

SIBUR

POLYPROPYLENE and POLYETHYLENE

SIBUR AT A GLANCE

More than **1400**
clients
in **80** countries



#1

petrochemical producer
in CIS and Eastern Europe

**27
000**

highly professional
employees

7,8

billion USD
revenue in 2017

35%

EBITDA
margin in 2017

Baa3

Moody's
rating

BB+

Fitch
rating

A black and white photograph of a pair of hands cupped together, holding a small, vibrant green plant with four leaves. The background is a blurred outdoor setting, possibly a park or garden. In the top right corner, there is a teal-colored rectangular box containing the text "OUR MISSION" in white, uppercase letters.

OUR MISSION

OUR MISSION: DRIVING TRANSFORMATIONS

We process natural resources in an environmentally sustainable way to produce midstream products and petrochemicals to deliver high-quality goods to businesses and consumers.

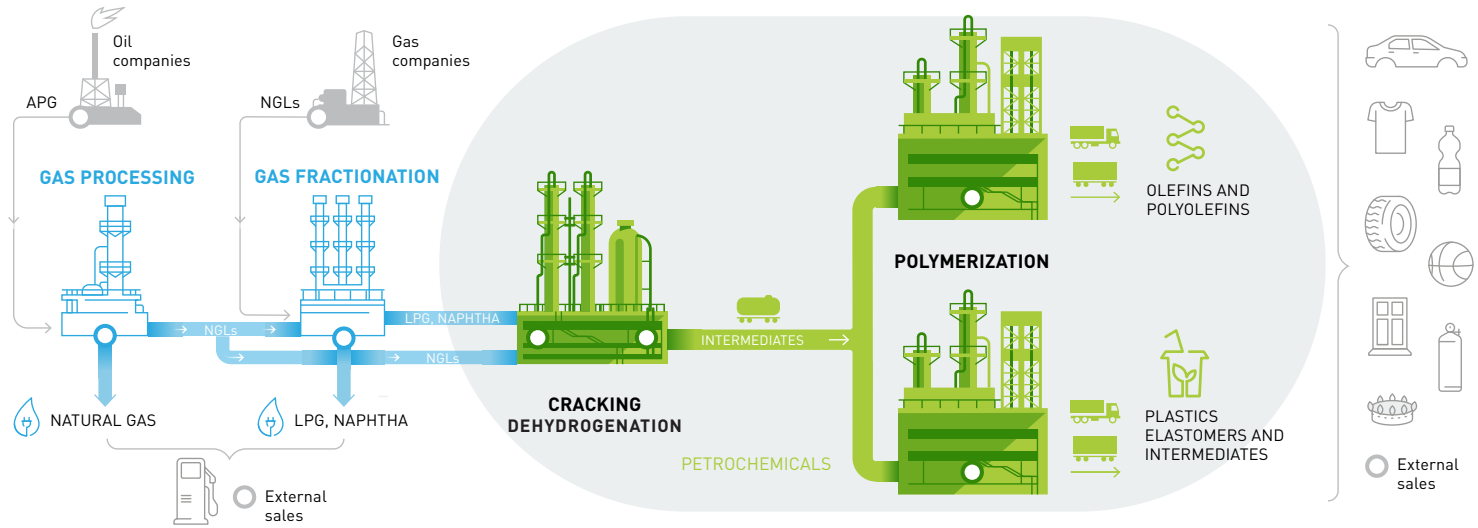
Through innovation we unlock scientific research and knowledge potential.

In this fast-paced world, our investments support Russia's transformation from an economy dependent on natural resources into a more sustainable and competitive manufacturing economy.

