



<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>





<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>





<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>





<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>

## USUAL PRODUCT RANGE

### FLEXIBLE PVC STRIP & SHEETS

Range	Ref.	Designation
TRANSPARENT	100	Clear blue
	100A	Clear blue Reinforced
	100R	Clear blue Ribbed
	101	Neutral
	101M	Neutral Matt
	105	Polar Clear green
	106	Super polar Clear green
	107	Polar Neutral
	108	Super polar Neutral
	111	Polar Clear blue
	111R	Polar Clear blue Ribbed
	113	Super polar Clear blue
	115	Green
	126	Bronze
	127	Anti-insect Yellow
	127R	Anti-insect Yellow Ribbed
	135	Blue
	140	TP Honey
	141	Red
	170	Fire retardant Clear blue (Thickness 3mm)
	174	85 Sh.A Super UV resistant Neutral
	179	95 Sh.A Super UV resistant Clear blue
OPAQUE	180	Anti-static Clear blue
	183	Super UV resistant Clear blue
	476	Signal red
	828	Polar Texas blue
	150	Silver grey
	153	Jet black
SCREENFLEX EN 1598  Quality for welding screens	154	Traffic blue
	156	Signal white
	161	Coral red
	162	Pure orange
	137E	Light green (Thickness 1mm)
	138E	Light green (Thickness 2mm)
	139E	Light green (Thickness 3mm)
	301E	Red (Thickness 1mm)
	302E	Red (Thickness 2 & 3mm)
	311E	Green Matt (Thickness 1mm)
	312E	Green Matt (Thickness 2mm)
	313E	Green Matt (Thickness 3mm)
	321E	Bronze (Thickness 1mm)
	322E	Bronze (Thickness 2mm)
	323E	Bronze (Thickness 3mm)
	330E	Dark green (Thickness 2mm)
	361E	Dark bronze (Thickness 2 & 3mm)

For other requests please contact our sales department.

## STANDARD DIMENSIONS

*For other requests please contact our Sales Department  
Available qualities, widths and thicknesses may be modified without prior notice.*

## FLEXIBLE PVC SHEETS AVAILABILITY

### STANDARD DIMENSIONS

(Roll length = 20 m)

PRODUCTS			REF.	Width (mm)	Thickness (mm)									
					1	2	3	4	5	6	6,5	7	8	10
TRANSPARENT	Clear blue	100	500											
			800											
			900											
			1000		*	*		*			*			
			1100											
			1200		*	*					*			
			1300											
			1400											
			1500		*	*	*	*			*			
			1600											
			1800											
			2000				*							
			2200					*						
			Clear blue Reinforced	100A		Please contact us. (Usual thicknesses: 6,5mm & 9,5mm)								
	Neutral	101	900											
			1000			*								
			1200											
			1500											
			2000											
	Polar Clear green	105	1500											
	Polar Clear blue	111	1000											
			1200											
			1500											
	TP Honey	140	1000											
	85 Sh.A Super UV resistant Neutral	174		Please contact us										
	95 Sh.A Super UV resistant Clear blue	179												
	Super UV resistant Clear blue	183	1000											
			1500											
OPAQUE	Silver grey	150	800											
			1200											
			1250											
			1500											
	Jet black	153	1200											
	Traffic blue	154	1200											
	Signal white	156	1200											

For other requests please contact our Sales Department

Available quantities, widths and thicknesses may be modified without prior notice

\*

On stock

15 days max.

For other requests please contact our Sales Department

Available qualities, widths and thicknesses may be modified without prior notice.

\* On stock

15 days max.

**extruflex FLEXIBLE PVC TECHNICAL SPECIFICATIONS****- VALUES -**

PROPERTY	Standard	Units	Standard	Reinforced	Polar	Super Polar	Anti-Insect	Anti-static	Fire retardant	Super UV resistant	85 Sh.A	Colored Opaque or Transp.	Screenflex (Welding)
Light transmittance	ASTM D 1003	%	85	85	85	85	<80	85	85	80	85	o to 80	≤ 13
Shore A hardness	EN ISO 868	Sh A	80	80	65	62	80	80	80	80	85	65 to 85	80
Tearing resistance	DIN 53515	N/mm	50	80	28	25	50	50	65	50	65	28 to 65	55
Tensile strength at break	ASTM D 638 EN ISO 527	N/mm <sup>2</sup>	16	16	12	10	16	16	20	16	20	12 to 20	18
Elongation at break		%	340	340	390	420	340	340	280	340	280	280 to 390	300
Residual elong. (after break)		%	68	60	76	80	68	68	60	68	60	60 to 76	62
Thermal conductivity	ASTM C 177	W/m.K	0,16	0,16	0,16	0,16	0,16	0,16	0,16	0,16	0,16	0,16	0,16
Cold bend brittle temp.	ISO 8570	°C	-35	-35	-40	-65	-35	-35	-20	-35	-20	-20 to -40	-25
Min. usage temp.	EN 1876	°C	-15	-15	-25	-60	-15	-15	0	-15	0	-15 to -25	-15
Max. usage temp.		°C	+50	+50	+30	+15	+50	+50	+50	+50	+50	+30 to +50	+50
Vicat softening temp.	EN ISO 306	°C	50	50	48	46	50	50	50	50	50	48 to 50	50
Specific heat capacity	ISO 11357	kJ/kg.K	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6
Sound reduction	DIN 52210	dB	>35	>35	>35	>35	>35	>35	>35	>35	>35	>35	>35
Reaction to fire	NF P 92-507 AS/NZS 3837 DIN 4102	Grade	Grp4 B2	Grp4 B2	-	-	Grp4 B2	Grp4 B2	M2 Grp 3	Grp4 B2	Grp4 B2	- / Grp4 - / B2	EN 1598
UV/IR filter	EN 1598	Filter	-	-	-	-	-	-	-	-	-	-	EN 1598
UV resistance	ISO4892	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High	Yes	Yes	High
Charge buildup	IEC 61087	Sparks	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Surface resistivity	IEC 60093	Ω/□	4.10 <sup>13</sup>	4.10 <sup>13</sup>	4.10 <sup>13</sup>	4.10 <sup>13</sup>	4.10 <sup>13</sup>	2.10 <sup>12</sup>	4.10 <sup>13</sup>	4.10 <sup>13</sup>	4.10 <sup>13</sup>	4.10 <sup>13</sup>	4.10 <sup>13</sup>
Water absorption	EN ISO 62	%	-0,2	-0,2	-0,2	-0,2	-0,2	1 to 1,6	-0,2	-0,2	-0,2	-0,2	-0,2
Anti-insect	-	-	No	No	No	No	Yes	No	No	No	No	No	No
Density	ASTM D 792	g/cm <sup>3</sup>	1,22	1,23	1,18	1,18	1,22	1,22	1,33	1,22	1,29	1,2 to 1,5	1,2 to 1,3

The data contained in this technical specification is given for information only and is based on our current knowledge of the products concerned.  
This information given to our customer in good faith to inform him and to help him in his search, does not constitute any formal or implicit guarantees as to its use.





