



MARUN
PETROCHEMICAL
COMPANY

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Ethane Recovery Plant:

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| Introduction |

Aspirations to discover an elixir to change inexpensive metals into gold are as old as history. These aspirations never came true but they took a different shape with the advent of industrialization. The petrochemical industry in general and Marun Petrochemical Complex in particular are partly the focal point of attempts to realize one of mankind's ancient dreams.

| Marun Petrochemical Co. |

The company was established in 1998 to implement NPC's Olefin Number 7th Project. With a production capacity of 1.1 million metric tons/year of ethylene, it has one of the world's largest olefin plants and also it is the first Iranian petrochemical plant that recovers C2⁺ from natural gas and converts it to various olefins, polymers and chemicals.

| Location |

Marun Petrochemical Co. has been built in two separate sites with a total area of 102.5 hectares:

1) Curait Camp of Ahvaz

Marun's ethane recovery plant has been built in an area of 9.5 hectares near to Ahvaz city, the capital of Khuzestan Province. A 95-km pipeline will pump the extracted C2⁺ feedstock to the olefin plant that is located in the Petrochemical Special Economic Zone (P.S.E.Z)

2) Petrochemical Special Economic Zone

The olefin plant plus HDPE, PP, EO/EG, UT and Offsite Plants are located in Site No. 2 of the Petrochemical Special Economic Zone in an area of 93 hectares, near to the port of Bandar Imam Khomeini (BIK).

| C2⁺ recovery plant |

The main feedstock for the downstream olefin plant is C2⁺ which is produced in C2⁺ recovery plant (CRP). The operation at the C2⁺ recovery plant is driven by the Linde technology. It has a capacity of 1,908,720 MT/year and extracts ethane and heavier components, which were initially used as fuels, from natural gas.

| Gas Cracking plant |

The olefin plant capacity is 1.1 MMT/year of ethylene and 200,000 MT/year of propylene, as the main feedstocks for downstream plants. Besides, it yields pyrolysis gasoline, heavy C3⁺, methane and hydrogen as by-products.

| EO/EG plant |

Ethylene oxide (EO) is an important intermediate product that is used for the production of a wide range of products. A major portion of ethylene oxide at the EO plant reacts with water to yield 443,000 MT/year of different grades of glycols (MEG, DEG, TEG). Ethylene glycol is used for the production of synthetic fibers, films, automotive coolant and antifreeze. Other applications include unsaturated polyester resins, paper, protection shields, production of paints and inks. EO is used to produce antiseptics, pesticides and numerous other products.



Mono Ethylene Glycol

Appearance	Colourless, Transparent
Purity	99.8 wt % min
Colour (Pt-Co)	5 max
DEG	0.08 wt % max
Water	0.08 wt % max
Specific Gravity, 20/20°C	1.1151-1.1156
Boiling Range at 0.1013 Mpa	--
5% vol	min. 196°C
95% vol	max. 199°C
Aldehydes (as formaldehyde)	8 mg/Kg max
Acidity (as acetic acid)	10 mg/Kg max
Iron (as Fe)	0.1 mg/Kg max
Inorganic Chlorides (as Cl)	0.05 mg/Kg max
Ash	50 mg/Kg max
UV Transmittance %	--
- 220 nm	80 min
- 275 nm	95 min
- 350 nm	99 min

Diethylene Glycol

Appearance	Colourless, Transparent
Purity	99.8 wt % min
MEG	0.05 wt % max
TEG	0.05 wt % max
Water	0.05 wt % max
Colour (Pt-Co)	10 max
Specific Gravity, 20/20°C	1.1175-1.1195
Boiling Range at 0.1013 Mpa	--
5% vol	min 242 °C
95% vol	max 250 °C
Acidity (as acetic acid)	50 mg/Kg max
Ash	50 mg/Kg max

Triethylene Glycol

Appearance	Colourless, Clear
Purity	99 wt % min
DEG	1 wt % max
PEG	0.1 wt % max
Water	0.05 wt % max
Colour (Pt-Co)	25 max
Ash	100 mg/Kg max
Boiling Range at 0.1013 Mpa	--
5% vol	min 280°C
95% vol	max 295°C
Specific Gravity 20/20°C	1.124-1.126

Polypropylene (PP) Plant

The PP plant has an annual capacity of 300,000MT and produces various grades of PP. Marun was the first producer of the Hifax PP grade in Iran, a high impact polypropylene copolymer resin that is widely used in automotive industry.

