

INNOVATION AND QUALITY IN PU SOLUTIONS

SYNTHENE

PRODUCT OVERVIEW 2022.1

POLYURETHANE ELASTOMERS AND RESINS



HIGH PERFORMANCE FOR INDUSTRIAL PROJECTS AND PROTOTYPING VERSATILITY FROM VERY SOFT TO VERY RIGID

- » Wear proof and chemical resistant elastomers with a wide range of hardnesses
- » PU resins for daily or more specific prototyping jobs and small series
- » Tailor-made formulation for unique projects

SYNTHENE IS
CERTIFIED ACCORDING TO



SYNTHENE 2021-12-16 001 EN

OVERVIEW SYNTHENE PRODUCTS

- » Polyurethane solutions for all types of parts, moulds or composites
- » Favoured across the globe for **high quality and health standards**
- » Validated by many industries: automotive, aerospace, construction, medical etc.



ELASTOMERS FOR ALL APPLICATIONS

- » 3 ranges of elastomers offering a **wide range of hardnesses** between 35 Shore A and 65 Shore D
- » Versatile processing and curing options
- » For all types of projects such as: bellows, car bumpers, hoses, wheels, parts with clips etc.

THE VERSATILE HPE

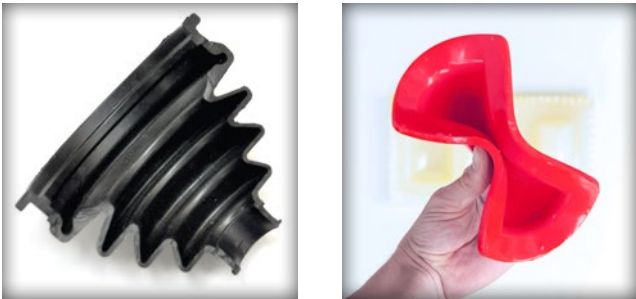
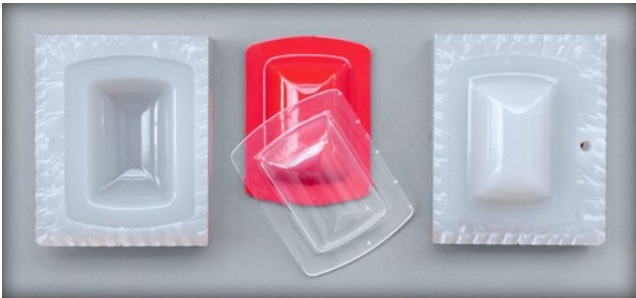
- » Offers **high mechanical properties** with a curing at room temperature or in an oven
- » **Good chemical resistance**, suitable for submarine or engine environments
- » Recommended for both small and massive parts, from seals to moulds

NEW THE QUICK FASTELAST

- » **Fast demoulding and strong properties** within 1 to 2 hours
- » Colourable parts to give life to your prototyping projects
- » Adapted to vacuum casting application

NEW THE SEMI-RIGID HPR65

- » Intermediate hardness between a rigid product and a rubber-like material
- » **High impact resistance and flexibility**, suitable for living hinges applications or foundry models
- » Limited exothermic reaction for **mass casting applications**



PU FOR ALL PROTOTYPING PROJECTS

- » High-end vacuum casting resins for demanding jobs
- » Specific solutions for specific requirements: UV-stability, food-contact, fire resistance etc.
- » **Excellence through advanced technical tests**

PR7 SERIES PERFORMANCE MADE SIMPLE

- » Based on the technological assets of PR700: **Long mould-life, high thermal, mechanical and chemical properties**
- » Declined in various rigidities & colourabilities
- » More and more ease for the user

THE NEEDED BASICS FOR DAILY JOBS

- » Those resins are convenient for simple jobs and small series
- » Declined in various rigidities to answer all your project requirements
- » Faster demoulding with the addition of **NEW SYNFILL G** fibreglass filler

EVERLASTING TRANSPARENCY TRADITION

- » **UV-stable & mercury-free** materials
- » A stunning combination of thermal, mechanical and optical properties for clear projects like automotive lights
- » Adapted solutions for **mass casting** with the **NEW CRISTAL HRI 35**