Racing ahead for safety and environment

# extruflex FLEXIBLE PVC TECHNICAL SPECIFICATIONS

## - DESCRIPTIONS -

PROPERTY	Standard	Description
Light transmittance	ASTM D 1003	Visible light rate transmitted through the material.
Shore A hardness	EN ISO 868	Index based on a flat indenter's penetration depth. Scale from 0 (Soft) to 100 (Hard).
Tearing resistance	DIN 53515	Minimum tensile stress required to tear a pre-slit sample.
Tensile strength at break	ASTM D 638 EN ISO 527	Maximum tensile stress that a material can be subjected to before break.
Elongation at break		Elongation of the specimen at the break point under tensile stress.
Residual elong. (after break)		Permanent elongation of the specimen measured after rupture in a tensile test.
Thermal conductivity	ASTM C 177	Ability to conduct heat. The Lower it is, the more insulation.
Cold bend brittle temp.	ISO 8570	Temperature at which the specimen break under torsion stress. Brittle point (CLASH & BERG).
Min. usage temp.	EN 1876	Temperature range where material keep its mechanical properties (flexibility).
Max. usage temp.		
Vicat softening temp.	EN ISO 306	Temperature at which the specimen is penetrated to a depth of 1 mm by a 1 kg flat indenter of 1 sq. mm.
Specific heat capacity	ISO 11357	Heat energy required to increase the temperature of one kilogram of the material by one degree Celsius.
Sound reduction	DIN 52210	Average sound level (freq. 0,1 to 3,2 kHz) decreased by a 1,76 sq.m. and 5 mm thick PVC curtain.
Reaction to fire	NF P 92-507 AS/NZS 3837 DIN 4102	Standard classifications of material self-extinguishing and resistance to combustion.
UV/IR filter	EN 1598	Ability to filter welding rays allowing the use of this material as a welding protection screen.
UV resistance	ISO4892	Ability to resist to UV (Sun, welding arc).
Charge buildup	IEC 61087	Earthed sample is rubbed with cotton, acrylic and nylon rubbers. At electrode approach, spark appears or doesn't.
Surface resistivity	IEC 60093	Material surface electric resistivity measured with a 500 V direct voltage.
Water absorption	EN ISO 62	Material mass variation after exposure to humid conditions. (<0 if released / >0 if absorbed)
Anti-insect	-	Special ability to keep insects away. (Food processing plants, tropical regions)
Density	ASTM D 792	Mass per unit volume.

*The data contained in this technical specification is given for information only and is based on our current knowledge of the products concerned.  
This information given to our customer in good faith to inform him and to help him in his search, does not constitute any formal or implicit guarantees as to its use.*

## GENERAL TOLERANCES OF EXTRUFLEX FLEXIBLE PVC STRIPS & SHEETS

PRODUCT	LENGTH	THICKNESS		WIDTH (coiled)
STRIPS	≥ 50 m	If nominal thickness ≥ 2 mm	0 mm - 0,3 mm	0 mm - 4 mm
		If nominal thickness < 2 mm	± 0,1 mm	
PRODUCT	LENGTH	THICKNESS		WIDTH (coiled)
SHEETS	≥ 20 m	If nominal thickness > 2 mm	0 mm - 0,3 mm	± 5 mm
		If nominal thickness ≤ 2 mm	± 0,15 mm	

*Tolerances may be modified without prior notice.*

## FLEXIBLE PVC STRIP ROLLS PALLETIZATION

Strip roll length = 50m

Strip width (mm)		100		150		190		200			300			380			400			570			
Strip thick (mm)		1,2	2	3	2	3	2	4	2	2 R	3	3 R	4	5	2,5	3	4	2	3	4	4 R	5	1
Internal Ø (mm)		150	200	200	200	200	200	200	200	180	200	180	200	200	200	200	200	200	200	200	180	200	280
External Ø (mm)		309	393	467	393	467	393	531	393	553	467	608	531	588	432	467	531	393	467	531	658	588	373
Pallet size (mmxmm)		800x400	32 (1750)		20 (1650)	16 (1670)	16 (1750)											8 (1750)					
		1000x500			32 (1750)	20 (1650)	16 (1670)				16 (1750)				8 (1670)				8 (1750)				
		1000x1000	63 (850)																				
		1100x550												16 (1750)				8 (1670)			8 (1750)		
		1100x1100									20 or 36 (1150 or 1950)										16 or 20 (1750 or 2150)		
1200x800									48 or 60 (1750 or 2150)					16 (1750)							8 (1750)	12 (1290)	
1200x1200												16 or 24 (1350 or 1950)								16 (1750)			

Rolls diameters and palletization may be modified without prior notice.

Number of rolls per pallet  
(Pallet height in mm)

For Ref. 100 & 101 only



## FLEXIBLE PVC SHEET ROLLS PALLETIZATION

Sheet roll length = 20m

Pallet size (mmxmm)	1		2		3		4		5		6		6,5		7		8		9,5		10	
	Thickness (mm)		280		280		280		280		280		280		280		280		320		320	
	Internal Ø (mm)		320		320		320		320		320		320		320		320		320		320	
800x1200	External Ø (mm)		352		385		417		446		474		489		502		526		582		630	
1000x1000																						
1100x1100																						
1200x1200																						
730x1300																						

*Rolls diameters and palletization may be modified without prior notice.*

Number of rolls per pallet if sheet width > 800mm  
( Number of rolls per pallet if sheet width ≤ 800mm )



