB 228.1/229.1, MAN 271, VOLVO VDS, MTU TYPE 1, TEDOM 258-2(B). TATRA TDS 30/12, AVIA, ZETOR

Advantages of use:

- carefree startability also at temperatures around -25°C;
- reduction of oils range;
- prevention of deposits creation;
- fulfillment of emission limits;
- extension of intervals for oil change;
- ideal for mixed fleet.

MOTOR OILS FOR MIXED FLEET

TRYSK SUPER TURBO

Year-round motor oils of a type "mixed fleet" of the highest performance. It is extremely suitable not only for lubrication of modern gasoline and compression ignition engines of cars, but also for highly turbocharged engines of trucks.

SAE	API	ACEA	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
15W - 40	CG-4/SJ	A2, B3, E2	13,5	–30	885

Corresponds to performance specifications: VW 505.00, MB 228.1/229.1, MAN 271, VOLVO VDS, MTU TYPE 1, TEDOM 258-2(B). TATRA TDS 30/12, AVIA, ZETOR

Advantages of use:

- carefree startability also at temperatures around -25°C;
- reduction of oils range;
- prevention of deposits creation;
- fulfillment of emission limits;
- extension of exchange oil periods;
- ideal for mixed fleet.

TRYSK SUPER

Year-round motor oils of a type "mixed fleet". It is suitable not only for lubrication of modern gasoline and compression ignition engines of cars, but also for highly turbocharged engines of trucks.

SAE	API	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
15W - 40 20W - 40	SG/CF-4	13,5	–30	885

Corresponds to performance specifications: MB 227.1, TEDOM 258-1

Advantages of use:

- carefree startability also at temperatures around -25°C, in some case -20°C;
- reduction of oils range;
- prevention of deposits creation;
- fulfillment of emission limits;
- acceptable price.

MOTOR OILS FOR TRUCKS

TRYSK GLOBAL

Excellent semi-synthetic UHPD oil designed for lubrication of highly turbocharged compression ignition engines operating under the extremely demanding conditions. It is suitable for most modern engines of European and American origin.

SAE	API	ACEA	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
10W - 40	CF	E4	14.3	–36	875

Corresponds to performance specifications: MB 228.5, MAN 3277, VOLVO VDS-2, SCANIA LDF, MACK EO-L, MACK T9, MTU Type 3, RENAULT RDX

Advantages of use:

- carefree startability also at temperatures around -30°C;
- reduction of engine wear;
- prevention of deposits creation;
- maximum extension of exchange oil periods;
- fuel economy;
- low consumption of oil;
- fulfillment of emission limits.

Classification according to Act number 434/2005, Collection, see safety data sheet

TRYSK TOP TIR FE

Year-round SHPD motor oil of highest quality. It is designed for lubrication of highly turbocharged compression ignition engines operating in most demanding operation conditions especially for international transport.

SAE	API	ACEA	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
10W - 40	CI-4/SL	E7, E5, E3, B3, B4, A3	14.5	–39	875

Corresponds to performance specifications: MB 228.3/229.1, MAN 3275, VOLVO VDS-3, MTU Type 2, Cummins CES 20076/7/8, Caterpillar ECF1

Advantages of use:

- carefree startability also at temperatures around -30°C;
- reduction of engine wear;
- prevention of deposits creation;
- extension of intervals for oil change;
- fuel economy;
- fulfillment of emission limits;
- universal use for mixed fleet.

TRYSK TOP TIR

Year-round SHPD motor oil of highest quality. It is designed for lubrication of highly turbocharged compression ignition engines operating in most demanding operation conditions especially for international transport.

SAE	API	ACEA	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
15W - 40	CI-4/SL	E5, E3, B3, B4, A3	14.3	–30	890

Corresponds to performance specifications: MB 228.3/229.1, MAN 3275, VOLVO VDS-3, Cummins 20076/7/8, DHD-1, DLD-3

Advantages of use:

- carefree startability also at temperatures around -25°C;
- reduction of engine wear;
- prevention of deposits creation;
- extension of intervals for oil change;
- fulfillment of emission limits.

OLDER TYPES OF MOTOR OILS

Year-round: TRYSK STABIL M7ADX

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
15W - 40	SF/CC	13.8	–30	890

Year-round: TRYSK M8AD

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
15W - 50	SE/CC	17.5	–30	890

Year-round: TRYSK M5AD

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
20W - 30	SC/CB	12.5	–30	895

F: TRYSK M6ADS III

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
40	SF/CF	13.5	–25	900

Monograde: TRYSK M6ADS II PLUS

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
30	SF/CD	11.1	–24	900

Monograde: TRYSK M9ADV

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
40	CB	13.6	–21	900

Monograde: TRYSK M6AD

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
40	SC/CB	13.7	–24	895

Monograde: TRYSK M6A

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
30	SB	10.6	–24	895

MOTOR OILS FOR TWO-STROKE ENGINES

TRYSK M2T SUPER

Year-round oil designed for lubrication of modern high-speed two-stroke engine including sports versions, mowing machines and chain saws.

API	JASO	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
TC	FC	10.7	–24	880

Advantages of use:

- excellent anti-corrosion protection;
- prevention of deposits creation;
- stability of oil film.

TRYSK M2T

Year-round oil designed for lubrication of older types of two-stroke engines.

API	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
TB	17.0	–24	905

GEAR OILS SPECIFICATION

Viscosity

The specification according to SAE (Society of Automotive Engineers, USA) is used for characteristics of viscosity attributes of gear oils. This standard is used for classification of oils of four winter classes, labeled by a number and "W" (Winter) and five summer classes labeled by a number.

Winter classes: 70W, 75W, 80W, 85W.

Summer classes: 80, 85, 90, 140, 250.

If only one class is used during labeling, it means that it concerns monograde oil (summer or winter). When there is a combination of summer and winter class (e.g. 80W-90), it concerns multigrade oil or year-round. More often, the producers require monograde gear oils, compared to motor oils.

Performance categories

API (American Petroleum Institute, USA) classification is used for labeling of performance categories of gear oils. Labeling of performance class consists of letters "GL" (Gear Lubricant) and a number which characterizes six performance levels.

Presently, the following efficiency classes are used:

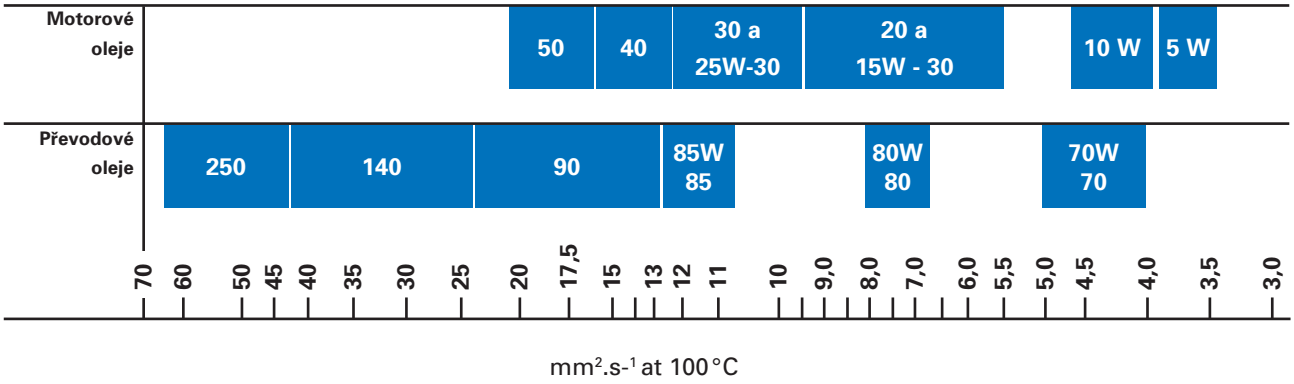
GL – 3 low-additive oils for manual gearboxes with medium stress;
GL – 4 high-additive oils designed mainly for manual gearboxes and light-duty hypoid gearboxes;
GL – 5 oils designed for heavy-load hypoid gearboxes, operating in most demanding operating conditions, exposed to variable impact loading;
GL – 6 oils for hypoid gearboxes operating in extreme conditions. They are rarely used.

API GL-5 and GL-6 oils are not suitable for use in manual gearboxes, even though they have higher performance class than API GL-4, because synchronization may be damaged due to sticking.

Similarly as in case of motor oils, norms of particular gearboxes producers exist, but they are mainly applied at specification of demands on oils for automatic gearboxes (Voith, ZF, GM, Ford, Allison).

Comparison of SAE viscosity classifications of gear and motor oils

Change graph inside: Motor oils, Gear oils



$mm^2.s^{-1}$ at 100 °C

Viscosity grades of gear oils according to SAE J306A

SAE degree	Max. temperature for dynamic viscosity 150 Pas, s (°C)	Kinematic viscosity at 100 °C min.	
		($mm^2.s^{-1}$)	Max. ($mm^2.s^{-1}$)
70W	–55	4.1	–
75W	–40	4.1	–
80W	–26	7.0	–
85W	–12	11.0	–
80	–	7.0	< 11
85	–	11.0	< 13,5
90	–	13.5	< 24
140	–	24.0	< 41
250	–	41.0	–

GEAR OILS

How to select the right gear oil?

1. First principle during selection of gear oil is to follow suggestions of automobile producer, included in car owner's manual in every car. Only the producer of gearbox (of automobile) can responsibly say which oil can be used. Practically no producer recommends certain oil brand (it contradicts with the economic competition in European Union acts). Car producers recommend oils according to so-called performance specification, e.g. API GL-4, API GL-5, VW TL 726 Y and viscosity specification SAE, e.g. 75W, 80W-90.
2. For synchronized gearboxes, there are mainly used oils API GL-4, for hypoid gearboxes API GL-5. Do not use oils API GL-5 instead of API GL-4 oils and vice versa, you may damage synchronization, alternatively hypoid gearboxes.
3. Exchange periods are specified for these oils. Manual gearboxes of cars mainly use lifetime fillings.
4. If you do not have car owner's manual, ask the producer (in the Czech head office of automobile importer). Remember, the automobile producer does not recommend oil brand, only performance and viscosity specification.

Our oils offer you excellent quality for very beneficial price. Spend your money wisely!

GYROL SYN 75W-90

Gear oil GYROL SYN 75W-90 is fully synthetic oil containing in optimal composition most modern additives which guarantee fulfillment of corresponding requirements of producers and operators of gearboxes and universality of use. GYROL SYN 75W-90 is marked with extreme protection against sticking, it has an excellent oxidative stability, shear stability, ability to transform high pressures, it does not foam, it protects metals against corrosion and is compatible with sealing materials. It has excellent viscous-thermal conditions, i.e. excellent fluidity also at -40°C and sufficiently high viscosity at temperatures around 100°C and higher. Its shear remains the same in all operating conditions and it is marked with efficient damping of gearboxes noises. Gear oil GYROL SYN 75W-90 is designed as year-round and lifetime filling of gearboxes of engine vehicles, especially personal vehicles and commercial vans and vehicles with all-wheel drive. Regarding its unique composition, gear oil GYROL SYN 75W-90 can be used for synchronized gearboxes where it shows excellent tolerance with materials of synchronization, and for extremely stressed hypoid gearboxes, where its excellent high pressure attributes are demonstrated.

SAE	API	Viscosity at 100°C mm^2/s	Pour point °C	Density kg/m^3
75W - 90	GL-3/GL-4/GL-5	15.2	–42	875

Advantages of use:

- minimum gearbox wear;
- fuel economy;
- excellent low-temperatures attributes;
- lifetime gearbox fill;
- easy shifting;
- noise reduction;
- use universality;
- compatibility with seal materials.

GYROL SYN 75W-LF

Year-round oil for automobile gearboxes. GYROL 75W LF is designed for lifetime fill. It possesses ŠKODA approval and fulfills requirements of central standard VW TL-726 Y.

SAE	API	MIL - L	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
75W	GL-4	-	6.9	–42	880

Approved: ŠKODA Auto, a.s.

Advantages of use:

- minimum gearbox wear;
- fuel economy;
- excellent low-temperatures attributes;
- lifetime gearbox fill;
- easy shifting;
- compatibility with seal materials.

GYROL 80W-90

Year-round oil designed for lubrication of mechanical gearboxes with frontal or spiral gearing operating from low up to high speeds and loads. Oils can be alternatively used where oil SAE 80W or SAE 90 is recommended.

SAE	API	MIL - L	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
80W-90	GL-4	2105	13.9	–33	890

Advantages of use:

- year-round usage;
- excellent anti-corrosion properties;
- very good anti-abrasion properties;
- low foaming;
- compatibility with seal materials.

GYROL 80W-90H

Year-round oil designed for lubrication of mechanical gearboxes with hypoid gear design operating at conditions of various combinations of high speeds and high or impact load, for which the oil in the range of viscosity grades 80W-90 are recommended.

SAE	API	MIL - L	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
80W-90	GL-5	2105D	14.8	–33	890

Advantages of use:

- year-round fill;
- excellent anti-corrosion properties;
- very good anti-abrasion properties;
- low foaming;
- compatibility with seal materials.

GYROL 85W-140H

Year-round oil designed for lubrication of mechanical gearboxes with hypoid gear design operating at conditions of various combinations of high speeds and high or peaking load, for which the oil in the range of viscosity grades 85W-140 is recommended.

SAE	API	MIL - L	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
85W - 140	GL-5	2105D	27.5	–18	910

Advantages of use:

- year-round fill;
- excellent anti-corrosion properties;
- very good protection against wear;
- compatibility with seal materials;
- favorable viscosity properties;
- low foaming.

GYROL 80W

Oil for mechanical gearboxes and axle drives of modern automobiles.

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
80W	GL-4	8.2	–33	900

Advantages of use:

- good flowing property at low temperatures;
- excellent anti-corrosion properties;
- very good protection against wear;
- resistance against foaming;
- compatibility with seal materials.

GYROL 90

Oil for mechanical gearboxes and axle drives of modern automobiles if they require higher viscosity of gear oil.

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
90	GL-4	15.6	–27	905

Advantages of use:

- excellent anti-corrosion properties;
- very good protection against wear;
- resistance against foaming;
- compatibility with seal materials;
- low pour point.

GYROL 90H

Oil for mechanical gearboxes with hypoid gear design if they require higher viscosity of gear oil.

SAE	API	Viscosity at 100 °C mm²/s	Pour point °C	Density kg/m³
90	GL-5	15.6	–30	905

Advantages of use:

- excellent anti-corrosion properties;
- very good protection against wear in conditions of high load;
- resistance against foaming;
- compatibility with seal materials;
- low pour point.

AUTOMATIC TRANSMISSIONS FLUIDS

GYROL ATF DIII

Semi-synthetic oil designed for most modern automatic gearboxes. Due to its complex attributes it is usable also in manual gearboxes, hydraulic and lubricating circles with increased requirements for lubricating attributes. It fulfills requirements of specifications GM DEXRON III, VOITH, FORD MERCON, ALLISON C-4, CATERPILLAR TO-2, ZF TE-ML 02F, 03D, 04D, 11B, 14A.

Voith	GM	FORD	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
G 607	DEXRON III	Mercon	8.0	–45	860

Advantages of use:

- excellent anti-corrosion properties;
- excellent viscosity attributes;
- excellent oxidation and thermal stability;
- compatibility with seal materials.

GYROL ATF DIID

Semi-synthetic oil designed for modern automatic gearboxes. Due to its complex attributes it is usable also in manual gearboxes, hydraulic and lubricating circles with increased requirements for lubricating attributes. It fulfills requirements of specifications GM DEXRON IID, FORD MERCON, ALLISON C-4, VOITH G607, ZF TE-ML 11A.

Allison	GM	ZF TE-ML	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
C-4	DEXRON IID	11A	7.5	–42	870

Advantages of use:

- excellent anti-corrosion properties;
- excellent viscosity attributes;
- excellent oxidation and thermal stability;
- compatibility with seal materials.

GEAR OILS FOR AGRICULTURE

GYROL UTTO

Universal oil designed for lubrication of gearboxes, wet disc brakes and as a fill for hydraulic systems.

SAE	API	MIL - L	Viscosity at 100 °C mm^2/s	Pour point °C	Density kg/m^3
80W	GL-4	2105	11.1	–39	890

Fulfills the following performance specifications: FORD M2C 86C, MASSEY FERGUSON CMS M 1141/CMS 1143, John Deere J20C, ZETOR, CNH MAT 3525, ZF TE- ML-03E/05F

Advantages of use:

- reduction of oils range;
- excellent anti-abrasion attributes;
- excellent anti-corrosion properties;
- prevents gears squeezing.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

- *Automotive oils*
- ***Industrial oils***
- *Metal-working fluids, process oils and corrosion preventives*
- *Bituminous products for waterproofing*
- *Road bitumens*
- *Fuels*
- *Solid hydrocarbons*
- *Paramo contractual dealers*

PARAMO

INDUSTRIAL OILS

Under overall name "industrial oils", we understand a big group of lubricating oils, which apply in a wide use during lubrication of machines and equipment operated in industry, energetics, mining industry, construction, agriculture, etc. Industrial oils are divided into several main groups, which names arise from characteristics and use of these oils. We therefore distinguish bearing, turbine, compressor, gearing, hydraulic, cylindrical, dark oil, oil for slideways, etc.

Industrial oils are supplied in railway tanks, auto tanks, 1 000-liter containers, 200-liter drum, 10-liter canisters, alternatively in other packing after an agreement with a customer. They do not contain chlorine or other industrial harmful pollutants.

Standard bearing oils PARAMO OL-B

ISO VG (15), (32), 46, (68), (100); ISO 6743: ISO-L-AN
DIN 51 502: AN

PARAMO OL-B are petroleum oils without additives. They are produced in various viscosity grades.

TYPICAL PARAMETERS	OL-B1	OL-B2	OL-B4	OL-B5	OL-B7
Viscosity at 40 °C (mm²/s)	19	30	46	75	115
Pour point (°C)	-15	-15	-9	-9	-9
Flashpoint (°C)	180	210	220	240	250
TAN (mg KOH/g)	0,05	0,05	0,05	0,05	0,05

Use:

- short-term lubricating systems;
- machinery parts lubrication with loss;
- technological purposes;
- quenching (OL-B4);
- flushing of circulation systems during oil fill exchange (OL-B2).

