

# *Innovation*

— at the —

# CORE





## IndianOil – The Energy of India

Indian Oil Corporation Ltd. (IndianOil) is one of India's largest commercial enterprises, with sales turnover of ₹ 8,66,345 crore and profits of ₹ 39,619 crore for the year 2023-24. It is also a leading Indian corporate in Fortune's prestigious 'Global 500' listing of the world's largest corporates, ranked at the 116<sup>th</sup> position for the year 2024.

As India's flagship national oil company, IndianOil's business interests straddle the entire hydrocarbon value-chain – from refining, pipeline transportation and marketing of petroleum products to exploration & production of crude oil & gas, marketing of natural gas and petrochemicals, besides forays into alternative energy and globalisation of downstream operations.

### Petrochemicals: World-scale Plants, World-class Technologies

IndianOil is one of the largest players in the domestic petrochemicals market, offering a full slate of petrochemical products and intermediates under the brand name **PROPEL**. The Corporation made its big-ticket entry into petrochemicals business with the commissioning of the country's largest LAB with capacity of 162 TMTPA (Linear Alkyl Benzene used in the production of detergents) plant at its Koyali Refinery in August 2004. An integrated PX/PTA (Paraxylene/ Purified Terephthalic Acid) complex came up at Panipat in Haryana in 2006 with a world-scale capacity of 700

TMTPA. A world-class Naphtha Cracker of 947 TMTPA Ethylene capacity with downstream polymer units, set up at Panipat in 2010, is the largest operating Naptha Cracker capacity in India. Its downstream unit produces about 55 grades of polymers catering to diverse range of applications.

IndianOil has commissioned a Polypropylene plant with a capacity of 680 TMTPA at its Paradip Refinery in February 2019. A 357 TMTPA Ethylene Glycol plant has been commissioned at Paradip, Odisha.

**Brief details of Polymer plants are given below:**

Unit	Technology & Licensor	Capacity (TMTPA)
Polypropylene	Spheripol II – LyondellBasell, Italy	600 (2X300) at Panipat 680 (2X340) at Paradip
Dedicated HDPE	Hostalen – LyondellBasell, Germany	300 at Panipat
LLDPE/HDPE Swing	Sclairtech- Nova Chemicals, Canada	350 at Panipat

IndianOil has already implemented Petrochemical projects worth ₹ 35,000 crore. Further plans are on the anvil for various petrochemicals projects touching capex of ₹ 1,20,000 crore in next 5-7 years.

Further, Polypropylene plants at Barauni (200 TMTPA), Panipat (450 TMTPA) & Vadodara (500 TMTPA) are expected to be commissioned by 2025-26.

Construction of a 1200 TMTPA PTA Plant is already underway and is expected to be commissioned in 2025-26.





