

BEHRAN OIL CO.



PRODUCTS GUIDE II

4th Edition - January 2019



Behran oil co. is a leading lubricant manufacturer in Iran with a dominant market share in terms of automotive and industrial lubricants, and one of the top-thirty worldwide lubricant manufacturing companies. on July 6th, 1962 a joint venture of an Iranian group of shareholders and Exxon founded a blending unit for producing motor oils under the trademark ESSO in Tehran.

In 1968, a base oil refinery was commissioned with the production capacity of 30000 tons per year.

Throughout the years, a number of different expansion and modification projects have improved the quality as well as the quantity of base oil production to more than 220000 metric tons per year.

Behran manufactures and markets more than 300000 tons per year of 900 different products including automotive oils, industrial oils, greases, petroleum waxes, process oils, engine coolants, antifreezes and furfural solvent in different packages from 1 to 1000 liters.

Behran oil company has been progressively increasing its commitment in the field of lubricant production technology through considerable investment in research and development and, its R&D department provides improvement in product quality and tailor-made Formulations according to market demands and high international standards.

Behran's state of the art products give a high level of satisfaction to customers and meet or exceed the products quality, protection of environment and production in accordance with the highest national and international standards and it is an ISO 9001, ISO 14001, OHSAS 18001, ISO 17025, and ISO TS 16949 certified company.

Behran initiated exporting its products in 1991 with the sale of paraffin wax and furfural extracts to international markets like Pakistan and Italy.

- Behran is the only producer of Furfural solvent in west Asia since 2007.
- Behran has been the leader of the private gas station network in Iran since 1984.
- Now, by relying on its logistic abilities, Behran exports to more than 40 countries in 3 continents of Europe, Asia and Africa.
- The export-and-import terminal in Imam Khomeini port with a storage capacity of 35000 tons with heating, loading and unloading facilities and a railway connection is one of Behran's advantages.

Important Note

These characteristics are typical of current production. Whilst future production will conform to Behran's specification, variations in these characteristics may occur.









BEHRAN PARAFFIN WAX



INTRODUCTION

WAX is an organic, plastic-like substance that is solid at ambient temperature and becomes liquid when melted. In general terms waxes are naturally or synthetically derived.

Crude oil is transported to refineries where it is refined into finished products by complex processes. One of the many products derived from refining is lube/base oils. The waxes are produced in the lube/oil refining process.

Petroleum waxes as a mixture of hydrocarbons are classified in three general categories. They include microcrystalline and semi-microcrystalline paraffin wax. Behran Paraffin Waxes are microcrystalline and provide a wide variety of physical characteristics such as oil content and melting point, can be used in a wide range of industries.

PRODUCTION OF PETROLEUM WAXES

Base oils are produced in a series of steps which are designed to enhance certain desirable properties such as viscosity index, low temperature properties. In base oil production process, the solvent extracted lube fraction is dewaxed by chilling to a low temperature which removes much of the wax.

This improves the low temperature fluidity of the product and produces dewaxed lube fractions and slack wax. Figure 1 illustrates refining process in Behran oil Co.

Through deoiling/sweating of slack wax, paraffin waxes are obtained.

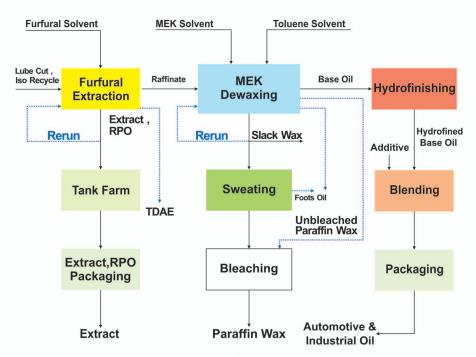


Figure 1: process of wax production in Behran oil co.