<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>

# Are all plastic materials the same?

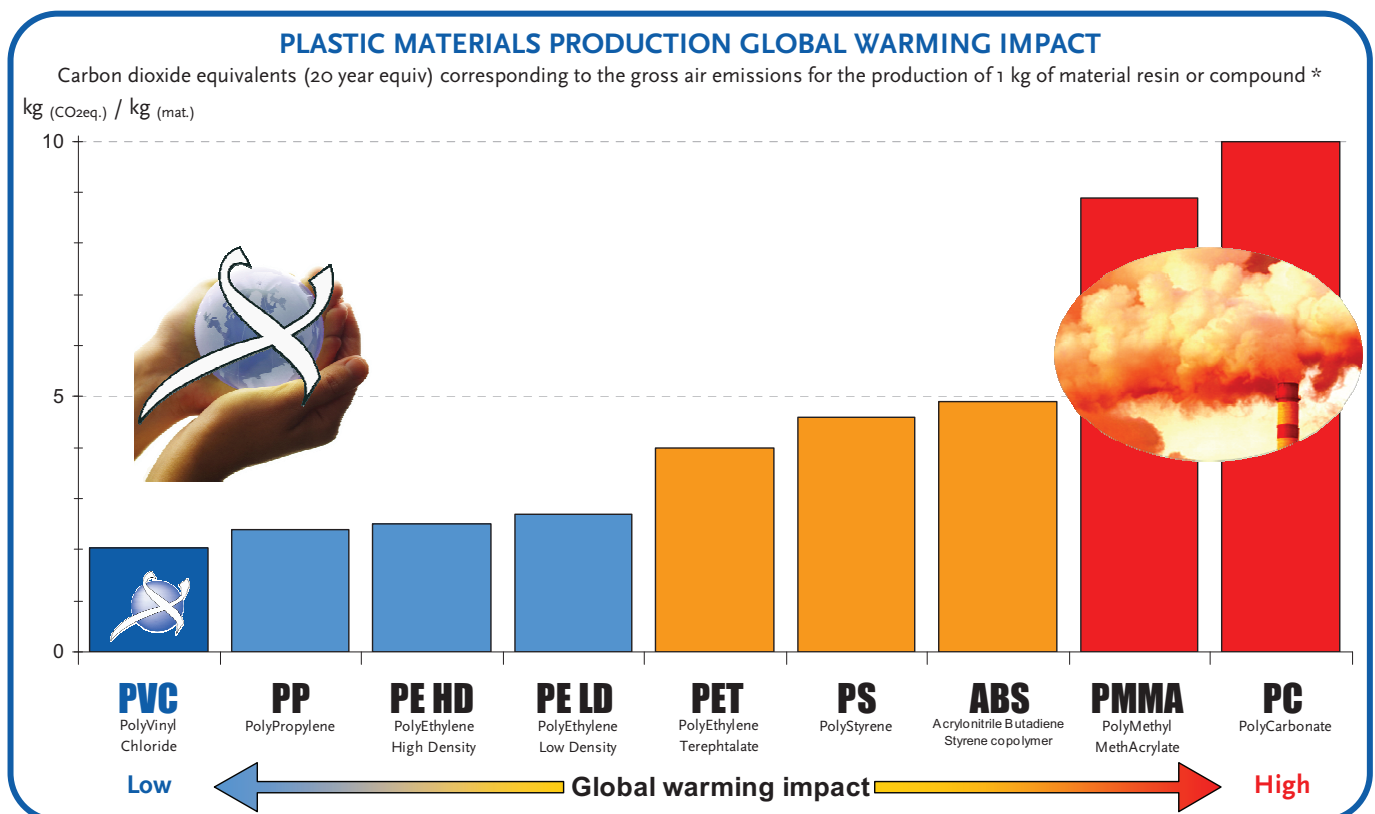
focus on

## PLASTIC MATERIALS & GLOBAL WARMING

Like any products, plastic materials have impacts on earth's global warming and environment. To assess those impacts, plastics eco-profile studies use the carbon dioxide equivalents or global warming potential of the gases emitted all along the production process (from earth's resources extraction to plastics resins or compounds production).

Gas emissions can be very different according to the plastic material produced, leading to very different impacts on earth's global warming and environment. Make the right material choice has become essential in a context where earth is warming faster and faster to levels never met before and needs to be saved and preserved urgently.

**extruflex** help to make the right material choice to save and preserve earth.



\* The gross air emissions refer to the cumulative totals arising when all production processes operations are traced back from plastic material resin or compound production to the extraction of raw materials from the earth. Any gaseous emission that is thought to contribute to global warming is assigned a value equal to the equivalent amount of CO<sub>2</sub> that would be needed to produce the same effect. Because the different gases react chemically in the atmosphere as a result of sunlight, their effect will change with time as they are changed chemically. Here CO<sub>2</sub> equivalent values correspond to a 20 year effect. (For more details refer to data sources)

Data sources: Eco-profiles of the European Plastics Industry (PVC: Ostermayer & Giegrich 2006; PS: Boustead 2006; Others: Boustead 2005) - [www.lca.plasticseurope.org](http://www.lca.plasticseurope.org)

Eco-profile of high volume commodity phthalate esters - European Council for Plasticizers and Intermediates (ECPI 2001) - [www.ecpi.org](http://www.ecpi.org)

Note: CO<sub>2</sub>eq. values of PVC and flexible PVC based on a mix of PVC resin (65%) + Phthalate esters (35%) are similar within 2%.

High global warming impact plastics are often used in order to make more profits to the detriment of environment. Such practices have contributed to degrade the image of plastics in the public opinion instead that low global warming impact plastics such as flexible PVC are safe and environmental friendly.

Due to its very low global warming potential air emissions and its highly efficient applications, such as strong thermal insulation,

**extruflex flexible PVC strips & sheets save and preserve earth and environment.**

The data contained in this technical specification is given for information only and is based on our current knowledge of the products concerned.  
This information given to our customer in good faith to inform him and to help him in his research, does not constitute any formal or implicit guarantees as to its use.



# Are all plastic materials the same?

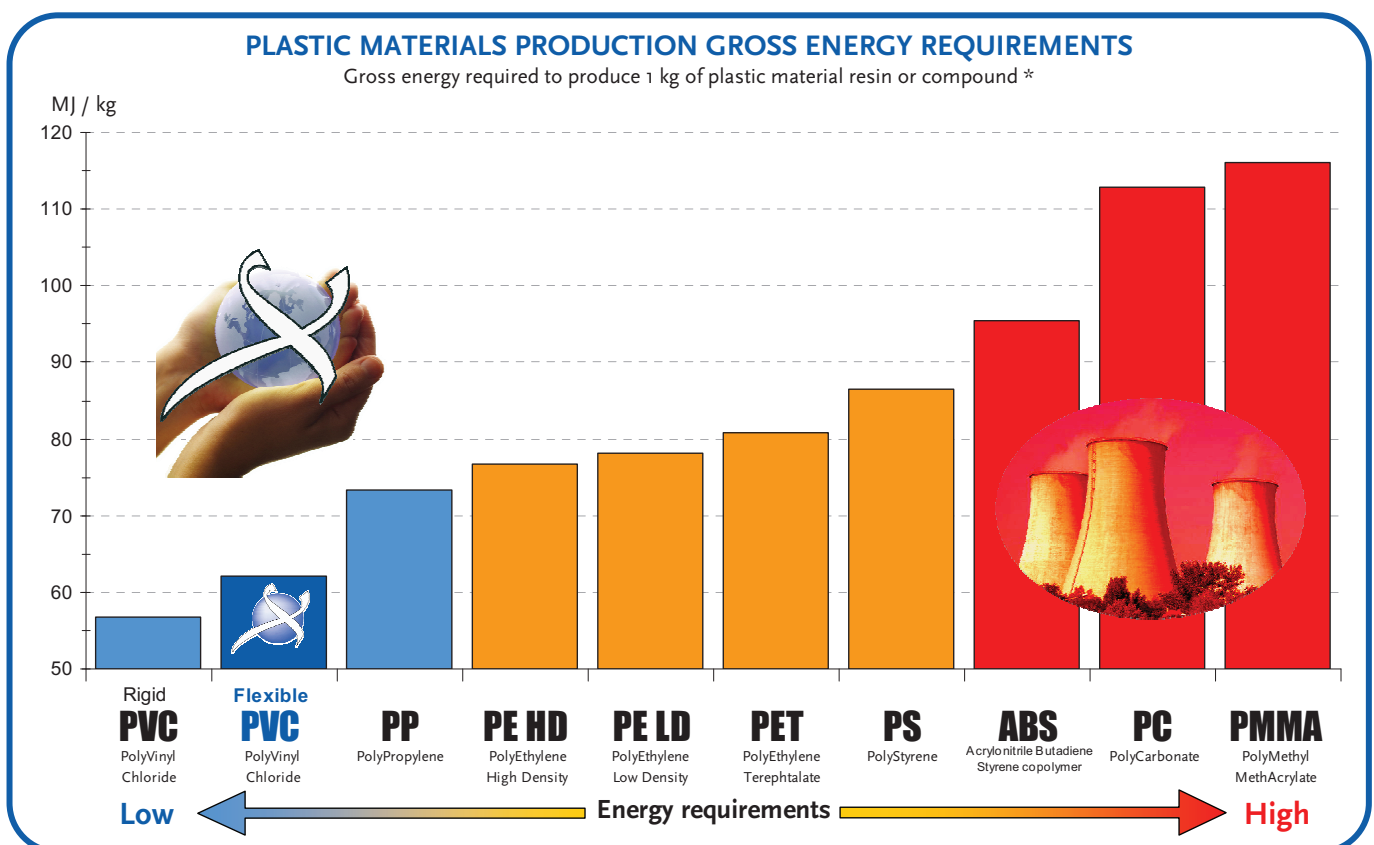
focus on

## PLASTIC MATERIALS & EARTH'S ENERGY RESOURCES

Like any products, plastic materials have impacts on earth's energy resources. To assess those impacts, plastics eco-profile studies use the gross energy required to produce them. It includes all gross primary fuels used as energy or raw materials and all other energy resources consumed all along the production process (from earth's resources extraction to plastics resins or compounds production).