LLDPE / HDPE Grade Slate : Sclairtech Swing Plant						
Product	Sector	Grade	MFI(I <sub>g</sub> )	Density	Special Characteristics	Application
LLDPE	LL FILM	010F18S	0.9	0.918	Good processability, Low gel, Good mechanical properties, Excellent optical properties. Contains slip and antiblock.	Liquid packaging film, Multilayer film for adhesive lamination, Carrier bags.
		010F18A	0.9	0.918	Good processability, Good mechanical properties, does not contain slip and antiblock.	Multilayer film for adhesive lamination, Mulch Film, Stretch Cling film.
		020F18A	2.0	0.918	Easy processability, Low gel, does not contain slip & antiblock.	Cast film for stretch wrapping, stretch cling film.
	DRIP LATERAL	010L22S	1.1	0.922	Excellent processability, Good strength, Controlled morphology, Low gel content.	Drip lateral pipe.
LLDPE	ROTATIONAL MOULDING	042R35A	4.5	0.935	Very good processability, Ease in de-moulding, Good mechanical strength	Overhead water tanks, Loft tanks, Septik tanks, Toys, Garden Furniture
		040R40A	4.0	0.940	Superior Mechanical Strength, Excellent rigidity, Impact resistance and easy processability.	Medium and large tanks, Septic tanks, Manholes and Chambers.
		042R35U	0.45	0.935	UV stabilized, very good processability, ease in demoulding, good mechanical strength	Outdoor exposure application like coloured overhead tanks, garden toys and furniture etc.
LLDPE	INJECTION MOULDING	500M24A	50	0.924	Very good flow and processability.	Carrier resin for master batches, Injection moulding of flat and large warpage-free products and lids.
LLDPE	EXTRUSION COATING	065E24A	6.5	0.924	Good processability. Low neck-in, Good adhesion on substrates.	Extrusion coating on HDPE Raffia fabric, Paper etc. Base resin for XLPE compounds.
HDPE	INJECTION / COMPRESSION MOULDING	020M52	2.7	0.952	Superior Processability, Superior Mechanical properties.	Compression molded Caps and Closures.
	INJECTION MOULDING	080M60	8	0.960	Good processability, Superior mechanical properties.	Crates for vegetables, milk, fish and material handling, Injection moulded Pallets, Caps & Closures.
		080M55	8	0.955	Good processability, Superior mechanical properties.	Caps & Closures.
		080M60U	8	0.960	UV stabilised, Good processability, Superior mechanical properties.	Soft drink crates, Industrial crates for outdoor usage, Injection moulded Pallets, Caps & Closures.
		180M50	20	0.950	Excellent flow properties, very good processability, DMF approved.	Injection Molded Housewares, Thin wall injection moulded products.
HDPE	RAFFIA	010E52	0.9	0.952	Excellent orientation characteristics, Low water carry over, Excellent mechanical properties.	Woven sacks for fertilizer packaging, Wrapping fabric, Tarpaulin, Agri shade net, Raschel bags, Extruded sheets.
		012E50	1.2	0.950	Narrow MWD, Excellent orientation characteristics, Low water carry over. Superior mechanical properties.	Tarpaulin, Wrapping fabrics, Monofilaments for mosquito nets, fishing nets, etc.
HDPE and HMHDPE Grade Slate : Dedicated (Hostalen) Plant						
Sector	Grade	MFI(I <sub>g</sub> )	Density	Special Characteristics		Application
HM Film	002DF50	0.4	0.950	Bimodal grade with very good processability with high molecular weight. Excellent dart impact strength.		Shopping bags, Films for wrapping, Liners.
GPBM	012DB54	1.3	0.954	Bimodal grade with very good processability, Good balance of stiffness, ESCR and impact properties. DMF approved.		Blow molded containers for lubricating oil packaging upto 5L capacity, Pharmaceutical edible oil & other general-purpose packaging, DWC pipe.
High ESCR Blow Molding	010DB50	1.2	0.950	Bimodal grade with very good processability, Superior mechanical properties, High ESCR properties.		High ESCR Blow molded containers, Containers for packing chemicals, pesticides, etc.
High Stiffness Blow Molding	012DB60	1.3	0.960	Superior Processability, Superior mechanical properties and impact resistance, High rigidity.		Containers and bottles up to 20 ltr capacities, Containers for packing Edible oils.
MBM	003DB52	0.40	0.952	Bimodal HMHD grade with very good processability, High stiffness, toughness & good ESCR properties.		Blow moulded containers upto 100 litres. DWC Pipe. Blow moulded water tanks, solar panels sloaters.
LBM	002DB52	0.20	0.953	Bimodal HMHD grade with good processability, Good balance of stiffness and impact properties.		Large Volume containers >100L for Chemicals, Pesticides, Lube Oils, Water etc.
PIPE	002DP48	0.25	0.950	Bimodal grade with good processability. Excellent impact & stiffness. Classified as MRS 10.0 material (PE-100) (Element certification).		Pipes for Water transportation, Sewerage, Industrial Piping etc.
	004DP44	0.45	0.950	Bimodal grade with very good processability, Classified as MRS 8.0 material (PE-80).		Pipes for Water transportation, Sewerage, Sprinkler pipes etc.
	010DP45	0.9	0.950	Bimodal grade with good processability. Classified as MRS 6.3 material (PE-63).		Pipes for Drip Irrigation and sprinkler applications, Pipes for drinking water, Industrial effluent etc.
	010DP45U	0.9	0.945	Bimodal grade with good processability, specially formulated for teleduct applications. It is UV stabilized grade. CACT approved for OFC ducts and telecom applications.		Teleducts for OFC, DWC pipes.