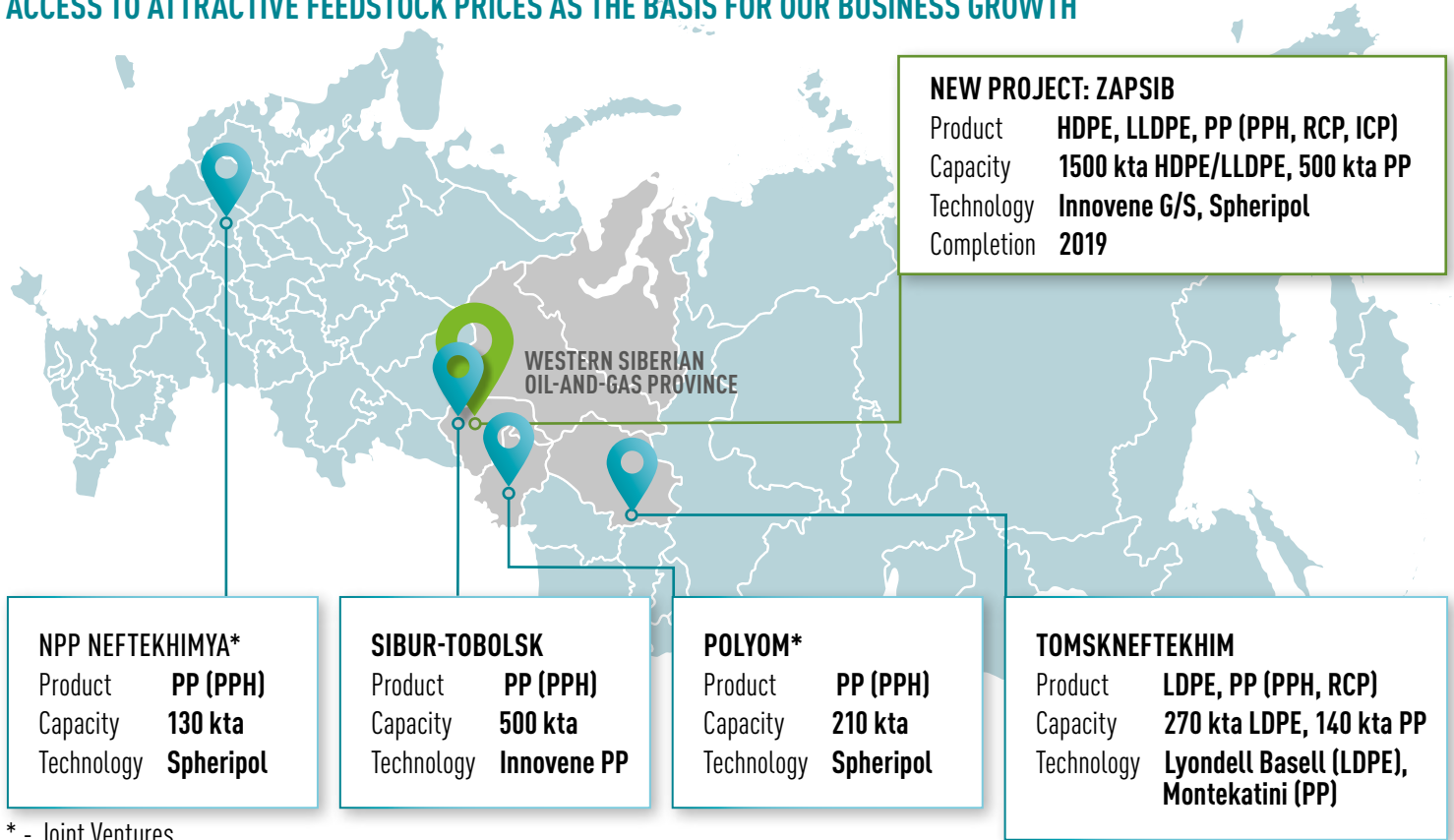


PRODUCTION CHAIN

SIBUR INTEGRATED PETROCHEMICALS BUSINESS MODEL DELIVERS RESILIENT PERFORMANCE AND HIGHER MARGINS



THE LOCATION OF POLYOLEFIN PRODUCTION CAPACITIES NEAR OIL AND GAS EXTRACTION AREA PROVIDES LONG-TERM ACCESS TO ATTRACTIVE FEEDSTOCK PRICES AS THE BASIS FOR OUR BUSINESS GROWTH



8 * - Joint Ventures

ZAPSIB

Each ZapSib production unit is built with specific technology to provide high quality product



Slurry polymerization
Technology
Product

2 units
Innovene S
HDPE



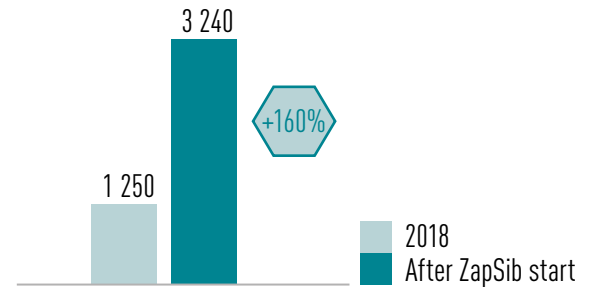
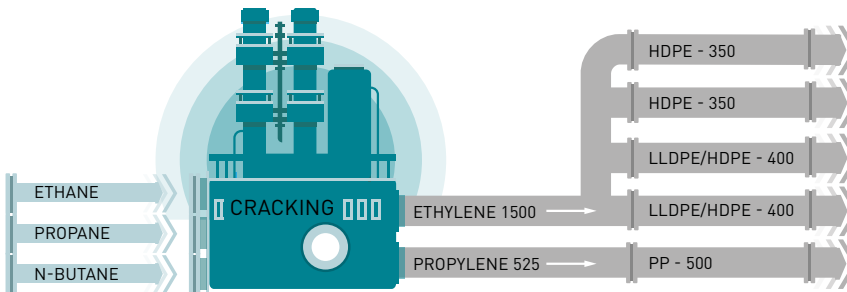
Gas-phase polymerization
Technology
Product

2 units
Innovene G
HDPE/LLDPE



Bulk polymerization
Technology
Product

1 unit
Spheripol
PP (homo, random, impact)



Sibur's polyolefins capacity, kta

The image shows an industrial site with two prominent white cylindrical tanks in the foreground. A tall, dark chimney stack is positioned between them. The background features a complex of industrial buildings and piping under a cloudy sky. A teal banner is overlaid on the right side of the image.

