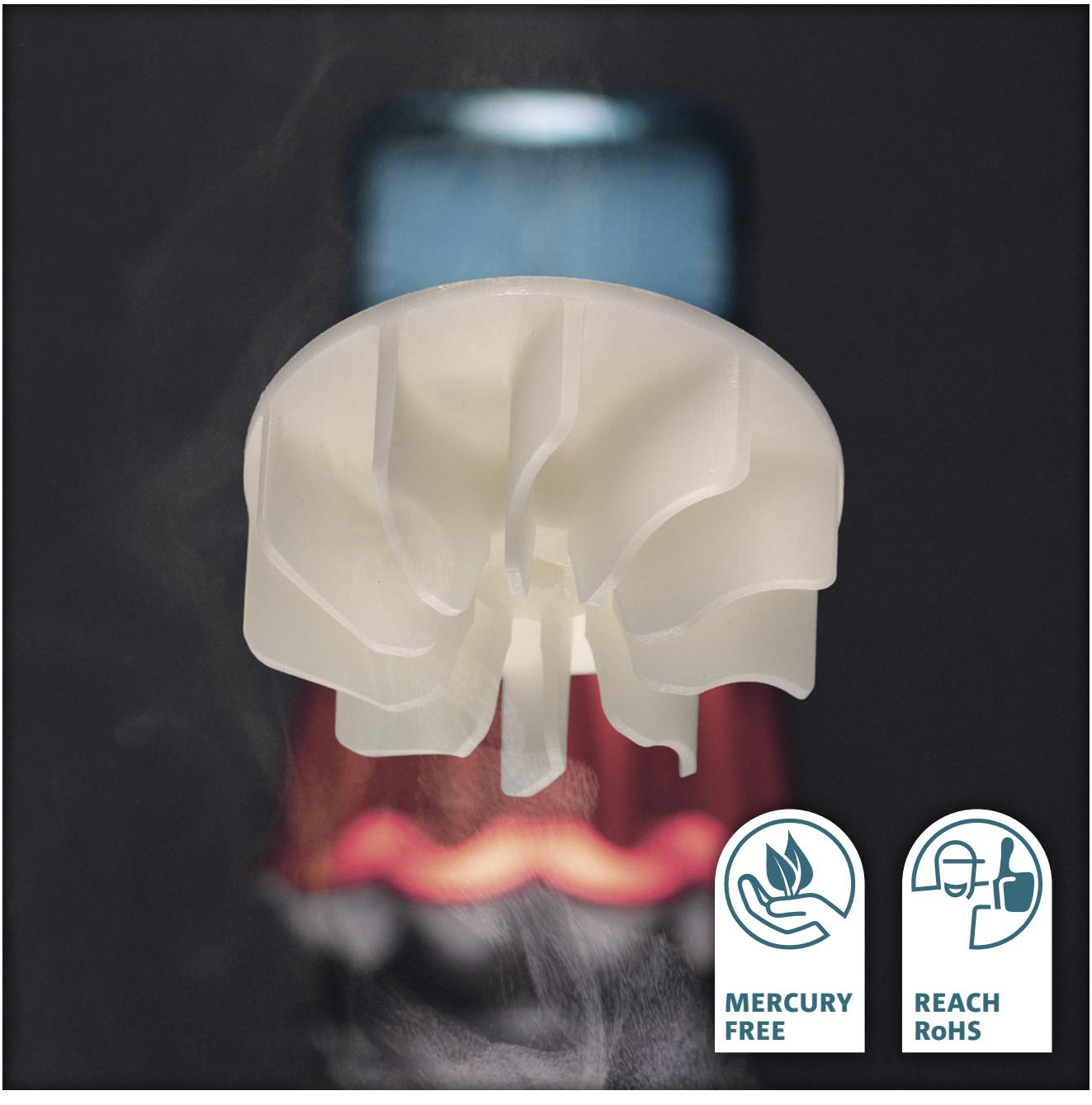
INNOVATION AND QUALITY IN PU SOLUTIONS

SYNTHENE
PRODUCT OVERVIEW 2024.11

POLYURETHANE ELASTOMERS AND RESINS



THERMOSET PU FOR INDUSTRIAL AND PROTOTYPING PROJECTS
HIGH PERFORMANCE FROM SOFT TO RIGID

- Wearproof 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 ISO 9001 : 2015

