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« PRODUCT CATALOG »

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We grantee that our customers could make informed decision without
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OIL

CRUDE OIL

TYPES OF CRUDE OIL

Crude oil quality is measured in terms of density (light to heavy) and sulfur content (sweet to sour).
Density is classified by the American Petroleum Institute ('API'). API gravity is defined based on density at a temperature of 15.6 °C. The higher the API gravity, the lighter the crude. Light crude generally has an API gravity of 38 degrees or more, and heavy crude an API gravity of 22 degrees or less. Crude with an API gravity between 22 and 38 degrees is generally referred as medium crude.
Sweet crude is commonly defined as oil with a sulfur content of less than 0.5%, while sour crude has a sulfur content of greater than 0.5%.

BRENT BLEND

Brent Blend is a light, sweet North Sea crude with an API gravity of approximately 38 and a sulfur content of approximately 0.4%. Most Brent Blend is refined in Northwestern Europe, but significant volumes are also shipped to the US and Mediterranean countries.
Brent Blend is used for pricing around two-thirds of the crude traded internationally. Rolling price assessments are based on physical Brent-Forties-Oseberg crude oil cargoes loading not less than 10 days ahead and loaded free on board at the named port of shipment ('Brent Dated).

RUSSIAN EXPORT BLEND

Russian Export Blend, the Russian benchmark crude, is a mixture of several crude grades used domestically or sent for export. Russian Export Blend is a medium, sour crude oil with an API gravity of approximately 32 and a sulfur content of approximately 1.2%. Its spot price is reported at Augusta, Italy, and Rotterdam, the Netherlands, which act as the two primary delivery points.

West Texas Intermediate

West Texas Intermediate, the US benchmark crude oil, is a light, sweet crude oil with an API gravity of approximately 40 and a sulfur content of approximately 0.3%. The spot price of West Texas Intermediate is reported at Cushing, Oklahoma.

IMPACT ON REFINING

The quality of crude oil and other feedstocks dictates the level of processing and conversion necessary to achieve what a refiner sees as an optimal mix of products.

Light, sweet crude is more expensive than heavier, sourer crude because it requires less processing and produces a slate of products with a greater percentage of value-added products, such as gasoline, diesel, and aviation fuel. Heavier, sourer crude typically sells at a discount to lighter, sweeter grades because it produces a greater percentage of lower value-added products with simple distillation and requires additional processing to produce lighter products.

OIL

BITUMEN

Classification of Bitumen

Bitumen is classified by the depth to which a standard needle will penetrate under specified test conditions. This "pen" test classification is used to indicate the hardness of bitumen, lower penetration indicating a harder bitumen. Specifications for penetration graded bitumens normally state the penetration range for a grade, e.g. 50/70. Other tests are used to classify the bitumen for specification purposes, such as softening point, solubility, flash point etc.

40/50

Characteristic	value	Test Method
Specific Gravity @ 25/25 °C	1.01-1.06	ASTM D-70
Penetration @ 25°C (dmm)	40-50	ASTM D-5
Softening Point(°C)	52-60	ASTM D-36
Ductility @ 25°C (cm)	100	ASTM D-113
Loss on Heating (%wt)	0.2max	ASTM D-6
Drop in Penetration after Heating(%)	20max	ASTM D-6&D-5
Flash Point (°C)	250min	ASTM D-92
Solubility in CS2(%wt)	99.5min	ASTM D-4
Spot Test	negative	A.A.S.H.O.T.102*

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OIL

BITUMEN

60/70

BITUMINOUS BINDERS, PREPARATIONS

Bitumens are also used as a raw material to manufacture mixtures (preparations) with improved handling and application characteristics, or to enhance the physical properties. In such products bitumen is often the principal component, but they can contain significant proportions of other materials. These products are often referred to as bituminous binders or bitumen products, and are chemically classified as bitumen preparations. The three most commonly used are:

CUT-BACK BITUMEN

Cut-backs are bitumen preparations in which the viscosity of the binder has been reduced by the addition of a volatile solvent, normally derived from petroleum. Typically the solvents used are white spirit and kerosene. Cut-back products are typically used for spraying and some mixing applications.

Fluxed bitumen

Fluxed bitumens are bitumen preparation where the viscosity of the binder has been reduced by the addition of relatively non-volatile oils. Typical fluxants include gas oil and vegetable based oils.

MODIFIED BITUMEN

Modified bitumens are bituminous binders whose performance properties, such as elasticity, adhesive or cohesive strength, have been modified by the use of one or more chemical agents. These agents may be polymers, crumb rubber, sulphur and polyphosphoric acid, among other materials. Modified bitumens are widely used in the production of roofing felt and in paving applications.

Characteristic	value	Test Method
Specific Gravity @ 25/25°C	1.01-1.06	ASTM D-70
Penetration @ 25°C(dmm)	60-70	ASTM D-5
Softening Point(°C)	49-56	ASTM D-36
Ductility @ 25°C(cm)	100 min	ASTM D-113
Loss on Heating (%wt)	0.2 max	ASTM D-6
Drop in Penetration after Heating (%)	20 max	ASTM D-6&D-5
Flash Point(°C)	250 min	ASTM D-92
Solubility in CS2(%wt)	99.5 min	ASTM D-4
Spot Test	negative	A.A.S.H.O.T.102*

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OIL

BITMUMEN 80/100

Characteristic	value	Test Method
Specific Gravity @ 25/25°C	1.01-1.06	ASTM D-70
Penetration @ 25°C(dmm)	60-70	ASTM D-5
Softening Point(°C)	49-56	ASTM D-36
Ductility @ 25°C(cm)	100 min	ASTM D-113
Loss on Heating (%wt)	0.2 max	ASTM D-6
Drop in Penetration after Heating (%)	20 max	ASTM D-6&D-5
Flash Point(°C)	250 min	ASTM D-92
Solubility in CS2(%wt)	99.5 min	ASTM D-4
Spot Test	negative	A.A.S.H.O.T.102*

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BITUMEN EMULSION

Bitumen emulsions are products in which tiny droplets (the dispersed phase) of bitumen or bituminous binder are dispersed in an aqueous medium (the continuous phase). The bitumen particle charge can be positive (cationic), negative (anionic), or uncharged (non-ionic) depending on the emulsifier employed. The binder can be either a bitumen, cutback, or modified bitumen. Bitumen emulsions are used largely in road surfacing applications, such as surface dressing, cold mixtures and slurry seals.

ASPHALT

Asphalt is a mixture of a bituminous binder with mineral aggregate (stone), sand and filler, typically containing approximately 4-7%m bitumen. Asphalt is primarily used for road construction, the properties being dependent upon the type, size and amount of aggregate used in the mixture, all of which are adjusted to provide the required properties for the desired application.