Premium bearing oils PARAMO OL-J

ISO VG 3, 10, 22, 32, 46, 68, 100; ISO 6743: ISO-L-FC
DIN 51 502: C

PARAMO OL-J are highly refined oils containing anti-oxidation and anti-foaming additives.

TYPICAL PARAMETERS	OL-J3	OL-J10	OL-J22	OL-J32	OL-J46	OL-J68	OL-J100
Viscosity at 40 °C (mm²/s)	3	10	22	32	46	68	100
Viscosity index	-	90	95	95	92	92	90
Pour point (°C)	-18	-21	-24	-24	-24	-21	-9
Flashpoint PM (°C)	83	-	-	-	-	-	-
Flashpoint OK (°C)	-	185	210	225	230	255	265
Aniline point (°C)	-	90	100	100	100	100	110

Use:

- long-term fill of lubricating systems of machines;
- spindles (OL-J3, OL-J10);
- bearings, gears;
- fillings of hydrostatic equipment (OL-J22, 32, 46 – class HH);
- quenching.

Bearing oil with PARAMO OL-P 03 additive (spindle)

ISO VG 3: ISO 6743: ISO-L-FD
DIN 51 502 : C

PARAMO OL-PO3 is highly refined oil, containing anti-oxidation, anti-abrasive and anti-foaming additives.

TYPICAL PARAMETERS:	OL-P03
Viscosity at 40 °C (mm²/s)	3
Pour point (°C)	-30
Flashpoint PM (°C)	83
Corrosive interaction on metals Steel at 20 °C/24h	No corrosion

Use:

- lubrication of high-speed plain-bearing spindles of grinders and machine tools;
- as shear oil designed for finishing operations, grinding and honing, fine machining.

Low pour point oils PARAMO OLN-J

ISO VG 22, 32 46; CETOP RP 91H-HL
ISO 6743: ISO-L-HL
DIN 51 517-CL; DIN 51 524-HL

PARAMO OLN-J are de-waxed deeply refined oils with good oxidative stability, low viscosity temperature dependence and excellent low-temperature attributes.

TYPICAL PARAMETERS:	OLN-J22	OLN-J32	OLN-J46
Viscosity at 40 °C (mm²/s)	22	32	46
Viscosity index	95	98	93
Pour point (°C)	-39	-33	-33
Flashpoint (°C)	210	225	235
Aniline point (°C)	100	100	100
Acid number (mgKOH/g)	0,02	0,02	0,02

Use:

- hydrostatic equipment;
- in cases where bearing oils OL-J are not suitable due to their low temperature attributes.

Hydraulic oils PARAMO HM

ISO VG 22, 32, 46, 68, 100; CETOP RP 91H-HM
DIN 51 524/II – HLP; ISO 6743: ISO-L-HM

PARAMO HM are highly refined petroleum oils, containing additives improving oxidative stability of oil, anti-corrosion and anti-abrasive additives and additives against foaming.

TYPICAL PARAMETERS:	HM 22	HM 32	HM 46	HM 68	HM 100
Viscosity at 40 °C (mm²/s)	22	32	46	68	100
Viscosity index	100	100	100	100	100
Pour point (°C)	-42	-33	-30	-27	-27
Flash point (°C)	218	225	238	250	255
Anti-corrosion properties	No corrosion	No corrosion	No corrosion	No corrosion	No corrosion
FZG test (A20/8.3/90) Unsatisfactory degree, min.	11	12	12	12	12

Use:

- hydrostatic equipment with high mechanical and heat load.

Hydraulic oils PARAMO HV

ISO VG 32, 46, 68; CETOP RP 91H-HV
DIN 51 524/III-HVLP; ISO 6743: ISO-L-HV

PARAMO HV are highly refined petroleum oils containing, except the additives contained in HM set, shear stable viscosity modifier, which improves rheological attributes at low and high temperatures and reduces dependence of viscosity on temperature.

TYPICAL PARAMETERS:	HV 32	HV 46	HV 68
Viscosity at 40 °C (mm²/s)	32	46	68
Viscosity index	175	175	170
Pour point (°C)	-39	-36	-36
Flash point OK (°C)	212	220	230
Anti-corrosion properties	No corrosion	No corrosion	No corrosion
FZG test (A20/8.3/90) Unsatisfactory degree, min.	12	12	12

Use:

- high-pressure hydrostatic equipment with high mechanical and thermal load;
- for machinery operating yearly in a wide range of temperatures;
- for machinery requiring low dependence of viscosity on temperature.

Long life oil for hydrodynamic transmission PARAMO OT-HP3

ISO VG 32; Allison C3

PARAMO OT-HP3 is refined petroleum oil, which contains additives for improving anti-oxidation and anti-abrasive attributes, additives against corrosion and foaming.

TYPICAL PARAMETERS:	OT-HP3
Viscosity at 40 °C (mm²/s)	32
Viscosity index	125
Pour point (°C)	-39
Flash point (°C)	210
FZG test (A20/8.3/90) Unsatisfactory degree,	11

Use:

- hydrodynamic and hydrostatic equipment of buses, construction machinery, fork lifters;
- further mechanisms operating in external environment.

Hydraulic biologically degradable oil PARAMO SYNTECO 46

ISO VG 46; CDMA 24568/24569 – HESS

PARAMO Synteco 46 is highly biologically degradable liquid on the basis of saturated synthetic esters. Biological degradability > 90% according to CEC-L-33-T-82 test. The water hazard degree WGK = 0. This oil has excellent oxidative stability, excellent anti-corrosion and anti-abrasive attributes and low dependence of viscosity on temperature.

TYPICAL PARAMETERS:	Synteco 46
Viscosity at 40 °C (mm²/s)	46
Viscosity index	150
Pour point (°C)	-24
Flash point (°C)	225
FZG test (A20/8.3/90) Unsatisfactory degree	12

Use:

- especially where biologically degradable liquid is needed, e.g. in agriculture, logging industry;
- in other installations operating in wide open space.

Identification agent PARAMO INDIKÁTOR

It is used for coloring or labeling of system oil fill with the need to exactly identify the site of leak.

Synthetic hydraulic fluid PARAMO H 10

ISO 6743 – HFAS

PARAMO H 10 is a mixture of synthetic components and water.

TYPICAL PARAMETERS	H 10
Viscosity at 40 °C (mm^2/s)	1,94
Density at 15 °C (kg/m^3)	1050
Pour point (°C)	-3
pH 5% of solution in distilled water at 20 °C	9,4
Stability of 5% solution In distilled water 72 h In hard water 3.58 mmol/l 72 h	 Pass Pass
Filter paper test 5% solution in hard water 3.58 mmol/l	 negative

Use:

Solution of liquid PARAMO H10 in concentration 2-4% in water is used as:
- as non-flammable biologically degradable liquid especially in mining reinforcements;
- also in other mechanisms requiring this type of liquid.

Oils for pneumatic machines PARAMO PNEUMAT

ISO VG 22, 32, 46; ISO 6743: ISO-L-P
DIN 51 502: D

PARAMO PNEUMAT 22, PARAMO PNEUMAT 32 ZF and PARAMO PNEUMAT 46 petroleum oils made by hydrogenation process, which contain additives improving anti-oxidation oil attributes, increasing viscosity index, decreasing pour point. They further contain high-pressure additives designed for improving anti-abrasion attributes and additives against foaming and rusting. PNEUMAT 32 ZF is based on zinc-free additive.

TYPICAL PARAMETERS	PNEUMAT 22	PNEUMAT 32 ZF	PNEUMAT 46
Viscosity at 40 °C (mm^2/s)	22	32	46
Viscosity index	100	105	100
Pour point (°C)	-42	-36	-30
Flash point OK (°C)	218	200	238
Anti-corrosion properties	No corrosion	No corrosion	No corrosion
Vickers test of wear – ring, lamella (mg.)	120-30	120-30	120-30

Use:

- mainly for pneumatic tools and pneumatic machinery;
- due to their attributes they are also suitable for other applications, e.g. hydraulic equipment.

Industrial gear oils PARAMO CLP

ISO VG 100, 150, 220, 320, 460, 680; DIN 51 517/III – CIP
U.S. Steel 224; AGMA 9005-D94; FRENCH STEEL FT 158

PARAMO CLP oils are produced from high refined base oils with additive of friction modifier, high-pressure additives, anti-oxidants and anti-corrosion additives.

TYPICAL PARAMETERS	CLP 100	CLP 150	CLP 220	CLP 320	CLP 460	CLP 680
Viscosity at 40 °C (mm^2/s)	100	150	220	320	460	680
Viscosity index	95	90	90	90	95	80
Pour point (°C)	-24	-21	-21	-15	-15	-15
Flashpoint (°C)	220	235	235	240	245	255
Anti-corrosion properties	pass	pass	pass	pass	pass	pass
FZG test (A20/8.3/90) Unsatisfactory degree, min.	12	12	12	12	12	12
Timken	70	70	75	75	75	75

Use:

- fill of circulatory lubricating systems;
- heavy-load industrial gearboxes.

Gear oils PARAMO PP

ISO VG (100), 220, (680)
API GL-3

PARAMO PP oils are produced from high refined base oils with additive of anti-abrasion and high-pressure additives.

TYPICAL PARAMETERS	PP 7	PP 13	PP 44
Viscosity at 40 °C (mm^2/s)	110	220	730
Pour point (°C)	-30	-21	-12
Flashpoint (°C)	230	240	240
Anti-corrosive attributes	satisfies	satisfies	satisfies

Use:

- fill of circulatory lubricating systems;
- older industrial gearboxes;
- gearboxes in old automobiles.

Oils for slideways PARAMO KV

ISO VG 46, 68, 100, 220; Cincinnati Machine P-47 a P-50
ISO 6743; ISO-L-G; DIN 51 502: CGLP

PARAMO KV are petroleum oils improved by additives against oxidation, corrosion, abrasion and for improvement of load capacity of lubrication film. They provide protection against stick-slips).

TYPICAL PARAMETERS	KV 46	KV 68	KV 100	KV 220
Viscosity at 40 °C (mm²/s)	46	68	100	220
Viscosity index	95	95	95	95
Pour point (°C)	-27	-24	-24	-12
Flash point OK (°C)	225	240	240	250
Anti-corrosion properties	no corrosion	no corrosion	no corrosion	no corrosion
FZG test (A20/8,3/90) Unsatisfactory degree, min.	12	12	12	12
1 h test for ČKS (392 N/75 °C/1200) max. width of abrasive trace (mm)	0,05	0,05	0,05	0,05

Use:

- lubrication of horizontal and vertical slideways of machining tools and manufacturing equipment;
- lubrication of other machinery parts, such as gearboxes, sliding fits, etc.;
- Multipurpose circulation oil for slideways, hydraulics and gears;
- Average demanding forming operations.

Long life compressor oils PARAMO K

ISO VG (100), (150), (220), (460); ISO 6743 : ISO-I-DAA (K8), ISO-I-DAB
DIN 51 506: VBI, VCI

PARAMO K are oils labeled with excellent chemical stability also at high temperatures.

TYPICAL PARAMETERS	K 8	K 12	K 18	K 28
Viscosity at 40 °C (mm²/s)	110	165	250	385
Viscosity index	90	90	90	88
Pour point (°C)	-9	-9	-9	-6
Flash point (°C)	240	250	260	280

Use:

- lubrication of air and gas compressors, industrial gearboxes;
- alternatively also as heat-transferring medium.

Compressor oils PARAMO VDL

ISO VG 46, 100; DIN 51 506-VDI; DIN 51 524/II-HIP
ISO 6743: ISO-I-DAJ, DAC

PARAMO VDL are petroleum oils doped by zinc-free mixed additive for improving anti-abrasion and low-temperature attributes, anti-corrosion properties and thermal-oxidative stability. They have excellent chemical and thermal-oxidative stability.

TYPICAL PARAMETERS	VDL 46	VDL 100
Viscosity at 40 °C (mm²/s)	46	100
Viscosity index	100	95
Pour point (°C)	-30	-27
Flashpoint (°C)	235	255
Anti-corrosion properties	no corrosion	no corrosion

Use:

- lubrication of air and gas compressors, VDL 46 for rotary, VDL for piston compressors;
- lubrication of industrial gearboxes with higher requirements on oil oxidative stability;
- fill of hydrostatic equipment.

Oil for cooling compressors PARAMO ON-5

ISO VG 68, ISO 6743: ISO-l-DRA

PARAMO ON-5 is oil on the basis of naphthalene raw materials. It excels by a naturally-low pour point and good fluidity at low temperatures and good oxidative stability.

TYPICAL PARAMETERS	ON-5
Viscosity at 40 °C (mm²/s)	68
Viscosity index	95
Pour point (°C)	-30
Flash point OK (°C)	205

Use:

- lubrication of ammonia piston and spiral compressors with discharge temperatures also above 100°C.

Air pump oil PARAMO R2

ISO VG 100; ISO 6743: ISO-L-DVA

PARAMO R2 is petroleum oil with low pressure of saturated steam up to 0.133 Pa at 25°C and with corresponding flash point.

TYPICAL PARAMETERS	R 2
Viscosity at 40 °C (mm²/s)	100
Viscosity index	90
Pour point (°C)	-9
Flash point PM (°C)	235

Use:

- lubrication of two stage rotational air suction pumps.

Cylinder oils PARAMO B, PARAMO P

ISO VG (460), (680), (1000); ISO 6743: ISO-L-Z

PARAMO B and P are oils characterized by high viscosity. PARAMO P oils contain additive for increasing lubrication and adhesion, reduces wipeable effects of steam.

TYPICAL PARAMETERS	B 25	B 28	B 31	P 28	P 31
Viscosity at 100 °C (mm²/s)	30	35	38	31	37
Pour point (°C)	-9	-9	-9	-9	-9
Flash point (°C)	295	305	315	310	315

Use:

- lubrication of steam engines;
- lubrication with loss;
- gearing;
- Where increased lubrication and adhesion are desirable;
- heating and tempering baths.

Dark oils PARAMO OD

ISO VG 46, 68, (150), (220), 320, (680);
ISO 6743: ISO-L-AY

PARAMO OD are petroleum oil distillation products containing additives decreasing pour point.

TYPICAL PARAMETERS	OD 3	OD 4	OD 8	OD 11	OD 16	OD 20
Viscosity at 40 °C (mm²/s)	46	68	140	200	320	-
Viscosity at 100 °C (mm²/s)	-	-	-	-	-	90
Pour point (°C)	-30	-24	-21	-15	-9	-6
Flash point (°C)	200	230	240	250	260	280

Use:

- lubrication of machinery equipment, where oil adhesion is used and there are no requirements for oxidative stability;
- lubrication of axles of railway cars, steel ropes, guides of frame and chain saws, bearings in dusty and humid environment, moving parts of agricultural machines, low-speed gearing, non-sealed gearboxes.

Separation agent PARAMO SEPAR, PARAMO SEPAR SDA, PARAMO SEPAR PB

ISO VG (7), 7, (68); ISO 6743: ISO-L-P

PARAMO SEPAR, PARAMO SEPAR SDA a PARAMO SEPAR PB are petroleum oils with greasy separation additive. They do not contain mechanical impurities, PCB or chlorine.

TYPICAL PARAMETERS:	SEPAR*	SEPAR SDA*	SEPAR PB
Viscosity at 40 °C (mm²/s)	6	7	75
Pour point (°C)	-15	-15	-9
Flash point PM (°C)	140	142	220
Sulphur content (%)	0,1	0,1	0,1
Substance of oil film (kg/100 m²)	11	11	25

Use:

PARAMO SEPAR - lubrication of molds during production of concrete pieces;
PARAMO SEPAR SDA
PARAMO SEPAR PB - lubrication of molds during aerated concrete pieces production.

*Classification according to Act number 434/2005, Collection, see Safety Data Sheet

Transformer oil PARAMO TRAFO N

ISO VG 10 ; IEC 60296; ASTM D 3487 type I, AS 1767.1 a BS 148 class II

PARAMO TRAFO N is non-inhibited hydrogenation-refined light distillate from naphtenic crude oil with significant chemical stability and low pour point.

TYPICAL PARAMETERS:	TRAFO N
Viscosity at 40 °C (mm^2/s)	11
Pour point (°C)	-45
Flash point PM (°C)	145
Breakdown voltage in kV min. delivered to a status after modification	30 70

Use:

- fill of transformers, switches, power capacitors;
- other high-voltage equipment;
- used also in electrical machines and devices as insulative and cooling liquid.

Frequently it happens that oils of the specified group are also used for other than designed purposes. In those cases, when a customer can not select by himself from above-mentioned oils, it is appropriate to confer with OTS employees about propriety of use of concrete oil or its adequate replacement.

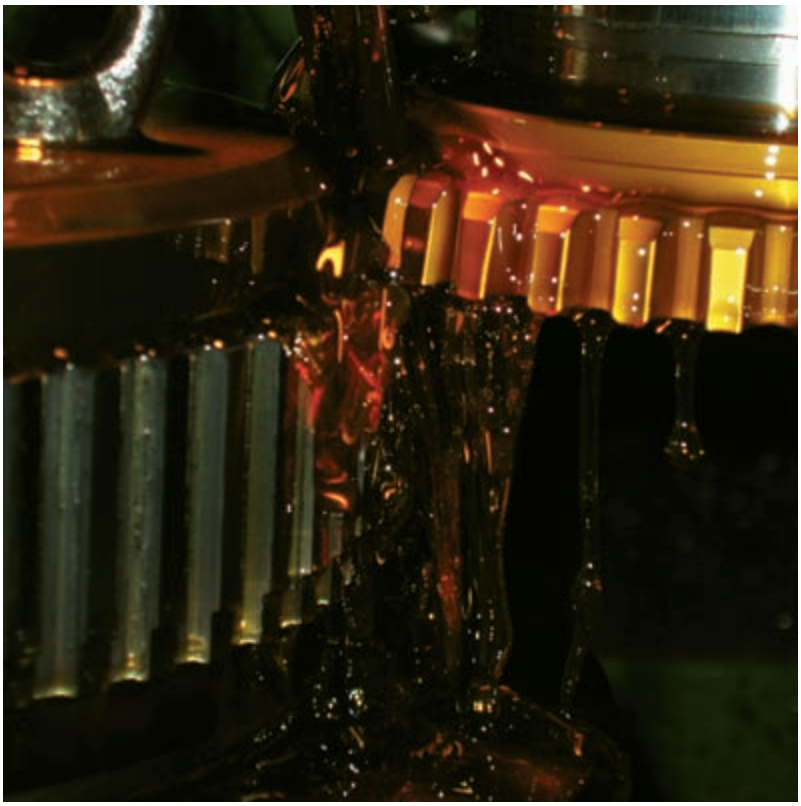
INDUSTRIAL OILS CLASSIFICATION

Industrial oils are classified according to viscosity grades and performance classes. Viscosity grades ISO VG determine mean value in mm^2 at 40°C. This viscosity is mainly contained in oil description and it is mainly a number at the end of a trade oil name. There is a written code under this number which characterizes oil performance. The first number generally labels oil classification according its main type of use according to standard ISO 6743 or DIN 51502 and further letters usually determine which refining additives the oil should have or closely specify way of use.