Plastic materials have very different gross energy requirements, leading to very different impacts on earth's resources. Making the right material choice has become essential in a context where earth's energy resources need to be carefully controlled.

**extruflex help to make the right material choice to save and preserve earth's natural resources.**



\* The gross or cumulative energy requirements refer to the total energy consumption when the production processes are traced back through all operations from plastic material resin or compound production to the extraction of raw materials from the earth. Masses of fuels have all been converted to energy units using the gross calorific values. (It includes Fuel production & delivery energy, Energy content of delivered fuel, Transport energy and Feedstock energy coming from Electricity, Oil fuels and Other fuels - For more details refer to data sources)

Data sources: Eco-profiles of the European Plastics Industry (PVC: Ostermayer & Giegrich 2006; PS: Boustead 2006; Others: Boustead 2005) - [www.lca.plasticseurope.org](http://www.lca.plasticseurope.org)

Eco-profile of high volume commodity phthalate esters - European Council for Plasticizers and Intermediates (ECPI 2001) - [www.ecpi.org](http://www.ecpi.org)

Note: Flexible PVC data are based on a mix of PVC resin (65%) + Phthalate esters (35%)

Plastics which use high levels of energy are often used in order to make more profits to the detriment of environment and earth's resources. Such practices have contribute to degrade the image of plastics in the public opinion instead that low production energy requirements plastics such as flexible PVC are earth's resources respectful and environmental friendly.

Due to its very low production energy requirements and its highly efficient applications, such as strong thermal insulation,

**extruflex flexible PVC strips & sheets save and preserve earth's natural resources and environment.**

The data contained in this technical specification is given for information only and is based on our current knowledge of the products concerned.

This information given to our customer in good faith to inform him and to help him in his research, does not constitute any formal or implicit guarantees as to its use.

16, rue Baudin, 92300 Levallois-Perret, France • Tel: +33(0)1 41499930 • Fax: +33(0)1 47590333 • [extruflex@extruflex.com](mailto:extruflex@extruflex.com) • [www.extruflex.com](http://www.extruflex.com)

September 2008 © Copyright

# Are all plastic materials the same?

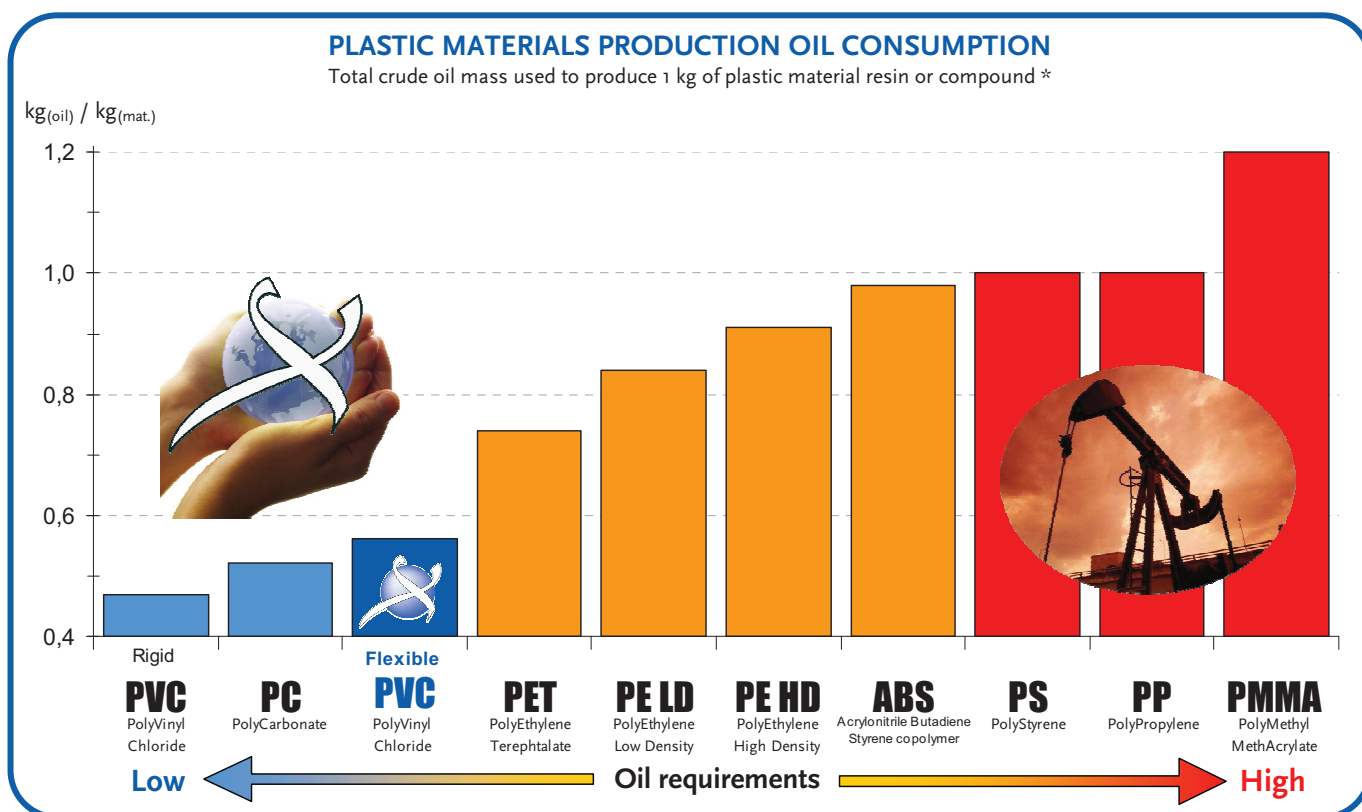
focus on

## PLASTIC MATERIALS & OIL RESSOURCES

Most plastic materials are derived from oil. Oil offers an extraordinary range of possibilities as to its use. This precious resource has been abusively exploited for many years, making earth's reserves run low. Nowadays it is essential to save and preserve this resource by using it respectfully at its fair value.

43% of PVC resin is made from petroleum products and 57% from salt products. Salt is for over half of its weight, a resource available in abundance on earth (sea water), flexible PVC is among the plastic materials consuming less oil resources. Flexible PVC contributes to save and preserve earth's oil resources by using it efficiently and respectfully.

**extruflex help to make the right material choice to save and preserve earth's natural resources.**



\*Total crude oil requirements refer to the total crude oil consumption when the production processes are traced back through all operations from plastic material resin or compound production to raw materials extraction from earth. (It includes total crude oil used for: Fuel production & delivery, Delivered fuel, Transport and Feedstock - For more details refer to data sources)

Data sources: Eco-profiles of the European Plastics Industry (PVC: Ostermayer & Giegrich 2006; PS: Boustead 2006; Others: Boustead 2005) - [www.lca.plasticseurope.org](http://www.lca.plasticseurope.org)

Eco-profile of high volume commodity phthalate esters - European Council for Plasticizers and Intermediates (ECPI 2001) - [www.ecpi.org](http://www.ecpi.org)

Note: Flexible PVC data are based on a mix of PVC resin (65%) + Phthalate esters (35%)

Oil greedy plastics are often used in order to make more profits to the detriment of environment and earth natural resources. Such practices have contribute to degrade the image of plastics in the public opinion instead that low oil requirements plastics such as flexible PVC are earth natural resources respectful and environmental friendly.

By efficiently using low oil quantity for highly efficient application such as thermal insulation, **extruflex** flexible PVC strips & sheets contribute to save and preserve earth natural resources.