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OIL

FUEL OIL

280

SPECIFICATION		RESULT	TEST METHOD
SPECIFIC GRAVITY @ 15.56 /15.56 °C		0.9764	ASTM D 4052
API		13.42	ASTM D 1298
SULPHUR CONTENT (Total)	Wt.%	3.19	ASTM D 4294
BASE SEDIMENT & WATER	Vol.%	0.05	ASTM D 1796
WATER CONTENT	Vol.%	<0.05	ASTM D 4006
SALT CONTENT	P.T.B	5	ASTM D 3230
FLASH POINT	°C	83	ASTM D 93
KINEMATIC VISCOSITY @ 40 °C	mm^2/Sec	628.3	ASTM D 445
" " @ 50 °C	mm^2/Sec	273.6	ASTM D 445
POUR POINT	°C	6	ASTM D 5853
ASH CONTENT	Wt.%	<0.2	ASTM D 482
ASPHALTENES	Wt.%	3.5	IP 143
WAX CONTENT	Wt.%	8.6	BP 237
DROP MELTING POINT OF WAX	°C	70	IP 133
CARBON RESIDUE CONRADSON	Wt.%	9.6	ASTM D 189
ACIDITY, TOTAL	mgKOH/gr	0.22	UOP 565
CALORIFIC VALUE	Kcal/Kg	10258	ASTM D 240
NICKEL CONTENT	PPm	23	ASTM D 5863
VANADIUM CONTENT	PPm	112	ASTM D 5863
IRON CONTENT	PPm	<1	ASTM D 5863
LEAD CONTENT	PPm	<1	ASTM D 5863
SODIUM CONTENT	PPm	12.0	ASTM D 5863

FRAC. NO	BOILING RANGE OF FRAC.@ 760 mmHg DEG. C	WEIGHT PERCENT	CUTTING RANGE WT%	SP.Gr. @15.56/ 15.56 °C	VOLUME PERCENT	CUTTING RANGE VOL %
1	IBP-250	3.44	3.44	0.7985	4.21	4.21
2	250-275	1.34	4.78	0.8263	1.58	5.79
3	275-300	1.67	6.45	0.8445	1.93	7.72
4	300-325	2.31	8.76	0.8533	2.64	10.36
5	325-350	2.90	11.66	0.8725	3.25	13.61
6	350-385	5.64	17.30	0.8924	6.17	19.78
7	385-425	7.85	25.15	0.9220	8.31	28.09
8	425-450	6.05	31.20	0.9334	6.33	34.42
9	450-475	5.90	37.10	0.9465	6.09	40.51
10	475-500	5.82	42.92	0.9578	5.93	46.44
11	500-530	7.93	50.85	0.9675	8.00	54.44
12	530-565	8.89	59.74	0.9789	8.87	63.31
13	565+	40.26	100.00	1.0715	36.69	100.00

Bunker fuel or bunker crude is technically any type of fuel oil used aboard vessels. It gets its name from the tanks on ships and in ports that it is stored in; in the early days of steam they were coal bunkers but now they are bunker fuel tanks. The Australian Customs and the Australian Tax Office define a bunker fuel as the fuel that powers the engine of a ship or aircraft. Bunker A is No. 2 fuel oil, bunker B is No. 4 or No. 5 and bunker C is No. 6. Since No. 6 is the most common, "bunker fuel" is often used as a synonym for No. 6. No. 5 fuel oil is also called Navy Special Fuel Oil (NSFO) or just navy special; No. 5 or 6 are also commonly called heavy fuel oil (HFO) or furnace fuel oil (FFO); the high viscosity requires heating, usually by a recirculated low pressure steam system, before the oil can be pumped from a bunker tank. Bunkers are rarely labeled this way in modern maritime practice.

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OIL

FUEL OIL

AVAILABLE GRADES IN MIDDLE EAST

We can export CST 380 and CST280 from Iran. We are able to trade other grade of fuel oil like 180 and 100 from our region.

380

Pricing methods for fuel oil,
Like other oil product, fuel oil has individual platts rate for each region. For example we determine fuel oil cst 380 price from Persian Gulf platts price for 180 plus or minus premium rate.
Like lpg and other oil product, premium rate shall be different, there are affecting factors like seasons of the year, amount of refinery production, sulfur content and so on…

SPECIFICATION			RESULT	TEST METHOD
SPECIFIC GRAVITY @ 15.56 /15.56 °C			0.9785	ASTM D 4052
API			13.11	ASTM D 1298
SULPHUR CONTENT (Total)		Wt.%	3.45	ASTM D 4294
BASE SEDIMENT & WATER		Vol.%	0.1	ASTM D 1796
WATER CONTENT		Vol.%	<0.05	ASTM D 4006
SALT CONTENT		P.T.B	11	ASTM D 3230
FLASH POINT		° C	66	ASTM D 93
KINEMATIC VISCOSITY	@ 40 ° C	mm^2 /Sec	899.2	ASTM D 445
" "	@ 50 ° C	mm^2 /Sec	377.8	ASTM D 445
POUR POINT		° C	0	ASTM D 5853
ASH CONTENT		Wt.%	0.04	ASTM D 482
ASPHALTENES		Wt.%	5.4	IP 143
WAX CONTENT		Wt.%	3.3	BP 237
DROP MELTING POINT OF WAX		° C	64	IP 133
CARBON RESIDUE CONRADSON		Wt.%	13.5	ASTM D 189
ACIDITY , TOTAL		mgKOH/gr	0.11	UOP 565
CALORIFIC VALUE		Kcal/Kg	10149	CALCULATED
NICKEL CONTENT		PPm	68	ASTM D 5863
VANADIUM CONTENT		PPm	202	ASTM D 5863
IRON CONTENT		PPm	7.5	ASTM D 5863
LEAD CONTENT		PPm	<1	ASTM D 5863
SODIUM CONTENT		PPm	25	ASTM D 5863

FRAC. NO	BOILING RANGE OF FRAC.@ 760 mmHg DEG. C	WEIGHT PERCENT	CUTTING RANGE WT%	SP.Gr. @15.56/ 15.56 °C	VOLUME PERCENT	CUTTING RANGE VOL %
1	IBP-225	4.72	4.72	0.7967	5.80	5.80
2	225-250	7.90	12.62	0.8106	9.54	15.34
3	250-275	3.53	16.15	0.8318	4.15	19.49
4	275-300	1.14	17.29	0.8508	1.31	20.80
5	300-325	0.72	18.01	0.8708	0.81	21.61
6	325-350	0.74	18.75	0.8951	0.81	22.42
7	350-385	0.91	19.66	0.9055	0.98	23.40
8	385-425	1.55	21.21	0.9173	1.65	25.05
9	425-450	1.51	22.72	0.9293	1.59	26.64
10	450-475	3.05	25.77	0.9402	3.17	29.81
11	475-500	5.54	31.31	0.9513	5.70	35.51
12	500-530	6.60	37.91	0.9598	6.73	42.24
13	530-565	9.17	47.08	0.9718	9.23	51.47
14	565+	52.92	100.00	1.0670	48.53	100.00

OIL

GILSONITE

GILSONITE IN ASPHALT & BITUMEN

Gilsonite Natural Asphalt , Natural Bitumen , Hard Asphalt or Hard Asphaltum is used as a performance-enhancing agent for asphalt mixes. Gilsonite-modified paving mixes achieve higher PG grades and incorporate perfectly into the asphalt blend with no need for high shear milling as is the case with many other modifiers. Gilsonite can partially or totally replace, or complement, the use of SBS polymers in modified asphalts at a fraction of the cost. Gilsonite-modified asphalts have higher stability, reduced deformation, reduced temperature susceptibility and increased resistance to water stripping than non-modified asphalts. Gilsonite is also used to make both solvent-based and emulsion pavement sealers with superior appearance and weathering properties

GILSONITE IN CHEMICAL

Gilsonite combines with many other chemicals and materials that take advantage of its unique physical and chemical properties. Binder and coating applications in metallurgical, wood product, refractary and other industries further demonstrate the versatility and usefulness of this remarkable material.

Gilsonite has many industrial applications, including metal alloy processing, refractary, steel desulfurization, friction products, wood products, waterproof pipe coatings, and adhesives. It is a non-toxic, non-carcinogenic alternative to coal tar pitch as well as an economical alternative to mineral rubber.