ISO 3448 viscosity grades of industrial oils

Viscosity grade at 40°C in mm^2/s	Medium oil viscosity in mm^2/s	Viscosity range at 40 °C
ISO VG **2**	2,2	1.98–2.42
ISO VG **3**	3,2	2.88–3.52
ISO VG **5**	4,6	4.14–5.06
ISO VG **7**	6,8	6.12–7.48
ISO VG **10**	10	9.0–11.0
ISO VG **15**	15	13.5–16.5
ISO VG **22**	22	19.8–24.2
ISO VG **32**	32	28.8–35.2
ISO VG **46**	46	41.4–50.6
ISO VG **68**	68	61.2–74.8
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
ISO VG **1500**	1500	1350–1650

	ISO 6743	DIN 51 502
Open lubricating system, common oils	A	AN, B
Separators, form oils	B	FS
Gearings, circulatory systems	C	C, HYP
Compressors	D	V, K
Combustion motors	E	HD
Spindles, bearings and related gears	F	C
Gliding conduit	G	CG
Hydraulic systems	H	H, HV, HF, ATF
Metals machining	M	S, W
Electrical insulation	N	J
Pneumatic machines, lubrication by oil vapor	P	D
Heat carrier media	Q	Q
Corrosion protection	R	R
Turbines	T	TD
Heat processing	U	L
Other applications	Y	F
Vapor machines	Z	Z



- *Automotive oils*
- *Industrial oils*
- ***Metal-working fluids, process oils and corrosion preventives***
- *Bituminous products for waterproofing*
- *Road bitumens*
- *Fuels*
- *Solid hydrocarbons*
- *Paramo contractual dealers*

PARAMO

METALWORKING FLUIDS

Agents with lubricating and cooling effect are needed during processing of metals by machining and mechanical working. On their attributes depends quality of workpieces surface, dimensional accuracy, tool life, and also energetic and production economics. PARAMO, a.s. provides fluidsd esignated especially for cooling as well as fluids designated especially for lubrication. All these metal working fluids are chlorine- free.

Cutting oils

Cutting oils PARAMO CUT OC, CUT OC PLUS, CUT OC MULTI and CUT OC Al

It is modern conceived set of cutting oils designed mainly for machining centers and machining lines executing various machining operations in a wide specter of ferrous metals.

These cutting oils dispose of a wide range of attributes, which allow not only complex machining operations in the field of minimum splinter and low cutting speeds, but also, by its significant cooling effect, operations at high cutting speeds where common machining oils often malfunction.

TYPICAL PARAMETERS	CUT OC	CUT OC PLUS	CUT OC MULTI	CUT OC AI
Viscosity at 40 °C (mm^2/s)	13,8	12,6	14,8	12,5
Pour point (°C)	-22	-18	-15	-18
Flash point (°C)	180	180	190	180
Ash (%)	1,5	0,75	0,6	0,6
Steel corrosion test 20°C/24 h max. Brass corrosion 80°C/3h Copper corrosion test 100°C/3 h max.	Pass Pass	Pass	Pass Pass	Pass 1b

PARAMO CUT OC is universal cutting oil designed for various machining operations and ferrous metals.

PARAMO CUT OC PLUS is efficient cutting oil designed for various machining operation and ferrous metals.

PARAMO CUT MULTI is cutting oil of high performance, which maximally extends the tool lifetime and guarantees excellent results also during metal working with significantly worsened workability.

PARAMO CUT OC AL is cutting oil specially formulated for performance machining of light metals alloys.

Cutting oils PARAMO CUT 16 H and PARAMO CUT 22 H

They are efficient, modern conceived cutting oils designed mainly for machining operations of deep drilling by BTA or Ejektor systems. Both oils are equipped by high content of esters of higher fatty acids, AW additives, EP additives and corrosion inhibitors. By this, they allow execution of efficient machining operations with maximal lifetime of a tool, required quality of machined surface and dimensional accuracy of a workpiece.

TYPICAL PARAMETERS	PARAMO CUT 16 H	PARAMO CUT 22 H
Viscosity at 40 °C (mm^2/s)	13,8	22
Pour point (°C)	-22	-18
Flash point (°C)	180	150
Steel corrosion test 20°C/24 h max. Brass corrosion test 80°C/3h	Pass Pass	Pass -

Use:

PARAMO CUT 22 H is cutting oil for machining operations – deep drilling executed by ejector system, BTA system, gun cutters and double-blade cutters, not only by using carbide tools, but also tools from speed drill steel. Beside deep drilling of construction steel and alloyed steel of higher classes, it is possible to use for operations automating, shaping, grinding, screwing of materials with worsened machinability.

PARAMO CUT 16 H is cutting oil designed for machining operations – deep drilling with high ratio l/d, executed by ejector system, BTA system, gun cutters not only by using carbide tools, but also tools from speed drill steel. Beside deep drilling of construction steel and highly alloyed steel, it is designed for use in efficient automating and executing of common or complex machining operations in machining centers and lines.

Cutting oils PARAMO CUT 15, CUT 25 and CUT 25 A

They are efficient cutting oils with content of special substances for increasing of cutting effect and further improving additives. They are chemically stable with efficient protection against corrosion. They are marked with high cutting effect and positively influence quality, harshness and dimensional accuracy of machined surface and durability of tool blade.

TYPICAL PARAMETERS	CUT 15*	CUT 25	CUT 25 A
Viscosity at 40 °C (mm²/s)	15	25	22
Pour point (°C)	-10	-10	-10
Flashpoint (°C)	160	180	180
Steel corrosion test 20 °C/24 h Brass corrosion test 80 °C/3 h Copper corrosion test 50 °C/3 h	Pass - 2C	Pass Pass -	Pass Pass -

Use:

CUT 15, CUT 25 a CUT 25 A for demanding and extremely demanding operations, internal and external broaching, slotting and shaping by self-generating method.

*Classification according to Act number 434/2005, Collection, see Safety Data Sheet

Cutting oils PARAMO FIN 2, FIN 5, FIN 7, CUT 10, CUT 14, CUT BM

It is a set of cutting oil designed for finishing machining operations, where blade geometry is not accurately defined. During their formulation, there were used high-quality base oils of high flash point, minimal evaporation loss and ideal sedimentary ability. Maximally reduced fuzzing and suitable selection of AW and EP additives in a combination with efficient corrosion inhibitors allows them to guarantee optimally-cut attributes for efficient finishing technologies.

TYPICAL PARAMETERS	FIN 2*	FIN 5*	FIN 7	CUT 10	CUT 14	CUT BM
Viscosity at 40 °C (mm²/s)	3	5	7,5	12,5	14	15
Pour point (°C)	-30	-21	-18	-10	-10	-10
Flash point (°C)	80	140	120	170	180	175
Corrosion test on Brass 80 °C/3 h	Pass	Pass	Pass	Pass	Pass	Pass

Use:

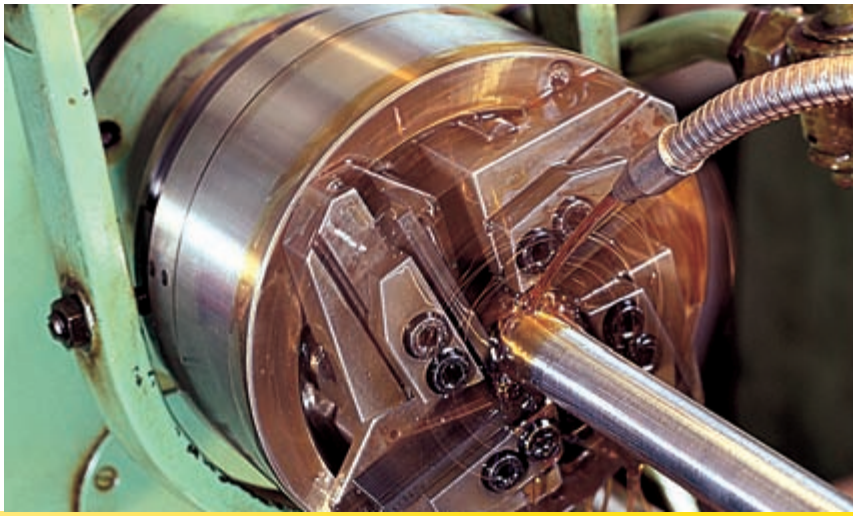
FIN 2, FIN 5 a FIN 7 are cutting oils designed especially for honing, super-finishing and lapping in metals, construction steel of common quality, quality construction steel and some non-ferous metals with used grinding material diamond, corundum, carbide of boron or silicon.

CUT 10 is universal cutting oil designed for all types of efficient metals grinding, construction steel of common quality, quality construction steel and some non-ferous metals with use all kinds of grinding materials.

CUT 14 is multifunctional cutting oil designed for efficient modern technologies, similar use as CUT 10, which in addition allows execution of operations such as shaping, machining, screwing, dividing, drilling including some operations of deep drilling.

CUT BM is efficient cutting oil designed for grinding of axis cutting tools.

*Classification according to Act number 434/2005, Collection, see Safety Data Sheet



Cutting oils PARAMO CUT 3, 22, 32, 32A, 46

Cutting oils PARAMO CUT are petroleum oils containing additives for cutting efficiency. They include also anti-mist additive, which reduces aerosol creation to minimum and therefore contributes to work environment improvement. They are suitable for machining of ferrous and non-ferrous metals.

Use:

PARAMO CUT 3 – finishing operations, grinding and honing, fine machining;
– due to properly selected lubricating additive this oil is designed also for lubrication of high-revolution spindles with sliding fits, especially in case of grinders (replacement OL-P03);

PARAMO CUT 22 efficient oil with wide range of use not only for operations with accurately defined tool geometry, but also for more complex grinding operations;

PARAMO CUT 32 universal efficient oil with wide range of use not only for operations with exactly defined tool geometry, but also for more complex grinding;
– multifunctional oil for lubrication of machining tools and for fillings of hydrostatic systems;

PARAMO CUT 32 A universal oil for machining automats and all common types of machining;

PARAMO CUT 46 machining with medium-size cuttings and moderate cutting speed, especially shaping and gearing slotting (deep drilling).

TYPICAL PARAMETERS:	CUT 3	CUT 22	CUT 32	CUT 32A	CUT 46
Viscosity at 40 °C (mm²/s)	3	22	32	31,5	46
Pour point (°C)	-15	-10	-10	-15	-10
Flash point (°C)	80	180	200	220	210
Steel corrosion test 20°C/24h Brass corrosion test 80°C/3h	Pass Pass	Pass Pass	Pass Pass	Pass Pass	Pass Pass

Additive for improving cutting effect of PARAMO EPK-1

PARAMO EPK-1 is lightly yellow high-pressure additive with high content of aggregate and active sulphur. It allows excellent reactivity with metals and therefore improvement of cutting attributes. During machining of non-ferrous metals, coloration of surface of machined material might take place, which does not have influence on its function.

TYPICAL PARAMETERS:	EPK-1
Viscosity at 40 °C (mm²/s)	50
Flash point (°C)	150
Corrosion test on copper 100 °C/3 h	4c

Use:

- as additive for cutting oils for improving of their attributes during most demanding cutting conditions, recommended concentrations 2-10% according to machining conditions;
- in concentrated state for lubrication, e.g. during threading, etc.;
- in systems using MQL system (mist lubrication).

COOLING LIQUIDS

Emulsifying semi-synthetic PARAMO EOPS, EOPS Plus

Emulsifying oils PARAMO EOPS and EOPS Plus are mixture of petroleum oil, synthetic components, emulsifiers and inhibitors of corrosion. They do not contain chlorine, PCB, PCT and heavy metals. With water, they create micro-emulsion with high stability, resistance against microorganisms and from it resulting long lifetime, stable pH, low foaming, high lubricating and cooling performance and protective ability. They fully correspond to the requirement for efficient lubrication and cooling liquid. PARAMO EOPS Plus, beside these favorable attributes, finds its use especially where the requirement for increased conservational ability and suitable content of EP additives create favorable cutting environment.

TYPICAL PARAMETERS:	EOPS	EOPS Plus
Viscosity at 40 °C (mm^2/s)	140	140
pH 5% emulsion in distilled water at 20 °C	9,3	9,3
Density at -15 °C (kg/m^3)	955	955
Pour point (°C)	-12	-12
Flash point OK (°C)	Above 100	Above 100
Stability at 0 °C 40 °C	Clear, homogenous Clear, homogenous	Clear, homogenous Clear, homogenous
Features and stability of 5% emulsion - distilled water 48 h - hard water – 3.58 mmol/l, 48 h	Clear, yellow liquid Mild opalescence	Clear, yellow liquid Mild opalescence
Filter-paper test, 5% solution 4% vol. emulsion	Pass	Pass
Factor for manual refractometer	1	1

Use:

PARAMO EOPS universal liquid for all common operations of machining of ferrous and non-ferrous metals and aluminum alloys (machining, shaping, drilling, grinding, etc.); in concentration 3-10% according to machining conditions.

PARAMO EOPS Plus is liquid designed for cases where we are forced to execute complex machining operations or materials with worsened machinability and when increased requirements for conservation ability take place.

Emulsifying semi-synthetic oil PARAMO UNI PLUS

Emulsifying oil PARAMO UNI PLUS is a mixture of petroleum oils and synthetic components. It is marked with high stability and bio-resistance. It has excellent lubricating and cooling ability. It fully complies with requirement for efficient lubricating and cooling liquid.

TYPICAL PARAMETERS:	UNI PLUS
Viscosity at 40 °C (mm^2/s)	50
pH 5% emulsion in distilled water at 20 °C	9,2
Density at 15 °C (kg/m^3)	980
Pour point (°C)	-20
stability of 5% emulsion - distilled water 48 h - hard water – 3.58 mmol/l, 48 h	Pass Pass
Filter-paper test, 5% solution	0
Factor for manual refractometer	1

Use:

- universal liquid for all common operations of splinter machining of ferrous metals, non-ferrous metals, light metals and their alloys (machining, shaping, drilling, grinding, etc.) in concentration 3–10% according to machining conditions;
- it is used for particular machines and central systems.

Emulsifying semi-synthetic oil PARAMO LACTIC

PARAMO LACTIC is modern emulsifying oil conceived on a basis of derivate of lactic acid, containing selected petroleum oils, emulsifiers, efficient de-foamer and corrosion inhibitors. With water, it creates micro emulsion with high stability, resistance against microorganisms and from it resulting long lifetime, stable pH, low foaming, high lubricating and cooling liquid, which sparingly treats significantly exposed skin of employees operating machine tools.

Typical parameters:	PARAMO LACTIC
Viscosity at 40 °C (mm^2/s)	22
pH 5% emulsion in distilled water at 20°C	9,3
Density at 15°C (kg/m^3)	1090
Pour point (°C)	-6
stability of 5% emulsion - distilled water 48 h - hard water – 3.58 mmol/l, 48 h	Pass Pass
Filter-paper test, 5% solution	0
Factor for manual refractometer	1

Use:

– universal liquid for all common operations of splinter machining of ferrous metals, non-ferrous metals, light metals and their alloys (machining, shaping, drilling, grinding, etc.) in a concentration 3-10% according to conditions of machining;
- it is designed for particular machines and for central systems.

EMULSIFYING PETROLEUM OILS

PARAMO ERO-SB, ERO-SB Plus, ERO-D

Emulsifying petroleum oils PARAMO ERO-SB, ERO-SB Plus and ERO-D are mixtures of petroleum oil fractions, emulsifiers, inhibitors of corrosion and biocides against premature microbial decomposition. With water, it creates uniform milky emulsion.

Typical parameters::	ERO SB	ERO-SB Plus	ERO D
Viscosity at 40 °C (mm^2/s)	30-50	30-50	30-50
pH 5% emulsion in distilled water at 20°C	9.3	9.3	9.3
Emulsion (5%) stability in distilled water 48 h	Pass	Pass	Pass
Corrosive test Herbert-test 2% emulsion in distilled water at 20°C			negativní
Corrosive test of emulsion 5% vol. degree	negative	negative	
Factor for manual refractometer	1	1	1

Use:

– cooling fluids for machining with accurately defined tool geometry (machining, shaping, drilling, cutting, etc.) also for grinding;
- recommended concentration 3-8% according to conditions of machining; they are suitable for machining of ferrous and non-ferrous metals and Al alloys;
- Fire-resistant pressure fluids of HFAE type for hydrostatic equipment in concentration 2-5%.

Synthetic metal working liquids PARAMO SK220, SK300, SK400

Synthetic metal working liquids PARAMO SK220, PARAMO SK300 and PARAMO SK400 are mixtures of synthetic components, suitable inhibitors of corrosion and water. PARAMO SK 300 in addition contains lubricating additive. They are marked with high stability and bio-resistance. Corrective coefficient for refractometer equals 2.

Typical parameters::	SK 220	SK 300	SK 400
Viscosity at 40 °C (mm^2/s)	3,15	6,7	6,7
pH 5% emulsion in distilled water at 20°C	9,4	9,4	9,4
Density at 15 °C (kg/m^3)	1075	1090	1090
Pour point (°C)	-10	-14	-14
Stability of 5% solution in distilled water 48 hours In water 3.58 mmol/l 48 hours	Pass Pass	Pass Pass	Pass Pass
Test on filter paper 5% solution in hard water	negative	negative	negative
Factor for manual refractometer	2	2	2

Use:

PARAMO SK 220 is designed in concentration 2-5% in water for grinding of ferrous or non-ferrous metals;

PARAMO SK 300 is designed in concentration 3-7% in water for splinter machining and grinding of ferrous or non-ferrous metals;

PARAMO SK 400 has the same application use as SK229, in addition disposes by increased conservational ability.