BUREAU VERITAS Certification

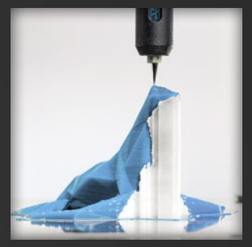
SYNTHENE 2024-11-08 001 EN

NOUS FORMULONS VOS SUCCES.
SINCE 1958

» **SYNTHENE**'s core activity is above all product **formulation and development**

» Our R&D laboratory formulates **tailor-made materials** to support your development projects

» **SYNTHENE**'s testing and production facilities **ensure high quality** from idea to delivery



HIGH EXPERTISE IN PU

» Polyurethane solutions for all types of parts **from soft to rigid,** for a lot of different production processes like hand casting, vacuum casting, 2-component mixing machine and 3D printing

» **SYNTHENE** emphasizes safer and more environmental-friendly formulas for a more **sustainable chemistry**

» At home in many industries: automotive, aerospace, construction, medical etc.

» **NEWS** **SYNTHENE** is a pioneer in formulating **thermoset PU** elastomers designed for **Additive Manufacturing**

Got a challenging project?
Contact our team to formulate a specific thermoset polyurethane.

comm@synthene.com
+33 3 44 31 72 00

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**

PRF100 FOOD GRADE

» Certified for a contact with a **wide variety of foods** including liquids, for temporary or long exposure

» **Water-clear transparency** with good colourability

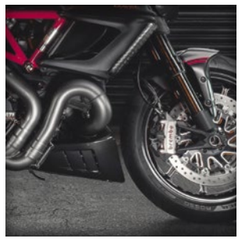
» Compliant with 10/2011 EU regulation **similar to FDA**

SYNFILL G FIBREGLASS REINFORCEMENT FILLER

» A handy glass fiber filler to **increase the material rigidity** and **temperature resistance**

» Possibility to reach up to a **4650 MPa flexural modulus** for a PA or filled PA equivalent

» Wide choice of options depending on the filler rate and selected resin



PR7 SERIES PERFORMANCE MADE SIMPLE

» **PR740, PR777 & PR752** are based on the technological assets of the proven and highly praised **PR700:** **long mould-life, high thermal, mechanical and chemical properties**

» Available in various rigidities & colourabilities

» Enhanced user-friendliness due to short demoulding time

THE NEEDED BASICS FOR DAILY JOBS

» The **PR408, PR1508 & PR2000** are convenient for simple jobs and small series

» ABS-like colourable resins with **easy 1:2 mixing ratio**

EVERLASTING TRANSPARENCY TRADITION

» **UV-stable & mercury-free** materials

» **PRC1810 & PRC1819** show a stunning combination of thermal, mechanical and optical properties for clear projects like automotive lights

» Adapted solutions for **mass casting** with the **CRISTAL HRI 35**

FIRE RESISTANT PRA794 & PRA730 FOR SPECIFIC STANDARDS

» Self-extinguishing to reach the UL94 V0 and FAR 25 requirements

» Available **UL Yellow Card certification**

» **Low aggressiveness** to silicone moulds

NEW FLAME RETARDANT PRA610

» **Very rigid fire resistant material** according to EN 60695-11-10B (V0)

» **Whitish** material with **very good all-round mechanical properties**

» High efficiency due to **long pot life** and **short demoulding** time

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
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
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
PR752	150	169	177	177