PP is also used for the production of pipes, textiles, home appliances, toys, electronic parts, stationery, cable insulators, fishing goods and many more.



Adstif Homopolymer Grades

Grade	New Code	MFI ISO 1133 (2.16Kg-230°C)	Main Applications
T 2101 F	HA 840 K	3.5	Thermoforming, extrusion, film applications.
ADXP 680	--	3.5	Extrusion, thermoforming & film applications.
ADXP 699	--	3.5	Bopp, cast film applications.
ADXP 770	--	45	Thin wall injection moulding.
V 2400 G	HA 840 R	15	Injection moulding, food packaging containers, housewares.

Homopolymer Grades

Grade	New Code	MFI ISO 1133 (2.16Kg-230°C)	Main Applications
C 30 G	HP 500 L	6	Injection mouldings, housewares, small containers, crates, garden furniture, toys, stadium seats, caps and closure.
C 30 S	HP 510 L	6	Extrusion of film yarn, monofilament, cast film & sheet, baler twines, packaging twines & ropes, brush & broom filling & technical applications.
D 50 S	--	0.3	Extrusion & thermoforming, heavy sheet for industrial applications, profile & pipe.
F 30 G	HP 500 N	12	Injection moulding of consumer goods such as food containers, cool boxes, vacuum flasks, toys, garden furniture & small appliances.
F 30 S	HP 502 N	12	Extrusion of staple fibers for spinning wool system fiber for carpets, rugs and garments such as a overalls and socks
F79 S	HP 554 N	12	Fine denier staple fibers for nonwoven, thermobonded fabrics.
H 22 S	HP 565 S	37	Spunbond nonwoven fabrics, diapers, medical & sanitary tissues, protective fabrics for agricultural, industrial & medical applications.
H 32 GA	HP 648 S	35	Injection moulding of thin-walled packaging in the cosmetic and food industry.
H 39 S	--	35	High speed production of BCF & CF for carpet face yarn.
HP 562	--	37	High speed production of very low denier BCF and CF. nonwoven, extrusion.
Q 30 P	HP 501 D	0.7	Extrusion & thermoforming, blow moulding small and medium sized containers.
S 28 C	HP 422 H	2.1	BOPP films.
S 28 F	HP 522 H	2.0	BOPP films & metallized BOPP films.
S 30 G	HP 500 H	1.8	Injection moulding applications such as textile bobbins, wheels, fittings closures.
S 30 S	HP 502 H	1.8	Thermoforming, film yarn with a denier count ranging from 3000 to 28000 and monofilament.