**extruflex flexible PVC strips & sheets save and preserve earth's natural resources and environment.**

The data contained in this technical specification is given for information only and is based on our current knowledge of the products concerned.  
This information given to our customer in good faith to inform him and to help him in his research, does not constitute any formal or implicit guarantees as to its use.

Levallois-Perret, 17 September 2008,

To whom it may concern

**CERTIFICATE**  
**HYGIENE OF FOODSTUFFS**

All **extruflex** flexible PVC strips and sheets (except anti-static references (Ref. 180) which is moisture absorbent as mentioned on its label) can be used as floor surface, wall surface, ceiling or door in rooms where food is prepared, treated or processed, including rooms contained in means of transport.

This smooth surface, non-absorbent, impervious, washable and non-toxic material is easy to clean and to disinfect. It meets the requirements enounced by the regulation (CE) n° 852/2004 of the European parliament and of the council of 29 April 2004 in reserve to be correctly implemented.

Thank you for your concern and support to our environmental and safety policy.



Jacques VALAT  
Chief Executive Officer



Levallois-Perret, 17 September 2008,

To whom it may concern

**CERTIFICATE**  
**SILICONE FREE PRODUCTS**

**extruflex** flexible PVC strip and sheet products do not contain silicone.

This does not mean that this substance may not be found in our products in extremely low quantities, without toxicological or regulatory significance.

**extruflex** can in no way be held responsible if the product is contaminated by other products it may come in to contact with after the goods are dispatched.

Thank you for your concern and support to our environmental and safety policy.



Jacques VALAT  
Chief Executive Officer



<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>


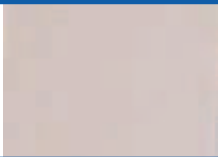
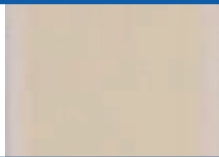
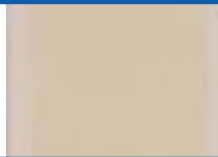
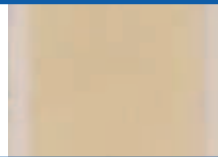
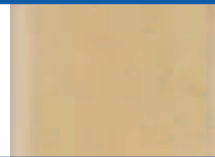

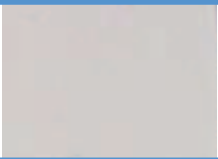
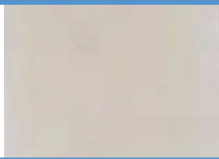
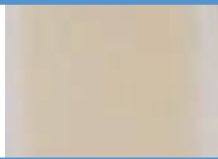



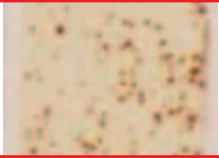
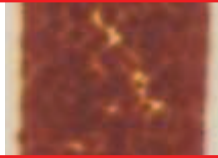


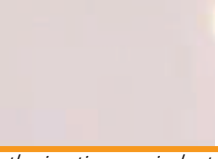
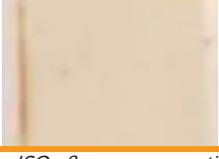

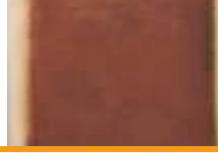

# Are all flexible PVC strips & sheets the same?

focus on

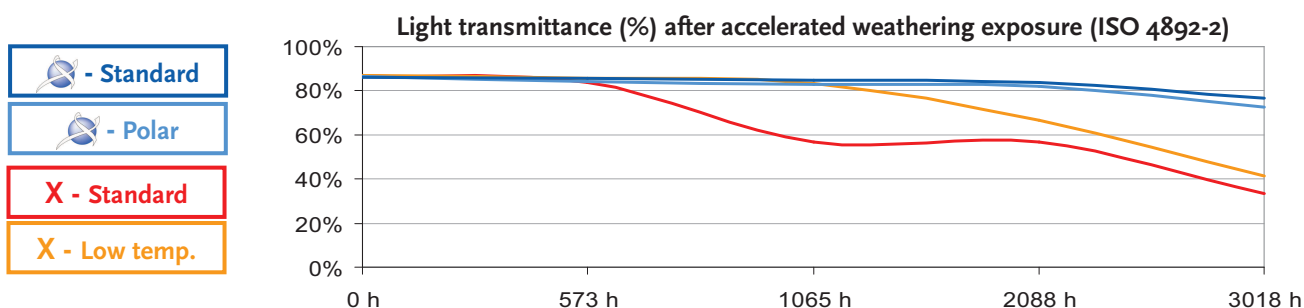
## STABILIZERS & DURABILITY

In use, flexible PVC strips and sheets are exposed to harmful constraints coming from surrounding environment. UV sun radiations (Ultra Violet) can break down polymer chemical bonds, degrading its mechanical performances and transparency. This phenomenon can be largely delayed by adding UV stabilizers into the material. UV stabilizers inhibit polymer degradation by absorbing and dissipating harmful radiations and make flexible PVC strips and sheets very durable. Contrary to **extruflex**, some manufacturers don't use UV stabilizers and that make a real difference on end products durability.

Flexible PVC strips and sheets after accelerated weathering exposure (ISO 4892-2)

ISO 4892-2 <i>Natural weathering*</i>	0 hours -	573 hours <i>6 months</i>	1065 hours <i>1 year</i>	2088 hours <i>2 years</i>	3018 hours <i>3 years</i>
 <b>extruflex</b> Standard Clear (Ref. 100)					
 <b>extruflex</b> Polar (Ref. 105)					
<b>OTHER PRODUCER</b> Standard (not UV stabilized)					
<b>OTHER PRODUCER</b> Low temp. (not UV stabilized)					

\* Approximate natural weathering time equivalent to ISO 4892-2 exposure time.



**All extruflex flexible PVC strips and sheets are UV stabilized to ensure durability.**

Flexible PVC strips and sheets available on the market are often not UV stabilized because customers can't notice it on new products and that allows cost savings in order to make more profits to the detriment of product durability. Such practices contribute to degrade the image of PVC in the public opinion instead that flexible PVC is a safe, environmental friendly, ecological, recyclable and durable product if made properly.