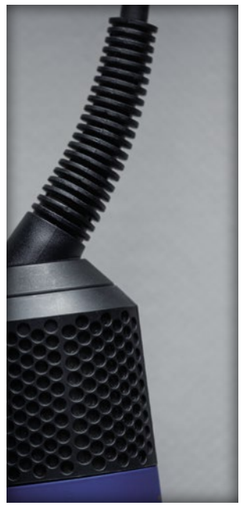
SYNTHENE
PRODUCT OVERVIEW 2024.11 [1]
RESINS

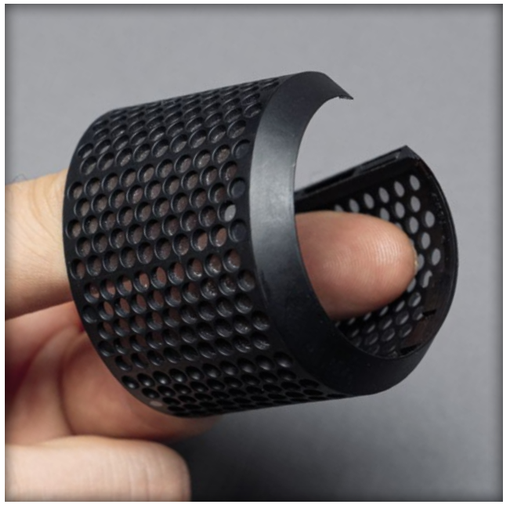
			HDPE, PP & ABS PR7 SERIES				ABS, PA & PC FOR DAILY JOBS		TRANSPARENT & UV-STABLE			FLAME RETARDANTS			FOOD-GRADE
												NEW			
SYNTHENE PRODUCT TYPE			**PR740**	**PR777**	**PR700**	**PR752**	**PR408** PR1508	**PR2000**	**PRC1810**	**PRC1819**	**CRISTAL HRI 35**	**PRA610**	**PRA794**	**PRA730**	**PRF100**
Hardness	(Shore A/ D)		70D	75D	82D	87D	77D	80D	85D	85D	84D	83D	80D	81D	82D
Simulation of [2]			HDPE/ PP	HDPE/ PP	ABS	ABS	ABS	ABS		ABS/ PC/ PMMA		filled ABS/ PA	ABS	ABS	PC/ ABS
Colour of the cured material			gold–transp. [7]	milky/ beige [7]	black	gold–transp. [7]	milky/ white	milky/ white		clear transparent		transl. ivory	black/ brown	dark grey	clear transp.
Colourability [3]															
Density	(g/ cm³)		1,11	1,13	1,14	1,16	1,12	1,13	1,1	1,1	1,21	1,18	1,16	1,2	1,05
Flexural modulus	(MPa)	ISO 178	590	930	1700	2200	1600 1700	2000	2200	2100	2000	3100	1900	2100	2000
Maximum flexural strength	(MPa)	ISO 178	25	36	70	96	60	80	88	80	75	113	65	63	75
Elongation at break	(%)	ISO 527	> 50	35	16	13	10 13	5	6,5	14	5	5	5	4	14
Tensile strength	(MPa)	ISO 527-1	> 20	36	60	75	39	57	65	60	60	72	57	41	47
Impact resistance	(kJ · m⁻²)	ISO 179	24 (notched)	91	60	30	28 32	30	84	90	50	30	20	16	102
Heat deflection Temperature [8]	(°C)	ISO 75	96	110	130	150	70 71	101	84	86	62	97	130	105	71
Mixing ratio (P : Iso)	(in weight)		120 : 100	100 : 100	80 : 100	60 : 100	50 : 100	50 : 100	56 : 100	56 : 100	65 : 100	75 : 100	80 : 100	100 : 72	100 : 130
Mix viscosity by 25 °C	(mPa · s)		1000	700	600	1000	250	350	450	450	650	500	1100	2500	420
Pot life by 25 °C	(min)		7½	10	7	7	5 12	6	9	19	35	10	7 – 8	8	14
Demoulding time by 70 °C	(min)		40	45	45	50	60 120	45	120	180	180	45	45	45	240
Linear shrinkage [8]	(mm/ m)		7	7	7	7	4	4	7	7	3	5	7		3
App. maximum wall thickness	(mm)								~ 10	~ 50	100	6	~ 20		~ 10
Mould life in silicone [4]	(number of parts)		30 – 50	30 – 50	30 – 60	30 – 50	15 – 20	15 – 20	20	20		25	30 – 50	30 +	20
Standard & alt. packaging	(kg)		**13,2**	12 **20**	10,8 **18**	**16**	**15**	**12** 15	**10,02** 16,8	**10,02** 16,8	**9,9** 16,5	**10,5**	**18**	**17,2**	**11,7** 17,7
Shelf life [5]	(months)		18	18	18	18	12	12	12	12	12	9	12	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 › Flame retardant according to EN 60695-11-10A (HB)	› 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	› 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	› Flame retardant & self-extinguishing according to EN 60695-11-10B (V0) › Very good all-round properties › Short demoulding time	› 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

CHEMICAL RESISTANT · HEAT RESISTANT · IMPACT RESISTANT · FOOD GRADE · TRANSP & UV STABLE · LONG MOULD LIFE · LONG SHELF LIFE · REDUCED SMELL

