



BRAHMAPUTRA CRACKER
AND POLYMER LIMITED



GAIL (India) Limited
India's Youngest Maharatna

Polymers For Life

HDPE, LLDPE & PP



Brahma-Lene
HDPE



Brahma-Lene
LLDPE



Brahma-Pol
PP



INTRODUCTION

Brahmaputra Cracker and Polymer Limited (BCPL), the first ever petrochemical plant of north-east India, has played a significant role in promoting plastic industry with the motive of overall socio economic development of the region. The plant has been set up at Lepetkata, 15 kms away from Dibrugarh, Assam. Promoted by GAIL (India) Limited as a Joint Venture Company, BCPL looks forward to create sustainable development for the people residing in this region. The plant has been running successfully to 100% of its capacity. The cabinet committee on economic affairs on 24th Dec 2019 approved the transfer of administrative control of BCPL from Ministry of Chemicals & Fertilizer to Ministry of Petroleum & Natural Gas.

BCPL envisions a constructive presence in the north eastern region of India with 'Polymers for life' approach. The mega plant has helped in the development of ancillary plastic industries which is providing direct and indirect employment as well as increased per capita income and better quality of life to the local people.





Brahmaputra Cracker and Polymer Limited Dibrugarh, ASSAM

About BCPL

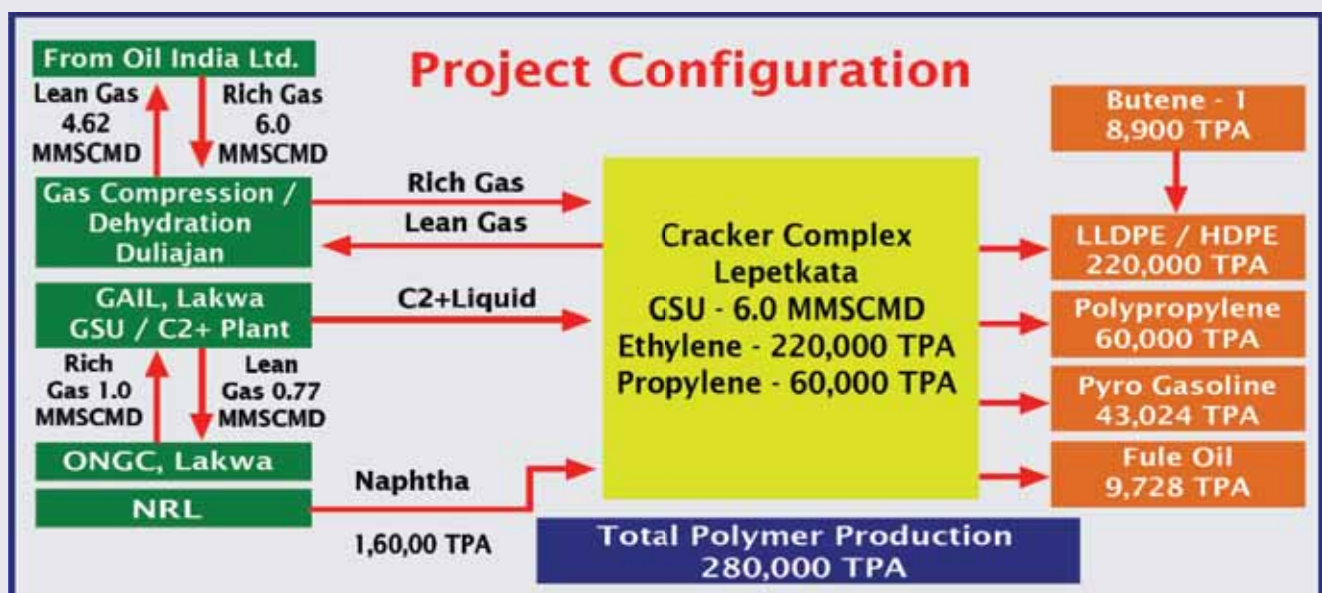
Brahmaputra Cracker and Polymer Limited (BCPL), a Joint Venture Company promoted by GAIL (India) limited with 70% equity and remaining 30% equity is shared equally among Oil India Limited (OIL), Numaligarh Refinery Limited (NRL) and Government of Assam, has set up a petrochemical plant at Lapetkata, District Dibrugarh, Assam.