Grade	New Code	MFI ISO 1133 (2.16Kg-230°C)	Main Applications
S 38 CA	HP 421 H	2.1	BOPP films.
S 38 F	HP 520 H	2	BOPP films, film for adhesive tapes and general packaging.
S 38 FA	--	2.1	BOPP films.
T 28 C	HP 425 J	3.0	BOPP films.
T 28 F	HP 525 J	3.0	Metallized BOPP films.
T 30 G	HP 500 J	3.2	Injection moulding, housewares, caps, closures, small containers & toys.
T 30 S	HP 550 J	3.2	Extrusion of sheet for thermoforming, film yarn and monofilament.
T 30 SW	--	3.2	Film yarn and monofilament.
T 31 SE	--	3.8	Extrusion & thermoforming, vending cups, blister packs, packaging for dairy products, trays for biscuits, chocolates & fruits
T 36 F	--	3.2	Tenter BOPP films.
T 38 CA	--	3.0	BOPP films.
T 38 F	--	3.0	BOPP films.
T 38 FA	--	3.0	BOPP films.
V 29 G	--	18	Injection moulding, three part syringes and a wide range of medical articles.
T 50 G	HP 532 J	3	Injection moulding, automotive under-the-hood applications, small household appliance.
V 30 G	HP 500 P	16	Injection moulding & compounding applications.
V 30 S	--	16	Fibres.
V 79 S	HP 554 P	21	Staple fibers for nonwoven fabrics, coverstock for diapers, feminine care products & incontinence pads.
X 30 G	HP 500 M	9	Injection moulding consumer goods such as food containers, housewares, automotive industry.
X 30 S	HP 510 M	9	Cast and water quenched blown film.
YD 50 G	--	<0.3	Extrusion and compression moulding of thick sheet, extrusion of pipes and profiles.
YF 39 S	--	12	Staple fibres for nonwoven fabrics.
YS 32 S	HP 640 H	2	Clear & pigmented thermoforming applications.
YX 37 F	HP 515 M	9	High speed extrusion of transparent cast & blown film.
Z 21 S	--	25	Low denier continuous filament for spunbonded, nonwoven fabrics.
Z 30 G	--	25	Injection moulding & compounding applications, thin-walled containers & other general purpose packaging items, toys.
Z 30 S	--	25	CF, BCF & staple fibers, bulked continuous filament for carpet, face yarns, handles for big bags and safety belts.
Z 69 S	HP 552 R	25	CF, BCF & staple fibers, nonwoven fabrics, bulked continuous filament for carpets, excellent anti gas fading properties.

Random Copolymer Grades

Grade	New Code	MFI ISO 1133 (2.16Kg-230° C)	Main Applications
EP1 X 35 AF	RP 316 M	8	Cast & water-quenched blown film/ this grade is formulated with a slip & antiblock package and exhibits excellent antistatic properties.
EP1 X 30 F	RP 310 M	8	Cast & water-quenched blown film.
EP1 X 35 HF	--	8	Cast & water quenched blown film/ the product contains slip and antiblocking agents.
RCXP 598	--	9	Cast & water quenched blown film.
RCXP 599	--	9	Cast & water quenched blown film.
EP2 S 29 B	RP 240 G	1.8	Blow moulding technology and single or multi-layer sheet extrusion.
EP2 S 30 B	RP 210 G	1.8	Extrusion of film and sheet and for blow moulding small and medium sized items.
EP2 S 12 B	RP 270 G	1.8	Blow moulding & sheet extrusion.
EP2 C 37 F	RP 215 M	6	Extrusion of cast & water-quenched blown film. This grade is formulated with a slip and antiblock package.
EP2 C 30 F	RP 210 M	6	Extrusion of cast & water-quenched blown film.
EP2 YX 29 GA	--	10	Injection moulded containers & thin-walled packaging, transparent housewares.
EP2 Z 29 G	RP 340 R	25	Injection moulding for household containers, lids, videocassette boxes, caps, packaging of food, cosmetics & pharmaceutical applications, syringes, test tubes & vials.
EP2 X 49 GA	RP 340 N	10	Injection moulded containers & thin-walled packaging, transparent housewares.
MR 230 C	--	<0.3	This grade is a polypropylene random copolymer grade, designed for hot and cold water supply system, industrial water conveyance, extrusion and injection moulding.

Random Terpolymer Grades

Grade	New Code	MFI ISO 1133 (2.16Kg-230° C)	Main Applications
EP3 C 37 F	--	5	Low sealing temperature BOPP.
EP3 C 39 F	--	5	Low sealing temperature BOPP.
EP3 X 37 F	--	8	Low sealing temperature BOPP.