PARAFFIN WAX APPLICATIONS

TYPE OF INDUSTRY	APPLICATION	TYPE OF INDUST	RY APPLICATION
candles	Fuel, drop Point regulations	Recycling	Compatibility sizing
Printing Inks	improvement of Rub Resistance, Slip	Ceramics and Metals	Binders for sintering
Paints and Coatings	Matting, surface protection	Paper and Cardboard	Surface Hardening
Building	Modification of Bitumen, Anti-Graffiti treatment	Polishes	Surface Protection of Leather, Floors, Cars
Explosives S	Stabilization,BindingAgent, PlasticizingAgent	Timber Industry	Water Proofing, providing Flexibility and Consistency
Matches, Pyrotechnics	Impregnations, Fuel	Rubber Industry	Release Agents Enhancing Rigidity Surface Hardening
Electrical and Electronics	Release Agent, Insulating Material and Etching Bases	Crayons and Wax Pastels	Vehicle for Pigments, Regulates Hardness
Adhesive and Hot melts	Viscosity Regulation Lubrication, Surface Hardening	Cosmetics	Binder and Consistency Regulation for Ointments, Pastor, Lipsticks, Creams
Packaging Lam	ninating, adhesive, Control flexibility, moisture barric coating	er Textile	Reinforce, Providing Water Proofing and Improving Tactile and Visual Aspect
Fire Logs Bi	indingAgent for Wood Particles, Helping Long Control Combustion	Plastics	lubrication (Poly Vinyl Chloride),Release Agents (poly Amide),Pigment Carriers (Master Batch)
Foods Coa	Citrus fruits and cheese ating, Chewing gum Base (control chewy texture Confectionary	e), Medicine and Pharmaceutical	Molding & Release Agents in Dental Laboratories Retardants, Surface Hardening Of pills





BEHRAN PARAFFIN WAX

TYPICAL CHARACTERISTICS

Paraffin Wax	Oil Content %wt max.	Melting Point °c	Color min SUS	Penetration 0.1mm@25°c	Viscosity@ 100°c(cSt)
Grade	ASTM D-721	ASTM D-87	Saybolt	ASTM D-1321	ASTM D-445
L1	1	60-62	28	18-23	3.6-4.4
L2	2	58-60	28	18-23	3.6-4.4
L3	3	58-61	28	18-23	3.6-4.4
L5	5	55-60	-	18-23	3.6-4.4
L10	10	54-59	_	18-23	3.6-4.4
UL1	1	58-61	29	24	3.6-4.4
UL2	2	58-61	29	24	3.6-4.4
M1	1	62-66	28	15-19	4.5-6.4
M2	2	62-66	28	15-19	4.5-6.4
M3	3	61-65	28	15-19	4.5-6.4
M5	5	60-65	-	15-19	4.5-6.4
M10	10	60-65	2	15-19	4.5-6.4
MB1	1	64-66	25	19	4.5-6.4
MB2	2	64-66	25	19	4.5-6.4
H1	1	68-71	18	3	6.0-8.0
H2	2	68-71	22	Max 23	6.0-8.0
H3	3	68-71	18	Max 23	6.0-8.0
H5	5	68-71	-	-	6.0-8.0
H10	10	66-69	=	₩.	6.0-8.0

PACKAGING

Slabs (25*50*4cm) In carton (app.24 kg)

Granules packed in one plastic bag in carton (app.16 kg)





BEHRAN UNBLEACHED PARAFFIN WAX

TYPICAL CHARACTERISTICS OF AROMATIC PROCESS OIL

Unbleached Paraffin Wax Grade	Oil Content wt % max. ASTM D-721	Melting Point °c ASTM D-87	Color Max ASTM D-1500	Penetration 0.1mm@25°c ASTM D-1321	Viscosity@ 100°c(cSt) AST D-445
M1	1	62-66	1	15-19	4.5-6.4
M 2	2	62-66	1	15-19	4.5-6.4
M 3	3	61-66	1	15-19	4.5-6.4
M 5	5	60-65	1	15-19	4.5-6.4
M 10	10	60-65	1	15-19	4.5-6.4
H1	1	68-71	1	-	6.5-8.0
H2	2	68-71	1	21-28	6.5-8.0
H3	3	68-71	1.5	21-28	6.5-8.0
H5	5	68-71	1.5)-	6.5-8.0
H10	10	66-69	2	*	6.5-8.0