The Petrochemical Complex mainly comprises of 280,000 TPA Cracker Units (based on gas and naphtha feeds) along with downstream Polymer units to produce 220,000 TPA of Polyethylene (LLDPE & HDPE) and 60,000 TPA of Polypropylene. BCPL annually caters to more than 400 customers, spread throughout the length and breadth of the country, to meet their requirement of LLDPE and HDPE.

GAIL (India) Limited is exclusively handling the distribution and marketing of BCPL polymer grades which are manufactured using gas phase process technology. GAIL, the promoter owns and operates a gas based Petrochemical Complex at PATA, District Auraiya, near Kanpur in UP (around 380 km from Delhi). GAIL has world class "Sclairtech" solution polymerization process licensed from M/s Nova Chemicals, Canada to produce LLDPE and HDPE, with a nameplate capacity of 2,10,000 MT/annum and has two slurry based polymerization processes licensed from M/s Mitsui Chemicals, Japan to produce HDPE, each with a nameplate capacity of 1,00,000 MT/annum. A new world class gas phase Unipol PE Process of M/s Univation Technology, USA, to produce HDPE/LLDPE/mLLDPE with a nameplate capacity of 400,000 MTPA has also been added in 2016.

BCPL Project Configuration

The project configuration includes the separation of C2+ liquid from the available gas at GAIL's LPG Plant at Lakwa, which is transferred via pipeline to Gas Cracker unit at Lepetkata. The rich gas from Oil India Limited is transferred by pipeline to Gas Cracker plant where C2+ liquids is recovered and used as a feed for the Gas Cracker. The combined C2+ liquid and naphtha is fed to the Gas Cracker to produce ethylene and propylene for production of LLDPE, HDPE and polypropylene.





Technologies in BCPL

- **Cracker Unit** is based on the technology licensed by Lummus, USA. It is a dual feed cracker with C2+ liquid and Naphtha as feed stock. The unit is designed to produce 220,000 TPA of polymer grade ethylene and 60,000 TPA of polymer grade propylene.
- **LLDPE/HDPE Swing Plant** is based on Innovene G gas phase process technology which is licensed by INEOS Technology, U.K. This plant can manufacture Polyethylene grades having MI value in the range of 0.05 to 21 g/10min and Density value in the range 0.920 to 0.960 g/cc.
- **Polypropylene Plant** is based on Novolen Gas Phase technology of Lummus Novolen Technology GmbH (NTH), Germany. This plant can manufacture 60,000TPA of homopolymer polypropylene from a single polymerization and extrusion train. The unit is also capable of producing random co-polymer grades of PP using ethylene as a co-monomer. The product range of the PP plant covers various grades of homopolymer and random copolymer manufactured by gas phase polymerization in one vertically stirred bed reactor.

About Brahma-Lene

Brahma-Lene is the brand name of HDPE/LLDPE resins produced by BCPL and marketed by GAIL (INDIA) Ltd. The resin grades manufactured using Innovene G gas phase process technology, licensed by INEOS Technology, U.K. (HDPE/LLDPE) primarily cater to the Film, Injection Moulding, Rotational Moulding, Raffia & Mono filament sectors etc.

Brahma-Lene LLDPE Resin Grades

Film Grades

F20S010I is recommended for general purpose co-extruded laminated/non-laminated film for various film applications. It has adequate level of slip and antiblocking agent for good openability and slip characteristics of the film. Film made from this grade has excellent sealing, puncture resistance, great drawdown capability and high tensile strength. It is suitable for manufacturing laminated film, heavy duty packaging, agriculture films, liners, milk packaging film etc.





F20A010I has excellent processability with optimum balance of mechanical and optical properties. It is without slip and an antiblocking agent additive. It is widely used for lamination and blown cling film applications.



