

# *Icorene* powders for rotomolding

Product range



# Rotomolding powders

At Specialty Powders we strive to provide the rotational molding industry with the most comprehensive and technical grade slate available in Europe.

*Icorene* is our registered trade mark representing our wide range of materials for rotomolding and technical powders. *Icorene* powders are available in natural, black, standard colors, custom compounded colors and specialty stone and speckle effects.

Our standard range of General Purpose Linear Low Density Polyethylene grades is used to manufacture a wide range of typical rotomoldings such as tanks, drums, bins, pipe connectors, access chambers, lids, boats and more.

For more demanding applications, Specialty Powders supplies High Performance Hexene or Hexene mPE powders that can outperform butene based LLDPE.

Many molders take their powders as custom matched pre-colored or standard colors in order to ensure good batch to batch consistency.

In addition to our regular materials, Specialty Powders also supplies other specific polyolefin powder products that fulfill the demands of certain roto products, these include:

- High Density PE with X linking agents for extended flex fatigue resistance, higher vicat and ultra-low temperature toughness.
- Flexible PE grades that shrink less than standard PE and react differently to external stress.
- High Stiffness PE grades with impact modifiers for a combination of toughness and rigidity.
- Polypropylene grades for higher temperature, hardness and scratch resistance than HDPE and LLDPE.
- Specialty grades are available for demanding applications in all regions.



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## General purpose rotomolding powders

All fully UV and heat stabilized for use in rotomolding:

- *Icorene* General Purpose resins are prime quality ground powders supplied in bags, bulk or big bags
- The *Icorene* product range is available as natural powder or in compounded black, standard or customer colors



Color	<i>Icorene</i>	Density	MFI	Characteristics	Typical Applications
Natural, Black & Colors	3545	0.935	4.2	Medium stiffness, easy to mold	General purpose
	3546	0.935	4.1	Medium stiffness, easy to mold	General purpose
	3560	0.935	5	Medium stiffness, easy to mold	General purpose
	3575	0.935	7.5	High flow & easy to mold	General purpose, intricate items
	3855	0.938	5.0	Higher stiffness & easy to mold	Tanks and other large moldings

## Hexene high performance powders

- These excellent high performance rotomolding materials all contain a premium high performance UV and AO stabilization package
- They also contain a special internal release agent, enabling moulders to require the use of minimal externally applied release agent



Color	<i>Icorene</i>	Density	MFI	Characteristics	Typical Applications
Natural, Black & Colors	1210	0.926	3.3	Flexible, tough with very high impact strength & ESCR	IBCs, floats and bins
	1314	0.939	3	Very high ESCR & impact with good stiffness and easy release	Large tanks for water, Heating oil EN 13341, Chemical, Septic & Agricultural tanks
	1339	0.943	3	Very high stiffness, high impact strength and ESCR	Big tanks and other large moldings
	1380	0.939	4	Very high ESCR & impact with good stiffness	Large tanks, heating oil, chemical, septic and agricultural tanks
	1440	0.940	4	Very high ESCR & impact with good stiffness	Big tanks and other large moldings
	1460	0.936	7.5	High cure speed & wide impact window	Fuel tanks, custom parts
	1613	0.938	4.5	Good stiffness, high processing speed, impact strength & ESCR	General Molding, medium sized tanks & fuel tanks

## *Icorene* materials used in automotive applications

- Rotomolding is used to manufacture all kinds of products used in trucks, buses, tractors and off road vehicles. These include for example: interior and exterior cab components and mudguards for tractors and trucks; diesel fuel tanks that vary from small sized tanks in quad bikes to very large tanks for harvesters (e.g. 800 liters)
- For diesel fuel tanks, *Icorene* grades 1440, 1460, 1505, 1613 and 1761 have been successfully tested in customer fuel tanks to pass the automotive regulation ECE R34 Annex 5. These grades are recognized by test houses such as TUV and appear on certain specific "approved material" lists