PACKAGING

Bulk by vessel

ISO tank

Slabs (25*50*4cm) In carton (app.24 kg)

Granules packed in one plastic bag in carton (app.16 kg)

One ton Jumbo bag

208 liter steel drum

BEHRAN SLACK WAX

INTRODUCTION

Slack wax, a mixture of oil and wax, is a byproduct of base oil refinery process, which serves as a feed stock and, is further refined to produce paraffin waxes.

Behran Slack Wax can be used as blending components or a water proofing agent in the manufacture of various industrial products such as candles, canvass coatings and composite wood panels.

These waxes can also function as controlled release agents for various chemicals and fertilizers.

TYPICAL CHARACTERISTICS

Slack Wax Grade	Oil Content wt % max. ASTM D-721	Congealing Point °c ASTM D-938	Viscosity@ 100°c(cSt) ASTM D-445	Appearance Visual
Behran Ultra Light Slack wax	23	49-51	3.9	Creamish
Behran Light Slack wax1	31	47-59	3.8-4.4	Creamish
Behran Light Slack wax2	31	52-59	4.5-6.5	Yellow
Behran heavy Slack wax1	33	57-65	6.6-10.5	Light Brown
Behran heavy Slack wax2	33	57-65	6.6-10.5	Dark brown

PACKAGING

Bulk by vessel

ISO tank

One ton Jumbo bag

208 liter steel drum



BEHRAN FOOTS OIL

INTRODUCTION

Foots oil or residue wax, is a byproduct obtained through slack wax deoiling or sweating in the paraffin wax manufacturing process. It is used in textile, leather and rubber industries as well as petroleum jelly and white oil manufacturing.