DISTRIBUTION

SIBUR is building a globally competitive leadership position and expanding on export markets. The export trade activities are managed by its subsidiary Sibur International GmbH in Vienna



CURRENT PRODUCT PORTFOLIO

EXTRUSION BLOW MOLDING



EXTRUSION BLOW MOLDING SOLUTIONS

SIBEX

Product solution	Key properties		Advantages	Efficiency
	MFI g/10 min	Flexural modulus, MPa		
SIBEX® PP R015 BM	1.8	900	Ultra-purity material Can be sterilized at 121°C	Meets European Pharmacopeia requirements
SIBEX® PP R018 BM	1.8	900	High melt crystallization temperature Enhanced rigidity Improved transparency	Shorter cooling time, shorter cycle time, increased line capacity Production of thinner-wall products saves on material End-products stand out from competitors

PROSPECTIVE SOLUTION

Prospective solution	Key properties		Description
	MFI, g/10 min	Flexural modulus, MPa	
SIBEX® PP R020 BM	1.8	900	ULTRA CLEAR POLYPROPYLENE





CAPS AND CLOSURES

SIBUR SOLUTIONS FOR CAPS AND CLOSURES

SIBEX

Process	Product solution	Key properties		Efficiency
		MFI g/10 min	Flexural modulus, MPa	
Injection molding	PP H120 GP	12	1500	Processing stability
	PP H250 GP	25	1500	
	PP H350 GP	35	1500	
	SIBEX® PP H452 IM	45	1800	Shorter cooling/cycle time High rigidity (Downgauging) Dimensional stability Increased equipment efficiency
	SIBEX® PP H552 IM	55	1800	
	SIBEX® PP H558 IM	55	1900	
Compression molding	SIBEX® PP H022 CM	2,6	1600	Easy mould release Low warpage High processing speed Tamper-resistance Increased equipment efficiency

PROSPECTIVE SOLUTION

Product solution	Key properties		Description
	MFI, g/10 min	Flexural modulus, MPa	
SIBEX® PP R022 CM	2,6	1 300	Random copolymer for compression molding Stress crack resistant



INJECTION MOLDING

INJECTION MOLDING SOLUTIONS



End-product requirements	Product Solutions	Key properties		Efficiency
		MFI g/10 min	Flexural modulus, MPa	
Basic grades	PP H120 GP	12	1500	Process stability
	PP H250 GP	25	1500	
	PP H350 GP	35	1500	
Transparency	SIBEX® PP H251 IM	25	1700	High transparency
	SIBEX® PP H351 IM	35	1700	
	SIBEX® PP H451 IM	45	1800	
Rigidity	SIBEX® PP H252 IM	25	1800	High rigidity (Downgauging)
	SIBEX® PP H352 IM	35	1800	Dimensional stability
	SIBEX® PP H452 IM	45	1800	Increased equipment efficiency
	SIBEX® PP H552 IM	55	1800	
Enhanced rigidity	SIBEX® PP H558 IM	55	1900	Phthalatefree solution for polystyrene substitution

A close-up photograph of several plastic cups arranged in a row. The cups are in various colors: white, blue, and grey. The blue cup in the foreground is the most prominent, showing its rim and the top edge. The other cups are slightly out of focus, creating a sense of depth. The background is a neutral, light grey color.

THERMOFORMING

SIBUR THERMOFORMING SOLUTIONS

SIBEX

Product solution	Key properties		Description	Efficiency
	MFI g/10 min	Flexural modulus, MPa		
PP H030 GP	3	1500	Basic grade	Process stability
SIBEX® PP H032 TF	3	1700	Customized thermoforming product solutions	High rigidity (Downgauging)
SIBEX® PP H038 TF	3	1800		Dimensional stability Increased equipment efficiency PP H038 TF is phthalate-free

PROSPECTIVE THERMOFORMING

Product solution	Key properties		Description
	MFI, g/10 min	Flexural modulus, MPa	
SIBEX® PP H031 TF	3	1700	ULTRA CLEAR POLYPROPYLENE