Color	<i>Icorene</i>	Density	MFI	Characteristics	Typical Applications
Natural PE	1440	0.940	4	High density material with good impact	Tanks and other large items
Natural PE	1460	0.936	7.5	High cure speed & wide impact window	Fuel tanks, custom parts
Natural PE	1613	0.938	4.5	Ad-blue resistance	Ad-blue garage bulk storage and on-truck tanks
Natural mPE	1741	0.941	4	Diesel resistance, High toughness and rigidity	Bulk storage, diesel tanks and on-truck tanks
Natural mPE	1761	0.935	6	Ad-blue resistance	Ad-blue garage bulk storage and on-truck tanks, TUV positive list ECE R34
Natural XPE	1505	0.945	na	Higher temperature resistance vs PE	Hot hydraulic and coolant solution tanks
Natural & Black PP	4014	0.900	15	Higher temperature resistance vs PE	Hot hydraulic and coolant solution tanks
Black PE	1440 Black 9001	0.941	4.0	Diesel resistance, High toughness	Diesel fuel tanks, TUV positive list ECE R34
Black PE	1460	0.936	7.5	Diesel resistance	Diesel fuel tanks, TUV positive list ECE R34
Black PE	1613 BK85	0.938	4.5	Diesel resistance, High toughness	Diesel fuel tanks, TUV positive list ECE R34
Black mPE	1741 Black 9001	0.941	4	Diesel resistance, High toughness and rigidity	Bulk storage, diesel tanks and on-truck tanks
Black mPE	1761 Black 9001	0.935	6	Diesel resistance, High toughness	Diesel fuel tanks, TUV positive list ECE R34
Black XPE	1505 Black 9001	0.945	na	Diesel resistance, High toughness & Lower Creep	Diesel fuel tanks

## Metalocene hexene (mPE) powders

### High Performance Powder Grade Range

- These high performing mPE rotomolding materials all contain an excellent UV and AO stabilization package
- They are designed to have super toughness, improved gloss and a wider than standard processing window. LyondellBasell is a preferred supplier of these materials in natural, black and custom colored powder form



Color	Icorene	Density	MFI	Characteristics	Typical Applications
Natural, Black & Colors	1741	0.941	4	High density metallocene material with very good impact	Tanks, stiff custom parts
	1761	0.934	6	Medium stiffness mPE, with high cure speed & wide impact window	Fuel tanks, custom parts

## Flexible rotomolding grades

- All listed PE materials are fully UV and heat stabilized for use in rotomolding
- Moulders use these materials to make products that are designed to flex rather than crack under bending or impact stress
- With lower shrinkage rates than typical PE roto materials, they are often used to keep tolerance too



Color	Icorene	Density	MFI	Flex Mod (Mpa)	Characteristics	Typical Applications
Natural, Black & Colors	1210	0.926	3.3	400	Flexible and tough with very high impact strength & ESCR	IBCs, floats and bins
	2550	0.924	3.6	380	Flexible, good ESCR, low shrinkage and very tough	Floats, buoys & items for material handling
	1901	0.900	10	100	Rubber-like Plastomer, high flexibility & easy molding	Floats, buoys & fenders
	9402	0.890	30	100	Optimum hot and cold Elastomer, soft touch, easy to process and extremely tough	Furniture, marine buffers and automotive ducting
	9468	1.110	8.5	45	Flexible and tough with very high scratch resistance	Interior parts automotive

## Specialty rotomolding powders

- LyondellBasell designs and manufactures many specialized powder materials for rotomolding
- These include electrically conductive materials, X linkable PE, Polyamide, Polycarbonate, TPE, Elastomer, PVDF and rotolining
- These and other specialty grades are made for applications requiring properties that PE/PP resins don't have

Please contact us to discuss your special material's requirements.



Color	Icorene	Density	MFI	Characteristics	Typical Applications
Natural, Black & Colors	1062 ESF	0.934	8	Next generation Enhanced Surface Finish and excellent mechanical properties.	Design furniture, hygienic & medical applications
Natural & Black	1505	0.945	na	Cross link HDPE superior ESCR, chemical resistance and flow.	Hydraulic oil & fuel tanks, chemical tanks and abrasion applications
Natural	1869	0.927	3.5	Adhesive grade, good bond to metal, good processability & physical properties.	Adhesive tie layer for PE, corrosion protection rotolining of pipes or tanks
Black	1870	0.939	20	Adhesive grade, good bond to metal, especially aluminum, excellent processability & physical properties.	Excellent lining for aluminum tanks. E.g.: Ad-blue, fire extinguishers
Black	3590 SC Black 9002	0.935	9	Semi Conductive black PE. Exhibits good flow and impact properties.	Bins & parts requiring electrical conductivity
Natural & Black	7710	1.150	na	Nylon 6. Very high temperature and high impact resistance. Fully stabilized	Engineering performance products e.g. ducts
Natural & Black	9005	1.010	63	Nylon 12, Easy to mould, exhibiting high temperature resistance. Fully stabilized	Engineering performance products e.g. Two layer automotive fuel tanks
Natural, Black & Colors	9402	0.890	30	Optimum hot and cold Elastomer, soft touch, easy to process and extremely tough.	Furniture, marine buffers and automotive ducting
Natural, Black & Colors	9468	1.110	8.5	Flexible and tough, very high scratch resistance	Interior parts automotive
Natural & some tints	9909	1.200	20	Polycarbonate, glass-clear, roto-powder. High stiffness & built-in flame retardancy	Lighting globes, point of sales items, safety products, small cabinets
Natural	9993	1.800	na	PVDF. Easy to mold exhibiting EXTREMELY high temperature and chemical resistance	Typically chemical tanks and ducts, continuous service temperature to 120°C