Polypropylene (PP) Grade Slate : Spheripol Plant					
Family	Sector	Grade	MFI (L)	Special Characteristics	Application
HOMO POLYMER	INJECTING MOULDING	1030MG/ P1030MG	3	Good balance of impact and rigidity, Good processability.	Industrial products, Household products, General purpose extrusion, Blending with Raffia.
		1060MG/ P1060MG	6	Good balance of impact and rigidity, Good processability.	Industrial products, Household products. Also used in blends in Thermoforming & Raffia.
		1110MG/ P1110MG	11	High flow and high rigidity, Very good gloss.	Rigid Packaging, Household articles, Furniture, Caps & Closures.
		1110MAS/ P1110MAS	11	A superior grade having high flow, very high stiffness with excellent gloss. The grade offers better productivity and reduces energy consumption. DMF approved.	Furniture, Household articles & Auto components where high stiffness is required.
		1200MC	20	Good flow characteristics, high clarity, good processability. Bio-Compatibility approved.	Syringe barrel application, multicavity products, high clarity intricate products.
		P1200MAS	20	High flow & high stiffness, Excellent gloss, Contains antistatic agent and faster molding cycles and	Housewares, Auto & Appliance component and Thin Wall & Multicavity Products.
		P1500MG	40	High flow, good processability, Designed to offer faster molding cycles.	Housewares, Base resin for Compounds.
		P1600MN	60	High flow, Excellent processability.	Thin walled injection Molding articles, compounding application
	EXTRUSION COATING	1350EG/ P1350EG	35	Excellent flow characteristics, Low neck-in & good processability, Good surface finish & excellent adhesion to substrate.	Extrusion coating on substrate PP Raffia fabrics, Lean blend with LDPE.
	RAFFIA	1030RG/ P1030RG	3.5	Good processability, Low water carryover, Good balance of tenacity & elongation.	Woven sacks for Cement, Chemicals, Fertilizer, Food grain packaging, FIBC for bulk industrial packaging applications.
	BOPP FILM	1030FG/ P1030FG	3	Gel free, Good stretchability and processability.	General purpose & co-extruded BOPP film, Heat sealable films, Cast PP films, etc.
	TQ FILM	1100FS P1100FS	10	Very good processability, Excellent gloss and clarity, contains Slip and Antiblock.	TQ films for packaging of snacks and bakery foods, Garment packaging, Textiles over wraps.
	FIBER AND FILAMENT	1200YG	20	Good melt strength, stable extrusion even at high spinning speeds and stretch ratios.	Lower denier bulk continuous fibre, Continuous Fibre and Staple fibres, High tenacity continuous filament for straps, Low denier staple fibres for spun bond and non-woven
		1350YG/ P1350YG	35	High melt flow, High speed production of fine denier yarns, low gsm non-woven fabrics, Anti gas fading properties.	Spun bonded non-woven fabric for Disposables, Commodity packaging etc.
		1350YH	35	High melt flow, Excellent Processability, soft feel non-woven fabrics, Anti gas fading properties	Spun bonded non-woven fabric for Medical disposables and Hygiene applications.
	CAST FILM	P1070FG	07	Excellent clarity and gloss; very good processability	General purpose as well as metallized cast film for packaging of food, stationery, multi layer lamination film etc.
RANDOM CO-POLYMER	BLOW MOULDING	2020EC	2	Excellent clarity & gloss, superior processability & balance of stiffness & impact properties. DMF approved.	Blow moulded articles, sheet extrusion, IBM products.
	INJECTION MOULDING	2120MC	12	Excellent clarity & good processability, grade offers higher productivity and energy saving opportunities in processing. DMF approved.	Transparent injection moulded rigid containers, Houseware, Syringes, ISBM bottles.
		2300MC	30	Excellent transparency, gloss, superior processability, balance in stiffness & impact properties	Thin wall Injection Molding, High clarity Rigid containers, Housewares ISBM products
IMPACT CO-POLYMER	INJECTION MOULDING	4015EG	1.5	Medium flow for easy processing, High impact strength & High stiffness.	Automotive components, Blow molded bottles, Sheets and Thermoforming.
		3030MG	3.5	Medium flow, Good stiffness and high impact strength balance.	Injection moulding of components for automobiles, Home appliances and Industrial products, Caps & Closures.
		4080MA	8	Medium flow for easy processing, Good impact & stiffness balance, anti-static properties.	Paint Pails, Furniture and industrial components.
		4100MH	10	Medium flow, Very good processability, Long term heat ageing, Good impact & stiffness balance.	Battery containers, Industrial mouldings, Components requiring long heat exposure like under-the-hood automotive components.
		5080MG	10	Good processibility, No break (Superior impact strength).	Very High impact automotive components, Impact modifier in specialty PP compounds.
		3120MA	12	Medium flow, Good processability, Good impact and stiffness balance, Anti-static properties.	Home appliances, Automotive components, PP compound for automotive components, Houseware, Molded furniture, Luggage shells.
		3250MN	25	Good processability, Good surface finish & Gloss, Optimized balance of stiffness and toughness.	Appliance, Automotive Components & Housewares.
		3400MN	40	High flow, Good processability, Low warpage, Nucleated grade.	Home appliances, PP Compound for automotive components, Thin wall Injection Moulding.
		3650MN	65	High flow, Good processability, Low warpage, Nucleated grade.	PP Compounding for automotive components, TWIM, Appliances.
		5300MN	30	High Stiffness, Very Good Processability, No. Break (Super Impact Strength)	Very High Impact Automotive components PP compounds for automotive & Industrial applications.
	EXTRUSION COATING	3250MG	25	High flow, Very good processability, Low neck-in.	Extrusion coating on PP Raffia fabric, Sandwich Lamination of Raffia fabric with BOPP film or Craft Paper etc. in blends with suitable grades of LDPE