CAST FILMS

SIBUR CAST FILM SOLUTIONS

SIBEX

Properties		Method	Typical values*
Flow Melt flow index	(230°C/2,16 kg)	ASTM D1238	8.0 g/10 min
Mechanical Tensile stress at yield	(50 mm/min)	ASTM D638	34 MPa
Elongation at yield	(50 mm/min)	ASTM D638	8%
Flexural modulus	(50 mm/min)	ASTM D790	1300 MPa
Notched Izod impact strength	(23°C)	ASTM D256	33 J/m ²
Heat-transfer Vicat softening temperature	(10 H)	ASTM D1525	145-160°C
Heat deflection temperature	(0.45 MPa)	ASTM D648	105-110°C

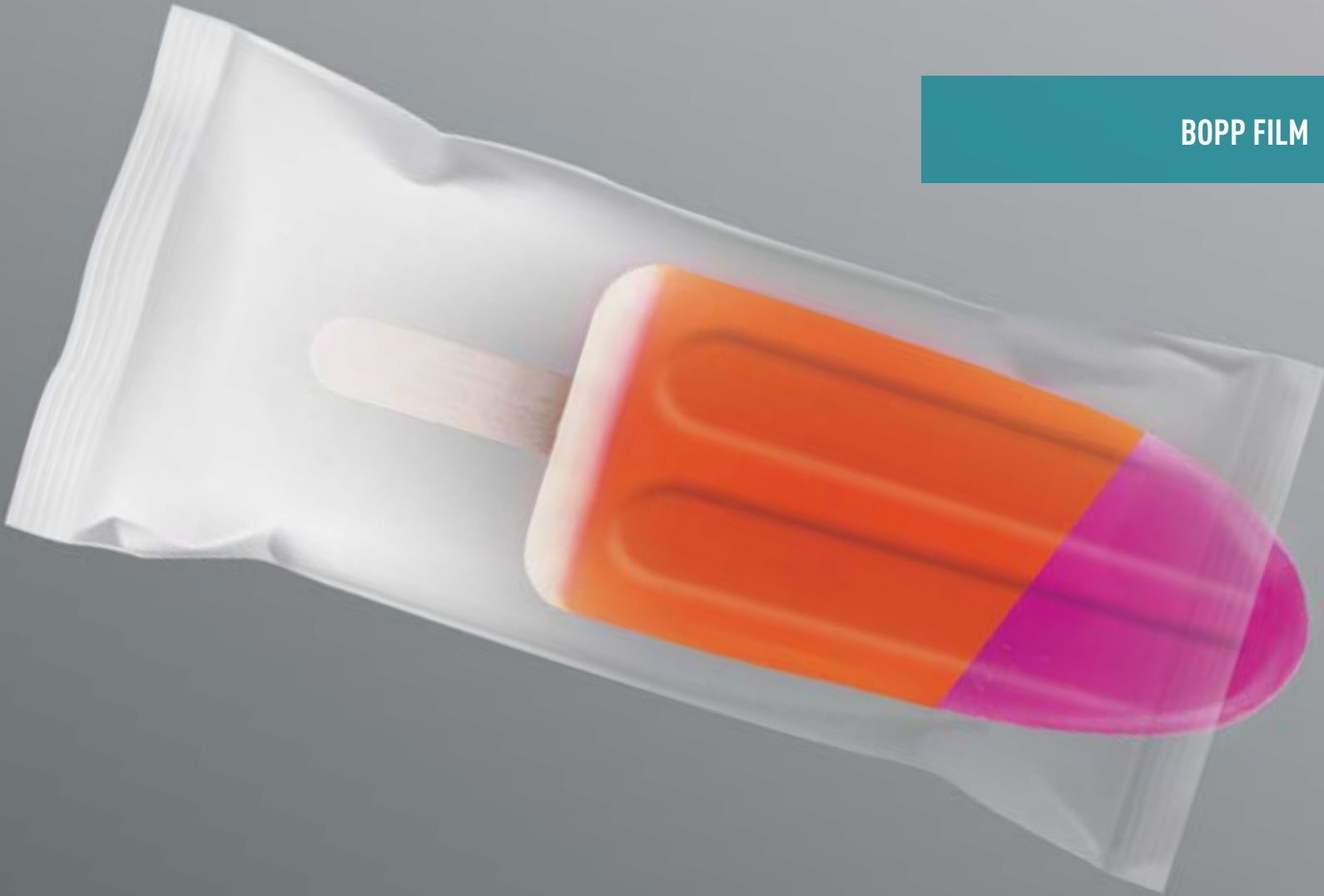
*Typical values; not for use in specifications.

SIBEX® PP H080 CF is a basic barefoot grade with a standard molecular-weight distribution designed for the core layers of non-metallized films.

SIBEX® PP H081 CF is a special grade with a standard molecular-weight distribution developed for metallized cast films.

SIBEX® PP H085 CF is a special grade with a standard molecular-weight distribution containing slip and anti-block additives.