Supportive agents for metal working liquids PARAMO SYSTEMCLEAN, PARAMO pH STABILIZÁTOR, BIOCLEAN, ANTIFOAM, ANTIRUST

Fundamental condition for optimal function and especially service life of machining emulsion liquids and water solutions is complete purification of conduits of working fluids and machine parts where these fluids might be contaminated by microorganisms during operation. Since this contamination can not be prevented during operation, it is recommended to use supportive agents which can eliminate these negative effects. With de-foamer we are able, in case of need, to remove unpleasant foaming of machining. Additive of complex applied inhibitors of corrosion is able to suppress corrosive effect of machining liquid or directly increase its conservation attributes.

PARAMO SYSTEMCLEAN:

Use:

PARAMO SYSTEMCLEAN* system cleaner, applied into machining liquid 0.5-2% os system filling max. 8 hours before exchange;

PARAMO pH STABILIZÁTOR agent designed for treatment and stabilization of pH value of machining in upward direction. It is applied during operation of machining liquid, in case of reduction of pH value under the limit of 8, directly into machining liquid in a concentration of 0.3-0.35%. After a short circulation of machining liquid, increase of pH value of machining liquid to 9.3-9.5 takes place.

PARAMO BIOCLEAN Plus* biocide agent designed for microorganisms termination used especially against their outbreak in machining liquid. It is applied during higher concentrations of microorganisms which is mainly accompanied by reduction of pH value directly into machining liquid in a concentration of 0.1-0.2%;

PARAMO BIOCLEAN biocide agent used for conservation of machining liquid. Its effective components prevent microorganisms outbreak. It is applied roughly after 10-day intervention by biocide agent PARAMO BIOCLEAN Plus in concentration of 0.1-0.2% directly into machining liquid.

PARAMO ANTIFOAM de-foamer, with increased foaming it is dosed as 0.003-0.01% of system filling;

PARAMO ANTIRUST* additive of complex applied inhibitors of corrosion which significantly extends conservational ability of machining liquid or eliminates some factors causing corrosion of metal working liquids. It is dosed into cooling system of machining liquid in concentration of 0.5-1.0%.

*classification according to Act number 434/2005, Collection, see Safety Data Sheet

LUBRICANTS FOR PLASTIC FORMING

For shaping operations, oils are used which have excellent lubricating attributes, rigidity of lubrication film and they are sufficiently adhesive to formed material surface. From PARAMO, a.s. production, oils for bearings PARAMO KV or conservation oil KONKOR 268 comply with these requirements. Selection of oil always depends on conditions of shaping operations.

Forming oil PARAMO PRESS 80

PARAMO PRESS 80 is refined mineral oil doped with optimal mixture of high-based calcium sulphonate, sulphonated ester and modern synthetic ester additive. These additives guarantee to oil necessary EP attributes, which significantly reduce friction coefficient in wide range of temperatures.

TYPICAL PARAMETERS	PRESS 80
Viscosity at 40 °C (mm²/s)	80
Pour point (°C)	-20
Flash point OK (°C)	180
Corrosion Copper corrosion test 100°C 3 h Steel 20 °C 24 h	4b negative

Additive PARAMO EPK-2 for shaping effect improvement

PARAMO EPK-2 is dark yellow high-pressure and anti-abrasion additive with high content of active substances, enables excellent reactivity with metals, which, together with high rigidity of lubrication film, resists also extremely high pressures.

TYPICAL PARAMETERS	EPK-2
Viscosity at 100 °C (mm²/s)	16–37
Flas hpoint OK (°C)	230
Corrosion Copper corrosion test 100°C 3 h	3a

Use:

– as additive to oils used during various shaping operations, enables excellent reactivity with metals and high adhesion and capacity of oil film. We recommend concentration 6-20% according to complexity of executed forming operation;
- in concentrated state it shows results also for most complex forming operations.

Classification according to Act number 434/2005, see Safety Data Sheet

LUBRICANTS FOR HEAT TREATMENT OF METALS – HEAT TRANSFERRING MEDIA

During metals processing, it is sometimes necessary to change their attributes, such as hardness, toughness, etc., by heat treatment, mainly by quenching, tempering, annealing, etc. These technologies are based on heating of material to desired temperature and subsequent controlled cooling. During these processes, oils apply as cooling, alternatively heating liquids.

Oils for thermal quenching PARAMO TK

ISO VG 22, 46, 68

Oils PARAMO TK 22, TK 22 A, TK 46, TK 150 and TK 180 are deeply refined petroleum oils containing additives for increasing cooling speed, thermal and thermo-oxidative stability. They have high inflammation point and fire point, small evaporation capacity and very low tendency to create sludge. They guarantee even through-quenching of quenched components.

Oils PARAMO TK 46 and TK 150 are also designed for use as heat transferring media for heating of heating system up to 315 °C in closed systems and 230 °C in opened systems.

TYPICAL PARAMETERS	TK 22	TK 22 A	TK 46	TK 150	TK 180
Viscosity at 40 °C (mm²/s)	22	22	46	68	150
Viscosity at 100 °C (mm²/s)	5	5	6,5	8,3	13
Viscosity index	100	100	95	95	90
Pour point (°C)	-12	-12	-12	-15	-12
Flash point OK (°C)	220	220	230	250	270
Flash point PM (°C)	210	210	220	230	240

Use:

Quenching oils are marked by very low evaporation loss and so-called clear quenching process.
TK 22 – for fast quenching and mainly small or middle-sized workpieces.
TK 22 A – for moderately fast or fast quenching of small or middle-sized workpieces.
TK 46 – for moderately fast quenching and small or middle-sized workpieces.
TK150 – for thermal quenching of shape complex parts at bath temperature of 150 °C.
TK 180 – for thermal quenching of shape complex parts at bath temperature of 180 °C.

Heat transfer oil PARAMO TERM 22

ISO VG 22, ISO 6743-Q

PARAMO TERM 22 is oil formulated from quality base oils and suitable additives. It has high flash point and fire point, low evaporation loss and very low inclination toward sediments creation.

TYPICAL PARAMETERS	TERM 22
Viscosity at 40 °C (mm²/s)	22
Viscosity at 100 °C (mm²/s)	4,3
Viscosity index, min.	100
Flash point (°C)	210
Pour point (°C)	-17

Use:

- heat transferring oil for heating of heating systems up to 300°C.

In some cases, some further oils described in a prospect INDUSTRIAL OILS, e.g. PARAMO OL-B4, OL-J22, OL-J46, B25, B28, B31 are used for preparation of quenching, tempering and heating baths.

CORROSION PREVENTIVES

All metallurgic semi-products and engineering products are during storage and transport exposed to atmospheric air and they are endangered by corrosion. The danger of corrosion is then increased with increasing humidity, air temperature, incidence of gas impurities contained in the air, etc. One of the ways of anti-corrosion protection of metallic part are conservation agents, which guarantee temporary protection in storage and during transport in the combination with suitable wrapping also long-thermic protection.

Conservation oils KONKOR 101, 103

KONKOR 101 and KONKOR 103 are fluids of brown color containing additive of absorbing corrosion inhibitors. They do not cause so-called contact corrosion. They will stop further corrosion if they are used on corroded places, so-called stop-effect.

TYPICAL PARAMETERS	KONKOR 101	KONKOR 103
Viscosity at 40 °C (mm^2/s)	10	68
Pour point (°C)	-25	-15
Flash point (°C)	120	200
Ash (% of mass)	0.05	0.07
Oil film weight at 20 °C ($kg/100\ m^2$)	1.5	2.5
Relative protective performance Ur (%) 30 days, in % of vol.	97	100
Period of first corrosion creation (days) min.	11	11

Use:

- for conservation of ferrous metals against atmospheric corrosion. Supposed protection against corrosion is dependent on package kind, storing and climatic conditions.

Conservation oils KONKOR 210, 222, 268

Conservation oils of 200 series are petroleum oils of yellow color with additive of complex corrosion inhibitor. They have ability to displace water from metallic surfaces and efficiently neutralize finger prints. They can be applied easily and form very thin homogenous oil film (2-10 µm) with excellent protective attributes. Protective films easily soluble in lubricating oils and do not need to be removed during further applications.

TYPICAL PARAMETERS	KONKOR 210	KONKOR 222	KONKOR 268
Viscosity at 40 °C (mm^2/s)	12	27	75
Pour point (°C)	-25	-10	-8
Flash point (°C)	170	180	220
Ash (% of mass)	0.6	0.6	0.6
Oil film weight at 20 °C ($kg/100\ m^2$)	1-2	1-2.5	2-3.5
Relative protective performance Ur (%) 30 days, in % of vol.	97	100	100

Use:

– for protection of ferrous and non-ferrous metals against atmospheric corrosion. Supposed protection against corrosion is dependent on wrapping kinds, storing and climatic conditions.

Conservation products KONKOR 420, 437

KONKOR 420 and KONKOR 437 are modern conceived water-soluble agents, they are mixtures of suitable inhibitors of corrosion and water. After water evaporation, thin dry protective layer remains on the surface of conservation material. Agents of KONKOR of 400 set do not contain petroleum hydrocarbons and they are well biologically degradable – environment-friendly. They can be applied easily, create thin homogenous protective film. They have high performance.

TYPICAL PARAMETERS	KONKOR 420	KONKOR 437
Density at 15 °C (kg/m^3)	996	1 000
Appearance	Brownish milk emulsion	Brown solution
Relative protective performance of 30 days 100% relative humidity (%)	100	95
Performance of protective film at 20 °C ($kg/100\ m^2$)	0.2	0.1

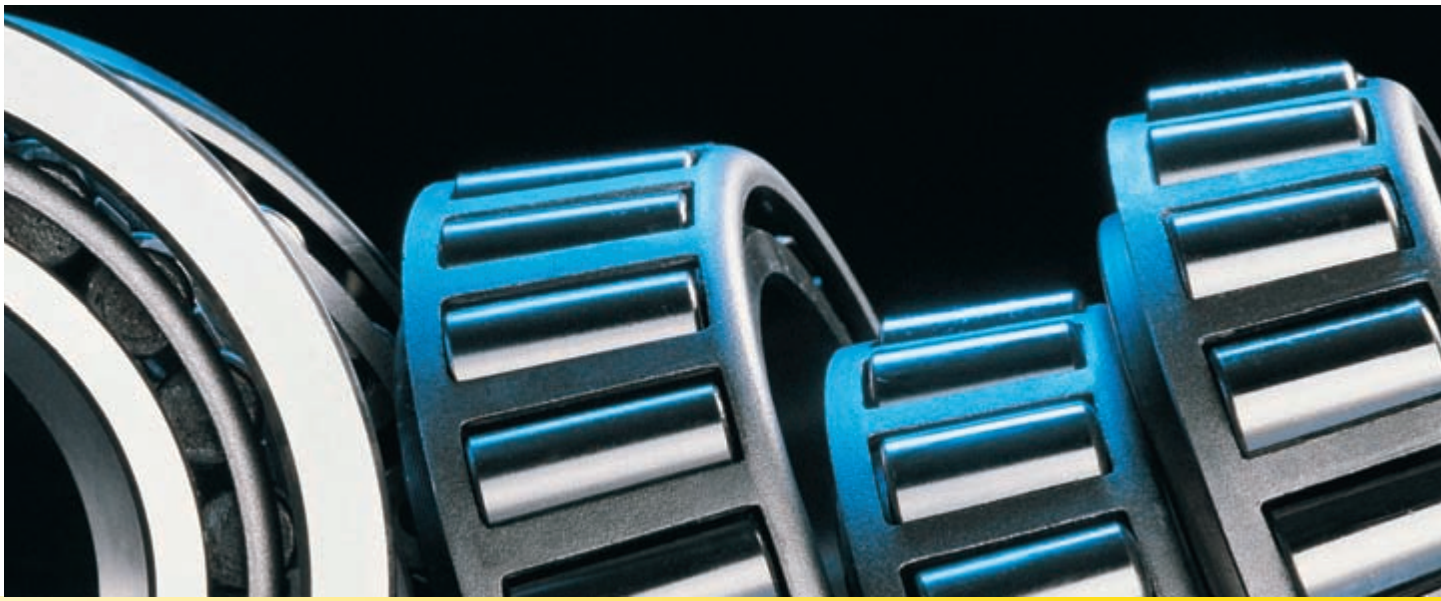
Use:

– Anti-corrosion protection of ferrous and non-ferrous metals.

Machining, technological and conservational agents are supplied in railway tanks, truck tanks, 200-liter drum, 10-liter canisters, in some cases in other containers after the agreement with a customer.

Some liquids and oils can be, except its main use, used and are used for other purposes. It is suitable to consult these cases with our tribotechnical department.

It is generally necessary to give increased care to metal working fluids, because they are exposed to many effects, which can influence their functionality and lifetime. PARAMO, a.s. therefore provides service and consultancy for above mentioned questions of using liquids and oils.