# Are all flexible PVC strips & sheets the same?

focus on

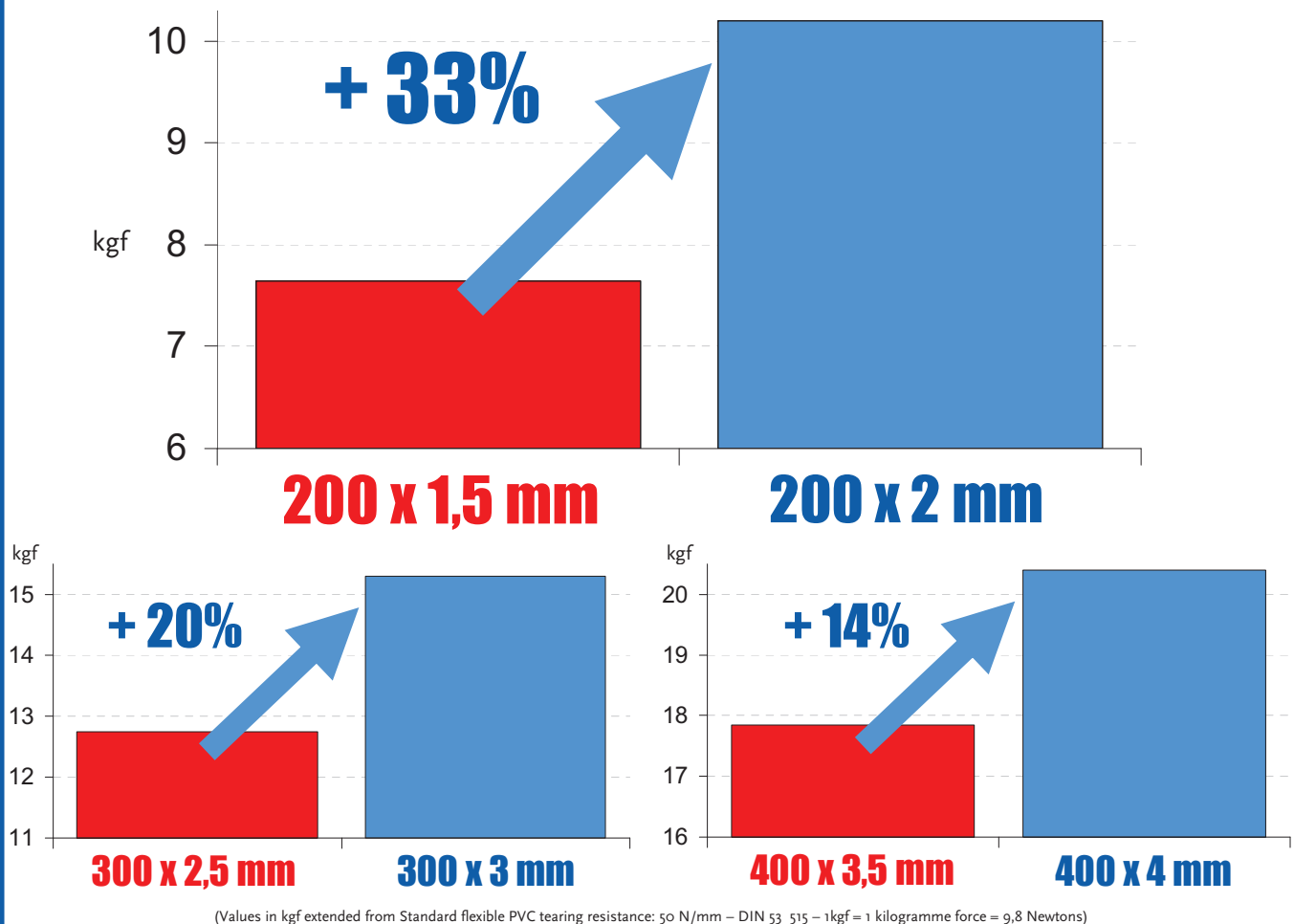
## THICKNESS & MECHANICAL PERFORMANCE

Flexible PVC strips and sheets mechanical performance is directly linked to their thicknesses. The thicker the product, the more efficient it is. But it is a common practice for a lot of manufacturers to decrease more and more their products thickness in order to make more profits to the detriment of product performances and durability.

**extruflex** raise the level to ensure flexible PVC strips and sheets high performances & durability.

### TEARING RESISTANCE

Minimum tensile stress required to tear a pre-slit Standard flexible PVC strip in trousers configuration.



Use a 2 mm thick Standard flexible PVC strip instead of 1,5 mm allows to increase mechanical performances of **33%**.

Decreasing thickness more and more is not a real cost save. It decreases products durability by not matching mechanical performances required by industrial applications.

**extruflex** respects precise production tolerances to provide high performances products to its customers.

The data contained in this technical specification is given for information only and is based on our current knowledge of the products concerned.  
This information given to our customer in good faith to inform him and to help him in his search, does not constitute any formal or implicit guarantees as to its use.



## CHEMICAL RESISTANCE CHART

The resistance of plastics and elastomers can be affected by presence of other chemicals and others factors.

This Chemical Resistance Chart has to be considered as a guide rather than a recommendation.

## KEY

Chemical effect rating

	No effect - Excellent
	Minor effect - Good
	Moderate effect - Fair
	Severe effect - Poor
	Not tested

Dot's explanation






	Satisfactory to 22°C (72°F)
	Satisfactory to 49°C (120°F)

	ABS	EPDM	NYLON	POLYETHYLENE	POLYPROPYLENE	PVC		ABS	EPDM	NYLON	POLYETHYLENE	POLYPROPYLENE	PVC
Acetaldehyde							Chlorine (Anhydrous Liquid)						
Acetamide							Chlorine (Dry)						
Acetate Solvent							Chlorine (Aqueous Solution)						
Acetic Acid (Glacial)							Chlorobenzene (Mono)						
Acetic Acid (20%)							Chloroform						
Acetic Acid							Chlorosulfonic Acid						
Acetic Anhydride							Chromic Acid (5%)						
Acetone							Chromic Acid (30%)						
Acetyl Chloride (Dry)							Chromic Acid (50%)						
Acetylene							Citric Acid						
Aluminium Chloride							Clorox (Bleach)						
Aluminium Fluoride							Com Oil						
Aluminium Hydroxide							Copper Chloride						
Aluminium Potassium Sulfate (100%)							Copper Cyanide						
Aluminium Sulfate							Copper Nitrate						
Amines							Copper Sulfate (5%)						
Ammonia (10%)							Cotton Seed Oil						
Ammonia (Anhydrous)							Creosote Oil						
Ammonia (Liquid)							Cresols						
Ammonium Bifluoride							Cresylic Acid						
Ammonium Carbonate							Cyclohexane						
Ammonium Chloride							Detergents						
Ammonium Hydroxide							Diacetone Alcohol						
Ammonium Nitrate							Dichloroethane						
Ammonium Persulfate							Diesel Fuel (20, 30, 40, 50)						
Ammonium Phosphate, Dibasic							Diethylamine						
Ammonium Phosphate, Monobasic							Diethylene Glycol						
Ammonium Phosphate, Tribasic							Epsom Salts (Magnesium Sulfate)						
Ammonium Sulfate							Ethane						
Amyl Acetate							Ethanol						
Amyl Alcohol							Ethanolamine						
Amyl Chloride							Ether						
Aniline							Ethyl Acetate						
Anti-Freeze							Ethyl Chloride						
Antimony Trichloride							Ethylene Chloride						
Aqua Rega (80% HCl, 20% HNO <sub>3</sub> )							Ethylene Dichloride						
Aromatic Hydrocarbons							Ethylene Glycol						
Arsenic acid							Ethylene Oxide						
Barium Carbonate							Fatty Acids						
Barium Chloride							Ferric Chloride						
Barium Cyanide							Ferric Nitrate						
Barium Hydroxide							Ferric Sulfate						
Barium Nitrate							Ferrous Chloride						
Barium Sulfate							Ferrous Sulfate						
Barium Sulfide							Fluoboric acid						
Beer							Fluorine						
Beet Suggar Liquids							Fluosilicic Acid						
Benzaldehyde							Formaldehyde (40%)						
Benzene							Formaldehyde (100%)						
Benzoic Acid							Formic acid						
Benzyl Alcohol							Freon 12 (Dichlorodifluoromethane)						
Borax (Sodium Borate)							Freon 13 (Chlorotrifluoromethane)						
Boric Acid							Fuel Oils (1, 2, 3, 5A, 5B, 6)						
Bromine							Furan Resin						
Butadiene							Furfural						
Butane							Gallic Acid						
Butanol (Butyl Alcohol)							Gasoline						
Butylene							Glucose						
Butyl Acetate							Glucerin						
Butyric Acid							Glycolic Acid						
Calcium Bisulfide							Heptane						
Calcium Bisulfite							Hexane						
Calcium Carbonate							Hexanol						
Calcium Chloride							Hydraulic oil (Petro)						
Calcium Hydroxide							Hydraulic Oil (Synthetic)						
Calcium Hypochlorite							Hydrobromic Acid (20%)						
Calcium Sulfate							Hydrobromic Acid (100%)						
Carbolic Acid (see Phenol)							Hydrochloric Acid (Dry Gas)						
Carbon Bisulfide							Hydrochloric Acid (20%)						
Carbon Dioxide							Hydrochloric Acid (37%)						
Carbon Disulfide							Hydrochloric Acid (100%)						
Carbon Monoxide							Hydrocyanic Acid						
Carbon Tetrachloride							Hydrocyanic Acid (gas 10%)						
Carbonated Water							Hydrofluoric Acid (20%)						
Carbonic Acid							Hydrofluoric Acid (100%)						
Chloroacetic acid							Hydrofluosilicic Acid (20%)						



The resistance of plastics and elastomers can be affected by presence of other chemicals and others factors.

