A. Schulman Speciality Powders

ICORENE®

Powders for Rotomoulding

High Performance Specialty Grades 2015

Contents Summary Sheet

Colour	ICORENE®	Density	MFI	Characteristics	Typical Applications
Natural	1060 ESF	0.934	8	Enhanced Surface Finish will eliminate pinhole problems. While providing excellent mechanical properties.	Medical and hygiene mouldings, point of sale and other design applications requiring a high quality finish.
Natural	1505	0.945	na	Cross link HDPE superior ESCR, chemical resistance and flow.	Hydraulic oil & fuel tanks, chemical tanks and abrasion applications.
Black	1505 Black 9001	0.945	na	Black cross link HDPE for toughness, ESCR, chemical resistance, superflow.	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	A highly adhesive grade, excellent chemical resistance, lower processing times.	Rotolining of tanks and pipes requiring high chemical resistance. eg: Fire extinguishers.
Natural & Black	4014	0.900	15	PP copolymer. Used for its higher stiffness, temperature & scratch resistance. Easy to mould. UV stabilised.	Engine components, small tanks, ducting and industrial housings.
Natural & Black	4035	0.900	30	PP copolymer, With higher stiffness vs PE combined with high flow characteristics and improved impact.	Engine components, small tanks, ducting and industrial housings.
Natural & Black	7620 Fuel Lock™	1.050	na	Nylon 6. Very good temperature and fuel permeation resistance. stabilised. Also available: 7620 Black.	Engineering performance products eg. Automotive ducting and CNG tank lining.
Natural	9005	1.020	na	Nylon 12. Easy to mould, exhibiting high temperature resistance.	Engineering performance products eg. Two layer automotive fuel tanks.
Off White, Light Grey & Dark Grey	9105 V0	>1.00	na	UL94 V0 rated for 5mm flame retardant PE. Easy moulding. Specific colours only.	Tanks, machine covers and bins required to have flame retardancy.
Natural & Black	9402	0.890	30	Optimum hot and cold Elastomer, soft touch, easy to process and extremely tough.	Furniture, marine buffers and automotive ducting.
Natural & some tints	9909	1.20	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 mould exhibiting EXTREMELY high temperature and chemical resistance.	Typically chemical tanks and ducts, continuous service temp to 120C.

ICORENE® Speciality Grades

At **A .Schulman** we strive to provide the rotational moulding industry with the most comprehensive and technical grade slate available in Europe.

The ability to call on our experiences from our other business units such as Engineering plastics and Masterbatch, provides the Specialty powder division with resources that cannot be matched by our competitors.

Enclosed you will find the high performance specialty grades for rotational moulding that will enable new products and applications to be explored. This will provide OEM's with alternatives to other processes that they are currently using.

ENJOY!



ICORENE® 1060

(ESF) Enhanced Surface Finish

Designer Furniture

Outdoor bench

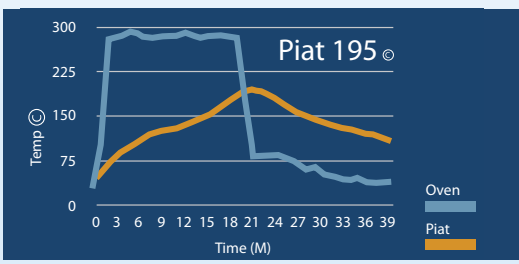
“ESF will improve your quality to the next level.”

Moulders have always battled with pinholes on the surface of products. High flow grades have been used in the past, however they have poor physical properties. A.Schulman Specialty powders in collaboration with its Master batch division have produced a grade that when processed correctly, produces a remarkable “Enhanced Surface Finish” with excellent mechanical properties that cannot be matched in the market place.

Perfect for mouldings in applications such as hygienic or medical environments and high value products such as furniture.
Bring your quality up to a new level with Icorene 1060 Enhanced Surface Finish.

Features:

- Smooth surface
- Good flow
- Easy processing
- Good physical properties
- No surface pinholing



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ICORENE® 1505
Xlink

Chemical storage tanks

Diesel tank

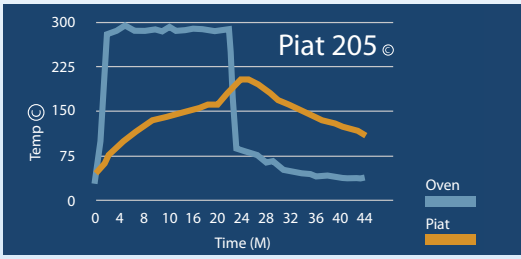
"Performance Advantages and a Remarkable Toughness"

When making plastic parts, maintaining a balance between high molecular weight attributes and low molecular weight processing flow can be a challenge. Cross-linkable ICORENE® high density polyethylene resins are unique materials that offer rotational moulders the advantage of high-flow moulding and high molecular weight part performance.