Gilsonite is used as a binder and mixing agent in steel desulfurization products. It has consistent volatiles that promote mixing of the other desulfurization chemicals like magnesium and hydrated lime. It will also add carbon content to the steel and will provide a reductive atmosphere as it oxidizes at high temperatures.

Gilsonite is used to make waterproof coatings for water pipes. It is a natural non-toxic resin with excellent adhesion properties. A corrosion-resistant, chemically inert pipe coating can be made from Gilsonite.

The wood products industry also uses Gilsonite as a binder. It has excellent waterproofing and weather resistant properties. Because Gilsonite is a hard resin it will make a very hard particleboard.

Composition	
Carbon	87.92 Min .(WT.PERCENT)
Sulphur	2.45 Min
Hydrogen	3.15 Min
Oxygen	1.56 Min
Nitrogen	0.45 Min
Solubility In Toluene	21.85 Approx.
SolubilityIn CS2	41.74 +/- 1Min.
Solubility In Benzene	36.18 Min
Solubility In Methanol	1.07 Min
Solubility In Ethanol	1.39 Min
Moisture	0.09 Min
Softening Point	200+DEG. CEN. APPROX
Density (Srec. Grav.)	1.08 gm per cubic centimete
Viscosity	Only in solutin

Chemical	
OXIDES	PCT
SiO2	0.42
Al2O3	0.08
Fe2O3	0.15
TiO2	0.07
CaO	3.28
MgO	n.d.
Na2O	0.03
K2O	0.01

Elements	
C	87.92%
S	2.45%
O	1.56%
H	3.15%
N	0.45%
ASH	4.04%
TOTAL	99.57

Composition	
Carbon	84 Min. (WT.PERCENT)
Sulphur	3 Min
Hydrogen	1.5 Min
Oxygen	1.09 Min
Nitrogen	1.02 Min
Solubility In Toluene	21.85 Approx.
SolubilityIn CS2	39.53 +/- 1Min.
Solubility In Benzene	31 Min
Solubility In Methanol	0.5 Min
Solubility In Ethanol	1-2 Min
Moisture	0.05 Min
Softening Point	200+DEG. CEN. APPROX
Density (Srec. Grav.)	0.070 gm per cubic centimeter
Viscosity	Only in solutin
Particle Size (Natural)	0-800 MM

Chemical	
OXIDES	PCT
SiO2	0.49
Al2O3	0.13
Fe2O3	0.02
TiO2	n.d.
CaO	0.18
MgO	n.d.
Na2O	0.01
K2O	n.d.

Elements	
C	84.87%
S	3.09%
O	1.49%
H	5.97%
N	0.77%
ASH	2.59%
TOTAL	99.61

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OIL

GASOIL D2-L62

D2 is a refinery abbreviation for Gasoil. It is the second distillate from the crude oil, and can be used without reformers and additives. So, the first engines used D2 as fuel - before petrol cars as we know them today was invented. That is because the engine invented by a German called Diesel, requires no spark plugs. The diesel engine will ignite and combust when the pressure increases so that the heated "plug" makes it explode. Here we get the name "Diesel" - since the same principles are used in diesel engines today. However, automotive diesel that you fill has additives that the refinery will add to make the engine more efficient and also easier to start in the winter. Diesel changes "flash point" in the winter. It also has additives to absorb water that condense. If you use summer diesel in the winter, you will get better mileage, but your fuel pipes may freeze and can also burst, and the wax makes the diesel flow thicker.

The principal difference between GASOIL and D2 is the content of sulphur. Just 10 years ago, the US EPA introduced a limit of 4% sulphur in the GASOIL, whereas Europe and the rest of the world followed later. As in most other cases, when you first have to remove the sulphur, it was soon discovered ways of doing this more efficient. Then it was discovered that the sulphur, as sulphuric acid, could be traded with a good profit - which now is the motivator for extracting as much as possible.

Quality of D-2 GAS (DIESEL) OIL L0.2/62 delivered under contracts, should meet to requirements of GOST 305-82, switching, but not being limited to requirements of the mentioned below specifications

COMPONENT	UNIT	MIN.	MAX.
DENSITY at 20°C	kg/m^3		860
Color	LB	0.003	0.01
Flash Point, Pmcc	°C		62
Four point	°C	(*)	-10.0
Cloud point	°C	(*)	-5.0
Mercaptan sulphur			0.01
Acidity, mg / 1000cm3			5
Iodine number	G/100g		6
Ash	%wt		0.01
Total sulphur	%wt	0.02	0.05
Copper corrosion 3 hrs at 50°C			1 A
CCR ON 10% Residues	%wt		0.2
Cetane index			45
Distillation range			
50% Recovered Volume	°C		280
90% Recovered Volume	°C		360
Bacteria MBC	Fibre / it		500
Bacteria CFU	Fibre / it		1000
Kinematic viscosity at 20°C	°Cst	3,0	6,0
Summer from March to October		(PP 5.0 degrees C)	
Summer from March to October		(CP 0.0 degrees C)	
Winter from November to February		(PP 10.0 degrees C)	
Winter from November to February		(CP 5.0 degrees C)	

So "Low sulphur Gasoil" is no longer 4 percent - but below 0.2 percent. Then we have a new, "Ultra Low Sulphur" at 0.02% at the most, and the limit here is (a) that mass spectographs requires extensive calibration to measure below 1000ppm, and (b) sulphur has a way to form clogs - the molecules binds to free hydrogen molecules and form a cluster of molecules that will break if "cracked" by the refinery, but as explained above, D2 is a distillate and has not been "cracked".

ISO has a standard for D2 that most of oil companies use as their reference.

In the U.S. it is ANSI that has defined the US national standard for D2, according to proposals from the ASTM, API and EPA.

In Europe there are similar national variants, e.g. in Germany set by DIN, and in Russia by GOST.

The GOST variant for D2/Gasoil is GOST 305-82 and specifies now a sulphur content of 0.02 MAX which is according to the ISO standard. However, the ANSI standard will call this "Ultra Low Sulphur", and retain 0.2% (2000ppm) as the "Low sulphur". The reduction of sulphur in the Gasoil used for heating has contributed to less pollution in many cities.

Automotive diesel has national variants - but the usual variants traded are EN590 and EN560 which are specified by ISO in Paris. These qualities may be sold in the U.S., and be compliant with EPA regulations in the U.S. Automotive diesel is now tested in planes with great success, where you get greater mileage per weight unit of fuel - as much as 40% increase. In these days, when no stone remains unturned to reduce emissions, one outcome may be that planes will fly on Gasoil and not kerosene. The problem is condensate / ice particles and wax that may cause the jet engine (which is a turbine) to be completely destroyed. A preliminary solution is to heat the gasoil before injection, and pass it through an electrostatic filter