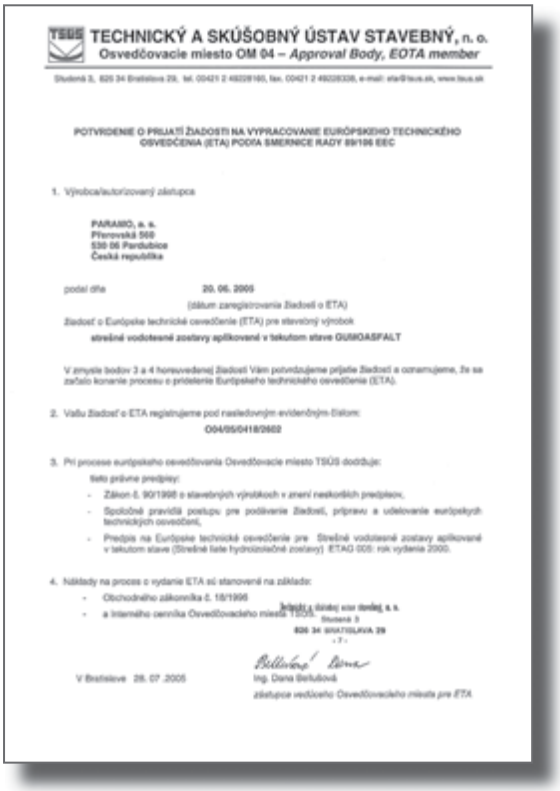
BASIC RECOMMENDATION OF CUTTING FLUIDS

Material type / Machined material	Steel: Carbon and alloyed steel with low % C	Steel: Carbon and alloyed steel (also hard metals) - only yellow indicated product	Steel: Corrosion- and heat-resistant steel and alloys	Cast metals	Copper corrosion test and its alloys	Aluminum corrosion test and its alloys
Grinding with use of water based cutting liquids	PARAMO SK 220 - 4 % PARAMO SK 300 - 3 až 4 % PARAMO EOPS PLUS - 3 až 4 % PARAMO EOPS - 3 až 4 % PARAMO EOPS PLUS - 3 až 4 % PARAMO ERO-SB; ERO-D - 5 %	PARAMO SK 220 - 4 % PARAMO SK 300 - 3 až 4 % PARAMO EOPS PLUS - 3 až 4 % PARAMO EOPS - 3 až 4 % PARAMO EOPS PLUS - 3 až 4 % PARAMO ERO-SB; ERO-D - 5 %	PARAMO SK 220 - 4 % PARAMO SK 300 -3 až 4 % PARAMO EOPS PLUS - 3 až 4 % PARAMO EOPS - 3 až 4 % PARAMO EOPS PLUS - 3 až 4 %	PARAMO SK 400 - 4 % PARAMO SK 220 - 4 %	PARAMO SK 400 - 4 % PARAMO SK 220 - 4 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 3 až 4 % PARAMO EOPS - 3 až 4 % PARAMO UNI PIUS - 3 až 4 % PARAMO UNI PIUS - 3 až 4 %
Grinding with use of non-water-based cutting fluids	PARAMO CUT BM PARAMO CUT 10 PARAMO CUT 22 PARAMO CUT 32	PARAMO CUT BM PARAMO CUT 10 PARAMO CUT 22 PARAMO CUT 32	PARAMO CUT 10 PARAMO CUT 22	PARAMO CUT 10 PARAMO CUT 22 PARAMO CUT 3	PARAMO CUT 32	PARAMO CUT 10 PARAMO CUT 22 PARAMO CUT 3
Honing super-finish and lapping	PARAMO FIN 2 PARAMO CUT 3 PARAMO FIN 5 PARAMO FIN 7	PARAMO FIN 2 PARAMO CUT 3 PARAMO FIN 5	PARAMO FIN 2 PARAMO CUT 3 PARAMO FIN 5	PARAMO FIN 2 PARAMO CUT 3	PARAMO CUT 3 PARAMO FIN 5 PARAMO FIN 7	PARAMO FIN 2 PARAMO FIN 5
Saw cutting	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 4 % PARAMO EOPS - 4 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO SK 400 - 5 % PARAMO SK 220 - 5 % PARAMO EOPS - 4 % PARAMO UNI PLUS - 4 % PARAMO ERO-SB; ERO-D - 3 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 6 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 6 %
Machining by SK tools	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO SK 400 - 5 % PARAMO SK 220 - 5 % PARAMO EOPS - 5 % PARAMO UNI PLUS - 5 % PARAMO ERO-SB; ERO-D - 5 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 7 % PARAMO EOPS - 7%	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 7 % PARAMO SK 300 - 7 %
Screws machining	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 7 % PARAMO SK 300 - 7 %	PARAMO SK 400 - 5 % PARAMO SK 220 - 5 % PARAMO SK 300 - 5 % PARAMO EOPS - 5 % PARAMO UNI PLUS - 5 % PARAMO ERO-SB; ERO-D 5 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 7 % PARAMO UNI PLUS - 7 až 9 % PARAMO EOPS - 7 až 10 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 7 % PARAMO UNI PLUS - 7 až 9 % PARAMO EOPS - 7 až 10 %
Recessing and parting	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 7 % PARAMO SK 300 - 7 %	PARAMO SK 400 - 5 % PARAMO SK 220 - 5 % PARAMO SK 300 - 5 % PARAMO EOPS - 5 % PARAMO UNI PLUS - 5 % PARAMO ERO-SB; ERO-D - 5 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 7 až 9 % PARAMO EOPS - 7 až 10 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 7 až 9 % PARAMO EOPS - 7 až 10 %
Drilling by SK tools	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 7% PARAMO SK 300 - 7 až 10 %	PARAMO SK 400 - 5 % PARAMO SK 220 - 5 % PARAMO SK 300 - 5 % PARAMO EOPS - 5% PARAMO UNI PLUS - 5 % PARAMO ERO-SB; ERO-D - 5 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 7 % PARAMO UNI PLUS - 7 až 9 % PARAMO EOPS - 7 až 10 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 7 % PARAMO UNI PLUS - 7 až 9 % PARAMO EOPS - 7 až 10 %
Drilling	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 7% PARAMO SK 300 - 7 až 10 %	PARAMO SK 400 - 5 % PARAMO SK 220 - 5 % PARAMO SK 300 - 5 % PARAMO EOPS - 5% PARAMO UNI PLUS - 5 % PARAMO ERO-SB; ERO-D - 5 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 7 % PARAMO UNI PLUS - 7 až 9 % PARAMO EOPS - 7 až 10 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 7 % PARAMO UNI PLUS - 7 až 9 % PARAMO EOPS - 7 až 10 %
Deep-hole drilling	PARAMO CUT 46 PARAMO CUT 32 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 8 %	PARAMO CUT 46 PARAMO CUT 32 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 8 %	PARAMO CUT 46 PARAMO CUT 32 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 7 %	PARAMO CUT 22 PARAMO CUT 32 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 7 % PARAMO EOPS - 7 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 6 % PARAMO UNI PLUS - 7 až 9 % PARAMO EOPS - 7 až 10 %
High-speed machining	PARAMO EOPS PLUS - 3 % PARAMO EOPS - 4 %	PARAMO EOPS PLUS - 3 % PARAMO EOPS - 4 %	PARAMO EOPS PLUS - 3 % PARAMO EOPS - 4 %	PARAMO EOPS PLUS - 3 % PARAMO EOPS - 4 %	PARAMO EOPS PLUS - 4 % PARAMO EOPS - 6 %	PARAMO EOPS PLUS - 4 % PARAMO EOPS - 6 %
Shaping of SK tools	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 5 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 5 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 % PARAMO SK 300 - 5 %	PARAMO SK 400 - 5 % PARAMO SK 220 - 5 % PARAMO SK 300 - 5 % PARAMO EOPS - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO ERO-SB; ERO-D - 5 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 6 % PARAMO UNI PLUS - 6 % PARAMO EOPS - 6 %	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 6 % PARAMO UNI PLUS - 7 % PARAMO EOPS - 7 %
Milling and shaping of ge	PARAMO CUT 15 PARAMO CUT 25 PARAMO CUT 46 PARAMO CUT 22 PARAMO CUT 32	PARAMO CUT 15 PARAMO CUT 25 PARAMO CUT 46 PARAMO CUT 22 PARAMO CUT 32	PARAMO CUT 15 PARAMO CUT 25 PARAMO CUT 46 PARAMO CUT 22 PARAMO CUT 32	PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 %	PARAMO CUT 32	PARAMO CUT OC AL PARAMO CUT 22 PARAMO CUT 32
Reaming of SK and RO tools	PARAMO CUT 15 PARAMO CUT OC MULTI PARAMO CUT 25 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5% PARAMO UNI PLUS - 8 % PARAMO EOPS - 8 %	PARAMO CUT 15 PARAMO CUT OC MULTI PARAMO CUT 25 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5% PARAMO UNI PLUS - 8 % PARAMO EOPS - 8 %	PARAMO CUT 15 PARAMO CUT OC MULTI PARAMO CUT 25 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5% PARAMO UNI PLUS - 8 % PARAMO EOPS - 8 %	PARAMO CUT 22 PARAMO CUT 32 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5% PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 %	PARAMO CUT 32 PARAMO ERO-SB; ERO-D - 5 % PARAMO UNI PLUS - 8 % PARAMO EOPS - 8 %	PARAMO CUT OC AL PARAMO CUT 22 PARAMO ERO-SB; ERO-D - 5 % PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 5 % PARAMO UNI PLUS - 8 % PARAMO EOPS - 10 %
Threading (using screw tap, thread eye, die head	PARAMO EPK - 1(přimazávání) PARAMO CUT 15 PARAMO CUT OC MULTI PARAMO CUT 25	PARAMO EPK - 1(přimazávání) PARAMO CUT 15 PARAMO CUT OC MULTI PARAMO CUT 25	PARAMO EPK - 1(přimazávání) PARAMO CUT 22 CF PARAMO CUT 15 PARAMO CUT OC MULTI PARAMO CUT 25	PARAMO CUT 22 PARAMO CUT 32 PARAMO ERO-SB; ERO-D - 5 % PARAMO UNI PLUS - 5 % PARAMO EOPS - 5 %	PARAMO CUT 32 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 10 % PARAMO UNI PLUS - 10 %	PARAMO CUT OC AL PARAMO CUT 22 PARAMO ERO-SB; ERO-D - 5 % PARAMO EOPS PLUS - 10 % PARAMO UNI PLUS - 10 %
External stretching	PARAMO EPK - 1 PARAMO CUT 15 PARAMO CUT 25	PARAMO EPK - 1 PARAMO CUT 15 PARAMO CUT 25	PARAMO EPK - 1 PARAMO CUT 15 PARAMO CUT 25	PARAMO CUT 25 PARAMO CUT 22 PARAMO CUT 32	PARAMO CUT 32	PARAMO CUT OC AL PARAMO CUT 22
Internal stretching	PARAMO EPK - 1 PARAMO CUT 15 PARAMO CUT 25	PARAMO EPK - 1 PARAMO CUT 15 PARAMO CUT 25	PARAMO EPK - 1 PARAMO CUT 15 PARAMO CUT 25	PARAMO CUT 25 PARAMO CUT 22 PARAMO CUT 32	PARAMO CUT 32	PARAMO CUT OC AL PARAMO CUT 22

Cooling functions of cutting liquids. Build-up prevention
Lubricating function of cutting liquids Cleaning function of cutting liquids
Machining and cutting oils are sorted according to performance by machining operations downwards.

- *Automotive oils*
- *Industrial oils*
- *Metal-working fluids, process oils and corrosion preventives*
- ***Bituminous products for waterproofing***
- *Road bitumens*
- *Fuels*
- *Solid hydrocarbons*
- *Paramo contractual dealers*

PARAMO



TECHNICKÝ A SKÚŠOBNÝ ÚSTAV STAVEBNÝ, n. o.
Osvedčovacie miesto OM 04 – *Approval Body, EOTA member*

POTVRDENIE O PRIJATÍ ŽIADOSTI NA VYPRACOVANIE EURÓPSKEHO TECHNICKÉHO OSVEDČENIA (ETA) PODĽA SMERNICE RADY 89/106 EEC

1. Výrobca/autorizovaný zástupca

PARAMO, a. s.
Pšeurovská 560
530 06 Pardubice
Česká republika

podal dňa 20. 06. 2005
(dátum zaregistrovania žiadosti o ETA)

Žiadosť o Európske technické osvedčenie (ETA) pre stavebný výrobok
strešné vodotesné zostavy aplikované v tekutom stave GUMOASFALT

V zmysle bodov 3 a 4 horeuvedenej žiadosti Vám potvrdzujeme prijatie Žiadosti a oznamujeme, že sa začalo konanie procesu o prideleniu Európskeho technického osvedčenia (ETA).

2. Vašu žiadosť o ETA registrujeme pod následovným evidenčným číslom:
OO4/05/0418/2005

3. Pri procese európskeho osvedčovania Osvedčovacie miesto TSÚS dodržuje:
tieto právne predpisy:
- Zákon č. 90/1998 o stavebných výrobkoch v znení neskorších predpisov,
- Spoločné pravidlá postupu pre podávanie Žiadostí, prípravu a udeľovanie európskych technických osvedčení,
- Predpis na Európske technické osvedčenie pre Strešné vodotesné zostavy aplikované v tekutom stave (Strešné fólie hydroizolačné zostavy) ETAG 005: rok vydania 2000.

4. Náklady na proces o vydanie ETA sú stanovené na základe:
- Obchodného zákonníka č. 18/1996
- a Interného cenníka Osvedčovacieho miesta TSÚS.

V Bratislave 28. 07. 2005

Ing. Dana Bellušová
zástupca vedúceho Osvedčovacieho miesta pre ETA

PARAMO

SK - Vyhlásenie zhody C_{SK}

Dolu podpísaný zástupca
výrobcu: PARAMO, a.s. Pšeurovská 560, 530 06 Pardubice
výrobne: HS Pardubice
týmto vyhlasuje, že výrobok: **asfaltový lak izolačný RENOLAK ALN**
je v zhode s ustanoveniami zákona č. 90/1998 Z. z. o stavebných výrobkoch v znení neskorších predpisov, ak je tento výrobok zabudovaný v súlade s návodom na použitie, a že sa na výrobok a jeho výrobu uplatňuje táto norma:
TN 23-016 Asfaltové laky izolační RENOLAK
V rámci počiatočných skúšok typu sa overili:

Vlastnosť	Deklarovaná hodnota	Číslo protokolu o skúške a odkaz na laboratórium
Bod vzplanutia PM, °C	min. 21	7835031/3/2001 1)
Výtoková doba F 6 ISO pri 23 °C, s	max. 70	7835031/3/2001 1)
Obsah nepriehľadných podielov v % hm.	min. 55	7835031/3/2001 1)
Bod mäknutia KK (krúžkovo-guľôčkový), °C	64 až 72	7835031/3/2001 1)
Obsah popola, % hm.	max. 5	7835031/3/2001 1)
Zaschnutý náter za 3 h, stupeň	max. 1	7835031/3/2001 1)

Oblasť výrobku a účel a spôsob použitia:
RENOLAK ALN sa používa na základné nátery kanalizačných rúr, izolačné nátery materiálov zo sivej liatiny, pri pokrývačských a izolatérskych prácach a renovačné nátery pri opravách lepenkových krytín. Výrobok nie je vhodný na nátery povrchov prichádzajúcich do priameho styku s pitnou vodou a potravinami.

Názvy a adresy laboratórií, ktoré skúšky vykonali:
1) ITC Zlín, AO č. 224

Pre preukázanie zhody boli použité:
Technické osvedčenie TO-05/0235 z 12.09.2005, platnosť do 11.09.2010
Certifikát preukázania zhody C3.3/010221/1/C/C04 zo dňa 19.03.2001
Správa o výsledku predbežnej inšpekcie č. 104/04/0165/04/5301/CIT zo dňa 21.03.2005, TSÚS
Záverečný protokol č. 7835031/3/2001 z 26.11.2001
Správa o dohľadu č.343500603A/2004 z 22.12.2004
TN 23-016 Asfaltové laky izolační RENOLAK
BL Asfaltový lak izolační RENOLAK ALN
Certifikát ISO 9001:2000, č. 04130619/8/01
Certifikát ISO 14001, č. 04 104 2003 9003/01

Platnosť PoZ: 11.09.2010

Meno: Ing. Petr Bláha
Funkcia: generálny riaditeľ PARAMO, a.s.
Dátum: 20.9.2005

Podpis

PARAMO, a.s.
Pšeurovská 560
530 06 PARDUBICE

ČLEN SKUPINY UNIPETROL

PARAMO has elaborated "Declaration of conformity" for all its bitumen products and presently asked also fro European technical certification (ETA) according to council standard 89/106 EEC.

Product name	Usable life
ALUMATOL	30. 6. 2007
AOSI/ 85/25	31. 8. 2009
GUMOASFALT SA 1	30. 6. 2007
GUMOASFALT SA 12	30. 6. 2007
GUMOASFALT SA 23	31. 8. 2008
GUMOASFALT SA 27	31. 8. 2008
KONKOR 500	30. 6. 2007
LUTEX ATN	30. 6. 2007
LUTEX ATS	30. 6. 2007
LUTEX LT	30. 6. 2007
LUTEX MOAT	30. 6. 2007

Product name	Usable life
PARAFALT AP 15	31. 5. 2007
PARAFALT AP 25	30. 4. 2008
PENETRAL ALP	31. 10. 2007
PENETRAL ALP-M	31. 11. 2007
PENETRAL MOAL-P	31. 07. 2007
REFLEXOL	31. 10. 2007
RENOLAK ALN	31. 12. 2007
RENOLAK ALT	31. 12. 2007
RENOLAK ALT-S	31. 12. 2007
VLYSEX 19	31. 3. 2007

BITUMINOUS PRODUCTS FOR WATERPROOFING

In construction industry, especially during construction work protection against humidity, bitumen and bituminous products are one of most frequent construction materials, despite plastic materials development. Modern technology allows production of numerous types, which attributes are modified and improved by addition of various modification additives. This guarantees their wide use in waterproofing technology. During modification of roofing, bitumen products apply during cold processing. These products have gained unsubstitutable place for using of all types of waterproofing, for its perfections, among which belong not only processing in cold temperatures, but also simplicity of spreading, very good weather resistance, work productivity during spreading and favorable price.

PENETRAL BITUMINOUS PRIMERS

This group of bitumen products consists of bituminous substances dissolved in organic solvents. At normal temperatures, bituminous primers are black liquid substances, which are free of water and mechanical impurities. Bituminous primers have after solvent evaporation good adhesion to all construction materials (concrete, metal, masonry, etc.) They penetrate deeply into porous base and create firm connection with further insulative layers. Separately-used bituminous primers are not directly resistant against weather effects and humidity. They do not create waterproofing layer.

ALP – bituminous primer

Use: for penetration of dry and cleaned base under bitumen insulative covering and insulation.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

ALP-M – modified bituminous primer

Use: for penetration of base where waterproofing from modified bitumen will be applied. It contains also adhesive additive against humidity. It guarantees adhesion also to humid base.

Processing: bituminous primers are processed at cold temperatures. For application, brush or roofing brush are used. It is possible to execute coating or soaking. Before use, it is necessary to mix the content properly. Consumption is dependent on the way of use: 0.3 kg/m^2.

Packaging and storage: it is supplied in 3.5 kg and 9 kg canisters, 20 kg buckets, 170 kg (200-liter) drum, in railway tanks and truck tanks of a supplier. They are stored in closed packing in sheltered areas. Packing with primers must not be exposed to increased temperatures or direct sun radiation. During storage, thickening of primer is allowed up to 50%. Bituminous primers can be thinned by solvent (S 6006).

Warning: Inflammable of 2nd class

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

RENOLAK BITUMINOUS WATERPROOFING PAINTS

It concerns a group of bitumen substances dissolved in organic solvent. Bitumen insulative primers are at normal temperatures grey-black or black viscous liquid substances which are free of water and mechanical impurities. Bitumen substance after evaporation has good adhesion to all construction materials (concrete, masonry, metal, etc.) and well holds on all bitumen surfaces.

ALN – BITUMINOUS COATING PAINT

Use: Renewing and protecting coating of bituminous and transite roofing, concrete and cement-asbestos pipes, wire fences, etc. Further for insulative paints of materials from grey covering, basic paints of sewer pipes, for roofing and insulation operations. After dry up time, the paint is plastic, non-sticky.

Classification according to Act 434/2005, Collection, see safety sheet

ALT – bituminous hard paint

Use: for restoring paints of bituminous felts covering, sewer pipes, insulative protective paints of sewer pipes, steel drum, constructions and other steel objects. The final appearance is bright black, after dry up time, the paint is hard and non-sticky, by touch dry.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

ALT-S – SILOLAK BITUMINOUS HARD PAINT

Use: as ALT; higher content of bitumen and viscosity allows to apply thicker paint, lower content of solvent reduces ecological load in the place of application, suitable for steel silos insulation.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

MOAL – MODIFIED BITUMINOUS PAINT

Use: for creation of protective and renovating coating on bitumen covering for covering of micro gaps, possibility to glue polystyrene only after solvent agent evaporates. It is also used for gluing of bituminous stripes at cold temperatures and heat-insulating materials on the basis of mineral fibre. It creates highly-elastic paint, which absorbs mechanical tensions originating during dilatation of base layer. It is suitable also for anti-corrosion layer of metals. Fresh paint is sticky after drying.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

ALIT – BITUMINOUS PAINT FOR INSULATION OF PIPES

Use: for creation of base layer of external bituminous pipes insulation or as temporary protection during their storage.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

KONKOR 500

Use: contains anti-corrosion additive, therefore it is used as anti-corrosion paint of metal objects and constructions for external use. Not suitable for paints of materials made of noble metals (Copper corrosion test, aluminum, galvanized steel, etc.).

Processing: bituminous primers are processed at cold temperatures. For application, brush or roofing brush are used. Spraying and soaking is also possible. Before use, it is important to mix the content properly. The consumption is dependent on way of application: 0.3-0.5 kg/^{2}.

Packaging and storage: supplied in 4 kg and 9 kg canisters, 160 kg (200-liter) drum, railway tanks and truck tanks of a supplier. They are stored in closed packing in sheltered areas. Packing with primers must not be exposed to increased temperatures or direct sun radiation. During storage, thickening of primer is allowed up to 50%. Bituminous primers can be thinned by solvent (S 6006).

Warning: Inflammable of 2nd class

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

PARASTICK BITUMINOUS STICKING VARNISH

Stick substance on the basis of diluted bitumen, synthetic rubber and resins. It is marked with high connection stability, stickiness also after drying. It is black liquid substance at normal temperature.

PARASTICK – BITUMINOUS ADHESIVE

Use: gluing bituminous protective insulating felts and similar roofing materials. Suitable also for sticking of polystyrene only after ventilation of solvent and for plastic materials sticking. Its main advantage is that at low temperatures it does not lose, compared to majority of other bitumen materials, its good adhesion to plastic materials.

Processing: Preferably, it is applied by spilling and subsequent distribution by spatula on a dry and clean surface. Supposed consumption is at smooth plastic ground 0.1 kg/m^2 and at other materials 0.3-0.5 kg/m^2, according to ground texture.

Packing and storage: sticking primer is supplied in 9 kg canisters and 44 kg drums. It is stored in closed packing in sheltered areas. Packing with primers must not be exposed to increased temperatures or direct sun radiation. It is thinned by toluene (S 6001).