BOPP FILM



SIBUR BOPP FILM SOLUTIONS



NOTE

SIBEX® PP H031 BF is designed for manufacturing biaxially-oriented films, including metallized films.

Properties		Method	Typical values*
Flow Melt flow index	(230°C / 2.16 kg)	ASTM D1238	3.0 g/10 min
Mechanical Tensile stress at yield	(50 mm/min)	ASTM D638	34 MPa
Elongation at yield	(50 mm/min)	ASTM D638	9%
Flexural modulus	(50 mm/min)	ASTM D790	1400 MPa
Notched Izod impact strength	(23°C)	ASTM D256	55 J/m ²
Heat-transfer Vicat softening temperature	(10 H)	ASTM D1525	145-160°C
Heat deflection temperature	(0.45 MPa)	ASTM D648	110-115°C

*Typical values; not for use in specifications.



NONWOVEN FABRICS

SOLUTIONS FOR NONWOVEN MATERIALS

SIBEX

Product solution	MFI g/10 min	Advantages	Typical applications
SIBEX® PP H253 FF	25	AGF stabilized Easy processing	Filament, multifilament, yarn and spun fibers
SIBEX® PP H270 FF	27	AGF stabilized Easy processing	Spunbond general purpose
SIBEX® PP H350 FF	35		
SIBEX® PP H263 FF	27	Phthalate-free technology AGF stabilized Easy processing	Spunbond for diapers and medical applications
SIBEX® PP H274 FF	27	UV&AGF stabilized Easy processing	Civil construction and agricultural
SIBEX® PP H354 FF	35		

SIBEX® Nonwoven product is tailored to spunbond fabric. Provides easy processing, high quality of final items. Phthalate-free polymerization technology allows using SIBEX® Nonwoven for medical and baby care goods.



FLAT YARN (RAFFIA)

SIBUR SOLUTIONS FOR FLAT YARN (RAFFIA)