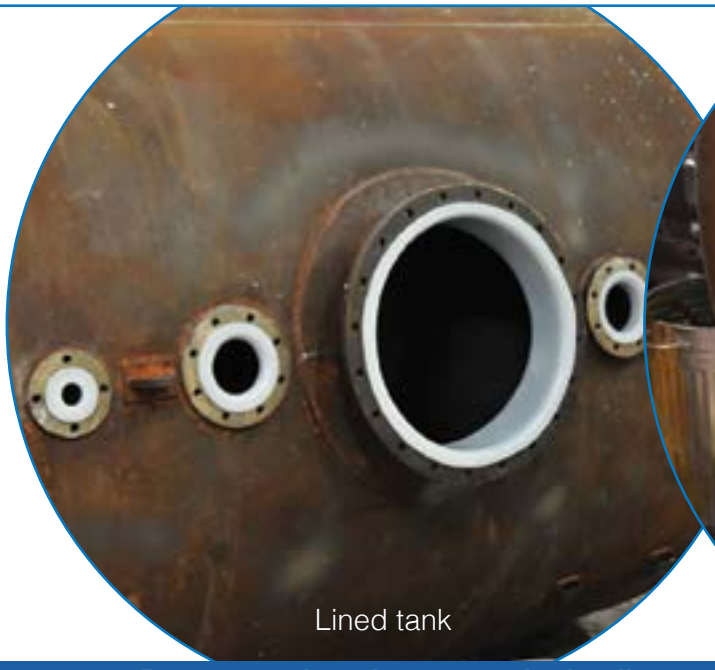
Cross linkable PE powder moulds in a similar way to normal HDPE powder but reacts in the mould with heat to form a continuous molecular structure that will not re-melt and flow as a standard HDPE would.

Features:

- Rapid melting
- High part definition
- Low odour
- High-notched impact strength
- Outstanding ESCR
- Excellent thermal resistance



ICORENE® 1869
Rotolining


Lined tank

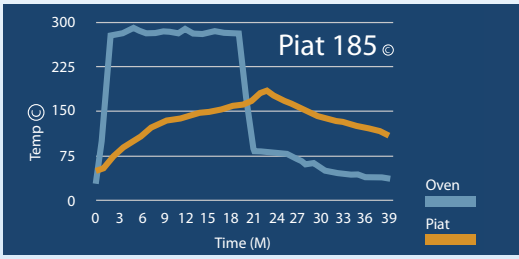

Flange of lined tank

"Proven product, known as the leading grade in rotolining"

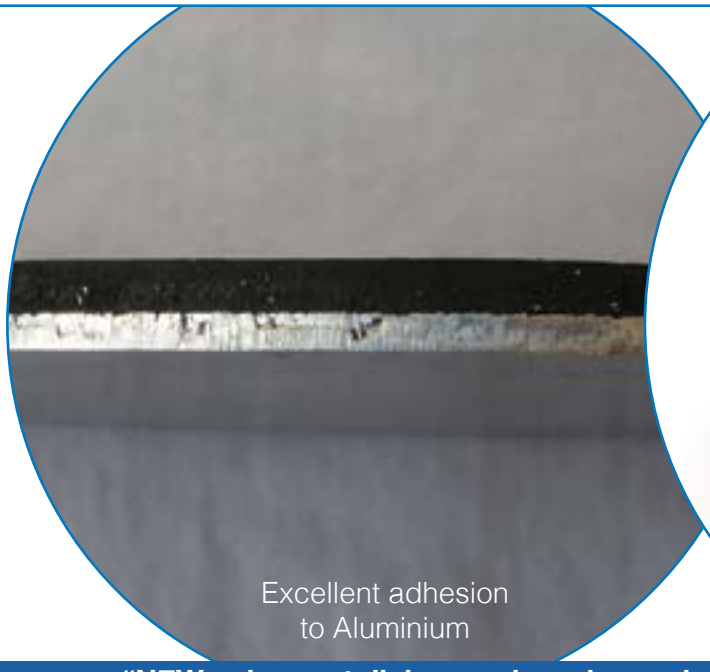
Standard roto moulding LLDPE and HDPE grades will shrink away from the metal when used for lining tanks and pipes. Icorene 1869 has been designed using a high performance additive package formulated to provide an excellent bonding to metal surfaces during processing. Rotolining provides a corrosion resistant coating that will give years of protection.