(\*for packaging of food, stationary, multilayer lamination film etc.)



Other Petrochemical Products					
Product	Technology	Sector	Technical Specification	Special Characteristics	Application
Linear Alkyl Benzene	DETAL , UOP	Detergents Intermediate	Molecular weight :235-239 N-Alkylbenzene : min 92%wt)	Clear, yellowish liquid with a characteristic odour, Insoluble in Water	Used as Surfactant to produce detergents in liquid, cake & powder form. Also used in Ink and pesticide Industry
Purified Terephthalic Acid (PTA)	Invista T 10 (currently DuPont)	Polyester	Median Particle Size: 90-120 $\mu$ . b* value: 0.8 +/- 0.4, 4-CBA: 25 PPM (Max)	Outstanding powder flow, fluidization, weathering, Good chemical and stain resistance, Good hardness/flexibility balance, Ideal glass transition temperature range	Raw material for Polyester downstream industries- Filament & Yarns, Flexible Packaging, PET Bottle. Powder Coatings and Resins
Glycols	Scientific Design, USA	Polyester	Min: 99.8 % wt. Purity	Colourless and odourless liquid with a sweet taste. Miscible with all the common organic compounds. Non- toxic. Extremely hygroscopic	Raw material for Polyester downstream industries- Filament & Yarns, Flexible Packaging, PET Bottle. Antifreeze solutions, Coolants, Conditioning agents, Adhesive, Sealant and Coating Industry etc.
1,3 Butadiene	BASF	Elastomers	Tert-Butyl Catechol: 70-100ppm.	Colourless gas with a mild aromatic or gasoline Odor at ambient temperature and pressure.Inhibitors	Used as Co-monomer in Synthetic rubber & Performance Plastics , used in tyres , Automotives & White goods
Butyl Acrylate	Mitsubishi Chemical Corporation	Paints and Adhesives	Monomethyl ether hydroquinone : 10-60 PPM	Clear, colourless liquid with a sharp Odor & Flammable	Used in Paints and coatings, Adhesives, Sealants, Textiles and leather chemicals, etc.



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