FLAME RETARDANT MATERIALS FOR SPECIFIC STANDARDS

- » Self-extinguishing to reach the UL94 V0 and FAR 25 requirements
- » Available **UL Yellow Card** certification
- » Halogen-free for a limited toxicity
- » **Low aggressiveness** to silicone moulds

PRF100 FOOD GRADE

- » Compliant with a **wide variety of foods** including liquids, for temporary or long contact
- » Water-clear transparency with good colourability

NEW SYNFILL G FIBREGLASS REINFORCEMENT FILLER

- » A handy glass fiber filler to **increase the material rigidity and temperature resistance**
- » Possibility to reach up to a **5400 MPa flexural modulus** for a PA or filled PA equivalent
- » Wide choice of options depending on the filler rate and selected resin



TECHNICAL DATA SYNFILL G

FLEXURAL MODULUS (MPa)				
Filler rate	0 %	15 %	20 %	25 %
PR700	1700	2700	3000	3400
PR777	900	1600	2000	2300
PR408	1600			3350
PR500	2700	4200	4700	5400
PR752	2200	3850	4250	4650

FLEXURAL STRENGTH (MPa)				
Filler rate	0 %	15 %	20 %	25 %
PR700	70	92	95	105
PR777	35	50	58	64
PR408	60			80
PR500	100	118	118	128
PR752	96	125	130	133

HEAT DEFLECTION TEMPERATURE (HDT (°C))				
Filler rate	0 %	15 %	20 %	25 %
PR700	130	140	140	140
PR777	94	115	128	131
PR408	70			70
PR500	70	71	74	75
PR752	150	169	177	177

RUBBER & HDPE



HDPE & PP



SYNTHENE PRODUCT TYPE			HPE ELASTOMER SYSTEM							FASTELAST SYSTEM										HPR65	
Hardness	(Shore A/ D)		40A	50A	60A	70A	85A	35D	55D	35A	45A	50A	60A	65A	75A	80A	86A	93A	65D		
Simulation of ²					rubber								rubber						HDPE/ PP		
Colour of the cured material					transparent amber ⁷					transp.			pearly translucent						transp. amber		
Colourability ³																					
Density	(g/ cm³)		1,06	1,06	1,07	1,07	1,08	1,07	1,07				1,04						1,12		
Flexural modulus	(MPa)	ISO 178																	450		
Maximum flexural strength	(MPa)	ISO 178																	19		
Elongation at break	(%)	ISO 37	270	400	500	800	900	460	325	385	1110	732	765	770	830	630	680	616	36 (ISO 527)		
Tensile strength	(MPa)	ISO 37	2,7	3,6	6	7,2	13	14	16	1,4	2,7	4,7	5,8	8,3	12,5	13	26	22	18 (ISO 527-1)		
Impact resistance	(kJ · m ⁻²)	ISO 179																	20 (notched)		
Tear resistance	(PLI)	ISO 34	11	18	27	40	54	58	70	8	7	15	25	29	41	45	74	60			
Working temperature	(°C)				– 40 ... +90								– 20 ... +80						– 20 ... +85		
Mixing ratio (P : P/ Iso : Iso)	(in weight)		100:100	75:8:100	50:16:100	25:24:100	32:100	50:50:50	75:100	100:30	90:10:37	85:15:41	75:25:48	60:40:58	45:55:69	30:70:79	10:90:93	100:100	100 : 74		
Mix viscosity by 25 °C	(mPa · s)		2000	2400	2700	3000	3200	1800	1300	350	310	310	300	300	300	300	300	300	885		
Pot life by 25 °C	(min)		60	55	50	45	40	25	18	12	10	8 ½	12 ½	10 ½	6	7	5	6	13		
Demoulding time by 70 °C	(min)		180	180	180	180	180	120	120	120	60	60	60	60	60	60	60	60	120		
Linear shrinkage thickness by 23 °C	(mm/ m)				7					5						5			7		
App. maximum wall thickness	(mm)		~ 100	~ 80	~ 80	~ 60	~ 50	~ 30	~ 20	30	30	30	30	30	30	20	20	20			
Mould life in silicone ⁴	(number of parts)				40 +								25 +						30 +		
Standard & alternative packaging	(kg)				20 (P/ Iso)	6 (P/ Iso)	16 (mix P & Iso)						6 (P/ Iso)			12 (mix P & Iso)				10,44 17,4	
Shelf life ⁵	(months)				18								12 (P)			6 (Iso)				18	
Available documentation ⁶																					
Annotations			› Casting by hand or machine › Curing at room temperature or in oven › Very good mechanical and chemical resistance							› Suitable for vacuum casting machine application › Strong parts in a short demoulding time › Colourable material							› Casting by hand or machine › High impact resistance › Can be used for massive parts				