F22S025I has adequate level of slip and antiblocking agent for good openability and slip characteristics of the film. This grade is suitable for the production of liners, industrial packaging and general purpose film application.



F22A025I is suitable for the production of blown film for light duty applications and for the production of stretch film by cast process. It is without slip and antiblocking agent additive.

Rotomoulding Grades

R38A040I has excellent processability with good mechanical properties and high Environmental Stress Cracking Resistance. It is recommended for use in chemical tanks, water storage tanks, loft tanks, pallets etc.



R38U040I is a UV stabilized, medium density, Polyethylene grade exhibiting excellent processability, good impact strength, high stiffness, excellent in ternal and external surface finish. It is used for manufacturing rotational moulded items for outdoor applications like toilets, containers, waste bins, road dividers etc.



Extrusion Coating Grade

E30A060I is generally used in blend with LDPE for extrusion coating on HDPE woven fabric for various packaging applications.



Brahma-Lene HDPE Resin Grades

HDPE Injection Moulding

I58A080I has excellent processability with optimum balance of mechanical properties, dimensional stability and gloss. It is used for general purpose and multipurpose crates, caps & closures etc.



I58U080I is a UV stabilized for long service life under outdoor exposure. It is characterized by easy processing, high rigidity, good impact strength and high warpage resistance. It is used for manufacturing crates, boxes, pallets, closures, helmets etc.



I52A180I is an easy flow high density polyethylene grade suitable for general purpose injection moulding applications. It has good flow, high warpage resistance and suitable for fast cycling applications. It is used for manufacturing housewares, thin walled food containers, shoulders for lamitube, etc



Monofilament Grade

W54A009I is a high density Polyethylene grade suitable for monofilament applications. It is characterized by excellent processability and tenacity. It is used for manufacturing ropes and low denier yarn for fishing, industrial and mosquito nets. It can also be used in low denier stretch tape applications like tarpaulin.

BIS certification of LLDPE Resin Grades

BCPL has been granted BIS certification license no CM/L-5400078606 to use BIS standard mark in respect of "Polyethylene Material for Moulding and Extrusion" as per IS 7328:2020 for the following LLDPE grades with additional requirement for product used in contact with food stuff, Pharmaceutical and drinking water.

1. F20S010I:- IS Designation code IS7328-2B- FBH-BXDA
2. F20A010I:- IS Designation code IS7328-2B-FBE-BXDA
3. R38A040I:- IS Designation code IS7328-2B-RB-CXDC





Typical HDPE/LLDPE Property Chart

LLDPE Film						
Grade	MFI (I ₂ , 190° C) (g/10 min) ASTM D 1238	Density (g/cc) ASTM D 1505	Tensile Strength @ Break (Kg/cm ²) (MD/ TD) ASTM D 882	Elong. @ Break (%) (MD/TD) ASTM D 882	Tear Strength (g/25u) (MD/TD) ASTM D 1922	COF(Static/ Dynamic) ASTM D1894
F20S010I	0.9	0.920	380/300	650/750	75/250	0.2/0.18
F20A010I	0.9	0.920	380/300	650/750	75/250	-
F22S025I	2.4	0.921	300/250	500/800	50/250	0.2/0.18
F22A025I	2.4	0.921	300/250	500/800	50/250	-
LLDPE Rotational Moulding						
Grade	MFI(I ₂ , 190° C) (g/10 min) ASTM D 1238	Density (g/cc) ASTM D 1505	Tensile Strength @ Yield (Kg/cm ²) ASTM D 638	Elong. @ Yield (%) ASTM D 638	Flexural Modulus (Kg/cm ²) ASTM D 790	ESCR(F50) Hrs (10% Igepal) ASTM D1693
R38A040I	4.5	0.938	180	16	6000	> 190
R38U040I	4.5	0.938	180	16	6000	> 190
HDPE Injection Moulding						
Grade	MFI(I ₂ , 190° C) (g/10 min) ASTM D 1238	Density (g/cc) ASTM D 1505	Tensile Strength @ Yield (Kg/cm ²) ASTM D 638	Elong. @ Yield(%) ASTM D 638	Flexural Modulus (Kg/cm ²) ASTM D 790	Izod Impact (J/m) ASTM D256A
I58A080I	8.4	0.960	280	10	12000	70
I58U080I	8.4	0.960	280	10	12000	70
I52A180I	20	0.952	240	12	9000	30
LLDPE Extrusion Coating						
Grade	MFI(I ₂ , 190° C) (g/10 min) ASTM D 1238	Density (g/cc) ASTM D 1505	Tensile Strength @ Yield (Kg/cm ²) ASTM D 882	Elong. @ Break (%) ASTM D 882	Flexural Modulus (Kg/cm ²) ASTM D 790	VSP (° C) ASTM D1525
E30A060I	7	0.922	240/200	600/700	-	88
HDPE Raffia & Monofilament						
Grade	MFI (I ₂ , 190° C) (g/10 min) ASTM D 1238	Density (g/cc) ASTM D 1505	Tensile Strength @ Yield (Kg/cm ²) ASTM D 638	Elong. @ Yield (%) ASTM D 638	Flexural Modulus (Kg/cm ²) ASTM D 790	VSP (° C) ASTM D1525
W54A009I	0.9	0.954	250	11	9000	123