Warning: Inflammable of 2nd class

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

LUTEX BITUMINOUS WATERPROOFING BINDERS

Bituminous binders are mixtures of oxidized construction waterproofing or modified bitumens dissolved in organic solvent with inorganic fillers. Binders are processed at cold temperatures and at normal temperature, they are grey-black or black color of dense consistency, they are free of water and mechanical impurities. Bitumen substance after solvent evaporation has very good adhesion to all construction base and materials (concrete, masonry, metal, etc.). Binders are not suitable for insulative paints in populated houses and in food industry.

ATN – BITUMINOUS BINDER PAINT

Use: for renovation of old or damaged bituminous waterproofing layers and structures, in some cases in combination with reinforcing fillers. It is used at temperatures above 5°C and roof pitch of up to 10°.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

ATS – BITUMINOUS BINDER SPRAY

Use: for repairs of old or damaged bitumen waterproofing layers and structures, in some cases also in combination with reinforcing fillers. It is used at temperature above 5°C and roof pitch of up to 5°. In some cases it is possible to use it also at lower temperatures.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

MOAT – MODIFIED BITUMINOUS MASTIC

Use: for repairs and for sticking of thermal insulation materials on the basis of mineral wool. During polystyrene sticking it is necessary to wait for evaporation of solvent. It can be further used for repairing of details and defective places of roofing (inlets, attics, transition from horizontal to vertical surfaces, etc.). During use of cement and reinforcing fillers, it is possible to repair roofs and also create seamless coating roofing. It can be also used as temporary waterproofing layers (e.g. winter roofing). This layer can later serve as good basis for fusion or sticking of further waterproofing layers.

Average mastic volume per one coat is 0.8 kg/m^2:

- for restoring layer of roofing min. 2 coats;
- for waterproofing layer with reinforcing fillers 5-6 coats;
- for temporary waterproofing layer (e.g. winter roofing) min. 2 kg/m^2;
- for sticking of thermal insulation materials 1-1.5 kg/m^2.

Processing: Progresses at low temperatures. The product is applied using brush or mop back. With the help of suitable equipment ATS mastic can be sprayed. Before use, it is necessary to stir binders in containers properly. In case of need it is possible to modify consistence by solvent (S 6006). Insulative operations can not be applied during rainy weather, on humid ground or during frost.

Packaging and storage: in containers with removable cap of volume 52 kg, 105 and 120 kg and in 10 kg buckets. During storage, the containers must be well closed and protected against water. The highest allowable temperature during storage is 30°C. Smoking and manipulation with open fire is prohibited near stored binders. Frost is not harmful.

Warning: Inflammable of 2nd class

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

LUTEX ATV – water diluted bitumen mastic

Use: for repairs of old or damaged bituminous waterproofing layers and structures, in some case in combination with reinforcing fillers; for insulation against ground humidity and as jointless coating roofing; for creating protective layers of coating roofing from insulative felts; for creating waterproofing layers on various ground materials. This waterproofing layer remains as basis for fusion or sticking of further waterproofing layers.

Consumption 0.7 kg/m^2. Application: by brush, roller, bitumen brush.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

BITUMEN STICKING BINDERS

LUTEX LT – BITUMINOUS STICKING MASTIC

Bitumen mastic diluted by light benzine.

Use: for sticking of all types of wooden boards and mineral insulative materials, for sticking of tiles on concrete of external terraces. It is not recommended for reconstruction of places in which people simultaneously live.

Processing: It is enough to perform it pointwise for sticking of insulative mineral boards, for others it is necessary to have full-area paint. Supposed consumption is 1-1.5 kg/m^2.

Packaging and storing: it is supplied in metal buckets of capacity 10 kg and 120 kg. It is stored in closed metal packing. It is necessary to protect it against the sun, max. storage temperature is 30°C.

Warning: Inflammable of 1st class

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

VLYSEX SA 19 – BITUMINOUS STICKING MASTIC

Use: for sticking of construction materials to grounds, especially timber flooring, thermally insulative polystyrene boards, fibre boards, where it is not possible to use LUTEX LT due to organic solvent content. It is applied by a tooth spatula. It has necessary hardness of knock-up in skid on a surface concrete-wood and wood-polystyrene. Consumption is 1.5 kg/m^2.
Application: by a spatula

ALUMINUM-BITUMEN REFLEXIVE PAINTS

Reflexive paints are mixtures of bitumen dissolved in suitable organic solvent with addition of aluminum pigment. In addition, reflexive binder contains additive of mineral fillers. Reflexive paints lose its reflexive look in dusty environment after 2-3 years after dab, especially on plain roofs, but they fulfill their most significant function – protection of surface covering against solar radiation – also in polluted state.

REFLEXOL – ALUMINUM-BITUMEN PAINT

Use: as surface treatment of new and renovated bitumen roofing. Protective effect lasts roughly 3-5 years. It is possible to be solvable (S 6005).

Warning: Inflammable of 2nd class

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

REFLEXOL SA 28

Use: in construction for application of protective reflexive paints of bitumen covering (waterproofing stripes, bitumen paint substances). It is water solvable silver bitumen emulsion. After drying, paints have light white-grey or silver color reflecting sunrays. It has good adhesion to bitumen surfaces. Consumption is 0.4-0.5 kg/m^2. Application: by brush, roller or bitumen brush. It reduces temperature of covering of roof deck.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

ALUMATOL – BITUMEN REFLEXIVE MASTIC

Use: as surface layer of new or renovated bitumen covering against solar radiation. Protective effect lasts 7-9 years. It reduces temperature of covering of roof deck.

Processing: At cold temperatures it is applied by brush or roofing brush, for REFLEXOL, it is possible to use also spraying. Base must be clean, dry and not frozen. Work in rain cannot be performed. It is necessary to mix it before use. Consumption in case of REFLEXOL is 0.3 kg/m^2 and in case of ALUMATOL 0.7-1 kg/m^2.

Packaging and storage: REFLEXOL is supplied in containers of capacity 91 kg and 41 kg, in 12 kg cylinder buckets and 3.8 kg cans. ALUMATOL is supplied in containers of capacity 50 kg and in 8.6 kg cylinder buckets. Paints are stored in tightly sealed packing which must not be exposed to increased temperatures or direct effects of solar radiation. Manipulation with open fire and smoking is prohibited in storage area. Frost is not harmful (with exception of 87 28 – must not be exposed to frost, because permanent damage of a product takes place).

Warning: Inflammable of 2nd class

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

BITUMINOUS EMULSIONS FOR WATERPROOFING OF ROOFS

It concerns water dissolvable paint substances of lightly acid character in which ground bentonite is contained as filling. They adhere well to all construction materials (concrete, brick, sheet metal, bitumen, rock, etc.). First, it is necessary to apply penetration paint which will create connecting bridge.

GUMOASFALT SA-1 – BITUMINOUS EMULSION

Use: maintenance of bitumen felts and waterproofing bolding top covers, protective paints of concrete roof parts.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

GUMOASFALT SA-12 – BITUMINOUS EMULSION

Use: for maintenance of bitumen roofing, combined covering of new roof felts, sealing of roof details.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

GUMOASFALT SA-23 – RUSSET BITUMEN EMULSION

Use: for surface modification of GUMOASFALTs, LUTEXes and roof felts. It is colored paint of insulative layers. It is not recommended for places where slops of water permanently stay.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

ANTIVIBRAL TH 12 – SOUND-DAMPING EMULSION

Use: for noise absorption of vibrating metal surfaces, e.g. automobile body. It is possible to use it also for waterproofing. It has higher running-down resistance and also cracks creation resistance.

Processing: At cold temperatures by paint of roof brush, brush, spatula or spraying by suitable equipment. It is necessary to properly mix the substance before use. It is always necessary to pay attention to properly spread the paint in order to create continual film. It does not receive water after perfect drying. Consumption is around 0.75 kg/m^2 per one coat.

Packaging and storage: it is supplied in 5 kg plastic buckets and 102 kg drums. The product must not be exposed to frost and must not be mixed with other bituminous substances.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

BITUMINOUS TWO-COMPONENT SPATULA EMULSION

GUMOASFALT SA-27 – bitumen insulative suspension

It is double-barrelled substance which consists of alkaline bituminous emulsion and powder congealing accelerator. After mixing of these two components we create dense binder which perfectly adheres in horizontal and vertical position to all construction grounds (concrete, bricks, wood, etc.). It is water thinnable, in case of need it is possible to modify consistence. It can not be mixed with other suspensions.

Use: for waterproofing of all construction materials, waterproofing against humidity, pressure and non pressure water. For maintenance of bitumen roofing, seal of roof details, sticking polystyrene to all types of grounds, for waterproofing of vertical walls and joint bonding.
– for creating thick-layered spatula waterproofing of bases,
– for insulation of balconies and terraces.

Processing: it is applied with spatula after mixing of powder hardener (component B) with bitumen substance (component A). It can be used only at temperatures above 10°C. It can not be applied during rain or fog. Consumption is 4-6 kg/m2 per coat. Minimum of 4 mm width per one coat is required. Two coats are required for pressure waterproofing. After mixing of both components it is necessary to process the content within 45 minutes. It is possible to use component A only for penetration. For this purpose, mix it with water in 1:1 ratio.

Packaging and storage: packing is adjusted for liquid material and supplied in 10-liter buckets and 2.3 kg powder hardener in paper sack, in 27.9-liter bucket (6.9 kg of powder hardener). Store in sheltered areas in tightly sealed packing at temperature 2-30°C. They must not be exposed to frost or the sun. At temperature 0°C permanent damage of suspension takes place.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

GUMOASFALT SA 18 – bitumen insulative suspension

Use: one-component thixotropic bitumen-latex water dispersive substance suitable especially for waterproofing paints of concrete and masonry, steep and vertical areas. It dries to very elastic insulative layer capable of bypassing cracks. It has good adhesion to concrete and bitumen stripes. Regarding absence of organic solvent, it is suitable also for internal areas. It is necessary to create minimum of 1.5 mm of dried layer, i.e. 4 coats for waterproofing of roofs.

Consumption: 0,4 kg/m^2.
Application: brush, roller or bitumen brush.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

AOSI – OXIDIZED BITUMENS FOR BUILDING INDUSTRY

Oxidized construction-insulative bitumen is petroleum bitumen produced by oxidation of softened residues of vacuum crude oil distillation. It is solid substance without water and mechanical impurities at normal temperature.

AOSI 85/25, AOSI 85/40, AOSI 95/35, AOSI 105/15

(numbers behind name describe softening point/penetration)

Use: AOSI 85/25, 85/40 are used for insulation of ground, industrial and engineering constructions. For production of materials for waterproofing – insulative felts and for other insulative and industrial purposes. AOSI 95/35 for bitumen insulative felts production. AOSI 105/15 for production of non-modified bitumen roof shingleses.

Processing: At hot temperatures for all materials according to corresponding technological progresses and standards ČSN. Long-term storage at hot temperatures may cause increase of softening point.

Transport: in insulated truck tanks, drum deliveries on pallet.

Packaging and storage: AOSI 85/25 in steel drums of capacity of 100 kg and 200 kg (115-liter and 200-liter) and in paper 50 kg packages. It can be also delivered in truck tanks of customer or transporter. Store in original containers with opening facing up in dry places protected against weather effects. In liquid state, they are stored in steel tanks equipped with heating. The quality remains the same during correct storage.

BASIC RULES OF USING BITUMEN PRODUCTS APPLIED AT COLD TEMPERATURES:

1. Mix properly before use.
2. Do not thin, the material is designed for optimal temperature for optimal use. Thin only in necessary cases (solvent evaporation).
3. Do not smoke, eat, drink, use open fire, work in closed space and do ensure good area ventilation during work with solvent materials.
4. When working with water-based materials, always watch the weather, if there is not certainty of paint drying, do not apply.
5. Respect whether it concerns upper or bottom paint. Upper paint is almost valueless without base coat.

Warning: the equivalent replacement of xylene is toluene – it is inflammable 1st class. Konkor 500 is not suitable for galvanized plate. The consumption is defined per one spraying/paint.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

Product Name	Trade Name	Thinner	Application	Outside Temperature Min. °C	Number Of Paints Min.	Padding	Combustible	Ecological Harm	Paint Consump-tion kg / m²	Packaging kg	Drying period	Area of Main use	Perma-nently In water
SA 1	GUMO-ASFALT	Water	Paint	10	Maintenance 2 Insulation 4	Yes	0	0	0,7	5, 10, 102	2 - 4	Bottom roof paint	No
SA 12	GUMO-ASFALT	Water	Paint	10	Maintenance 2 Insulation 4	Yes	0	0	0,7	5, 10, 102, 20, 30	2 - 4	Bottom roof paint	No
SA 18	GUMOASFALT	Water	Spattle, Paint	10	Maintenance 2 Insulation 4	Yes	0	0	0,4	10 20, 30	2-4	Vertical insulation, roof paint	No
SA 23	GUMO-ASFALT	Water	Paint	10	1	No	0	0	0,7	5, 10, 108	2 - 4	Top paint red-brown	No
SA 27	GUMOASFALT	Water	Spattle, Smoother	10	1 max. 2	No	0	0	5,0	9, 3	12	Vertical insulation Cracks cementation	No
TH 12	ANTIVIBRAL	Water	Paint	10	3 - 4	No	0	0	1,0	5, 10, 102	3 - 6	Anti-vibration paint Sloping roofs	No
A T N	LUTEX	White Spirit xylene	Paint	4	Maintenance 2 Insulation 4	Yes	2nd class	Dissolvent vapors	0,8	10, 120	2 - 6	Roof pain, flat roofs	No
A T S	LUTEX	White Spirit xylene	Spray	4	Maintenance 2 Insulation 4	Yes	2nd class	Dissolvent vapors	0,5	105	2 - 4	Roof pain, flat roofs	No
M O A T	LUTEX	White Spirit xylene	Paint	4	Maintenance1 Insulation 4	Yes	2nd class	Dissolvent vapors	1,0	10, 52, 120	2 - 8	Roof paint, sticking	No
LT	LUTEX	Benzine 80/110	Spattle	4	1 (2)	No	1nd class	Dissolvent vapors	1,5	10, 120	2-5	Adhesive cement	No
ATV	LUTEX	Water	Paint	10	2	No	0	0	0,7	10	2-4	Vertical insulations, roof paint	No
A L P	PENETRAL	White Spirit	Paint, spray	2	1	No	2nd class	Dissolvent vapors	0,3 - 0,4	4, 9, 160	1 - 3	Concrete penetration	Yes
A L P M	PENETRAL	White Spirit	Paint, spray	2	1	No	2nd class	Dissolvent vapors	0,3 - 0,4	9, 160	1 - 4	Concrete penetration	Yes
A L N	RENOLAK	White Spirit	Paint, spray	2	Maintenance1 Insulation 3	No	2nd class	Dissolvent vapors	0,4 - 0,5	9, 160	1 - 4	Insulation paint	Yes
M O A L	RENOLAK	White Spirit xylene	Paint, spray	4	Maintenance1 Insulation 4	No	2nd class	Dissolvent vapors	0,5 - 0,6	9, 170	1 - 4	Sticking paint	Yes
ALT	RENOLAK	White Spirit	Paint, spray	2	Maintenance1 Insulation 3	No	2nd class	Dissolvent vapors	0,4 – 0,5	160	1 - 4	Insulation paint	Yes
Reflexol	REFLEXOL	White Spirit xylene	Paint, spray	4	1	No	2nd class	Dissolvent vapors	0,3	4, 12, 41, 91	1 - 4	Top reflexive paint	Yes
SA 28	REFLEXOL	Water	Paint	10	1	No	0	0	0,4 – 0,5	10	2 - 4	Water reflexive paint	No
Alumatol	ALUMATOL	Xylene	Paint	4	1	No	2nd class	Dissolvent vapors	0,8	9	4 - 6	To reflexive paint	No
SA 19	VLYSEX	Water	Spattle	10	1	Yes	0	0	1,5	10	6	Sticking cement	No
Parastick	PARASTICK	Toluene	Paint	4	1 - 2	No	1nd class	Dissolvent vapors	0,4	9, 44	1 - 2	Sticking paint	Yes
Konkor 500	KONKOR 500	White Spirit	Paint, spray	4	1 - 2	No	2nd class	Dissolvent vapors	0,3 - 0,5	4, 9, 160	1 - 4	Anti-corrosive paint	Yes

REPAIRING A ROOF USING GUMOASFALT AND FILLER

Priming of concrete using PENETRAL ALP paint.

Gumoasfalt SA 12 coat is applied on primed concrete using mop or brush.

Laying glass fabric on the first layer of SA 12.

On glass fabric SA 12 is applied using mop or roller.

Applying Gumoasfalt SA 23 using roller.

REPAIRING A ROOF USING PAINT

Renewal coat on old roofing using PENETRAL ALP and mop.

Gumoasfalt SA 12 is applied using mop or roller.

After opening package and mixing its content, Reflexol is ready for application.

Applying final coat of aluminum-bitumen paint.

EXTENSION OF LIFETIME OF WATERPROOFING FELT

Prior to laying waterproofing felt, the surface needs to be carefully cleaned.

Priming concrete base using a mop.

Laying SA 23 on new waterproofing felt, its lifetime is increased and UV protection is upgraded.

Application of SA 23 using roller.

WATERPROOFING AGAINST SOIL HUMIDITY AND PRESSURIZED WATER

Using a spatula, Gumoasfalt SA 27 is applied on a vertical wall.

Material is ready for distribution after proper mixing of powder hardener (component B) and bitumen mass (component A).

SA 27 is applied from bottom to the top. At least, one layer of 4 mm width must be applied.

- *Automotive oils*
- *Industrial oils*
- *Metal-working fluids, process oils and corrosion preventives*
- *Bituminous products for waterproofing*
- ***Road bitumens***
- *Fuels*
- *Solid hydrocarbons*
- *Paramo contractual dealers*

PARAMO

Continuous load of road network requires proper maintenance of roads and quality bitumen mixtures for their construction. PARAMO, a.s., Pardubice has in its production program, beside verified materials, the whole range of new progressive products. In many cases classic bitumen binders are not sufficient and it is necessary to apply modified binders. Modified bitumen and some newer types of construction layers have been used on the mass scale in the Czech Republic since the 90s. Extension of lifetime and quality increasing of roads leads to economic and ecologic benefits. There is reduction of demanding repairs and energetic demand factor decreases. Modified bitumen increase capacity and lifetime of bitumen roads, by which fulfill also conditions for further development of automobile transportation.