1 The exact data are available in our TDS. The thermal and mechanical properties have been tested under specific conditions of curing and post-curing

2 Simulation of plastic once the resin is cured

3 All the colours indicated in this document are illustrative and not contractual

4 Silicone mould life: according to our experience, depending on the mould geometry, surface, demoulding time, kind of silicone, etc.

5 On unopened jerry-cans or bottles

6 flame resistance, chemical resistance, dielectric properties, thermal conductivity, food compatibility, optical properties

7 Under UV action, the colour tends to darken



ABRASION
RESISTANT



CHEMICAL
RESISTANT



IMPACT
RESISTANT



TEAR RE-
SISTANT



FLEXIBLE



FOOD
GRADE



LONG
MOULD
LIFE



LONG
SHELF LIFE



REDUCED
SMELL

SYNTHENE PRODUCT OVERVIEW 2022.1 ¹ RESINS			HDPE, PP & ABS PR7 SERIES				ABS, PA & PC FOR DAILY JOBS			TRANSPARENT & UV-STABLE			FLAME RETARDANTS		FOOD- GRADE	
SYNTHENE PRODUCT TYPE			PR740	PR777	PR700	PR752	PR408 PR1508	PR2000	PR500	PRC1810	PRC1819	CRISTAL HRI 35	PRA794	PRA730	PRF100 ⁹	
Hardness (Shore A/ D)			70D	75D	82D	87D	77D	80D	85D	85D	85D	84D	80D	81D	82D	
Simulation of ²			HDPE/ PP	HDPE/ PP	ABS	ABS	ABS	ABS	ABS, PA & PC	ABS/ PC/ PMMA			ABS	ABS	PC/ ABS	
Colour of the cured material			gold–transp. ⁷	milky/ beige ⁷	black	gold–transp. ⁷	milky/ white	milky/ white	clear transp.	clear transparent			black/ brown	dark grey	clear transp.	
Colourability ³																
Density (g/ cm ³)			1,11	1,13	1,14	1,16	1,12	1,13	1,16	1,1	1,1	1,21	1,16	1,2	1,05	
Flexural modulus (MPa) ISO 178			590	930	1700	2200	1600 1700	2000	2600	2200	2100	2000	1100	2100	2000	
Maximum flexural strength (MPa) ISO 178			25	36	70	96	60	80	102	88	80	75	65	63	75	
Elongation at break (%) ISO 527			> 50	35	13	5	10 13	5	10	6,5	14	5	5	4	14	
Tensile strength (MPa) ISO 527-1			> 20	36	60	75	39	57	78	65	60	60	60	41	47	
Impact resistance (kJ · m ⁻²) ISO 179			24 (notched)	91	60	11.4	28 32	30	69	84	90	50	20	16	102	
Heat deflection Temperature ⁸ (°C) ISO 75			96	110	130	150	70 71	101	93	84	86	62	130	130	71	
Working temperature (°C)																
Mixing ratio (P : Iso) (in weight)			120 : 100	100 : 100	80 : 100	60 : 100	50 : 100	50 : 100	40 : 100	56 : 100	56 : 100	65 : 100	80 : 100	100 : 72	100 : 130	
Mix viscosity by 25 °C (mPa · s)			1000	700	600	1000	250	350	600	450	450	650	1100	2500	420	
Pot life by 25 °C (min)			7 ½	10	7	6 – 8	5 12	6	5	9	19	35	7 – 8	8	14	
Demoulding time by 70 °C (min)			40	45	45 – 60	50	60 120	60	45	120	180	120	45	45	240	
Linear shrink. thickness by 23 °C (mm/ m)			7	7	7		4	4	3		3	3	8		3	
App. maximum wall thickness (mm)							~ 5			~ 10	~ 50	100	~ 20		~ 10	
Mould life in silicone ⁴ (number of parts)			30 – 50	30 – 50	30 – 60	30 – 50	15 – 20	15 – 20	20	20	20		30 – 50	30 +	20	
Standard & alt. packaging (kg)			13,2	12 20	10,8 18	16	15	12 15	11,2	10,02 16,8	10,02 16,8	9,9 16,5	18	17,2	11,7 17,7	
Shelf life ⁵ (months)			18	18	18	18	12	12	6	12	12	12	18	12	9	
Available documentation ⁶																