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OIL

GASOLINE

OCTANE RATING

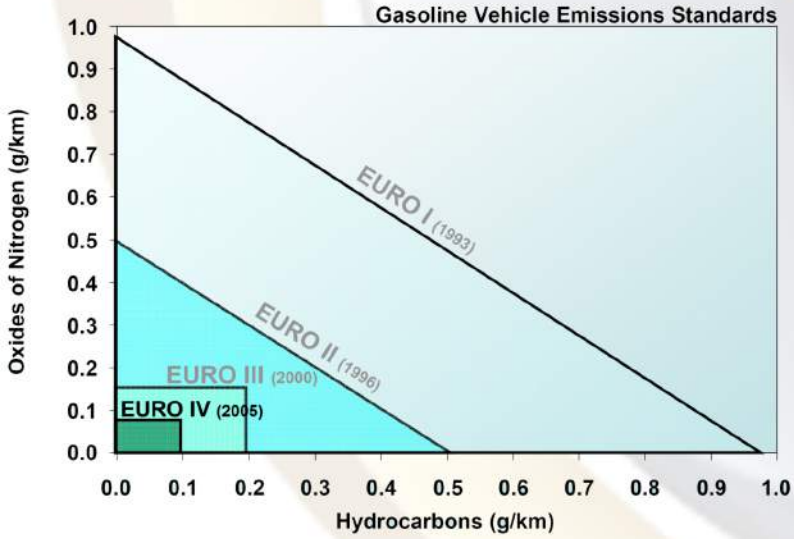
Octane rating or octane number is a standard measure of the performance of an engine or aviation fuel. The higher the octane number, the more compression the fuel can withstand before detonating (igniting). In broad terms, fuels with a higher octane rating are used in high performance gasoline engines that require higher compression ratios. In contrast, fuels with lower octane numbers (but higher cetane numbers) are ideal for diesel engines, because diesel engines (also referred to as compression-ignition engines) do not compress the fuel but rather compress only air and then inject the fuel into the air heated up by compression. Gasoline engines rely on ignition of air and fuel compressed together as a mixture without ignition, which is then ignited at the end of the compression stroke using spark plugs. Therefore, high compressibility of the fuel matters mainly for gasoline engines.

MOTOR GASOLINE SPECIFICATION

TEST	ANALYSIS	UNITS	LIMITS		TEST METHOD	
			MIN	MAX	ASTM	EN
1	DENSITY @ 15 ° C	Kg/m3	720	775	D 1298 D 4052	ISO 3675 ISO 12185
2	RESEARCH OCTANE NUMBER (SEE NOTE 1)		92		D2699	ISO 5164
3	MOTOR OCTANE NUMBER		81		D2700	ISO 5163
4	REID VAPOR PRESSURE (SEE NOTE 2)					
4.1	SUMMER	KPA		60*	D323	
4.2	WINTER	KPA		70*		
5	DISTILLATION :	%V/V				
5.1	INITIAL BOILING POINT	° C	24	40		
5.2	EVAPORATED AT 100 ° C	%V/V	46	57	D 86	ISO 3405
5.3	EVAPORATED AT 150 ° C	%V/V	75	87		
5.4	FINAL BOILING POINT	° C	190	215		
5.5	RESIDUE	%V/V		2		
6	HYDROCAROBN ANALYSIS :					
6.1	OLEFINS	%V/V		18	D1319	ISO 22854
6.2	AROMATICS	%V/V		35	D1319	ISO 22854
6.3	BENZENE	%V/V		1	D2267	ISO 22854
7	OXYGEN CONTENT	%M/M		2.7		ISO 22854
8	ALCOHOL	%V/V		ZERO		ISO 22854
9	SULFUR	mg/kg		50		ISO 20846
10	LEAD CONTENT	g/l		0.005	D 3237	IN 237
11	EXISTENT GUM (WASHED)	Mg/(100ml)		5		D 381
12	COPPER CORROSION (3 HOURS AT 50 °C)	SCALE		CLASS 1		D 130
13	INDUCTION PERIOD AT 100 ° C	MINUTES	360			D 525
14	COLOR – GREEN (SEE NOTE 3)	MG/L		1		IP 17
15	Mn CONTENT (SEE NOTE 1)			ZERO	D 3831	
16	Fe CONTENT (SEE NOTE 1)			ZERO	D 5863	

Note 1: The Octane Enhancer Agents Containing: Metals (LIKE FE, MN, PB,…).Aniline and its derivatives (Like N- Methyl Aniline ,N-N- dimity Aniline,…) And Chlorine Contain Agents (like Dichloroethane , 1, 2 Dichloropropane,…) Aren't Permitted. Any other type of the octane enhancer additives needs the Oil Products Specification committed approval.
Note 2: The RVP of the cargo should be MAX 60 Kpa during April 4th to October 7th. RVP should be MAX 70 for the rest of the year.
Note 3: Dye quantity should be about 1 Mg/L.
(The color of dye shall be green otherwise mentioned by buyer)
Please note dye will be placed on board of vessel and will not be mixed.

THE PATH TOWARD ZERO EMISSIONS ...



STANDARDS

Systematic fuel quality improvements in the European Union (EU) have historically preceded - and enabled - the successful introduction of more stringent tailpipe emission standards. The EU's fuel quality improvement initiatives have resulted in region-wide supply of both gasoline and diesel fuel (highway and nonroad) with near-zero sulfur content.

The first set of CEN standards in 1993 for automotive fuels were voluntary, but were observed by all fuel suppliers in Europe. Three standards covered automotive fuel quality: EN 590 for diesel, EN 228 for gasoline, and EN 589 for automotive LPG. Mandatory environmental regulations for several fuel properties were first introduced in 1998 , and were revised in 2003 and in 2009 . The applicable fuel properties include lead and sulfur content for gasoline, and cetane number, sulfur content, and FAME (Fatty Acid Methyl Esters) biodiesel content for diesel. The CEN standards are periodically updated to reflect changes in specifications, such as the mandatory reductions in sulfur content. In addition to regulating fuel quality, the 2009 directive introduced a Low Carbon Fuel Standard to reduce the greenhouse gas (GHG) intensity of energy supplied for road transport.

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OIL

NAPHTHA

Various qualifiers have been added to the term "naphtha" by various sources in an effort to make it more specific:

One source[6] differentiates by boiling point:

Light naphtha is the fraction boiling between 30 °C and 90 °C and consists of molecules with 5–6 carbon atoms.

Heavy naphtha boils between 90 °C and 200 °C and consists of molecules with 6–12 carbons.

Another source[7] differentiates light and heavy based on hydrocarbon structure:

"Light[is] a mixture consisting mainly of straight-chained and cyclic aliphatic hydrocarbons having from five to nine carbon atoms per molecule. Heavy [is] a mixture consisting mainly of straight-chained and cyclic aliphatic hydrocarbons having from seven to nine carbons per molecule."

LIGHT

Analysis	Unit	limit	Test Method
Density @ 15.0 °C	Kg/m3	700 max	ASTM D1298
Distillation	°C		ASTM D86
I.B.P	°C	35 min	ASTM D86
10 % Evaporated Temp	°C	60 max	ASTM D86
50 % Evaporated Temp	°C	85 min	ASTM D86
95 % Evaporated Temp	°C	125 max	ASTM D86
F.B.P	°C	150 max	ASTM D86
Residue	% Vol	1.5 max	ASTM D86
Loss	%Vol	1max	ASTM D86
Total Sulphur	% Wt	0.03 max	ASTM D1266
Corrosion 3 HRS	50°C	No 1 strip	ASTM D13
Vapour Pressure	K.Pa	75 max	ASTM D32
Mercaphtan Content	PPM	25 max	ASTM D322
Colour, Saybolt	-	20 min	ASTM D156
Paraffins Content	%Vol	70 min	ASTM D131
Oleffins Content	%Vol	2 max	ASTM D131
Naphthenes Content	%Vol	10 min	ASTM D131
Aromatics Content	%Vol	5 min	ASTM D131
Lead (PB) P.P.B	Uop	40 max	350-68T
C/H Ratio	Estimated	5.5 max	Calculate
Gum Existent (air jet)	Mg/100ml	3 max	ASTM D381