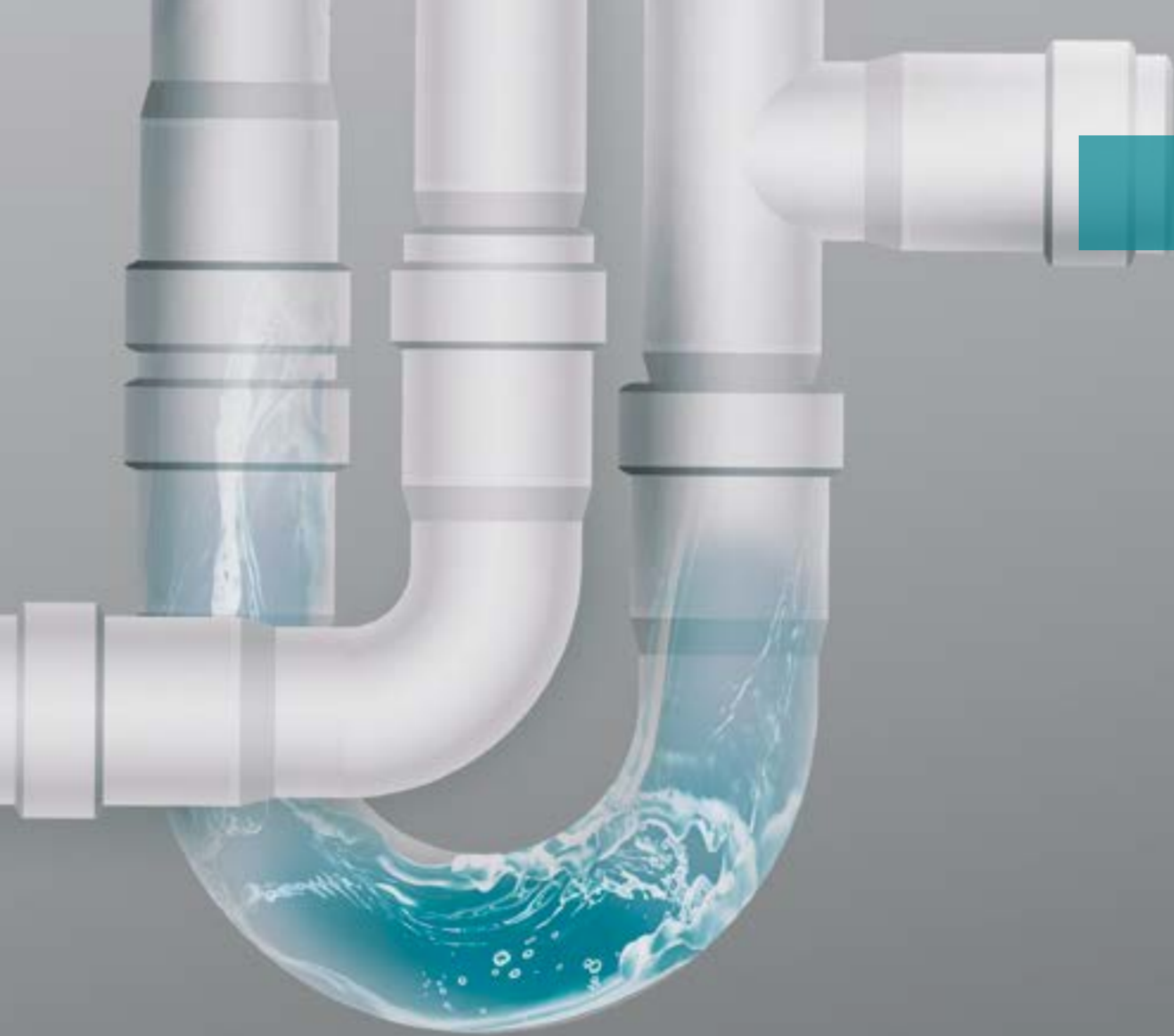
SIBEX

Product solution	MFI g/10 min	Advantages	Typical applications
SIBEX® PP H030 GP	3,0	Basic grade	General purpose flat yarn
SIBEX® PP H033 FF	3,2	Low water-carry-over Processing speed up to 460 m/min	Small bags and big-bags
SIBEX® PP H063 FF	6,0	Low water-carry-over Processing speed up to 550 m/min	Woven valve bags
SIBEX® PP H034 FF	3,2	UV stabilized Low water-carry-over	Big-bags and small bags

SIBEX® Raffia product for smooth processing.

Main effects by using SIBEX® Raffia product:

- increasing capacity up to 20%;
- high sustainability of the processing 50% breaks reduction;
- yarn's strength is increased 10% (downgauging).



INDOOR PP PIPES

SOLUTIONS FOR PP INDOOR PIPES

SIBEX

Product solution	MFI g/10 min	Advantages	Typical applications
SIBEX® PP H030 GP	3,0	Basic grade	Pipes and fittings for unpressured pipelines
SIBEX® PP H007 EX	0,7	High dimension stability Speed processing Low influence on taste and odor	Pipes and fittings for unpressured pipelines
SIBEX® PP R003 EX	0,3	High dimension stability Speed processing Low influence on taste and odor	Hot and cold water pipes and fittings for pressure pipelines

SIBEX® PP R003 EX is designed for manufacturing pipes and fittings for hot and cold water supply and heating.

SIBEX® PP H007 EX product is designed for manufacturing sewer pipes and fittings. It has high molecular weight, low melt flow index and provides long-term operation at high temperatures.



LOW DENSITY POLYETHYLENE (LDPE)

LOW DENSITY POLYETHYLENE (LDPE)

Grade	Density, kg/m ³	MFI, g/10 min	Note	Features
PE LD 03210 FE	921	0,3	Food packaging films	General purpose grades
PE LD 20190 FE	919	2,0	Shrink wrap Films for lamination	
PE LD 08220 FE	922	0,8	Agricultural films (greenhouses, mulching, silage)	Increased density grades with improved processing (downgauging)
PE LD 20220 FE	922	2,0	Industrial Packaging All-purpose films	



**EXTRUSION BLOW MOLDING
FOR THE PHARMACEUTICAL INDUSTRY**

SIBUR EXTRUSION BLOW MOLDING SOLUTION FOR BLOW-FILL-SEAL TECHNOLOGY

SIBEX

Product solution	Key properties		Description	Efficiency
	MFI g/ 10 min	Flexural modulus, MPa		
SIBEX® PP R015 BM	1,8	900	Special product solution for pharmaceutical use	Ultra-high purity material Meets European Pharmacopeia requirements Can be sterilized at 121°C

Approved by leading manufacturer of BFS equipment.

ZAPSIB PRODUCT PORTFOLIO

ZAPSIB HDPE/LLDPE PRODUCTS FOR FILMS




#	Grade	Catalyst, comonomer	Density, g/cm ³	MFI, g/10 min	Additives	Recommended application
1	LL09200 FE	C4, ZN	0.920	0.9	Base formulation	Blown mono- and multilayer films for packaging, film for lamination, agricultural films, sacks for heavy goods, grocery and garbage bags
2	LL09211 FE	C4, ZN	0.921	0.9	Slip, antiblock	
3	LL20200 FE	C4, ZN	0.920	2.0	Base formulation	Thin and medium thickness films, stretch-films, oriented films, base for multilayer films
4	LL20211 FE	C4, ZN	0.921	2.0	Slip, antiblock	
5	LL30200 FE	C4, ZN	0.920	3.0	Base formulation	Stretch films via cast extrusion Coextrusion High quality stretch packaging
6	HD14380 FE	C6, Cr	0.938	14 (at 21.6 kg)	Base formulation	Grocery bags, sacks and industrial packaging
7	HD15490 FE	C6, Cr	0.949	15 (at 21.6 kg)	Base formulation	
8	HD10500 FE	C6, Cr	0.950	10 (at 21.6 kg)	Base formulation	
9	HD85520 FE	C6, ZN	0.952	8.5 (at 21.6 kg)	Base formulation	Films for lamination, shrink films, backs. Very thin films at high speed lines