Features:

- High adhesion
- Excellent bond to pre-treated metal
- Easy processing
- Good physical properties
- Corrosion protection



ICORENE® 1870
Rotolining



Excellent adhesion
to Aluminium

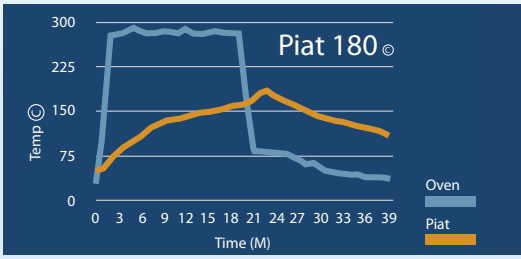
Fire extinguisher lining

“NEW unique rotolining grade, enhanced adhesion and chemical resistance”

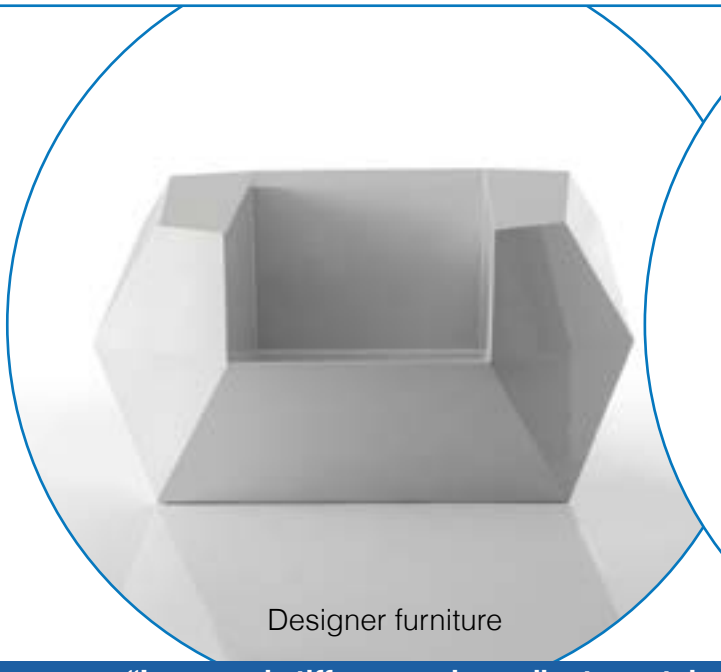
This new rotolining formulation with outstanding adhesion can be used at half the thickness of other rotolining grades. Icorene 1870 is a thermoplastic material that has been specifically developed using the formulation experience of A. Schulman in polymer technology.

Features:

- Excellent adhesion
- Outstanding bond to pre-treated metal
- Tough and long lasting
- Good physical properties
- Enhanced corrosion protection



ICORENE® 4014
Polypropylene



Designer furniture

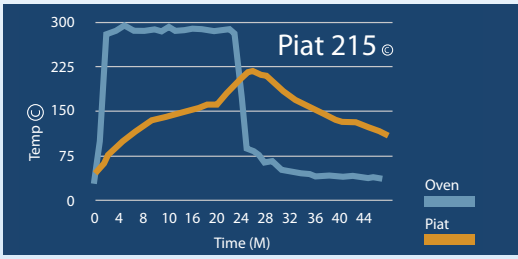
Hay Steamer

"Improved stiffness and excellent scratch resistance"

When the application requires an increased stiffness or a higher temperature resistance that PE cannot meet, then Icorene 4014 is an ideal grade choice. It is a copolymer that has been exclusively developed for rotational moulding with an excellent balance in properties, yet easy to mould.

Features:

- High temperature resistance
- High stiffness & creep resistance
- Excellent scratch resistance
- UV stabilised
- Available in colours



ICORENE® 4035
Polypropylene

Control panel

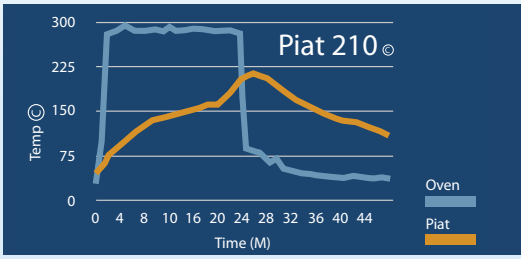
Side mirror casings

“High Impact rotational moulding polypropylene, that moulds well!”