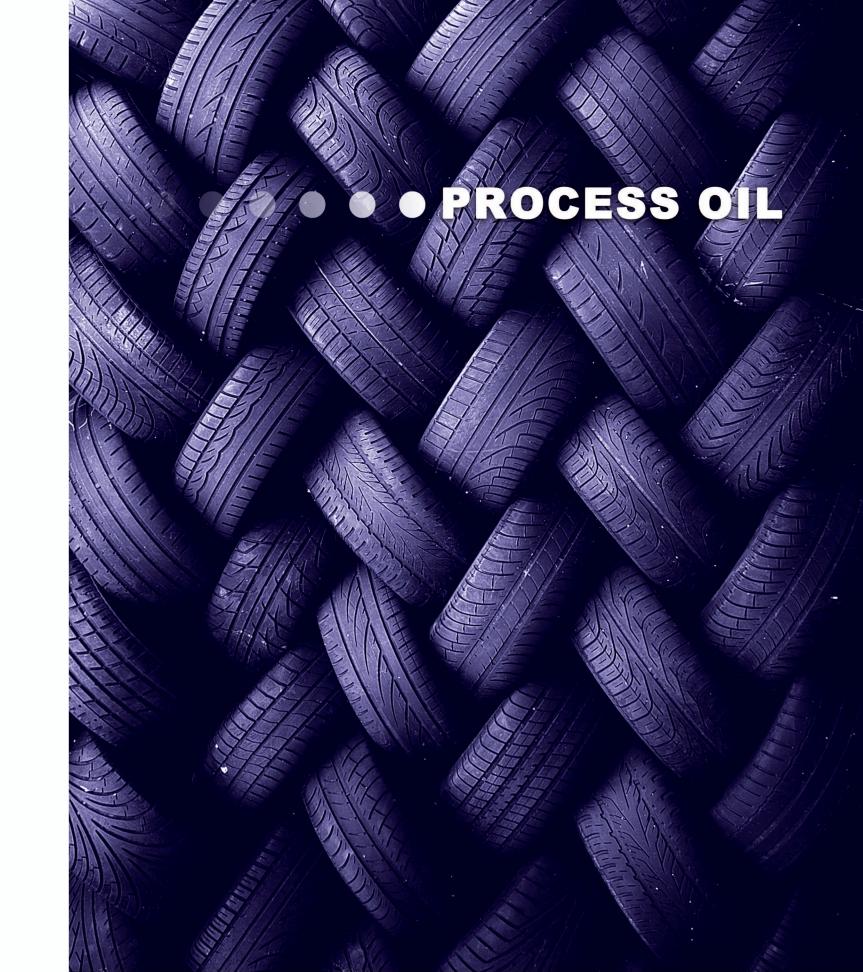
TYPICAL CHARACTERISTICS

Foots Oil Grade	Oil Content wt% ASTM D-721	Congealing point °C ASTM D-938	Viscosity @ 100°C(cSt) ASTM D-445	Color ASTM D-1500
LIGHT	25-40	40	3.6-4.6	1.5
MEDIUM	20-50	25	4.7-6.9	2.0
HEAVY	25-50	25	7-11.5	2.5

PACKAGING

20 ton flexi bag 208 liter steel drum









MINERAL BASE OILS

INTRODUCTION

Solvent Neutral mineral base oils are prepared from crude oil derivatives according to the following processes.

Distillation, to adjust the viscosity and flash point;

- Refining, to improve viscosity temperature characteristics e.g. viscosity index (solvent extraction with furfural);
- Dewaxing, to improve the low temperature properties (M.E.K dewaxing).
- Hydrofinishing, to remove undesirable impurities from petroleum distillates (such as sulfur and nitrogen compounds and

Base stocks, obtained after above listed operations are called Solvent Neutral Base Oil (SN) which are distinguished with numbers according to their approximate SUS viscosity at 40°C such as SN 90, SN150, SN350, SN500 etc.

In the Behran's modernized refinery plant, we use Lube-cut obtained from domestic petroleum oil refineries, to produce virgin mineral base oils base oil group I. High quality low oil paraffin waxes are also produced by "sweating process" which is in compliance with the environmental health care.

TYPICAL CHARACTERISTICS OF SN 90

SPECIFICATIO	N	Test method	Min.	Typical	Max.
Kinematic Viscosity @40	°C (cSt)	ASTM D-445	-	20	-
Kinematic Viscosity@100	0 °C (cSt)	ASTM D-445	3.5	-	4.2
Viscosity Index		ASTM D-2270	·=	100	-
Flash point (COC)	°C	ASTM D-92	170	¥	-
Pour point	°C	ASTM D-97	Æ	æ	-6
Carbon residue (conrads	son) Wt%	ASTM D-189	12	0.05	-
Total Acid Number	mg KOH/g	ASTM D-664) =	Æ	0.05
Demulsibility		ASTM D-1401	12	Pass	-
Sulfur Content	Wt%	ASTM D-1552	0.15	-	0.6
Color		ASTM D-1500	-2	0.5	1
Density @15 °C	Kg/m ³	ASTM D-4045	V=	870	-
Copper Corrosion (3hrs@	ᡚ 100 °C)	ASTM D-130	12	2	1A
Foam	ml	ASTM D-892	Y=	Nil	-

PACKAGING

Bulk by vessel

ISO Tank

20 ton flexi bag

208 liter steel drum

TYPICAL CHARACTERISTICS OF SN 150

SPECIFICATION	NO	Test method	Min.	Тур	Max.
Kinematic Viscosity @40 °C	(cSt)	ASTM D-445	-	32	-
Kinematic Viscosity@100 °C	(cSt)	ASTM D-445	4.2	-	5.6
Viscosity Index		ASTM D-2270	-	100	-
Flash point (COC)	°C	ASTM D-92	190	-	=
Pour point	°C	ASTM D-97	Ξ.	=	-6
Carbon residue (conradson)	Wt%	ASTM D-189		0.06	-
Total Acid Number r	ng KOH/g	ASTM D-664	-	-	0.05
Demulsibility		ASTM D-1401	-	Pass	-
Sulfur Content	Wt%	ASTM D-1552	0.15	-	0.6
Color		ASTM D-1500	-	0.5	1
Density @15 °C	Kg/m ³	ASTM D-4052	×	875	=
Copper Corrosion (3hrs@ 10	0 °C)	ASTM D-130	-		1A
Foam	ml	ASTM D-892	-	Nil	-