ZAPSIB HDPE AND PP PRODUCTS FOR PIPES

- Bimodal technology (real homo-copolymer structure) — grade properties exceed PE100 requirements and allow to classify ZapSib products as PE100+;
- Hexene-1 comonomer — enhances mechanical and operating properties of pipes;
- Low level of volatile components — no need for additional drying and degassing;
- Standard and low flow grades in portfolio — possibility to produce high quality grades of small and big diameter




#	Grade	Catalyst, comonomer	Density, g/cm ³	MFI, g/10 min	Additives
1	HD03594 PE	ZN	0.959	0.3 (5 kg)	Carbon black pipes PE100+ grade for gas and potable water supply
2	HD02604 PE	ZN	0.960	0.24 (5 kg)	Carbon black PE100+ grade for big diameter pipes
3	HD03594 RC	ZN	0.959	0.29 (5 kg)	Carbon black PE100RC pipe grade for with high crack resistance for alternative means of placement
Random PP for pressure water pipes					
4	PP R003EX	ZN	-	0.3 (2.16 kg)	Random ethylene and propylene copolymer for pressure pipes PPR80
Impact PP for non-pressure pipes					
5	PP I003EX	ZN	-	0.3 (2.16 kg)	Impact ethylene and propylene copolymer for sewage and drainage pipes

ZAPSIB HDPE PRODUCTS FOR SMALL BLOW MOULDING (SBM)

Application	SIBUR grade	Properties				Description
		Density, g/cm ³	MFI, g/10 min	Load, kg	ESCR, hour	
	HD02550 SB	0.955	0.2	2.16	50*	Medium molecular weight HDPE grade with optimal balance of properties for production of a wide range of blow molding items. Designed for production of up to 30 L containers for storage and transportation of household chemicals, oils, and food liquids
	HD03580 SB	0.958	0.3	2.16	50	Bimodal HDPE grade. Characterized by excellent ESCR. Designed for production of up to 30 L containers for storage and transportation of household chemicals and cosmetics
	HD06620 SB	0.962	0.6	2.16	25	Medium molecular weight HDPE grade with low ESCR, good processability and high stiffness. Designed for high speed production of dairy containers, light weight containers for dry products and household chemicals

* BTT (Belt telephone test) stress crack resistance, F50 100% при 50°C, ASTM D 1693



ZAPSIB HDPE PRODUCTS FOR MEDIUM (MBM) AND LARGE BLOW MOULDING (LBM)

Application	SIBUR grade	Properties				Description
		Density, g/cm ³	MFI, g/10 min	Load, kg	ESCR, hour	
	HD10520 LB	0.952	10	21.6	>1000*	High molecular weight HDPE grade with high ESCR and impact strength. Recommended for medium and large blow molding items of 1-60 L for storage and transportation of aggressive products
	HD19550 LB	0.955	1.9	21.6	>100**	High molecular weight HDPE grade. Designed for production of large packaging items: 210-227 L drums or storage and transportation of aggressive products
	HD60502 LB	0.950	6	21.6	>1000*	High molecular weight HDPE grade with UV stabilization. Designed for production of IBC containers of up to 5000 L volume

* BTT (Belt telephone test) stress crack resistance, 100% Adenol 50°C, ASTM 1693-97a

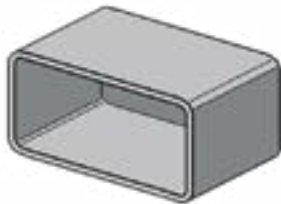
** BTT (Belt telephone test) stress crack resistance, 10% Igepal 50°C, ASTM 1693-97a

BENEFITS OF ZAPSIB PE AND PP GRADES FOR INJECTION MOLDING

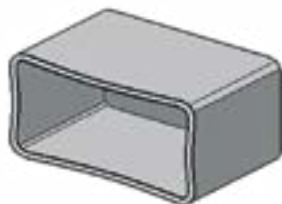
Application	Benefits	
	Benefits of ZapSib PP grades with high MFI for thin wall items	Wide product portfolio of impact and random copolymers with high MFI Grades with specialty formulation allow to produce goods with the best consumer properties: <ul style="list-style-type: none"> • high transparency (random PP); • high stiffness (random PP); • high frost resistance (impact PP); • high impact strength (impact PP).
	Benefits of ZapSib HDPE grades for injection molding goods:	<ul style="list-style-type: none"> • high mechanical strength; • high resistance to vertical load; • resistance to aggressive mediums; • possibility to reduce cost via weight reduction; • possibility to increase production rate without compromising on mechanical properties; • possibility to turn from production of shift caps instead of screw caps.
	Best organoleptic properties	Availability of grades with high MFI achievable without peroxides dramatically improves organoleptic properties of final goods