HEAVY

Analysis	Unit	limit	Test Method
Density @ 15.0 °C	Kg/m3	0.7580 Max	ASTM D1298
Distillation	°C		ASTM D86
10 % Evaporated Temp	°C	120 Max	ASTM D86
50 % Evaporated Temp	°C	115 Min	ASTM D86
95 % Evaporated Temp	°C	150-170	ASTM D86
F.B.P	°C	180 Max	ASTM D86
Residue	% Vol	1.5 Max	ASTM D86
Loss	%Vol	1 Max	ASTM D86
Total Sulphur	% Wt	0.08 Max	ASTM D1266
Corrosion 3 HRS	50°C	No 1 strip	ASTM D130
Vapour Pressure	K.Pa	27 Max	ASTM D323
Mercaphtan Content	ppm	70 Min	ASTM D3227
Colour, Saybolt	-	25 Min	ASTM D156
Paraffins Content	%Vol	50 Min	ASTM D1319
Oleffins Content	%Vol	1.5 Max	ASTM D1319
(Naphthenes + Aromatics) Content	%Vol	40 Min	ASTM D1319
Lead (PB) P.P.B	UOP	40 Max	350-68T
C/H Ratio	Estimated	6 Max	Calculate
Gum Existent (air jet)	Mg/100ml	2.5 Max	ASTM D381
Oxygenates	ppm	60 Max	ASTM D4815

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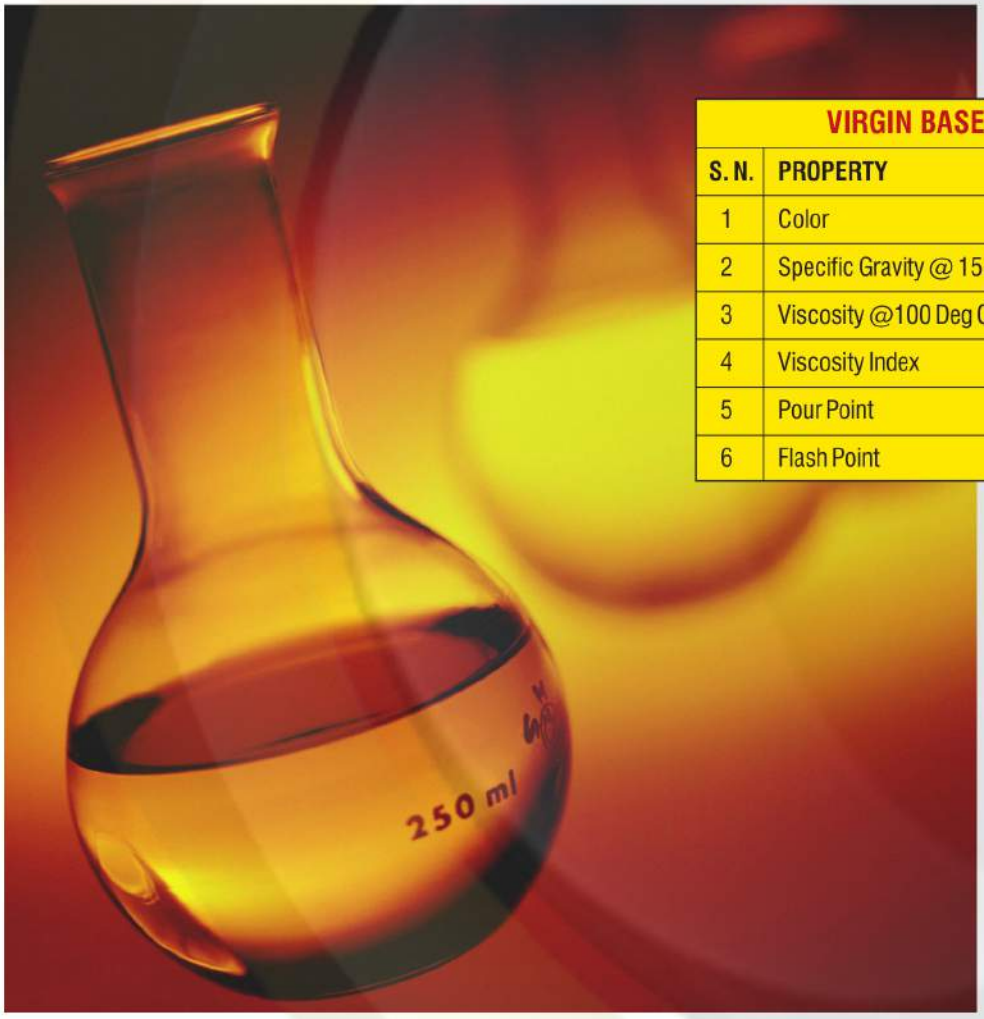
OIL

BASE OIL SN150

There are large numbers of crude oils all around the world that are used to produce base oils. The most common one is a type of paraffinic crude oil, although there are also naphthenic crude oils that create products with better solubility and very good properties at low temperatures. By using hydrogenation technology, in which sulfur and aromatics are removed using hydrogen under high pressure, you can obtain extremely pure base oils, which are suitable when quality requirements are particularly stringent



VIRGIN BASE OIL – SN 150 (Iranol)		
S. N.	PROPERTY	VALUE
1	Color	Max 2.0
2	Specific Gravity @ 15 Deg C	0.87 to 0.89
3	Viscosity @100 Deg C	5 to 6.5
4	Viscosity Index	Min 95
5	Pour Point	-9 Max
6	Flash Point	Min 190

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OIL

BASE OIL SN500

Chemical substances – additives – are added to the base oil in order to meet the quality requirements for the end products in terms of, for example, friction and cleaning properties. Certain types of motor oils contain more than twenty per cent additives

VIRGIN BASE OIL – SN 500 (Sepahan)		
S. N.	PROPERTY	VALUE
1	Color	Max 2.0
2	Specific Gravity @ 15 Deg C	0.886
3	Viscosity @100 Deg C	11.8
4	Viscosity Index	Min. 88
5	Pour Point	-3 Max
6	Flash Point	225
7	Asphaltness wt%	0.06
8	Water Content Vol%	0.02

RECYCLED BASE OIL – SN 500			
S. N.	PROPERTY	VALUE	TEST METHOD
1	Color	2.5 to 3.5	ASTM D98 / 1500
2	Specific Gravity	0.87 to 0.89	ASTM D96 / 4052
3	Viscosity @100 Deg C	9.5 to 11.5	ASTM D96 / 445
4	Viscosity Index	Min 95	ASTM D93 / 2270
5	Pour Point	0	ASTM D97
6	Flash Point	Min 205	ASTM D92

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GAS

LPG BUTANE

Liquefied petroleum gas or liquid petroleum gas (LPG or LP gas), also referred to as simply propane or butane, are flammable mixtures of hydrocarbon gases used as fuel in heating appliances, cooking equipment, and vehicles.

It is increasingly used as an aerosol propellant and a refrigerant, replacing chlorofluorocarbons in an effort to reduce damage to the ozone layer. When specifically used as a vehicle fuel it is often referred to as autogas.

Varieties of LPG bought and sold include mixes that are primarily propane (C_3H_8), primarily butane (C_4H_{10}) and, most commonly, mixes including both propane and butane. In winter, the mixes contain more propane, while in summer, they contain more butane

PRICING METHODS:

We can find out lpg price for butane and propane from contract price of Saudi Arabia for this product +/- premium rate. The premium rate will be different by changing ports of loading and specification and time of loading due to each year.