Heterophasic Copolymers Grades

Grade	New Code	MFI ISO 1133 (2.16Kg-230° C)	Main Applications
EPD 60 R	--	0.4	Blow moulding, extrusion of profiles, pipes & tough sheet for industrial applications.
EPQ 30 M	--	0.8	Extrusion, blow moulding, pipes, ducts for electrical distribution and automotive parts.
EPQ 30 RF	EP 310 D	0.8	Extrusion, blow moulding, film for lamination to paper and other resins.
EPYS 30 RE	--	1.3	Extrusion, blow moulding.
EPS 31 HP	EP 440 G	1.3	Extrusion of conduit pipe, corrugated pipe & other extrusion applications.
EPT 30 M	--	3.5	Injection moulding & thermoforming.
EPT 30 U	EP 200 K	3.5	Injection moulding, compounding applications.
EPT 30 R	EP 300 K	3.5	Injection moulding medium sized containers, buckets, pails.
EPC 30 R	PP 300 M	7	Injection moulding, extrusion of cast film for stationery.
EPC 40 R	EP 332 L	7	Injection moulding of battery cases & technical items.
EPC 31 H	EP 540 L	6	Injection moulding applications.
EPC 31 HR	EP 440 L	6	Injection moulding, applications, packaging, automotive & consumer goods industries.
EPF 31 HA	EP 548 N	12	Injection moulding applications.
EPF 31 HR	EP 440 N	12	Injection moulding applications.
EPV 31 RA	EP 548 R	21	Thin-wall injection moulding, such as flower pots, containers, housewares, filters, filter housings and appliance components.
EPYH 31 U	EP 340 S	42	Injection moulding applications.
EPH 31 RA	--	40	Thin-wall injection moulding.
EPYH 71 HA	EP 548 S	44	Thin-wall injection moulding.
EPL 31 UA	EP 348 U	70	Thin-wall injection moulding.
EPN 31 MA	EP 648 V	100	Thin-wall injection moulding.
HiFax 151	--	3.5	Thin-wall injection moulding.
HiFax 179	--	8	Injection moulding, for use in master batches or in special colors.
HiFax 238 G3	--	12	Bumper grade, injection moulding.
EPF 31 H	EP 540 N	12	Injection moulding applications.

MR230C Use in user Category 5 ISO 15874 Standard



High-density polyethylene (HDPE) plant

The plant produces 300,000 MT/year of HDPE. It can produce 21 different grades that can be used in the production of containers, bottles, chemical tanks, hygienic materials, cosmetics, films, high-impact fibers, cable insulations, high-pressure pipes and various packing films.

Film Grades

Grade	Basell Grade Code	Density (ISO 1183)	MFI ISO 1133 (5 Kg-190° C)	MFI ISO 1133 (21.6Kg-190° C)	Main Applications
EX 4	HM 9455 F	0.956	0.28	8	Film extrusion, blending partner, (refuse) bags, carrier bags
EX 4 HS	HM 9455 F1	0.957	0.22	7.5	Film extrusion, blending partner (refuse) bags, carrier bags
EX 5	HM 9450 F	0.949	0.28	8	Film extrusion, carrier bags, counter bag, wrapping films & sheets
EX 5 HS	HM 9450 F1	0.950	0.22	7.5	Film extrusion, blending partner (refuse) bags, carrier bags, wrapping films & sheets
EX 6 HT	HM 9445 HT	0.944	0.18	5.4	Film extrusion, blending partner (refuse) bags, carrier bags, heavy duty packaging

Monofilament Grades

Grade	Basell Grade Code	Density (ISO 1183)	MFI ISO 1133 (5 Kg-190°C)	MFI ISO 1133 (21.6Kg-190°C)	Main Applications
EX 7 C	HF 4750 K	0.946	3.5	63	Wire & cable insulation
EX 2 S	HF 7750 M2	0.956	2.8	28	Monofilaments, ropes, yarns fish netting, geotextiles, civil engineering
EX 2	HF 7750 M	0.956	2.5	25	Monofilaments, ropes, yarns
EX 1 S	HF 7740 F2	0.944	1.8	21	Tapes, netting, bag, sacks, packaging tubes, film extrusion, blending partner, film for laminating
EX 1	HF 7740 F	0.944	1.8	27	Stretched films and tapes for production of high strength knitted and woven