This Chemical Resistance Chart has to be considered as a guide rather than a recommendation.

**KEY****Chemical effect rating**

	No effect - Excellent
	Minor effect - Good
	Moderate effect - Fair
	Severe effect - Poor
	Not tested

**Dot's explanation**

	Satisfactory to 22°C (72°F)
	Satisfactory to 49°C (120°F)

	ABS	EPDM	NYLON	POLYETHYLENE	POLYPROPYLENE	PVC		ABS	EPDM	NYLON	POLYETHYLENE	POLYPROPYLENE	PVC
Hydrofluosilicic Acid (100%)							Potash						
Hydrogen Gas							Potassium Bicarbonate						
Hydrogen Peroxide (50%)							Potassium Bromide						
Hydrogen Peroxide (100%)							Potassium Carbonate						
Hydrogen Sulfide (aqua)							Potassium Chlorate						
Hydrogen Sulfide (dry)							Potassium Chloride						
Hydroxyacetic Acid (70%)							Potassium Chromate						
Iodine							Potassium Cyanide Solutions						
Isobutanol							Potassium Dichromate						
Isopropanol							Potassium Ferrocyanide						
Isopropyl Acetate							Potassium Hydroxide (Caustic Potash)						
Isopropyl Ether							Potassium Nitrate						
Jet Fuel (JP <sub>3</sub> , -4, -5)							Potassium Permanganate						
Kerosene							Potassium Sulfate						
Ketones							Potassium Sulfide						
Lacquers							Propane (Liquified)						
Lacquer Thinners							Propanol						
Lactic Acid							Propylene Glycol						
Lard							Pyridine						
Lead Acetate							Pyrogalllic Acid						
Lead Sulfamate							Rosins						
Lime							Sea Water						
Linseed Oil							Silicone						
Lubricants							Silver Nitrate						
Magnesium Carbonate							Soap Solutions						
Magnesium Chloride							Sodium Acetate						
Magnesium Hydroxide							Sodium Bicarbonate						
Magnesium Nitrate							Sodium Bisulfate						
Magnesium Sulfate							Sodium Bisulfite						
Maleic Acid							Sodium Borate						
Malic Acid							Sodium Carbonate						
Mercuric Chloride (dilute)							Sodium Chlorate						
Mercuric Cyanide							Sodium Chloride						
Mercury							Sodium Cyanide						
Methanol (Methyl Alcohol)							Sodium Fluoride						
Methyl Alcohol (10%)							Sodium Hydroxide (20%)						
Methyl Acetate							Sodium Hydroxide (50%)						
Methyl Bromide							Sodium Hydroxide (80%)						
Methyl Butyl Ketone							Sodium Hypochlorite (<20%)						
Methyl Cellosolve							Sodium Hypochlorite (100%)						
Methyl Chloride							Sodium Metaphosphate						
Methyl Dichloride							Sodium Metasilicate						
Methyl Ethyl Ketone							Sodium Nitrate						
Methyl Isobutyl Ketone							Sodium Perborate						
Methylene Chloride							Sodium Polyphosphate						
Milk							Sodium Silicate						
Mineral Oil							Sodium Sulfate						
Molasses							Sodium Sulfide						
Naphta							Sodium Tetraborate						
Naphtalene							Sodium Thiosulfate (Hypro)						
Nickel Chloride							Soybean Oil						
Nickel Sulfate							Stannic Chloride						
Nitric Acid (5-10%)							Stannous Chloride						
Nitric Acid (20%)							Sulfur Dioxide						
Nitric Acid (50%)							Sulfur Dioxide (Dry)						
Nitric Acid (Concentrated)							Sulfur Trioxide (Dry)						
Nitrobenzene							Sulfuric Acid (<10%)						
Octyl Alcohol							Sulfuric Acid (10-75%)						
Oleic Acid							Sulfurous Acid						
Oleum (25%)							Tannic Acid						
Oleum (100%)							Tanning Liquors						
Olive Oil							Tartaric Acid						
Oxalic Acid (cold)							Tomato Juice						
Paraffin							Turbine Oil						
Pentane							Urine						
Perchloroethylene							Vinegar						
Petrolatum							Water, Acid, Mine						
Phenol (10%)							Water, Distilled						
Phenol (Carbolic Acid)							Water, Fresh						
Phosphoric Acid (<40%)							Water, Salt						
Phosphoric Acid (>40%)							Whiskey and Wines						
Phosphoric Acid (Crude)							White Liquor (Pulp Mill)						
Photographic Developer							Xylene						
Picric Acid							Zinc Chloride						
Pine Oil							Zinc Sulfate						



<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>



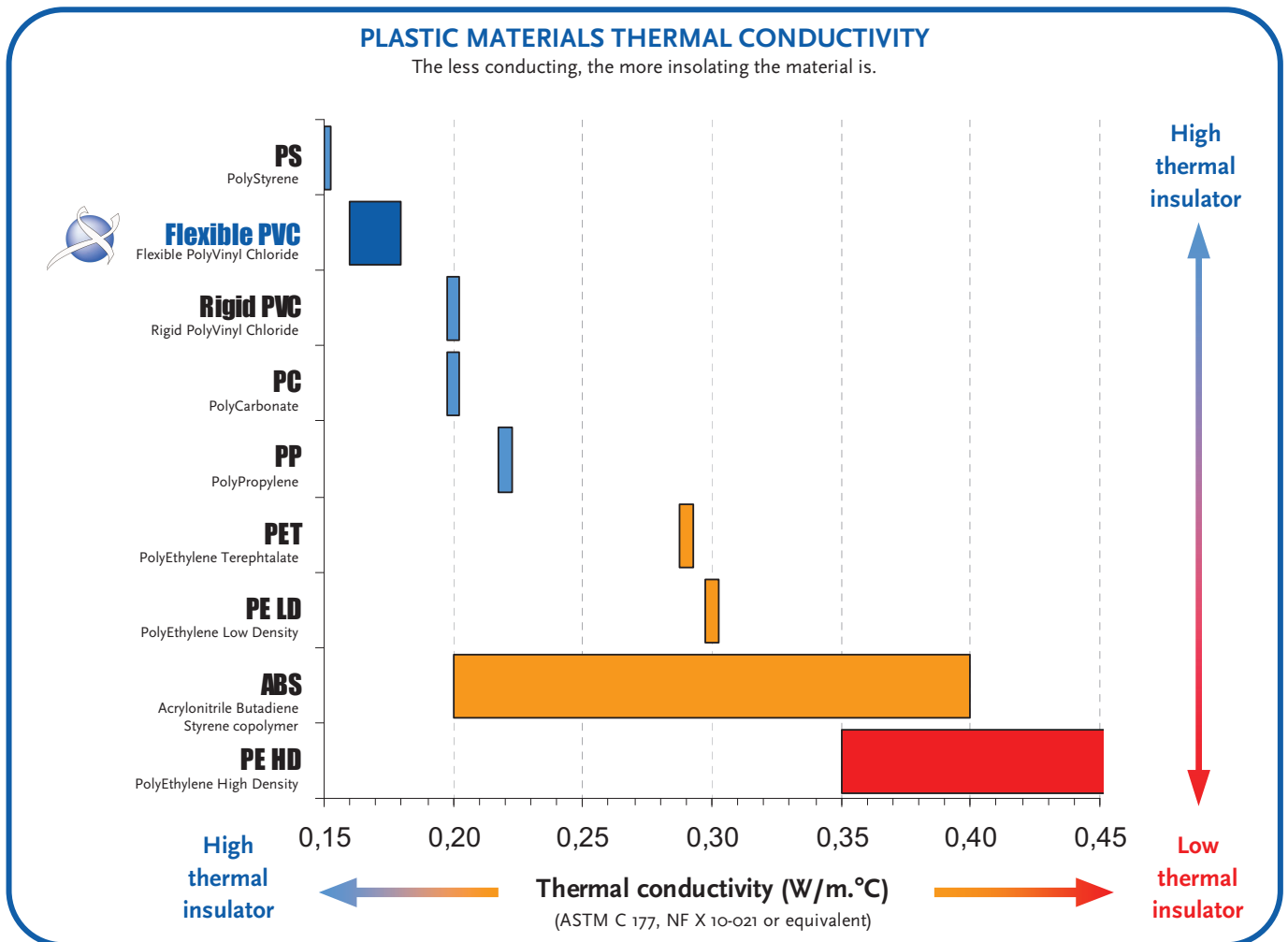
# Are all plastic materials the same?