## Rigid rotomolding powder grades

- All listed rigid materials are fully UV and heat stabilized for use in rotomolding
- LyondellBasell makes toughened HDPE for applications where high stiffness, hardness, temperature resistance is needed
- *Superlinear* is a trademark used by LyondellBasell group



Color	Icorene	Density	MFI	Flex Mod (Mpa)	Characteristics	Typical Applications
Natural, Black & Colors	1339	0.943	3	900	Stiff and tough	Kayaks and boats
	5045 SL	0.950	5.9	1130	Extremely rigid, hard and tough	Kayaks and boats

## Rotomolding powders for tanks

- These excellent rotomolding materials all contain a good quality UV and AO stabilization package
- Rotomolded tanks will vary in size and wall thickness, typically 4-8mm, but sometimes up to 25mm
- The smallest tank considered is 500 liters and the biggest known so far is 40000 liters
- In general the larger sized tanks will use lower MFI to cope with the need for very thick walls and the long heating times
- Higher MFI resins will be more likely to suffer “dripping” and may also have insufficient resistance to long term stress
- For the best longevity the material should be compound colored. Standard or matched colors are available



Color	Icorene	Density	MFI	Characteristics	Typical Applications
Natural, Black & Colors	1613	0.938	4.5	Good stiffness, high processing speed, impact strength & ESCR	Small and medium tanks. Large moldings
	3855	0.938	5	Higher stiffness & easy to mold	Spray tanks
	1440	0.940	4	High density material with good impact	Tanks and other large moldings
	1460	0.936	7,5	Material with high cure speed & wide impact window	Fuel tanks, custom parts
	1741	0.941	4	High density metallocene material with very good impact	Tanks and other large moldings
	1314	0.939	3	Very high UV, ESCR & impact with good stiffness and easy release	Big tanks for water. Heating oil EN 13341, chemical, septic, agricultural and other moldings
	1339	0.943	3	Very high stiffness, high impact strength and ESCR	Large tanks for water. Heating oil EN 13341, chemical, septic & agricultural tanks
	1505	0.945	na	Very stiff. Cross link HDPE superior ESCR, chemical resistance and flow. UV.	Small to VERY big tanks, hydraulic oil & fuel tanks, chemical tanks

## Additives for rotomolding

- LyondellBasell engineers can develop additive systems to help make your products perform better
- Incorporation of the additives can usually be done at the same time as colors are added



Additive	Characteristics	Typical Applications
Anti-oxidant (AO)	For extra protection in high temperature processing or long term use	Thick walled parts, hot temperatures
Micro-pellets	For use when dry flow-ability or bulk density of the powder needs to be increased	Intricate tools
Anti-static (AS)	Helps to keep dust from sticking to the finished parts. Ask for AS product line	POS or consumer items

## Polypropylene powder grades

- Polypropylene powders are relatively easy to use for the rotomolding process
- Final parts made in Polypropylene are in general more rigid than LLDPE or HDPE produced parts but typically do not exhibit the same excellent low temperature toughness
- All listed materials are fully UV and heat stabilized for use in rotomolding



Color	Icorene	Density	MFI	Characteristics	Typical Applications
Natural, Black & Colors	4014	0.900	15	Improved stiffness combined with high temperature and scratch resistance	Engine components, small tanks and industrial

## Special effect powders

- All of the LyondellBasell special effect colors are fully UV and heat stabilized for use in rotomolding
- The most common base is *Icorene 3560* and *Icorene 3590*



Color	Description	Typical Example	Typical Applications
<b>Millstone granite</b>	Dark colored marble effect		Garden, POS products, spas, small tanks
<b>White marble</b>	Light colored marble effect		Garden, POS products, spas, small tanks
<b>Green marble</b>	Dark colored marble effect		Garden, POS products, spas, small tanks
<b>Pink granite</b>	Light colored marble effect		Garden, POS products, spas, small tanks
<b>Sandstone</b>	Dark colored marble effect		Garden, POS products, spas, small tanks
<b>Terracotta</b>	Swirl effect		Garden planters, pet houses
<b>Sparkle</b>	Sparkle in various background colors including black		Various

Please note, colors may vary from the printed brochure. Please request sample from your Account Manager