Rotational moulding polypropylenes have always lacked an important material property; impact resistance.
Icorene 4035 exceeded our expectation during its recent development, with Impact @ 23© up to 6 times higher, Impact @ 0© up to 8 times higher and Elongation at break 3 times higher than the leading PP grades available in Europe.

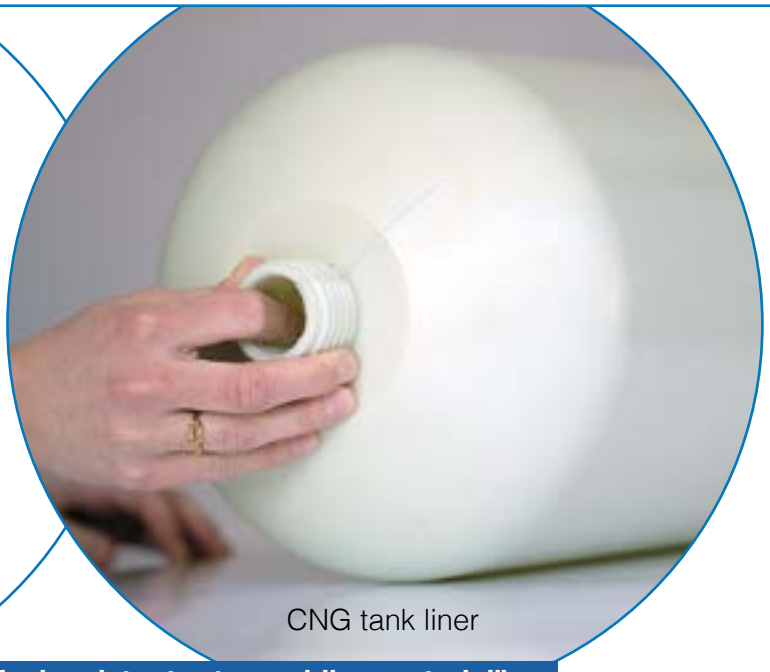
Features:

- Excellent Impact properties
- Good stiffness & creep resistance
- High scratch resistance
- UV stabilised
- Available in colours



ICORENE® 7620
Fuel Lock™

Petrol tank



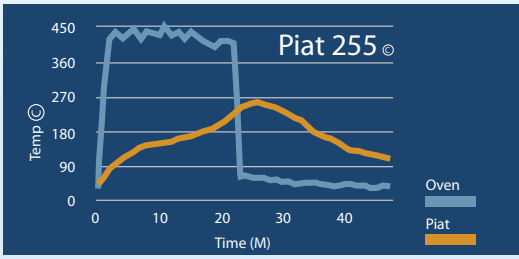
CNG tank liner

"Finally, a cost effective single layer fuel resistant rotomoulding material"

ICORENE® Fuel Lock™ powder represents an exciting new PA6 rotomoulding material option derived from a technical collaboration between A.Schulman and DSM Engineering Plastics. It is a unique new PA6 polymer based material from DSM research with their new Fuel Lock™ technology for optimum performance in fuel permeation resistance and excellent physical properties especially in direct contact with fuel.

Features:

- Excellent additive package specifically designed for rotomoulding
- Permeation resistance to Petrol and Alcohol fuels
- Very stiff, Flexural Modulus 1700 MPa
- Good impact resistance to –40 °C
- Chemical resistance
- Permeation barrier
- Low temp impact
- High heat performance



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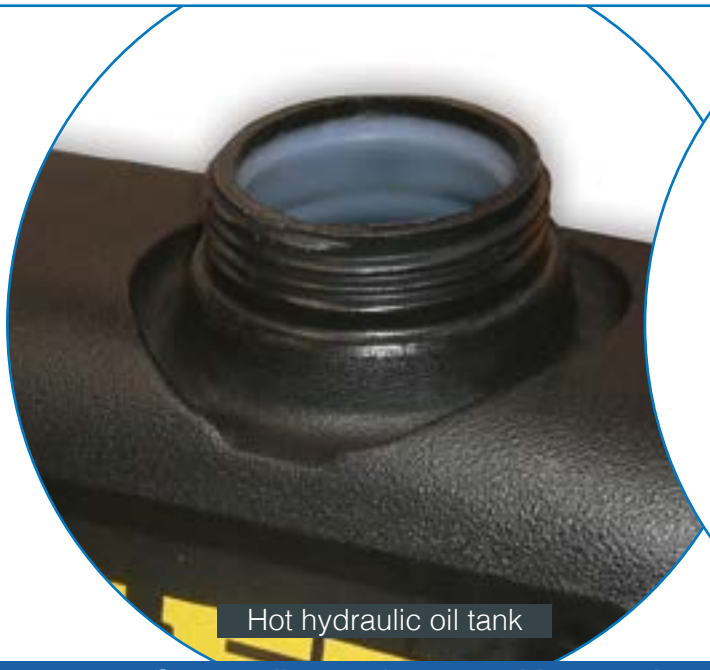
ICORENE® 9005
Nylon 12