Synthene





ELASTOMERS FOR ALL APPLICATIONS

» 2 ranges of elastomers offering a **wide range of hardnesses** between 40 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

THE SEMI-RIGID HPR65

» Intermediate hardness between a rigid product and a rubber-like material

» **High impact resistance and flexibility,** suitable for projects with living hinges or foundry models

» Limited exothermic reaction for **mass casting applications**

SYNTHENE
PRODUCT OVERVIEW 2024.11 [1]
ELASTOMERS

			RUBBER & HDPE							HDPE & PP
SYNTHENE PRODUCT TYPE										**HPR65**
HPE ELASTOMER SYSTEM										
Hardness	(Shore A/ D)		40A	50A	60A	70A	85A	35D	55D	65D
Simulation of [2]						rubber				HDPE/ PP
Colour of the cured material						transparent amber [7]				transp. amber
Colourability [3]										
Density	(g/ cm³)		1,06	1,06	1,07	1,07	1,08	1,07	1,07	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	78 (ISO 527)
Tensile strength	(MPa)	ISO 37	2,7	3,6	6	7,2	13	14	16	18 (ISO 527)
Impact resistance	(kJ · m⁻²)	ISO 179								20 (notched)
Tear resistance	(PLI)	ISO 34	11	18	27	40	54	58	70	
Working temperature	(°C)					– 40 … + 90				– 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 : 74
Mix viscosity by 25 °C	(mPa · s)		2 000	2 400	2 700	3 000	3 200	1 800	1 300	885
Pot life by 25 °C	(min)		45	45	50	45	40	25	18	13
Demoulding time by 70 °C	(min)		180	180	180	180	180	120	120	120
Linear shrinkage after post-curing	(mm/ m)					7				7
Mould life in silicone [4]	(number of parts)					40 +				30 +
Standard & alternative packaging	(kg)				**20** (P/ Iso)	**6** (P/ Iso)	**16** (mix P & Iso)			10,44 **17,4**
Shelf life [5]	(months)					18				18
Available documentation [6]										
Annotations			› Casting by hand or machine › Curing at room temperature or in oven › Very good mechanical and chemical resistance							› 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

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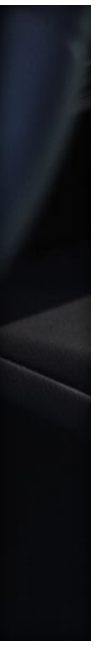
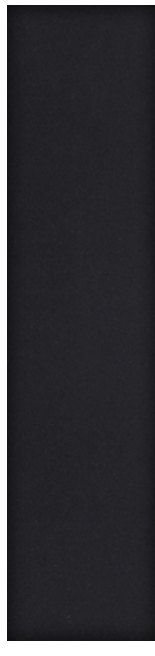
ABRASION RESISTANT · CHEMICAL RESISTANT · IMPACT RESISTANT · TEAR RESISTANT · FLEXIBLE · LONG MOULD LIFE · LONG SHELF LIFE · REDUCED SMELL

Synthene

IN ACCORDANCE WITH

REACH	EC Regulation 1907/2006
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.**

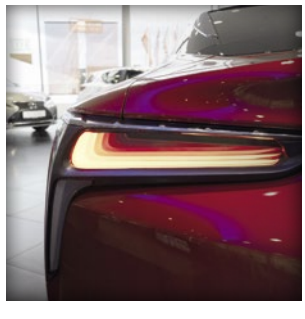
All our prototyping resins meet the current requirements of REACH.

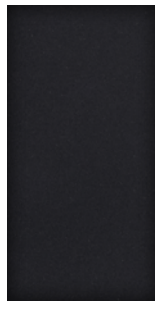
A DEDICATED TEAM

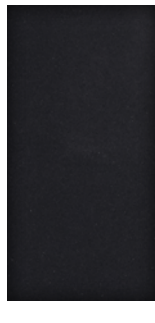
SYNTHENE's **highly trained** sales and technical team **helps you in the selection** of the optimal product for your project and **assists you in every step** of the prototyping or manufacturing process.

Our **network of distributors ensures fast delivery** and competent customer support **all around the world.**

All technical documents are available on our website. **Extended test reports and certificates** can be requested via email.







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