TYPICAL CHARACTERISTICS OF SN 350

SPECIFICATION	Test method	Min.	Тур.	Max.
Kinematic Viscosity @40 °C (cSt)	ASTM D-445	×	75	Ψ.
Kinematic Viscosity@100 °C (cSt)	ASTM D-445	8	8	9.3
Viscosity Index	ASTM D-2270	-	95	_
Flash point (COC) °C	ASTM D-92	220	-	-
Pour point °C	ASTM D-97	-	-	-6
Carbon residue (conradson) Wt%	ASTM D-189		0.06	-
Total Acid Number mg KOH/	g ASTM D-664	*	*	0.05
Demulsibility	ASTM D-1401	(-)	Pass	-
Sulfur Content Wt%	ASTM D-1552	0.15	-	0.6
Color	ASTM D-1500	-	2	2
Density @15 °C Kg/m³	ASTM D-4052	-	880	-
Copper Corrosion (3hrs@ 100 °C)	ASTM D-130	-	Ξ	1A
Foam ml	ASTM D-892	Ä	Nil	=

PACKAGING

Bulk by vessel

ISO Tank

20 ton flexi bag

208 liter steel drum









TYPICAL CHARACTERISTICS OF SN 500

SPECIFICA	TION	Test method	Min.	Тур.	Max.
Kinematic Viscosity @40	°C (cSt)	ASTM D-445	-	-	-
Kinematic Viscosity@100	°C (cSt)	ASTM D-445	10.2	-	11.9
Viscosity Index		ASTM D-2270	Ε.	90	Ξ
Flash point (COC)	°C	ASTM D-92	240		2
Pour point	°C	ASTM D-97	-	-	-6
Carbon residue (conradso	on) Wt%	ASTM D-189	-	141	0.3
Total Acid Number	mg KOH/g	ASTM D-664	-	-	0.05
Demulsibility		ASTM D-1401	::	Pass	-
Sulfur Content	Wt%	ASTM D-1552	Ē	æ	-
Color		ASTM D-1500	*	2.5	=
Density @15 °C	Kg/m ³	ASTM D-4052	-	892	-
Copper Corrosion (3hrs@	100 °C)	ASTM D-130		(-)	1A
Foam	ml	ASTM D-892	-	Nil	-

TYPICAL CHARACTERISTICS OF SN 600

SPECIFICATION	Test method	Min.	Тур.	Max.
Kinematic Viscosity @40 °C (cSt)	ASTM D-445	.*	*	Ē
Kinematic Viscosity@100 °C (cSt)	ASTM D-445	12	*	13.8
Viscosity Index	ASTM D-2270	G ₂	90	2
Flash point (COC) °C	ASTM D-92	242	140	-
Pour point °C	ASTM D-97	-	1.	-6
Carbon residue (conradson) Wt%	ASTM D-189		186	0.3
Total Acid Number mg KOH/g	ASTM D-664	· *) # (0.05
Demulsibility	ASTM D-1401	(#)	Pass	-
Sulfur Content Wt%	ASTM D-1552) 2 :	(=)	-
Color	ASTM D-1500	151	2.5	·#1
Density @15 °C Kg/m³	ASTM D-4052	125	895	-
Copper Corrosion (3hrs@ 100 °C)	ASTM D-130		(0)	1A
Foam ml	ASTM D-892	· ·	Nil	

PACKAGING

Bulk by vessel

ISO Tank

11

20 ton flexi bag

208 liter steel drum

BEHRAN RPO (RUBBER PROCESS OIL)

Process oil for Rubbers, Elastomers and Adhesives

USES

It is known that the modern rubber compounding processe requires high speed mixing and short mixing periods with proper polymer consistency for rapid processing.