Test Item	Test Method	Specification
Sp. Gr,15.6/15.6 Deg.C.	ASTM D 2598	To be reported
Vapor Pressure(psig at 100 deg.F)	ASTM D 1267 or D 2598	Max 70
Butane content (vol%)	ASTM D 2163	Min 95.0
Volatile residue (Pentanc +)(vol%)	ASTM D 2163	Max 2.0
Copper corrosion	ASTM D 1838	No. 1 strip
Sulfur content(ppm)	ASTM D 1266 or D 5453	Max 80
H2S	ASTM D 2420	Negative
Free water	Visual	None

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GAS

LPG PROPANE

PRICING METHODS:

We can find out lpg price for butane and propane from contract price of Saudi Arabia for this product +/- premium rate. The premium rate will be different by changing ports of loading and specification and time of loading due to each year.

Test Item	Test Method	Specification
Sp. Gr. 15.6/15.6 Deg.C	ASTM D 2598	To be reported
Vapor pressure (psig at 100 Deg.F)	ASTM D 1267 or D 2598	Max 200
Propane content (vol %)	ASTM D 2163	Min 96.0
Ethane content (vol %)	ASTM D 2163	Max 2.0
Volatile residue (Butane+)(Vol %)	ASTM D 2163	Max 2.5
Residue on evaporation of 100ml	ASTM D 2158	Max 0.05
Oil stain observation	ASTM D 2158	Pass
Copper corrosion	ASTM D 1838	No. 1 strip
Sulfur content (ppm)	ASTM D 1266 or D 5453	Max 40
H2S	ASTM D 2420 or IP103	Negative
Moisture	ASTM D 2713 or D 1744	Pass

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CONDENSATE ALL

KANGAN ASALUYEH ILAM

Natural-gas condensate is a low-density mixture of hydrocarbon liquids that are present as gaseous components in the raw natural gas produced from many natural gas fields. It condenses out of the raw gas if the temperature is reduced to below the hydrocarbon dew point temperature of the raw gas.

The natural gas condensate is also referred to as simply condensate, or gas condensate, or sometimes natural gasoline because it contains hydrocarbons within the gasoline boiling range. Raw natural gas may come from any one of three types of gas wells

Crude oil wells—Raw natural gas that comes from crude oil wells is called associated gas. This gas can exist separate from the crude oil in the underground formation, or dissolved in the crude oil. Condensate produced from oil wells is often referred to as lease condensate.

Dry gas wells—These wells typically produce only raw natural gas that does not contain any hydrocarbon liquids. Such gas is called non-associated gas. Condensate from dry gas is extracted at gas processing plants and, hence, is often referred to as plant condensate.

Condensate wells—These wells produce raw natural gas along with natural gas liquid. Such gas is also non-associated gas and often referred to as wet gas

CONDENSATE ASSALUYEH

Condensate production from South Pars is currently 200,000 barrels per day (32,000 m3/d), and by 2010, could increase to over 500,000 barrels per day (79,000 m3/d). As of December 2010, South pars gas field's production capacity stands at 75 million cubic metres (2.6 billion cubic feet) of natural gas per day. Gas production at South Pars rose by nearly 30% between March 2009 and March 2010. The field's reserves are estimated at 14 trillion cubic metres (490 trillion cubic feet) of natural gas and 18 billion barrels (2.9 billion cubic metres) of natural gas condensates. Production at South Pars gas field will rise to 175 million cubic metres (6.2 billion cubic feet) per day in 2012

South Zagros oil and gas production company, based in Shiraz, is in charge of producing oil and gas from the fields located in 5 southern provinces; Fars, Boshehr, Hormozgan, kohgiloyeh & boyerahmad and Charmahal & bakhtiyari. This company is responsible for providing gas and condensate for Farashband, Fajr, Sarkhon and Parsian refineries.

Sarvestan and Saadat Abad oil fields with 1 billion and 402 million barrels of oil cover an area of 242 km. these fields are set to produce 15 thousand barrels of oil in the first phase and in the final phase they would produce 25 bpd of oil in order to feed Shiraz refinery.

Part of the outlet gas is transferred and injected into Maroon oil field or fed into Bid Boland gas refinery during cold seasons. Farashband condensate is transferred to Shiraz oil refinery and Fajr gas refinery.

The refineries feed gas and condensate is produced from four operational regions such as Nar-Kangan, Aghar-Dalan, Parsian and Gheshm-Sarkhon including 9 gas fields known as Aghar, Dalan, Nar Kangan, Tabnak , Gavarzin, Sarkhon, Homa, Varavi and Shanol.

Once Sarvestan and Sa'adat Abad oil fields together with Khesht oil field come on stream in SZOGPC in near future, some 25 thousand barrels of oil will be added to country's output.

Current average gas and condensate production of the company is 250 million cubic meters per day and 71 thousand barrels per day, respectively.

PETROCHEMICAL

POLYMERS

- LLDPE
- HDPE
- PET
- PP
- ABC
- HIPD
- GPPS
- EPS
- PE
- PVC
- E/P

A polymer is a large molecule, or macromolecule, composed of many repeated subunits. Because of their broad range of properties, both synthetic and natural polymers play an essential and ubiquitous role in everyday life. Polymers range from familiar synthetic plastics such as polystyrene to natural biopolymers such as DNA and proteins that are fundamental to biological structure and function. Polymers, both natural and synthetic, are created via polymerization of many small molecules, known as monomers. Their consequently large molecular mass relative to small molecule compounds produces unique physical properties, including toughness, viscoelasticity, and a tendency to form glasses and semicrystalline structures rather than crystals

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PETROCHEMICAL

POLYMERS

The identity of the repeat units , comprising a polymer is its first and most important attribute. Polymer nomenclature is generally based upon the type of monomer residues comprising the polymer. Polymers that contain only a single type of repeat unit are known as homopolymers, while polymers containing a mixture of repeat units are known as copolymers. Poly(styrene), for example, is composed only of styrene monomer residues, and is therefore classified as a homopolymer. Ethylene-vinyl acetate, on the other hand, contains more than one variety of repeat unit and is thus a copolymer. Some biological polymers are composed of a variety of different but structurally related monomer residues; for example, polynucleotides such as DNA are composed of a variety of nucleotide subunits.

HDPE

- INJECTION MOULDING
- BLOW MOULDING
- FILM
- MONOFILAMENT
- ROTATIONAL MOULDING
- PIPE EXTRUSION
- MDPE

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POLYMERS

CHAIN LENGTH

The physical properties of a polymer are strongly dependent on the size or length of the polymer chain. For example, as chain length is increased, melting and boiling temperatures increase quickly. Impact resistance also tends to increase with chain length, as does the viscosity, or resistance to flow, of the polymer in its melt state.[21] Melt viscosity is related to polymer chain length Z roughly , so that a tenfold increase in polymer chain length results in a viscosity increase of over 1000 times. Increasing chain length furthermore tends to decrease chain mobility, increase strength and toughness, and increase the glass transition temperature (Tg)[citation needed]. This is a result of the increase in chain interactions such as Van der Waals attractions and entanglements that come with increased chain length[citation needed]. These interactions tend to fix the individual chains more strongly in position and resist deformations and matrix breakup, both at higher stresses and higher temperatures[citation needed].

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POLYMERS

A common means of expressing the length of a chain is the degree of polymerization, which quantifies the number of monomers incorporated into the chain. As with other molecules, a polymer's size may also be expressed in terms of molecular weight. Since synthetic polymerization techniques typically yield a polymer product including a range of molecular weights, the weight is often expressed statistically to describe the distribution of chain lengths present in the same. Common examples are the number average molecular weight and weight average molecular weight. The ratio of these two values is the polydispersity index, commonly used to express the "width" of the molecular weight distribution. A final measurement is contour length, which can be understood as the length of the chain backbone in its fully extended state.