About Brahma-Pol

Brahma-Pol is the brand name of Polypropylene resin produced by BCPL and marketed by GAIL (India) Ltd. The resin grades are manufactured by using Novolen Gas Phase technology of Lummus Novolen Technology GmbH (NTH), Germany, and are primarily catering to the TQ film, Injection Moulding and raffia sector.

Brahma-Pol PP Resin Grades

TQ Film Grade

FH110N is Polypropylene homopolymer for Tubular water quenched film application. Film manufactured from this grade has excellent stiffness and clarity. The applications are primarily transparent films for food packaging (bread, chips, namkeens, cookies etc), textile overwraps, garment bags, etc



Raffia and Monofilament Grades:

WH034N is a Polypropylene homopolymer for stretched tape and yarn applications. It combines low water carry-over with good processability & excellent mechanical properties. It is used for manufacturing woven sacks (Raffia bags) for cement, fertilizer, food grain, sugar packaging, geo textile, ropes etc.



WHO40N is a Polypropylene homopolymer for stretched flat tape and yarn applications. It is specially designed for high line speed processing on flat tape lines with excellent processability. It is also suitable for low denier applications. It is used for manufacturing leno bags, wrapping fabric and woven sacks for general purpose.





Injection Moulding Grade

IH120N is a Polypropylene homopolymer for general purpose injection moulding applications, rigid packaging, furniture, house-wares, planters, pots & closures etc.



Typical Polypropylene Property Chart

Raffia					
Grade	MFI (I ₂ ,230 ^o C) (g/10 min) ASTM D 1238	Density (g/cc) ASTM D 1505	Tensile Strength @Yield (Kg/cm ²) ASTM D 638	Elong @Yield (%) ASTM D 638	Flexural Modulus (Kg/cm ²) ASTM D 790
WH034N	3.4	0.91	340	9	14500
WHO40N	4.2	0.91	320	9	14500
TQ Film					
Grade	MFI (I ₂ ,230 ^o C) (g/10 min) ASTM D 1238	Density (g/cc) ASTM D 1505	Tensile Strength @Yield (Kg/cm ²) ASTM D 638	Elong @Yield (%) ASTM D 638	Flexural Modulus (Kg/cm ²) ASTM D 790
FH110N	10.5	0.91	340	9	14000
Injection Moulding					
Grade	MFI (I ₂ ,230 ^o C) (g/10 min) ASTM D 1238	Density (g/cc) ASTM D 1505	Tensile Strength @Yield (Kg/cm ²) ASTM D 638	Elong @Yield (%) ASTM D 638	Flexural Modulus (Kg/cm ²) ASTM D 790
IH120N	12	0.91	350	8	14000



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