## Drinking water approvals

- Rotomolded items in direct contact with drinking water require additional material and part testing
- These test standards for these approvals vary from region to region. They also require testing individually by color
- All of the listed LyondellBasell materials are fully UV & heat stabilized for use in rotomolding



Color	Icorene	Standard	Country	Density	MFI
<b>Natural</b>	<i>Icorene 1314 NATURAL 0000</i>	WRAS	UK	0.939	3.0
<b>Black</b>	<i>Icorene 1314 BLACK 9001</i>	WRAS	UK	0.939	3.0
<b>Black</b>	<i>Icorene 1613 BK85</i>	WRAS	UK	0.938	4.5
<b>Blue</b>	<i>Icorene 1613 BLUE 5747</i>	WRAS	UK	0.938	4.5
<b>Natural</b>	<i>Lupolen 3621 MRM</i>	DVGW/W270	Germany	0.936	7.5
<b>Natural</b>	<i>Lupolen 4021 KRM</i>	DVGW/W270	Germany	0.940	4.0

## “Designer” rotomolding powders

- All of the listed materials are fully UV and heat stabilized for use in rotomolding
- This is a segment of the rotomolding industry which demands very good looks and surface quality
- LyondellBasell supplies a number of specific PE powders that meet these requirements, below are a number of examples: Our powders are used in exciting lighting fixtures where clarity or whiteness is a key attribute
- Customers parts for outdoor furniture and lighting which needs to be free of surface pin-holes and pass international flammability standards



Color	Icorene	Density	MFI	Characteristics	Typical Applications
<b>Natural</b>	1062 ESF	0.934	8	Next generation Enhanced Surface Finish and excellent mechanical properties.	Design furniture, hygienic & medical applications
<b>Black &amp; colors</b>	1490	0.936	12.0	Very high ESCR and cold impact strength, low pinholes on the surface	Cleaning machines, Furniture
<b>Natural</b>	1761	0.934	6	Medium stiffness mPE, with excellent whiteness and great gloss	Furniture
<b>Natural</b>	3150	0.935	13.0	Extremely high flow LLDPE low pinholes on the surface	Furniture, lighting, intricate moldings
<b>Natural</b>	3590	0.935	9.0	Medium stiffness, high melt flow and low pinholes on the surface	Lighting, intricate moldings
<b>Natural</b>	9909	1.2	20	Polycarbonate, glass-clear, UV stabilized. Very high stiffness with built-in flame retardancy	Lighting, point of sale

**APPLICATIONS PER GRADE**

		Icorene grades														Icorene grades																		
		1062	1210	1314	1339	1440	1460	1490	1505	1613	1741	1761	1869	1870	1901	2550	3150	3545	3560	3575	3590	3855	4014	5045SL	7710	9106V0	9402	9468	9909	9993				
<b>Automotive (related) tanks</b>	Diesel tanks tractor / trucks			S	S	S	S		S	S	S	S										S	L		S						S			
	Diesel tanks other			S	S	S	S		S	S	S	S										S	L		S						S			
	Bio diesel tanks			S	S	S	S		S	S	S	S										S	L		S						S			
	Urea tanks			S	S	S	S		S	S	S		S									S	S		S						S			
	Gasoline tanks								L																S						S			
	Hydraulic oil								L	L													L		S							S		
	Petrol tanks								L																S							S		
	Caravan			S	S	S	S	S	S	S	S	S						S	S	S	S	S	S	S	S	S						S		
<b>Automotive parts</b>	Cabs, body panels etc	S	S												S		S	S	S	S	S		S											
	Trailers and load liners				S			S																								S		
	Fenders		S											S	S													S						
	Ducting			S	S	S	S	S	S	S	S											S	S	S	S							S		
<b>Road furniture</b>	Road Barriers/separators		S												S		S	S	S		S													
	Bollards		S											S	S												S	S						
	Road Cones		S											S	S																			
	Litter bins	S	S				S								S		S	S	S	S	S	S												
	Traffic signs						S									S	S	S	S	S	S													
	Salt or grit bins		S	S	S	S	S		S	S	S				S		S	S	S	S		S												
	Recycle bins		S	S	S	S	S		S		S				S		S	S	S	S	S													
<b>Infrastructure &amp; tanks</b>	Heating Oil			S	S		S	S	L	S																						S		
	Fuel stations			S	S	S		S	L		L																					S		
	Water<3000					S			S		S						S	S	S		S		S											
	Water>3000			S	S		S	S	S	S																								
	Water>20000				S		S																											
	Water drinking			S	S	S			S		S						S	S	S		S													
	Chemical static & IBC		S	S	S		S	S		S					S							S												
	Chemical drum			S	S			S																									S	
	Grease trap			S	S	S	S	S	S	S	S												S										S	
	Other tanks			S	S	S	S	S	S	S	S						S	S	S	S	S	S	S					S						
Rubble/mortar tubs		S	S					S							S		S	S	S		S													
<b>Infrastructure underground</b>	Septic			S	S		S	S	S	S							S	S	S		S													
	Wastewater treatment			S	S		S	S	S	S							S	S	S		S													
	Rainwater harvest			S	S	S	S		S	S	S						S	S	S		S													
	Grey water			S	S	S	S		S	S	S						S	S	S		S													
	Manholes & Inspection Chamber			S	S		S		S	S												S											S	
	Recycling deep containers		S	S	S	S	S		S	S	S				S		S	S	S		S													
	Telecon fittings																S	S	S															