The function of Behran rubber Process Oils is to improve the physical properties of vulcanization to reduce the cost of the finished rubber compounds.

PROPERTIES

Behran Rubber Process Oils are intermediate products with excellent process ability, loading (filler) characteristics and tensile properties.

Behran Rubber Process Oils are perfect intermediate products to optimize the required conditions. The compounder can achieve a workable mass with adequate dispersion of fillers through selection of the correct process oils.

Behran Rubber Process Oils are efficient secondary plasticizers that reduce costs.

Behran Rubber Process Oils are offered in two kinds: Aromatic and Paraffinic.

TYPICAL CHARACTERISTICS OF AROMATIC PROCESS OIL

SPECIFICATION		Test Method	Behran RPO 245	Behran RPO 250	Behran RPO 290	Behran Furfural Extract (DAE)
Density @ 15°C	kg/m3	ASTM D-1298	980-1040	990-1020	980-1015	980-1040
Flash point (COC)	°C	ASTM D-92	200	245	230	Min .180
Kinematic Viscosity@100 °C	cSt	ASTM D-445	6-12	50-80	19-28	7-65
VGC		ASTM D-2501	Max 0.96	0.96	0.96	0.96
Aniline Point	°C	ASTM D-611	Max 26	Max 32	Max 32	-

^{*}DAE (Distillate aromatic extracts) is oil for carbon black manufacturing feed.

TYPICAL CHARACTERISTICS OF PARAFFINIC PROCESS OIL

SPECIFICATION		Test Method	Behran RPO 840
Density @ 15°C	kg/m3	ASTM D-1298	900
Flash point (COC)	°C	ASTM D-92	184
Kinematic Viscosity @100 °C @40 °C		ASTM D-445	Min 5 21-28
VGC		ASTM D-2501	Max. 0.850
Aniline Point	°C	ASTM D-611	79

PACKAGING

Bulk by vessel
ISO Tank
20 ton flexi bag
208 liter steel drum







BEHRAN TDAE

Safe Process Oil

USES

Behran TDAE (Treated Distillate Aromatic Extract) is a non-carcinogenic mineral oil, used as an aromatic process oil to manufacture oil-extended natural or synthetic rubber and tire compounds.

PROPERTIES

- · Good abrasion resistance
- · Good low temperature flexibility
- · Low amounts of waste tires in the process
- Good resistance to reversion
- Saves fuel and energy consumption
- · Extends the lifetime of tires
- · Low environmental impact



TYPICAL CHARACTERISTICS

SPECIFICATION	Unit	Test Method	Result
Appearance	-	Visual	Dark
Density @ 15°C	kg/m3	ASTM D-1298	953
Flash point (COC) °C	°C	ASTM D-92	246
Congealing Point	°C	ASTM D-938	33
Total Acid Number	Mg KOH/gr	ASTM D-974	0.12
Kinematic Viscosity@40 °C (cSt)	cST	ASTM D-445	549.48
Kinematic Viscosity@50 °C (cSt)	cST	ASTM D-445	260.8
Kinematic Viscosity@100 °C (cSt)	cST	ASTM D-445	19.65
RI@20 °C	-	ASTM D-1218	1.5227
RI@67 °C		ASTM D-1218	1.5113
VGC	÷	ASTM D-2501	0.895
Aniline Point	°C	ASTM D-611	63
Refractivity Intercept	-	AMS 140.13	1.051
Water Content (Karl Fischer)	ppm	ASTM D-6304	412.2
Sulphur Content	(W/W)%	ASTM D-2622	Max 3
Carbon Type Distribution	CA/CN/CP	AMS 140.13	23/39/38
Content Of PCA Extract	(W/W)%	IP 346	2.2

PERFORMANCE SPECIFICATION

According to international standards (EU 2005/69/EC)

*This product complies with REACH requirements.

Bulk by vessel ISO Tank



20 ton flexi bag 208 liter steel drum