Annotations			› Flexible product › Colourable › Suitable for living hinges › Long mould life	› Very strong material › Colourable › Intermediary rigidity › Long mould life › Flame retardant according to EN 60695-11-10A (HB)	› Very good all round properties › Extremely long mould life › Flame retardant according to EN 60695-11-10A (HB)	› Very high thermal and mechanical properties › Long mould life	› ABS-like all-round colourable material › Limited exothermy › two potlife options to adapt to the part dimensions	› ABS-like all-round material › Colourable › Good mechanical properties	› Very good mechanical properties at demoulding › Colourable	› Limited aggressiveness against silicone › Transparent like glass › Flame retardant according to EN 60695-11-10A (HB)	› Limited aggressiveness against silicone › Transparent like glass › Flame retardant according to EN 60695-11-10A (HB)	› Suitable for mass casting › Transparent like glass › Very high refractive index	› Self-extinguishing › UL Recognized Component Yellow Card: E523647 (V0) › Long mould life	› Self-extinguishing according to FAR 25	› Suitable for temporary & long food contact › Suitable for a wide variety of foods including liquids › Colourable	
¹ The exact data are available in our TDS. The thermal and mechanical properties have been tested under specific conditions of curing and post-curing																
² Simulation of plastic once the resin is cured																
³ All the colours indicated in this document are illustrative and not contractual																
⁴ Silicone mould life: according to our experience, depending on the mould geometry, surface, demoulding time, kind of silicone, etc.																
⁵ On unopened jerry-cans or bottles																
⁶ flame resistance, chemical resistance, dielectric properties, thermal conductivity, food compatibility, optical properties																
⁷ Under UV action, the colour tends to darken																
⁸ After heat treatment																
⁹ Contains SVHC																
			<div><div>CHEMICAL RESISTANT</div><div>HEAT RESISTANT</div><div>IMPACT RESISTANT</div><div>FOOD GRADE</div><div>TRANSP & UV STABLE</div><div>LONG MOULD LIFE</div><div>LONG SHELF LIFE</div><div>REDUCED SMELL</div><div></div></div>													

IN ACCORDANCE WITH

REACH	EC Regulation 1907/2006, SVHC list in force
RoHS	Directive EU 2011/65, 2015/863 & 2017/2102
End-of-life vehicle directive	2000/53/EC
WEEE Directive	2002/96/EC
Directive related to cosmetic products	2000/11/EC
Recycling compliance	IMDS (mdsystem.com)



ABOUT SYNTHENE

The innovative chemical company, located in France, was founded in 1958. We provide **specific formulation and high quality industrial solutions.**

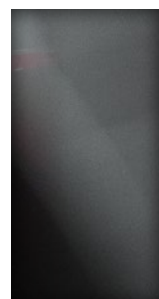
We place a particular emphasis on offering high-performance products, with **cautiously selected raw materials from trustworthy manufacturers.**

All our prototyping resins meet the current requirements of REACH.

A DEDICATED TEAM

Our chemists and technical team studies your list of specifications and develops with your organisation **tailor-made formulas adapted to your requirements.**

Excellence is valued and ensured through advanced technical tests and follow-up of our partners' projects.



SYNTHENE HEADQUARTERS

45 Ferme de l'Evêché
60723 Pont Sainte Maxence
France

T +33 3 44 31 72 00

F +33 1 57 67 44 58

comm@synthene.com

www.synthene.com