ZapSib PP and HDPE grades allow to produce light weight items with low deformation during lower cycle time

ZapSib products



Competitive grades

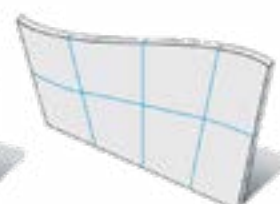


Weight 150g, cycle 30s

ZapSib products



Competitive grades



Weight 20g, cycle 8s

ZAPSIB MAIN HDPE AND PP PRODUCTS FOR INJECTION MOLDING

#	Grade	Catalyst	Density, g/cm ³	MFI, g/10 min
HDPE				
1	HD20520 IM	ZN	0.952	2
2	HD48572 IM	ZN	0.957	4.8
3	HD80602 IM	ZN	0.960	8
4	HD90610 IM	ZN	0.961	9
5	HD36530 IM	ZN	0.953	20
Random PP				
6	PP R112IM	ZN	-	11
7	PP R252IM	ZN	-	25
8	PP R482IM	ZN	-	48
9	PP R752IM	ZN	-	75
Impact PP				
10	PP I065IM	ZN	-	6
11	PP I152IM	ZN	-	15
12	PP I212IM	ZN	-	21
13	PP I482IM	ZN	-	48
14	PP I752IM	ZN	-	75

R&D CENTER

Mission is to sustain SIBUR's competitiveness by implementing new and innovative technical solutions and technologies.

MAIN ACTIVITIES:

- 1 Synthesis and catalysis processes improvement
- 2 Various analytical studies and on-demand lab examinations
- 3 Additives testing for PO and Rubbers
- 4 Product line expansion

MAIN INFORMATION

Location	Tomsk
Researchers	190
Start-up year	2005



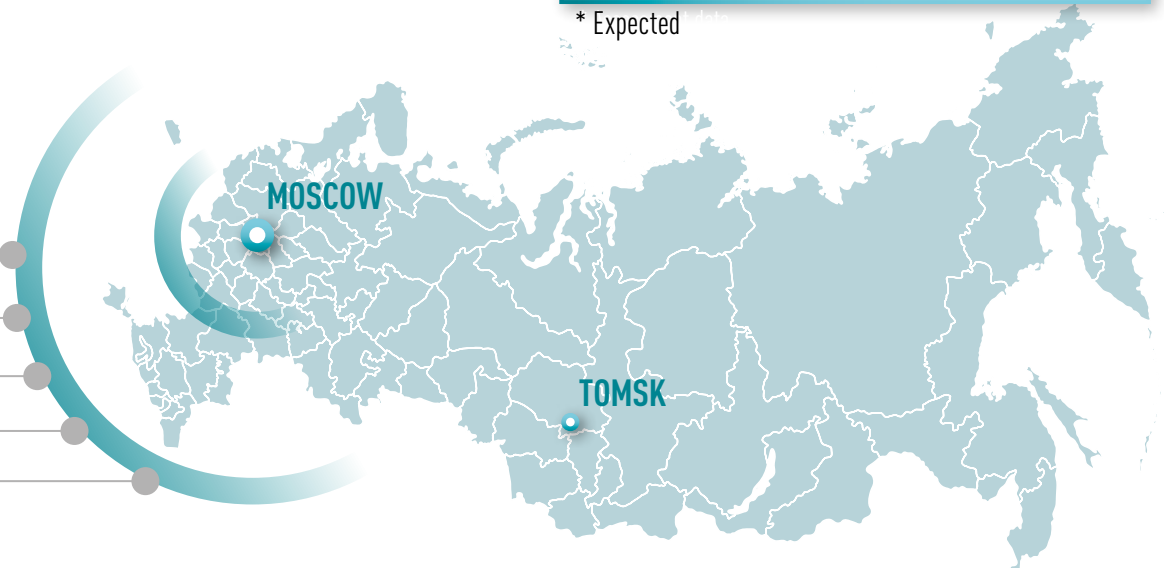
POLYOLEFINS APPLICATION DEVELOPMENT CENTER

- 1 Development of new grades
- 2 Technical support, promotion of developed grades
- 3 Optimization of developed grades
- 4 Quality improvement of manufactured grades
- 5 Complaint management

MAIN INFORMATION

Location	On the territory of Skolkovo Innovation Center
Building area	5350 m²
Instrument base	Processing lines, test equipment
Start-up year*	2018

* Expected



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