The flexibility of an unbranched chain polymer is characterized by its persistence length

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PETROCHEMICAL

UREA

Urea or carbamide is an organic compound with the chemical formula $CO(NH_2)_2$. The molecule has two —NH_2 groups joined by a carbonyl (C=O) functional group.

Urea serves an important role in the metabolism of nitrogen-containing compounds by animals and is the main nitrogen-containing substance in the urine of mammals. It is a colorless, odorless solid, highly soluble in water and practically non-toxic (LD50 is 15 g/kg for rats). Dissolved in water, it is neither acidic nor alkaline. The body uses it in many processes, the most notable one being nitrogen excretion. Urea is widely used in fertilizers as a convenient source of nitrogen. Urea is also an important raw material for the chemical industry

HOW IS UREA MADE?

Urea is made by reacting carbon dioxide (CO_2) with anhydrous ammonia (NH_3) under 3,000 psi pressure and at 350° F.

$CO_2 + 2NH_3 > CO(NH_2)_2 + H_2O$

The removal of water that occurs during the reaction is referred to as dehydration." The resulting molten mixture is further processed into either prills or granules.

WHAT IS THE DIFFERENCE BETWEEN GRANULAR UREA AND PRILLED UREA IN TERM OF PHYSICAL APPEARANCE AND APPLICATION?

Granular urea is somewhat larger in size than are prills, but the color will be the same as is the application technique. Granular urea is somewhat larger in size than are prills, but the color will be the same as is the application technique

WHY IS THERE SUCH A SHIFT TO UREA IN WORLD TRADE?

Urea has a number of advantages over other nitrogen fertilizers. Urea is safer to ship and handle, it is less corrosive to equipment, it has a higher analysis than any other dry nitrogen fertilizer and it can be used on virtually all crops. Urea can be stored and distributed through conventional systems. It can be applied in many different ways from sophisticated aerial application equipment to a farm spreading urea by hand. Urea is also highly water soluble so it moves readily into the soil. The high analysis means a reduced transportation and application cost per pound of nitrogen.

HOW MUCH NITROGEN DOES UREA CONTAIN?

Urea is 46% nitrogen. This is the highest concentration dry nitrogen fertilizer available.

IS THE NITROGEN IN UREA DIFFERENT FROM NITROGEN IN "ORGANIC FERTILIZERS" IN TERMS OF PLANT NUTRITION?

No; the ammonic nitrogen or nitrate nitrogen taken up by plants is chemically identical regardless of the source. Nitrate or ammonium that results from urea application is indistinguishable from the nitrate or ammonium that results from manure application. A plant utilizes inorganic ions, and the source of these nutrients is irrelevant to either the yield or quality of the fruit, grain, or vegetative matter produced by the plant.

Specifications for granular urea 46%N:

Nitrogen:	46% min.
Moisture:	0.5% max.
Biuret:	1.4 % max.
Granulation:	2 - 4 mm 90-94 % min.
Melting Point:	132 Degrees Celsius
Colour:	Standard White or Pure White
Radiation:	Non - Radioactive
Free Ammonia:	160pxt ppm max.

Free Flowing, Treated against caking, 100% free from harmful substances

Specifications for prilled urea 46%N:

Nitrogen:	46% min.
Moisture:	0.3% max.
Biuret:	1% max.
Granulation:	1 - 4 mm 90-94 % min.
Melting Point:	132 Degrees Celsius
Colour:	Pure White Prilled
Radiation:	Non - Radioactive
Free Ammonia:	160pxt ppm max.

Prilled, Free Flowing, Treated against caking, 100% free from harmful substances

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PETROCHEMICAL

METHANOL

HOW IS METHANOL MADE?

Methanol can be made from a wide array of feedstocks, making it one of the most flexible chemical commodities and energy sources available today. To make methanol, you need first to create synthesis gas, which has carbon monoxide and hydrogen gas as its main components.

While natural gas is most often used in the global economy, methanol has the distinct advantage of 'polygeneration' - whereby methanol can be made from any resource that can be converted first into synthesis gas. Through gasification, synthesis gas can be produced from anything that is or ever was a plant. This includes biomass, agricultural and timber waste, solid municipal waste, and a number of other feedstocks.

In a typical plant, methanol production is carried out in two steps. The first step is to convert the feedstock natural gas into a synthesis gas stream consisting of CO, CO2, H2O and hydrogen. This is usually accomplished by the catalytic reforming of feed gas and steam. Partial oxidation is another possible route. The second step is the catalytic synthesis of methanol from the synthesis gas. Each of these steps can be carried out in a number of ways and various technologies offer a spectrum of possibilities which may be most suitable for any desired application.

Conventional steam reforming is the simplest and most widely practiced route to synthesis gas production:

$$2\ CH_4 + 3\ H_2O \rightarrow CO + CO_2 + 7\ H_2 \text{ (Synthesis Gas)}$$

$$CO + CO_2 + 7\ H_2 \rightarrow 2\ CH_3OH + 2\ H_2 + H_2O$$

This process results in a considerable hydrogen surplus, as can be seen.

If an external source of CO2 is available, the excess hydrogen can be consumed and converted to additional methanol. The most favorable gasification processes are those in which the surplus hydrogen is "burnt" to water, during which steam reforming is accomplished through the following partial oxidation reaction:

$$CH_4 + \tfrac{1}{2}O_2 \rightarrow CO + 2\ H_2 \rightarrow CH_3OH$$

$$CH_4 + O_2 \rightarrow CO_2 + 2\ H_2$$

The carbon dioxide and hydrogen produced in the last equation would then react with an additional hydrogen from the top set of reactions to produce additional methanol. This gives the highest efficiency, but may be at additional capital cost.

Unlike the reforming process, the synthesis of methanol is highly exothermic, taking place over a catalyst bed at moderate temperatures. Most plant designs make use of this extra energy to generate electricity needed in the process

Methanol, also known as methyl alcohol, wood alcohol, wood naphtha or wood spirits, is a chemical with the formula CH3OH (often abbreviated MeOH). It is the simplest alcohol, and is a light, volatile, colorless, flammable liquid with a distinctive odor very similar to, but slightly sweeter than, ethanol (drinking alcohol).[4] At room temperature, it is a polar liquid, and is used as an antifreeze, solvent, fuel, and as a denaturant for ethanol. It is also used for producing biodiesel via transesterification reaction.

Natural gas is the feedstock used in most of the world's production of methanol. Methanol is a primary liquid petrochemical made from renewable and nonrenewable fossil fuels containing carbon and hydrogen

PETROCHEMICAL

ETHANOL

Where do you begin with understanding ethyl alcohol or commonly known as ethanol? There are several different types, so here's a quick breakdown to help you sort through it all:

Pure Undenatured Ethanol: Pure Ethanol is Ethyl Alcohol with no other additives or denaturants. Pure Ethanol is often referred to as pure alcohol even though the term "pure" can refer to any proof. Pure Alcohol is considered "pure" regardless of the "cut" of water (proof). Pure Alcohol (Ethanol) is commonly referred to as Beverage Grade Alcohol. It is always 192 proof and derived from natural sources.

Pure USP Alcohol: Pure Alcohol is also often referred to as USP Alcohol. That is because only pure, undenatured Ethanol can be certified as USP or NF Grade. Not all pure alcohol is USP grade certified, but only 190 and 200 proof pure ethanol which meets or exceeds the stringent standards set forth in the US Pharacopoeia.

Kosher Alcohol: Kosher is a grade certification for pure, undenatured alcohol. It certifies that the alcohol was manufactured and packaged under the supervision and guidelines of a duly recognized Rabbinical Authority.