Hot hydraulic oil tank

Air ducting

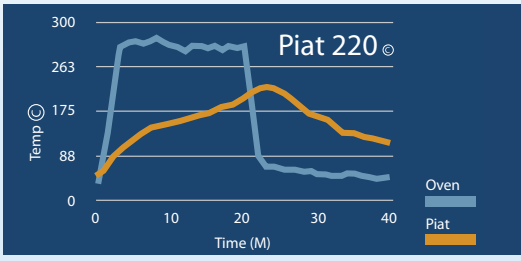
"Outstanding performance history, why gamble with anything else"

ICORENE® 9005 is a nylon 12 powder purposely developed for use in rotational moulding and is suitable for use in many different applications.
It has good overall mould ability, high stiffness and high temperature resistance.

COMMENT: Leading European Nylon 12 moulder.
"*Other nylon 12 grades might be cheaper on the market, but they do not have the proven performance over many years like Icorene 9005*"

Features:

- Easy to mould, no Nitrogen purging needed.
- Excellent high temp resistance.
- Superb fuel permeation resistance.
- Exceptional resistance to stress cracking.
- Good abrasion resistance.
- Excellent HDT



ICORENE® 9105
VO Flame Retardant

Waste bio-digester

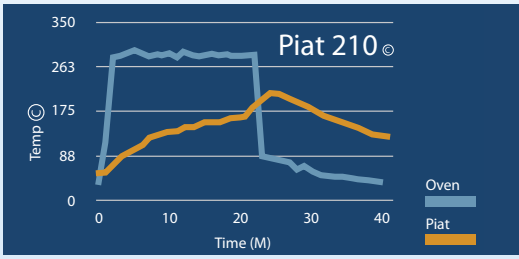
Medical waste bins

“Flame retardant with V0 characteristics! We have been waiting for years”

Many applications in the building, construction, transport and mobility sector specify a high flame retardancy in the properties of the thermoplastic. Now Icorene 9105 V0 FR meets this requirement opening new opportunities to moulder’s and OEM’s alike.

Features:

- Unique VO FR Properties.
- Easy to process, like HDPE.
- Good surface finish.
- Good mechanical properties.



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ICORENE® 9402
TPE

Floating dock, non-slip

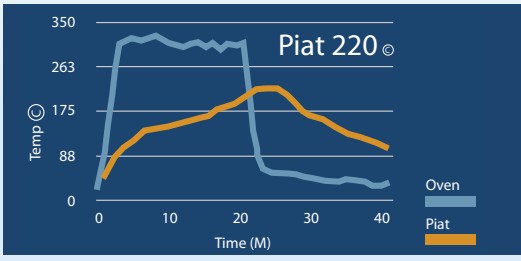
2 shot laminate,
TPE and foam layer

“An interesting grade, no break at -40©! A material that is unbreakable?”