BITUMEN EMULSIONS

Basic bitumen is emulsified in water with suitable emulsifiers.

Cationic emulsion

– suitable for all types of aggregates of acidic or neutral character.

Katebit R 65 M

Quick-fissionable road emulsion for paints and repairs of roads.

Katebit R 65

Quick-fissionable road emulsion for paints and repairs of roads.

Katebit S 60

Middle-fissionable emulsion for sludge alignment.

Katebit T 60 M

Middle-fissionable emulsion for binding sprays.

Katebit T 40

Middle-fissionable emulsion for binding sprays.

Katebit PS

Stable emulsion for wrapping.

Use:

Katebit R 65, R 65 M	for maintenance of bitumen roads by paint technology;
Katebit S 60	for laying of sludge alignments of the type “slurry seal”;
Katebit T 40, T 60 M	for binding sprays (prime-sprays, in-between-sprays) in an amount of 0.2 – 0.5 kg/m^2;
Katebit PS	for wrapping of aggregates and recycled material at cold temperatures.

Processing: At cold temperatures. The temperature of emulsion ranges from 40°C to 70 °C according to corresponding conductive standards and processing standards.

Transportation: All types of bitumen road emulsions are supplied in truck tanks. Katebit S 60 can be also supplied in 200-litre drum.

Storage: Cationic emulsions Katebit are stored in clean tanks or other suitable containers for the period of 8 weeks. For cationic emulsions, the storage tanks must not be after anionic emulsion in order not to degrade the emulsion. During storage of all types of emulsions, the temperature must not decrease below +2 °C. All emulsions are permanently degraded by frost. Bitumen emulsions KATABIT are non- flammable liquids according to ČSN 65 0201.

CUTBACK ROAD BITUMENS

Thinned road quick-setting (RT) bitumen is inflammable liquid of 2nd class of danger with Flash point above 21°C, thinned slow-setting (NT) bitumen is inflammable liquid of 3rd class of danger with Flash point above 55°C regarding standard ČSN 65 0201. It is necessary to observe standards regarding health protection and work safety.

AR - RT 90

Cutback road bitumen.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

Liquafalt AR - RT 50 A

Cutback road bitumen with adhesive agents.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

Asfalton ARP - 30 A

Regenerating cutback bitumen binder.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

AR - NT 20 A

Cutback road bitumen with special additives for wintertime repairs.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

Use:

AR-RT 90	for surface painting and of priming adjustments according to ČSN 73 6129;
AR-RT 50 A	for pre-coating of masonry of open granulity, which is used for repair of scabbing, for compaction of bitumen mixtures of open granulity or as spray according to ČSN 73 6129;
ARP-30 A	for regeneration and binding sprays, for coating of roads according to ČSN 73 6129;
AR-NT 20 A	as special binder for wrapping of mixtures laid during humidity or frost.

Processing:

AR - **RT 90**	at temperature	70 – 100 °C
AR - RT 50 A	at temperature	50 – 70 °C
ARP 30 A	at temperature	10 – 40 °C
AR - NT 20 A	at temperature	0 – 40 °C

Transportation: in truck tanks.

Storage: In storage tanks with indirect heating. Storage must correspond to ČSN 65 0201. Temperature during storage should not exceed 80°C.

ROAD BITUMENS – PARAFALT

They fulfill quality requirements ČSN EN 12 591.

ASF 160/220, ASF 70/100, ASF 50/70, ASF 30/45

They are produced from distilled residue of vacuum petroleum distillation, and modified by semi-blowing. In case of requirement for improving of adhesion to masonry, it is possible to supply bitumen for compaction bitumen layer with addition of adhesive additive.

Use: ASF 160/220, ASF 70/100 for priming adjustments and coats according to ČSN 73 6129;
ASF 70/100M ASF 50/70, ASF 30/45 for compacting of bitumen layer according to ČSN 73 6121.

Processing: Hot-processed, each modification always according to corresponding ČSN.

Transportation: In liquid state in truck tanks, which must be insulated and equipped with radiator heating coil.

Storage: In tanks with indirect heating. Storage temperature must not be higher than 50°C above the point of softening of stored bitumen. Above all, it is necessary to guarantee that bitumen is not exposed to higher temperatures in the long term. Road bitumens in drums are stored on dry places protected against weather effects, with discharge holes of containers opening facing up. Quality of product does not change with correct storage.

HARD AND SPECIAL ROAD BITUMENS

Hard road bitumens and special bitumens with high rigidity module are included in this group. Special bitumen are non-modified bitumen binders produced by other refinery processes than distillation or semi-blowing. Special bitumens, which differ in some parameters from common road bitumen, are designed for special road technologies. Below mentioned bitumen binder for high rigidity module Parafalt VMT 45 features itself, compared to equivalent binders AP 45 and AP 25, with extended area of plasticity and higher ductility.

AP 15 (TSA 10/20), AP 25 (TSA 20/30), VMT 45 (TSA 30/50)

(Labeling in brackets is according to valid ČSN EN 13924 – System of specification of hard road bitumen)

They are produced from distilling residue of vacuum petroleum distillation by oxidation of air oxygen, or by mixing with another suitable bitumen semi-products.

Use:

AP 15, AP 25 for cast road bitumen and cast special bitumen;
AP 25, VMT 45 for compacted bitumen layers with high rigidity module.

Transportation: In liquid state in truck tanks, types AP 25 and AP 15 also in 200kg steel drums by trucks or in railway cars.

MODIFIED ROAD BITUMENS

Modified bitumens are bitumens binders, which physical and mechanical attributes were modified by polymer additive. At normal temperature, they are semi-solid or solid homogeneous substances stabile against spreading out during storage. They do not contain water and mechanical impurities. In English and German texts and new European standard EN 14023 they are stated by abbreviation PmB(Polymer modified Bitumen, Polymer modifizierte Bitumen), in Czech texts and PARAMO texts SMA (silniční modifikovaný asfalt) abbreviation has been stated so far. In the words, modified bitumens traverse by continuous progress and not otherwise modified bitumens in PARAMO Pardubice, which bear trademark MOFALT. Mofalts were introduced on the basis of thermo-plastic rubber styrene-butadiene-styrene (SBS). Later, introduction of production of binders with binding modification SBS + EVA and with chemically networking modification with the help of reactive elastomer terpolymer (RET) took place.

MOFALT SMA 65 Extra (PMB 45/80-60), MOFALT SMA 45 Standard (PMB 25/55-55),
MOFALT SMA 45 Extra (PMB 22/55-60), MOFALT SMA 25 (PMB 10/40-65)

(labeling in brackets is according to valid ČSN EN 14023 – System of specification of road modified bitumen)

Primary imagination about performance of binder can be done from "European sorting" according to ČSN EN 14023, in which a fraction marks range of penetration and a number after dash mean minimum point of softening:

Binders gradation 65:

MOFALT SMA 65 Extra – for compacting of bitumen layer of class PMB 45/80-60 with increased level of modification by reactive elastomer terpolymer RET, middle point of softening = 60°C.

Binders of gradation 45:

MOFALT SMA 45 Extra – for compacting of bitumen layer of class PMB 25/55-55 with modifications by reactive elastomer terpolymer RET, middle point of softening = 60°C.

MOFALT SMA 45 Standard – for compacting of bitumen layer of class PMB 25/55-55 with modification SBA, minimum point of softening = 55°C.

Binders of gradation 25:

MOFALT 25 – for compacting of bitumen layer of class PMB 10/30-65 with modification by elastomer terpolymer RET, middle point of softening = 70°C.

Use: MOFALT SMA 45, MOFALT SMA 65 for compacting of bitumen layer according to ČSN 73 6121, for roads with high traffic volume (motorways and speedways, urban crossings, climbing lanes, roads on bridges, etc.).

MOFALT SMA 25 for production of cast bitumen, especially for protective layers of bridges

Processing: During hot temperatures. All common types of bitumen mixing plants are used for packing. The temperature for wrapping of by 5°C higher than for semi-blown bitumen of same gradation. Temperature for processing of all types of modified bitumen is 150-180°C. The highest permitted temperature for heating of modified bitumen is 200°C. For significant adhesion, PARAMO, a.s. supplies on request Romonta additive to all types.

Transportation: in automobile tanks, which must be insulated.

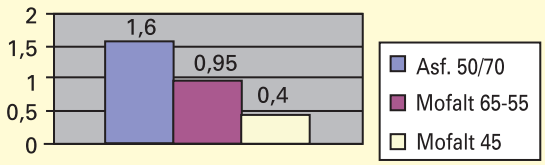
Storage: In insulated tanks equipped with indirect heating. The heating temperature must not exceed 200°C. At higher temperatures degradation of thermo-plastic rubber takes place. The recommended temperature for storage is 100°C – 130°C. It is necessary to mix before extraction after long-term storage.

In comparison with common bitumen binders, increase of resistance against creation of permanent deformations is reached for bitumen mixtures prepared with modified binders, especially at high temperatures along with decrease of thermal sensitivity. Endurance attributes are significantly improved and thus also durability of road 2-2.5 times. Further, adhesion to masonry, attributes at low temperatures and resistance against creation of frost cracks improve. Important prerequisite for reaching quality demands of modified bitumen is short period of primer bitumen. Primer bitumen for modification must be optimally compatible with added polymers. Particular bitumens have different solvent capability defined by their chemical composition. Stable composition of primer bitumen and quality parameters of range of modified binders is defined by applying following standards:

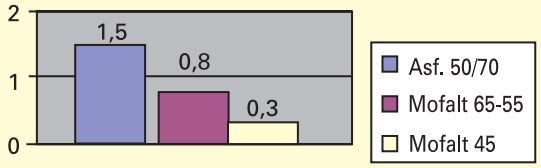
– constant raw materials source;
– selection of bitumen suitable for modification of particular SMA kinds;
– control of chromatographic composition by latroscan chromatograph.

Creation of plastic deformations – creation of tracks – is one of most common disorders of bitumen roads covers. By using bitumen binders modified by elastomers or plastomers, increase of resistance of composite mixtures for tracks creation will take place. The results of various modified binders for selected mixtures are shown by charts:

Very coarse bitumen concrete ABVH 12 000 traversings



Bitumen masticic carpet AKM 10 000 traversigs



MODIFIED SPECIAL ROAD BITUMENS

MOFALT SMA DM, IZOFLEX TS

MOFALT SMA DM – special binder if class PMB 60/105-75 with higher content of thermoplastic rubber SBS, middle point of softening = 85°C designed for membranes and drainage carpets. It is supplied in truck tanks.

IZOFLEX TS is bitumen adhesive substance with thermoplastic rubber. It serves for performing sticking paint in waterproofing system of steel and concrete bridges by technology of spatula insulation according to ČSN 73 62 42. It is supplied in 115-litre drums.

BITUMINOUS JOINT SEALANTS

Compounds are mixtures of bitumen with inorganic or organic fillers, in some case bitumen modified by polymers and additives for improving thermal and oxidative stability.

AZ

Bituminous joint sealant. Bitumen seal substance workable at hot temperature.

MOZAL TS

Thermoplastic elastic sealing mass, workable at hot temperature, with increased thermal stability. It is produced from suitable type of petroleum bitumen, thermo-plastic rubber and additives for improvement of thermal and oxidative stability.

MOFALT SMA 25

Modified bitumen for sealing joints with middle dilatations, for example joints in tram tracks.

Use: AZ sealant for filling concrete roads, airport runways, paving, pavements and concrete surfaces with small joints dilatations. It is necessary to clean a joint, dry and primed with penetration paint PENETRAL ALP. MOZAL TS sealant if designed for filling joints of cement-concrete roads, airport runways and joints of bitumen roads with higher dilatations. MOFALT SMA 25 is suitable for joints with medium dilatations, e.g. joints of tram rails.

Processing: At hot temperatures at 180-190°C. It is necessary to clean and penetrate the cracks. It is necessary to melt modified fillers by indirect heating. MOZAL TS filler is processed with machinery equipment (with indirect heating and jet) capable of maintaining temperature in the range 180°C-200°C. Joints will be perfectly cleaned, dried and primed with suitable adhesive layer (e.g. PARASTICK).

Wrapping: Sealants AZ, Mozal Ts and MOFALT SMA 25 are supplied in steel drums of 115-litre capacity or 35 kg paper packages.

Storage: In steel drums drums or paper packing in areas protected against weather effects with drum opening facing up.

- *Automotive oils*
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- ***Fuels***
- *Solid hydrocarbons*
- *Paramo contractual dealers*

PARAMO

PARAMO DIESEL FUEL

Diesel fuel conforms with its attributes in all attributes to European standard, accepted in the Czech Republic as ČSN EN 590:2004. Quality and suitability of diesel fuel for burning in compression ignition engines is evaluated on the basis of above mentioned standard by the following main criteria:

Distillation curve

In order for diesel fuel to combust properly, it must be gradually evaporating. From this point of view, it should be "light", i.e. contain the highest ratio of components evaporating at lower temperature. It must evaporate gradually with temperature increase. Therefore its distillation range is wide in order to achieve even combustion. Distillation range of diesel fuel lies roughly between 180 and 360°C. Crucial points of distillation curve of diesel fuel according to ČSN EN 590 are temperatures 250°C, 300°C and 360°C. Especially temperature 360°C, at which minimum of 95% of diesel must be distilled, is very important for maintaining specified exhalation limits. Diesel fuel PARAMO has therefore distillation curve modified in such a way, so that it contains minimum of heavy components. 95% of components is distilled up to 355°C, by which presumption is given for exhalations reduction, engine smoke emission reduction and deposits reduction in combustion engines.

Cetane number

Cetane number characterizes the scale of fuel resistance against compression ignition engine hard run. If the fuel has low cetane number, starting the engine will be difficult, slow engine heating, hard run, sediments creation and imperfectly burned components which deteriorate the quality of motor oil and exhaust fumes will take place. On the contrary, during burning of diesel with higher cetane number, the temperature increases rapidly, which also simplifies burning of heavier components. Cetane number 51 – 55 is recommended for optimal running of compression ignition engines.

Sulphur content and lubrication quality

Sulphur content is the first attribute of diesel fuel which is widely controlled by legislation in its relation to emissions level. Sulphur content reduction to a minimum is a worldwide effort. Since 1st January, 2005 sulphur content in diesel fuel is reduced to 0.005% m/m. Reduced sulphur content has ecological meaning, because it signifies reduction of exhalations of SO_2 and contributes to reduction of solid soot particles and NO_x in exhaust fumes of compression ignition engines and allows correct long-term function of catalytic converters.

Sulphur content in motor fuel (% of vol.)

Value since 2005	PARAMO diesel fuel
0.005	0.0035

Reduced lubrication quality of diesel fuel could cause problems for injection pumps of compression ignition engines. Any leakage, inaccuracies, or errors in these very important parts of engine cause deteriorated economy of operation, lower performance and significantly worse emission characteristics. Therefore, diesel fuel PARAMO contains necessary volume of special lubricating additives guaranteeing its good lubricating attributes. Lubrication performance is defined by HFRR test and maximal size of abrasive surface 460mm. The value of lubrication performance of diesel fuel PARAMO is 380 mm.

Low-temperature properties of diesel fuel

Consistence of diesel fuel is due to its composition dependent on environment temperature. Diesel fuel contains components which have tendency to crystallize at lower temperatures and create crystal lattice which prevents liquid flowing. Low-temperature criteria are described by several characteristics:

> temperature of separation of waxes (Cloud point) is temperature, when waxes start to separate in diesel fuel, which can block fuel filter by deposits. After some period the particles will cover the filter and fuel cannot be filtered any more;

> filterability (CFPP) is basic criterion for evaluation of diesel fuel. It determines the usability of diesel fuel depending on climatic conditions. It is a temperature during which the tested fuel at accurately defined conditions stops flowing through the filter with predefined pores as a result of its blockage by the deposited wax crystals.

Division of diesel fuel PARAMO according its usability in dependence on climatic conditions and its distribution

Class	Filterability	Distribution
B	0 °C	15.04. – 30.09.
D	-10 °C	01.10. – 15.11.
F	- 22 °C*	16.11. – 28.02.
D	-10 °C	01.03. –14.04.

** with WASA additive*

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

Winter diesel fuel PARAMO contains additives WASA (see the image) preventing wax deposits, separated under cloud point, minimizes crystals size and thus enabling them to pass through fuel filter with less difficulty, which enables the use at low temperatures by further 2 – 4°C and significantly simplifies manipulation with diesel fuels at temperatures under cloud point by the fact that necessary homogenization of tanks before pumping will abstain. By this, our customers acquire diesel fuel with excellent usability attributes at favorable economical conditions.

COMPARISON OF PARAMO DIESEL FUEL WITH WASA (TEST TUBE IN THE MIDDLE) AND CURRENT DIESEL FUELS

Density at 15°C

Density of diesel fuel has direct influence on compression ignition engine performance and composition of exhaust gases. Generally, lower density of diesel fuel means lower content of solid particles in air pollutants and lower smoke of engine. Diesel fuel PARAMO has therefore density value near the lower limit of allowed range. Density is set in kg/m^3 and serves also for volume to weight conversion.

Density of diesel oil (at 15 °C v kg/m^3)

Diesel oil PARAMO	Density according to regulation since 2003
830	820 – 845

Oxidizing stability

Oxidative stability of diesel fuel is a parameter which limits in motor oil the content of substances which tend to create resins, they can subsequently choke especially the fuel injection jets into pistons and negatively influence the amount and quality of gas emissions and engine performance. Long-term storage of diesel oil without sediments creation is guaranteed by excellent oxidative stability of diesel fuel PARAMO; possibility of sticky jets of compression ignition engine is reduced.

Polyaromatic hydrocarbons

Maximal attention is dedicated to content of polyaromatic hydrocarbons in diesel fuel regarding the possible creation of carcinogenic substances in exhaust fumes. Maximum allowance is 11% m/m. Diesel fuel PARAMO contains 3-4% m/m, which is below the maximal limit.