Natural vs. Synthetic Ethyl Alcohol: All Ethanol products can be made with naturally derived Ethanol (Grain alcohol or grain neutral spirits) or synthetically produced Ethanol. Natural alcohol is commonly referred to as Grain Alcohol. While grain and synthetic alcohol are technically the same, there are differences in the limited amount of contaminants in the product in the parts per million (ppm) range.

190 vs. 200 Proof Alcohol: All Ethanol products have a proof associated with the product description. The proof is the measure of water content of the Ethanol portion of the product and any level of proof can be manufactured based upon the amount of water added. The majority of all Ethanol products are either 190 or 200 proof, the third most common being 192 proof.

Anhydrous Alcohol: Anhydrous Alcohol literally means no-water alcohol, but in reality, it means low-water alcohol. This distinction is synonymous with 200 proof alcohol, but NOT with the term "pure." Pure Alcohol is undenatured alcohol, which could be anhydrous or not.

Grain Neutral Spirits (GNS): High purity grain alcohol, which has a neutral odor.

ACS Reagent Grade Alcohol: Pure alcohol used in industrial settings, hospitals and research facilities. It meets or exceeds specifications set forth in the American Chemical Society's Reagent Handbook.

Organic Certified Alcohol: Specialty pure alcohol derived from organically grown corn. All phases of the production process including fermentation, distillation, packaging and shipping are done under strict organic guidelines

This process results in a considerable hydrogen surplus, as can be seen.

If an external source of CO2 is available, the excess hydrogen can be consumed and converted to additional methanol. The most favorable gasification processes are those in which the surplus hydrogen is "burnt" to water, during which steam reforming is accomplished through the following partial oxidation reaction:

$CH4 + ½O2 \rightarrow CO + 2\ H2 \rightarrow CH3OH$

$CH4 + O2 \rightarrow CO2 + 2\ H2$

The carbon dioxide and hydrogen produced in the last equation would then react with an additional hydrogen from the top set of reactions to produce additional methanol. This gives the highest efficiency, but may be at additional capital cost.

Unlike the reforming process, the synthesis of methanol is highly exothermic, taking place over a catalyst bed at moderate temperatures. Most plant designs make use of this extra energy to generate electricity needed in the process

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PETROCHEMICAL

CHEMICALS

PRODUCTS

Polymers and plastics, especially polyethylene, polypropylene, polyvinyl chloride, polyethylene terephthalate, polystyrene and polycarbonate comprise about 80% of the industry's output worldwide. These materials are often converted to fluoropolymer tubing products and used by the industry to transport highly corrosive materials. Chemicals are used to make a wide variety of consumer goods, as well as thousands of inputs to agriculture, manufacturing, construction, and service industries. The chemical industry itself consumes 26 percent of its own output. Major industrial customers include rubber and plastic products, textiles, apparel, petroleum refining, pulp and paper, and primary metals. Chemicals are nearly a $3 trillion global enterprise, and the EU and U.S. chemical companies are the world's largest producers.

Sales of the chemical business can be divided into a few broad categories, including basic chemicals (about 35 to 37 percent of the dollar output), life sciences (30 percent), specialty chemicals (20 to 25 percent) and consumer products (about 10 percent).

BASIC CHEMICALS & COMMODITY CHEMICALS TO POLYMERS AND SPECIALITY CHEMICALS

Basic chemicals, or "commodity chemicals" are a broad chemical category including polymers, bulk petrochemicals and intermediates, other derivatives and basic industrials, inorganic chemicals, and fertilizers. Typical growth rates for basic chemicals are about 0.5 to 0.7 times GDP.[citation needed] Product prices are generally less than fifty cents per pound.[citation needed]

Polymers, the largest revenue segment at about 33 percent of the basic chemicals dollar value, includes all categories of plastics and man-made fibers.[citation needed] The major markets for plastics are packaging, followed by home construction, containers, appliances, pipe, transportation, toys, and games.

The largest-volume polymer product, polyethylene (PE), is used mainly in packaging films and other markets such as milk bottles, containers, and pipe.

Polyvinyl chloride (PVC), another large-volume product, is principally used to make pipe for construction markets as well as siding and, to a much smaller extent, transportation and packaging materials.

Polypropylene (PP), similar in volume to PVC, is used in markets ranging from packaging, appliances, and containers to clothing and carpeting.

Polystyrene (PS), another large-volume plastic, is used principally for appliances and packaging as well as toys and recreation.

The leading man-made fibers include polyester, nylon, polypropylene, and acrylics, with applications including apparel, home furnishings, and other industrial and consumer use.

PETROCHEMICAL

CHEMICALS

THE PRINCIPAL RAW MATERIALS FOR POLYMERS ARE BULK PETROCHEMICALS.

Chemicals in the bulk petrochemicals and intermediates are primarily made from liquefied petroleum gas (LPG), natural gas, and crude oil. Their sales volume is close to 30 percent of overall basic chemicals.[citation needed] Typical large-volume products include ethylene, propylene, benzene, toluene, xylenes, methanol, vinyl chloride monomer (VCM), styrene, butadiene, and ethylene oxide. These basic or commodity chemicals are the starting materials used to manufacture many polymers and other more complex organic chemicals particularly those that are made for use in the specialty chemicals category .

Other derivatives and basic industrials include synthetic rubber, surfactants, dyes and pigments, turpentine, resins, carbon black, explosives, and rubber products and contribute about 20 percent of the basic chemicals' external sales.

Inorganic chemicals (about 12 percent of the revenue output) make up the oldest of the chemical categories. Products include salt, chlorine, caustic soda, soda ash, acids (such as nitric acid, phosphoric acid, and sulfuric acid), titanium dioxide, and hydrogen peroxide.

Fertilizers are the smallest category (about 6 percent) and include phosphates, ammonia, and potash chemicals

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SULPHUR

PRODUCT DESCRIPTION

Elemental Sulphur 99.5% is designed to provide industrial sulphur users with a very pure form of sulphur featuring excellent handling characteristics. The material is formed from pure molten sulphur using a drop forming process that results in a compacted granular product known as a "pastille" — a split pea shape with rounded edges that minimize dust creation. This manufacturing process allows Tiger to deliver a quality material that surpasses the requirements of even the most stringent standards in industries such as steel making, pulp and paper, malting, fruit processing, mining, and other industries requiring sulphur. This product is very easy to handle with an extremely low dust content (< 0.5% fines at manufacturing), allowing for maximum safety during industrial handling processes. The smaller mesh sizing allows for a premier sulphur product to be handled in a smaller pastille size vs. larger sizing elemental sulphur products.

PROPERTY & COMPOSITION		SPEC.VALUE
PURITY	(WT%)	MIN 99.5
ASH CONTENT	(PPM)	MAX 500
HYDROCARBON	(WT%)	MAX 0.05
ACIDITY	(WT%)	MAX 0.02
MOISTURE	(WT%)	MAX 0.5
AS/TE/SE	(WT%)	COMMERTIALLY FREE
COLOUR		BRIGHT YELLOW
PARTICLE SIZE	(WT%)	
	(<2 MM & >7 MM)	MAX 10
	2-7 MM	90

Unit Process Licensors

UNIT	PROCESS	LICENSOR	PURITY	CAPACITY
SULPHUR 1	CLUAS	RALPHM-PARSON	99.9% PURITY	650TON
SULPHUR 2	CLUAS	RALPHM-PARSON	99.9% PURITY	650TON
SULPHUR 3	CLUAS	RALPHM-PARSON	99.9% PURITY	650TON
SULPHUR GRANULATION	GRANUL	POLYMIX	99.9%	1600TON

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