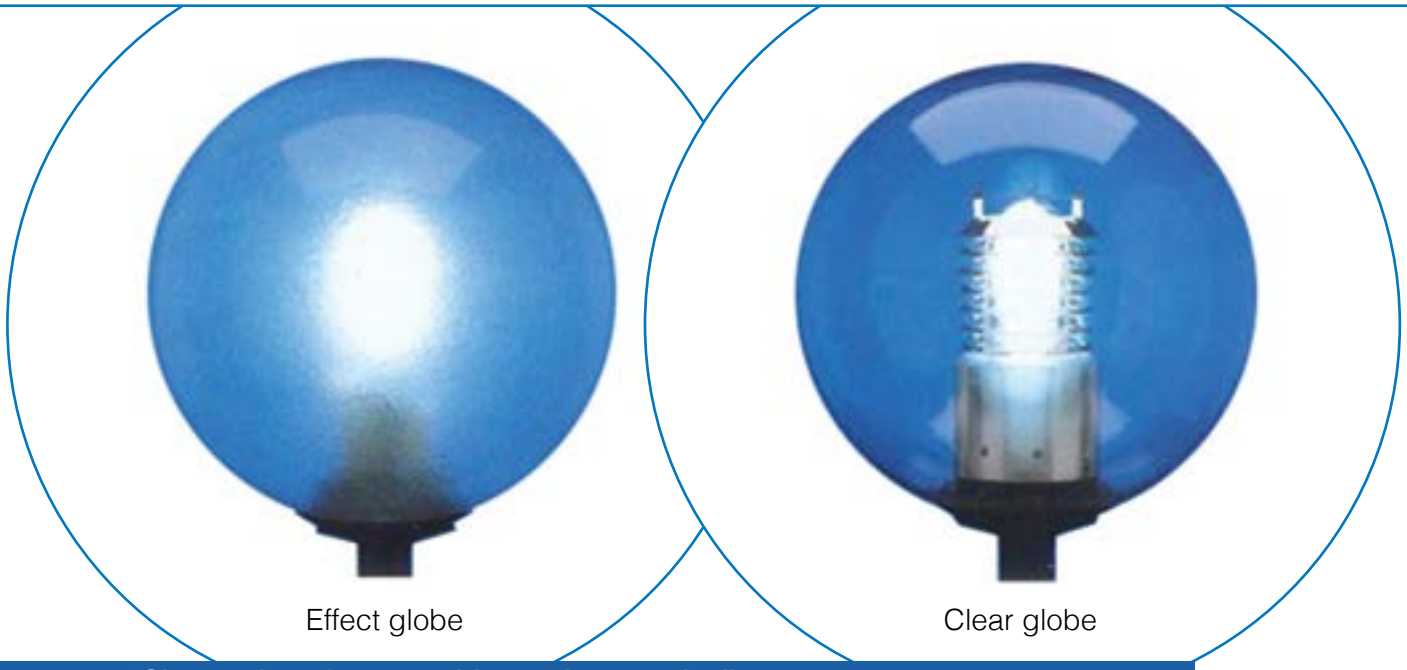
ICORENE® 9402 is an olefin elastomer particularly developed for rotational moulding by A Schulman in conjunction with API Plastics. Offering optimum cold and hot elasticity with UV resistance, it has an interesting appearance with excellent soft touch properties. Ideal applications such as non slip surface, furniture and high temperature applications such as ducting.

Features:

- Unique soft touch.
- Fully UV stabilised and age resistant.
- Non slip properties.
- Cold and hot elsticity.
- Compatible with polyethylene.
- Stiffness reinforcement by multilayer structures (Icorene® 6007 foam).



ICORENE® 9909
Polycarbonate



Effect globe

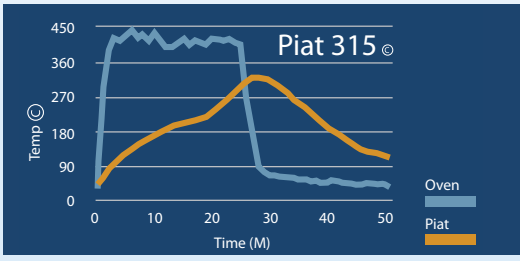
Clear globe

“Clear polycarbonate with good properties”

In the past only a few roto-moulders were able to process Polycarbonate (PC) in Europe. A. Schulman’s goal with the development of ICORENE® 9909 was to generalise the ability to process and enlarge the possible applications for PC. As an amorphous material, the PC is transparent with a glossy finish and exhibits excellent mechanical properties, a high Flexural modulus approx. 2000mpa, good impact strength and very low flame retardancy.

Features:

- Transparent.
- UV stabilised.
- Very high stiffness
- Flame retardant, inherently meets UL94-V2
- Higher oven temperature required.



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ICORENE® 9993
PVDF

Pipework for chemicals

Hot oil reservoir

“Recently described as the superman of all grades”

How many projects in roto moulding have been turned down due to no availability of a suitable material? ICORENE® 9993 PVDF belongs in the fluropolymer family and is the grade when other materials can not handle the specification. An incredibly high chemical resistance and toughness not found with any other roto grade. This is the grade when all other materials fail!

Features:

- Superb chemical resistance.
- High temperature and thermal stability.
- Excellent fire resistance, rated UL94-V0.
- Good resistance to UV radiation.
- Good abrasion resistance.
- Excellent HDT