Pipe Grades

Grade	Basell Grade Code	Density (ISO 1183)	MFI ISO 1133 (5 Kg-190°C)	MFI ISO 1133 (21.6Kg-190°C)	Main Applications
EX 3-100 S	HM CRP100 N (PE100)	0.949	0.23	6.2	Pipe extrusion PE 100 class, industrial and pressure pipe, gas pipe, drinking water pipe, relining, fittings
EX 3-80 S	HM 5010 T3N	0.944	0.43	10.3	Pipe extrusion PE 80 class, industrial and pressure pipe, gas pipe, drinking water pipe, relining, fittings
EX 3-80	HM 5010 T2N	0.945	0.45	12	Pipe extrusion PE 80 class, industrial and pressure pipe, gas pipe, drinking water pipe, relining, fittings, pressureless pipes



Injection Grades

Grade	Basell Grade Code	Density (ISO 1183)	MFI ISO 1133 (2.16 Kg-190°C)	MFI ISO 1133 (5 Kg-190°C)	Main Applications
I 4 S	HD 7255 (THS)	0.954	4	11	Injection moulding, engineering leisure & sport equipment
I 4	HD 7255 (THE)	0.954	3.5	11	Injection moulding, engineering leisure & sport equipment
I 3 S	HC 7260 (THS)	0.960	8	23	Injection moulding, crates, engineering parts, closures
I 3	HC 7260 (THE)	0.957	8	23	Injection moulding, crates, engineering parts, closures

Blow Moulding Grades

Grade	Basell Grade Code	Density (ISO 1183)	MFI ISO 1133 (5 Kg-190°C)	MFI ISO 1133 (21.6Kg-190°C)	Main Applications
BL 4 M	HM 8355	0.951	0.35	9.5	Jerry can, general purpose grad for large containers
BL 3 VD	HH 4765	0.959	1.5	28	Small blow moulding, bottles, containers (up to 10 lit)
BL 3	HF 4760	0.954	1.2	23	Small blow moulding, bottles, containers (up to 5 lit), packaging of pharmaceuticals & surfactants
BL 2	HF 4750	0.944	1.1	23	Small blow moulding, bottles, containers (up to 5 lit), packaging of pharmaceuticals & surfactants

Utility and Offsite plant

- The plant produces and includes:
- High-pressure steam (540 t/h)
- Medium-pressure steam (60 t/h)
- Sewage treatment with a capacity of 80 cubic meter/h
- Cooling towers with a maximum capacity of 120,000 cubic meter/h
- Water treatment (Reverse Osmosis method) with a capacity of 100 cubic meter/h
- Instrument air unit

Property	Unit	Method	Min.	Max.
Density at 15.6 °C	Gr/Cm3	D - 4052	0.86 0.88	--
R.V.P	Psia	D - 323	5.28	6.96
Colour Saybolt	--	D - 156	<-16	<-16
Total Sulphur	PPm	D - 3120	210.00	320.00
Lead Content	PPb	A. A.	<10	<10
IBP	°C	D - 86	39.00	45.00
5 PCT Volume Recovered	°C	D - 86	59.00	65.00
95 PCT Volume Recovered	°C	D - 86	198.00	236.00
FBP °C D - 86	--	--	--	--
218.00 258.00				
Paraffins	Wt %	G.C	0.66	2.42
ISO Paraffins	Wt %	G.C	1.33	2.44
Olefins	Wt %	G.C	14.90	22.00
Naphthenes	Wt %	G.C	0.43	1.01
Aromatics	Wt %	G.C	71.99	78.21
Others	Wt %	G.C	2.57	5.40
Benzene Content	Wt %	G.C	38.36	44.65
Gum Content	Mg/100MI	D-381	1210.00	1310.00
Doctor Test	--	--	Neg.	Neg.
Coper Corrosion	--	D - 850	No. 1A	No. 1A
Water	Wt%	E-203	0.00	0.18

The above results could be deviate according to feed & operation condition



| REACH Certificate of Compliance |

ISO 27001 2018	ISO 9001 2015
ISO 31000 2018	ISO 10001 2017
ISO 45001 2018	ISO 10002 2018
ISO 50001 2018	ISO 10004 2018
ISO 55001 2014	ISO 14001 2015