Anti-corrosion protection

Common concentrations of dissolved water in diesel fuel are in several tens of mg/kg. At water concentration of water on level 550 ppm and higher, reduction of fuel lubricity by influence of water microfilm creation on contact surfaces might take place. That is why there are added additives into diesel fuel which protect fuel pumps and injection systems of engine and storage tanks against negative effects of water.

Conclusion

Maximal effort of the company is henceforth uphold credit of diesel fuel PARAMO and increase its usability attributes so that lead during fulfillment of quality parameters of European quality according to ČSN EN 590 standard is maintained in order to reach full satisfaction of customers. Good quality of diesel fuel leads beside increased serviceability also to reduction of content of harmful substances in exhaust gases of motor vehicles and contributes to fulfillment of constantly more strict exhalation regulations and good function of catalytic converters and filters of solid particles.

PARAMO HEATING OILS

TOT R2V HEAVY HEATING OIL WITH SULPHUR CONTENT LESS THAN 3%

Heavy heating oil is designed for heat generation in special installations equipped with desulphurization. The area of use is limited by technical and economical views, such as type and status of incinerator, especially high-density ones.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

TOT-Z HEATING OIL WITH SULPHUR CONTENT LESS THAN 3%

Heavy oil TOT-Z is designed for heat production in special incinerators. The area of use is limited by technical and economical views, such as type and status of incinerator, especially high-density ones and functions of desulphurization installations.

Classification according to Act number 434/2005, Collection, see Safety Data Sheet

TOL L LIGHT HEATING OIL WITH SULPHUR CONTENT LESS THAN 1%

Heavy heating oil L is used for heat generation especially in small and medium incinerators with atomizing burners.

Quality parameters

Parameter	Heavy heating oils				Tested according to
	L	R2	R3	Z	
Density/15 °C,kg/m³ max.	920	1000	Inf.	Inf.	ČSN EN ISO 3675 ČSN EN ISO 12185
Flash point (PM), °C min.	66	85	75	70	ČSN EN 22719
Distillation,%(V/V): At 250 °C max. At 350 °C max.	 max. 65 max. 80	 – –	 – –	 – –	ČSN EN ISO 3405
Viscosity, mm²/s At 40 °C At 100 °C	 6 – 20 –	 – max. 55	 – max. 65	 – max. 75	ČSN EN ISO 3104
Pour point, °C max.	-9	+50	Inf.	Inf.	ČSN EN ISO 3016
CCT (max. % of weight)	0.5	15	15	25	ČSN EN ISO 10370 ČSN 65 6210
Ash content (max. % of weight)	0.02	0.15	0.20	0.25	ČSN EN ISO 6245
Deposits Mechanical impurities (max. % of weight).	0.1	1.0	1.0	1.0	ČSN EN ISO 3735 ČSN 65 6080
Water content (max. % of weight)	0.2	1.0	1.0	1.0	ČSN EN ISO 9029
Caloric capacity[1] (min. kJ/kg) inf	40	38	36	35	ČSN 65 6169
Sulphur content (max. % of weight) Low-sulphur (M) High-sulphur[2] (V)	 ≤ 1,0 > 1,0				ČSN EN 24260 ČSN EN ISO 8754 ČSN EN ISO 14596

[1] The caloric value is only informative, it is not tested during output control.
[2] Heating oils with sulphur content above 1% m/m (V type) can be used as heating medium only in accord with valid legislature in installations designated and approved for this purpose.
[3] Suitable installation must be ready for storage and further manipulation.
[4] According to consumption tax act, TOL-L contains specified amount of marker and must not be used as a fuel.

Classification according to Act number 434/2005, see Safety Data Sheet

TOEL EXTRA LIGHT HEATING OIL

TOEL extra light heating oil is used as fuel in special incinerators designed especially for heating of houses and flats. It is labeled with low values of emissions (CH, NOx, SO_2). According to consumption tax act, it is colored and labeled by specified way. It must not be used as a fuel.

Quality parameters

Density at 20 °C kg/m³ max.	860
Kinematic viscosity at 20 °C mm²/s max. **at 40 °C** **at 100 °C** **at 150 °C**	6 - - -
Flash point PM in °C min.	56
Pour point °C max.	-15
Distillation test: up to 360°C distillation products % vol. min.	85
Sulphur content in % of weight max.	0.1
Mechanical impurities in % of weight max.	0.1
Water content in % of weight max.	0.05
CCT in % of weight max.	0.1
Ash in % of weight max.	0.01
Caloric capacity in kJ/kg min.	42.900

According to standard of the Department of Environment of the Czech Republic from 11th July 2002, 357/2002, Collection, Act number 86/2002, Collection, on the Protection of the atmosphere, heating oil TOAL is regarded as gas oil.

Classification according to Act number 434/2005, see Safety Data Sheet

PYROLYSIS GASOLINE

Pyrolysis gasoline is mixture of liquid hydrocarbons boiling mainly in range 30-185°C. It is inflammable liquid of 1st class of danger according to ČSN 65 0201. It is used as raw material for pyrolitic processing.

Quality parameters

Parameter	Typical value	Value according to standard	Unit
Density	715	695–735	kg/m³
Distillation test **Distillation start** **Distillation end**	 30 180	 min. 30 max. 185	 °C
Sulphur content	0.05	max. 0.06	% of mass
Aromatic hydrocarbons content	11	max. 12	% of mass

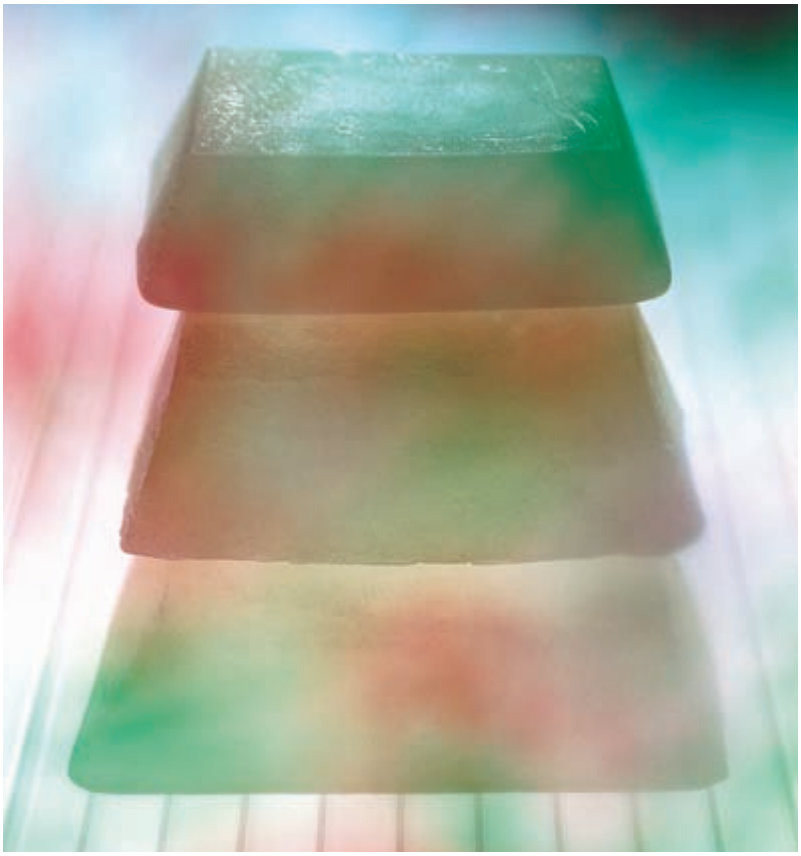
Classification according to Act number 434/2005, see Safety Data Sheet

Liquefied gases

Propane-Butane (according to ČSN 65 64 82) is supplied in two kinds, in summer quality (1.3. – 30.9.) and in winter quality (1.10 – 31.3.). It is used as fuel gas in households, chemical laboratories, in industry, etc.

Butane according to ČSN 65 64 83 is supplied in one kind and is used for heating purposes in households, especially for mobile gas appliances.

Classification according to Act number 434/2005, see Safety Data Sheet



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- *Fuels*
- ***Solid hydrocarbons***
- *Paramo contractual dealers*

PARAMO

PARAFFIN GATCHES

Gatch D, Gatch L, Gatch P

Characteristics:

Paraffine gatches are homogenous plastic or solid substances, dark yellow or brown color, of light specific smell.

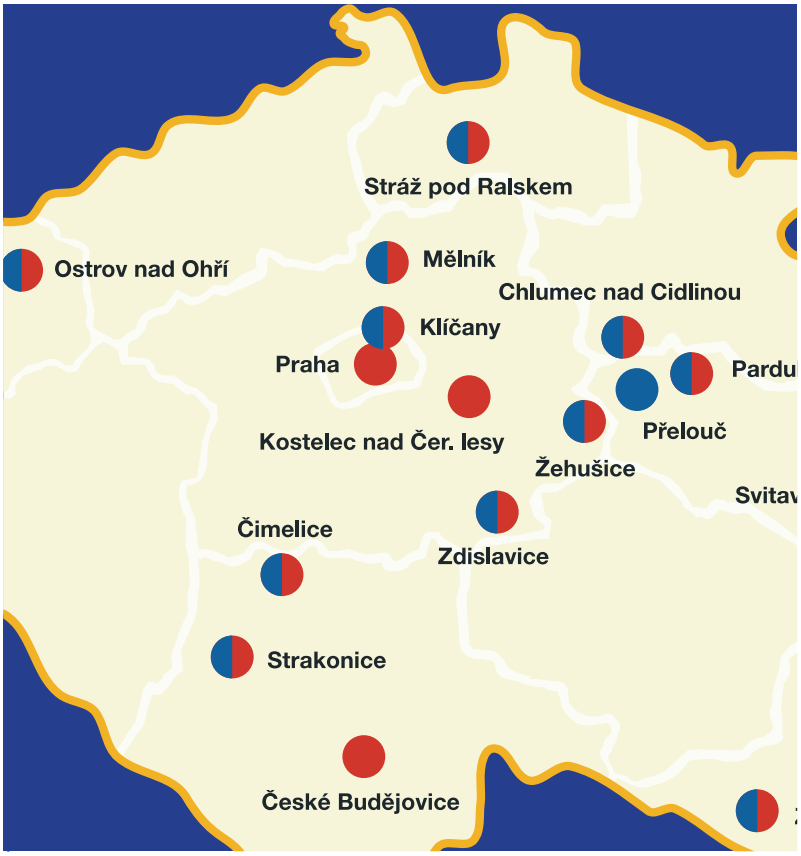
Use:

Paraffin gatches are used especially for paraffin production, further for technological purposes of industrial character, they increase resistance against water absorption.

Typical parameters	Gatch D	Gatch L	Gatch P
Pour point °C	56 - 58	51 - 53	63 - 69
Flash point COC in °C	236 - 260	222 - 234	294 - 304
Oil content in % of weight	11 - 21	12 - 19	13 - 22
Ash % of weight	0	0	-
Sulphur content % of weight	0.24 – 0.42	0.17 – 0.27	-

Packaging, transport, storage:

Paraffine gatches are supplied in liquid state in railway tanks with heating coils. They are stored in closed tanks so that they are protected against water and mechanical impurities penetration.



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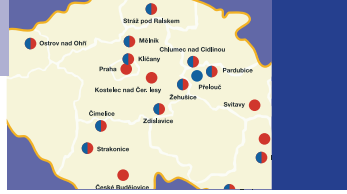
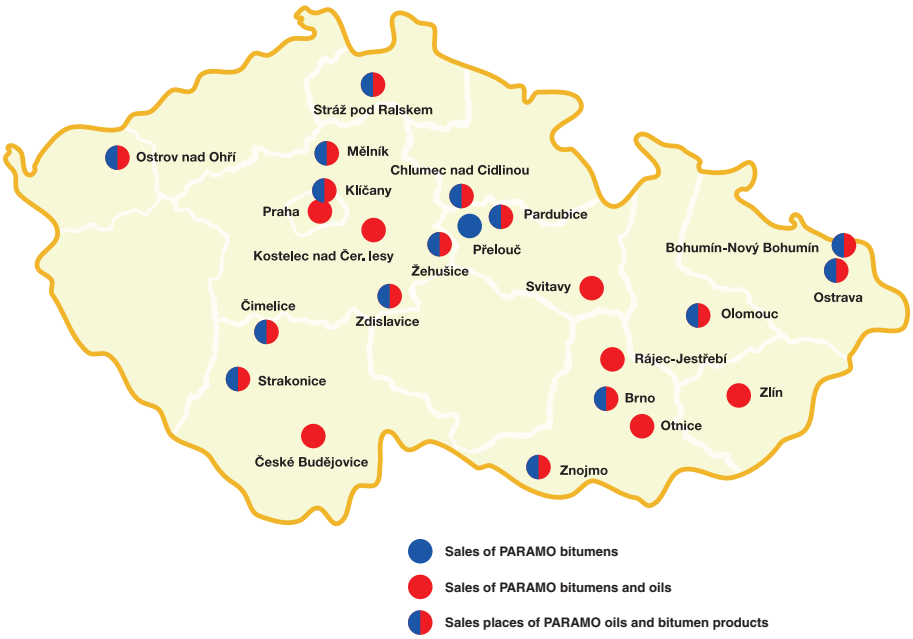
PARAMO



PARAMO PRODUCTS RESELLERS



Authorized dealers

Company	Street	Seat	ZIP	Phone	Products
BALACO, spol. s. r. o.	V zahrádkách 1	Svitavy	568 02	461 530 799	Bitumenous products
BAS OIL s.r.o.	areál ZZN	Zdislavice	257 64	317 851 724	Oils, bitumenous products
BARVY A LAKY Praha s. r. o.	Průmyslová 1472	Praha 10	102 19	296 584 111	Bitumenous products
BEKOS s. r. o.	Pražská 477	Kostelec nad Č. lesy	281 63	323 649 310	Bitumenous products
CONETOL s. r. o.	Schweitzerova 44	Olomouc	779 00	585 314 526	Oils, bitumenous products
CONETOL s. r. o.	28. října 84	Ostrava	702 00	603 527 037	Oils, bitumenous products
DEKTRADE s. r. o.	Teplárenská ul., areál Prefy	Praha-Malešice	108 28	272 705 837	Bitumenous products
HI-OIL s. r. o.	Plotní 6	Brno	602 00	541 174 153-6	Oils, bitumenous products
Ing. Martin Divišek s. r. o.	Zápečská 68/II	Chlumec n. Cidlinou	503 51	495 485 282	Oils, bitumenous products
Ing. Martin Divišek s. r. o.	Mladé Buky 7	Trutnov	542 23	499 733 252-3	Oils
JIHOSPOL, a. s.	Písecká 893	Strakonice	386 24	383 321 351	Bitumenous products
JIHOSPOL, a. s.	Hřbitovní 29	Plzeň	312 16	377 462 137	Bitumenous products
Josef Moravec - ADRIA	Žehušice 21	Žehušice	285 75	327 399 454	Bitumenous products
VESELÝ ZNOJMO s. r. o.	Dobšická 3698/40	Znojmo	669 02	515 223 056	Oils
OMA CZ, a. s.	Borová 103	Stráž pod Ralskem	471 27	487 851 016	Oils, bitumenous products
OMA CZ, a. s.	Areál AGPI Krsice	Čimelice	389 04	382 228 323	Oils, bitumenous products
OMA CZ, a. s.	K. Světlé 1205	Mělník	276 01	315 670 035	Oils, bitumenous products
OMA CZ, a. s.	Jáchymovská 72	Ostrov	363 01	353 844 134	Oils, bitumenous products
PELTAN ZDENĚK	Homole 198	České Budějovice	370 04	387 203 306	Bitumenous products
POPILKA s. r. o.	Klíčany 67	Klíčany	250 69	284 890 592	Oils
OK-OIL, a. s.	Nepumucká 208	Plzeň	326 00	377 242 747	Oils
MOGUL SLOVAKIA s. r. o.	U ihriska č. 300	Hradiště pod Vrátnom	906 12	421 34 658 1202	Oils
MOGUL SLOVAKIA s. r. o.	Zvolenská cesta 3132	Lučenec	984 01	421 3474 513 226	Oils, bitumen products
Ing. Zdeněk Jeřicha	Ovčárecká 314	Kolín	280 26	321 750 217	Oils
PANTER COLOR a. s.	Mladoboleslavská 73	Praha 9 Kbely	197 00	286 006 994	Bitumenous products
PARAPETROL,a.s.	Štefánikova 15	Nitra, SLOVAKIA	949 01	421 377 414 330	Oils, bitumen products
VOŽENÍLEK FRANTIŠEK	tř. Palackého 2752	Pardubice	530 02	466 536 688	Oils, bitumen products
VOŽENÍLEK FRANTIŠEK	nám. 5. května 291	Hradec Králové	500 02	495 514 279	Oils, bitumen products

Distribution centers and regional sales agents:

Company	Street	Seat	ZIP	Phone	Fax
PARAMO, a. s.	Přerovská 560	Pardubice	530 06	466 810 111	466 335 019
PARAMO, a. s., Kolín center	Ovčárecká 314	Kolín V	280 26	321 750 434	321 750 488
PARAMO, a. s.,	areál DNP Pracejovice	Strakonice	386 01	383 324 577	383 324 578
PARAMO, a. s.	Skyřická 9	Most - Velebudice	434 01	476 104 909	476 104 885
PARAMO, a. s.	Lípa u Zlína 275	Zlín 11	736 11	577 901 051	577 901 087
PARAMO, a. s.	Opavská 25/51	Hlučín	748 01	595 046 616	595 046 618

Area maneger for region	Mobile	Fax	E-mail
Central Bohemia	736 514 524	321 750 488	patocka@paramo.cz
Eastern Bohemia	736 507 033	466 810 169	ales.jurcik@paramo.cz
Southern Bohemia and Plzeň region	736 507 115	383 324 578	hulovec@paramo.cz
Northern Bohemia and Karlovy Vary region	736 514 521	476 441 983	stanek@paramo.cz
Southern and Northern Moravia	736 507 107	577 901 087	horinek@paramo.cz

Notes

Issued by PARAMO, a.s., 2007

PARAMO, a. s., Přerovská 560, 530 06 Pardubice
tel.: 466 810 111, fax: 466 335 019
e-mail: paramo@paramo.cz
www.paramo.cz