S = suitable  
L = limited

**APPLICATIONS PER GRADE**

		Icorene grades														Icorene grades														
		1062	1210	1314	1339	1440	1460	1490	1505	1613	1741	1761	1869	1870	1901	2550	3150	3545	3560	3575	3590	3855	4014	5045SL	7710	9106V0	9402	9468	9909	9993
<b>Leisure &amp; Consumer</b>	Flower pots	S						S								S	S	S	S	S										
	Statues etc	S						S								S	S	S	S	S										
	Furniture	S	S			S		S	S		S				S	S	S	S	S	S	S	S	S				S	S	S	
	Composters		S													S		S	S	S		S								
	Water butt			S	S	S	S	S	S	S	S						S	S	S	S	S	S								
	Foam boats									S												S		S						
	Canoe/boat			S	S	S	S			S	S	S											S							
	Kayak			S	S	S	S			S	S	S						S	S	S		S		S						
	Speakers & Instrument case	S	S	S		S		S		S		S				S	S	S	S	S	S	S				S				
	Display/Exhibition	S	S			S		S		S		S				S	S	S	S	S	S	S	S							S
	Point of Sale/Shop	S				S		S		S		S			S		S	S	S	S	S	S	S						S	S
	Pet products		S					S								S		S	S	S	S									
	Spa			S	S		S			S	S												S							
	Mannequins					S		S				S					S	S	S	S	S	S								
Toys/Playground	S	S	S	S	S	S	S		S	S	S				S		S	S	S	S	S						S	S		
<b>Agriculture</b>	Farm containers		S	S	S	S	S		S	S	S				S		S	S	S		S		S							
	Troughs		S	S	S	S	S		S	S	S				S		S	S	S		S									
	Shelters		S	S	S	S	S		S	S	S				S		S	S	S		S									
	Hoppers etc		S	S	S	S	S		S	S	S	S				S		S	S	S		S								
	Chemical spray-tank			S	S	S		S	S	S																			S	
<b>Marine</b>	Buoys		S	S			S		S	S				S	S		S	S	S								S	S		
	Pontoon		S	S	S	S	S		S	S	S	S			S	S		S	S	S		S					S	S		
	Fish box		S	S					S						S															
	Fish farm		S	S	S				S						S															
<b>Industrial</b>	Lamps	S						S								S				S		S		S			S	S		
	Insulated transit boxes		S	S		S		S		S					S		S	S	S	S										
	Rotolined vessels											S	S																	
	Food carts	S	S			S		S		S					S		S	S	S	S										
	Pallets			S	S		S		S		S												S							
	Hoppers	S		S	S	S	S		S	S	S						S	S	S		S		S							
	Refuse bins			S	S	S			S		S							S	S	S		S								
	Bin lids					S					S							S	S	S		S								
	Food/general bins	S	S			S		S		S					S		S	S	S	S	S	S								
	Cleaning machines			S	S	S	S		S	S	S							S	S	S		S								
	Hospital Medical products	S		S		S		S		S						S	S	S	S	S		S								
Portable toilets	S		S	S		S		S	S								S	S	S		S									

S = suitable  
L = limited



# About us

We are LyondellBasell (LYB) – a leader in the global chemical industry creating solutions for everyday sustainable living. Through advanced technology and focused investments, we are enabling a circular and low carbon economy. Across all we do, we aim to unlock value for our customers, investors and society. As one of the world's largest producers of polymers and a leader in polyolefin technologies, we develop, manufacture and market high-quality and innovative products for applications ranging from sustainable transportation and food safety to clean water and quality healthcare. For more information, please visit [www.lyb.com](http://www.lyb.com) or follow [@LyondellBasell](https://www.linkedin.com/company/lyondellbasell) on LinkedIn.

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