focus on

## PLASTIC MATERIALS & THERMAL INSULATION

Flexible PVC is a very strong thermal insulator, one of the best insulating plastics. It is water and air tight, qualities usually required in insulation application. Due to its low thermal conductivity, flexible PVC leads to high thermal energy savings allowing costs and resources savings and increases people comfort. Making the right material choice is essential in a context where energy prices are growing up faster and faster to levels never met before and where energy resources need to be carefully preserved.

**extruflex** help to make the right material choice to maximize energy savings.



For information, some non plastic materials thermal conductivity in W/m.°C : Air ≈ 0,026 ; Rock wool ≈ 0,04 ; Glass wool ≈ 0,04 ; Asbestos ≈ 0,17 ; Wood ≈ 0,12 to 0,23 ; Rubber ≈ 0,4 ; Water ≈ 0,6 ; Glass ≈ 1 to 1,2 ; Stainless steel ≈ 26 ; Steel ≈ 46 ; Iron ≈ 80 ; Aluminium ≈ 237.

How to compare energy flow lost by thermal conduction through different materials?

$$Q = \frac{\lambda \times S \times \Delta T}{Th}$$

Q = Energy flow lost by thermal conductivity (W)  
λ = Thermal conductivity (W/m.°C)

S = Surface (m²)  
ΔT = Temperature difference (°C)

Th = Thickness (m)

**extruflex flexible PVC strips & sheets, strong thermal insulators, lead to high energy saves and preserve environment.**

The data contained in this technical specification is given for information only and is based on our current knowledge of the products concerned.  
This information given to our customer in good faith to inform him and to help him in his search, does not constitute any formal or implicit guarantees as to its use.

# Are all flexible PVC strips & sheets the same?

focus on

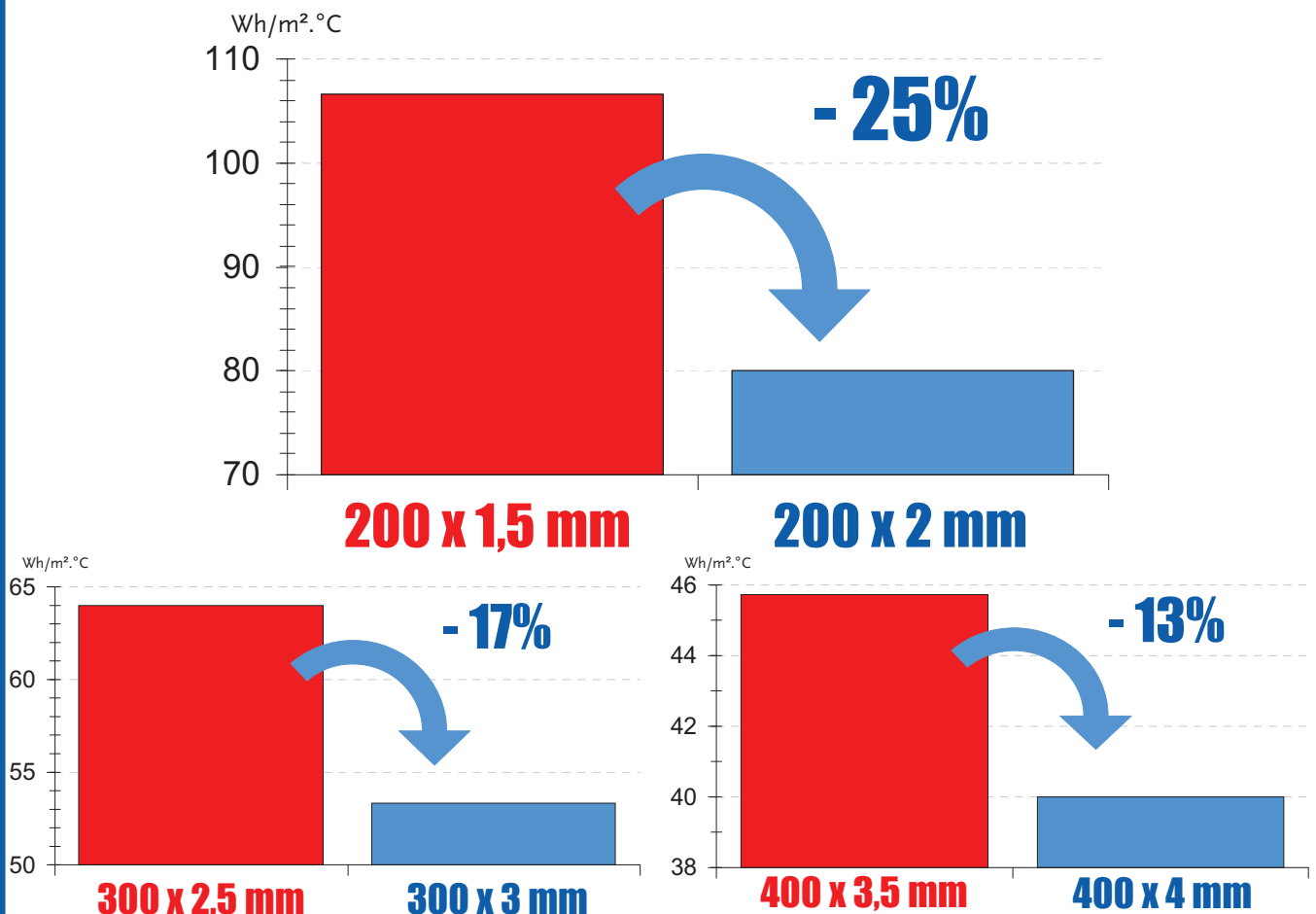
## THICKNESS & THERMAL INSULATION

Flexible PVC strips and sheets insulation performance is directly linked to their thicknesses. The thicker the product, the more efficient it is. But it is a common practice for a lot of manufacturers to decrease more and more their products thickness in order to make more profits to the detriment of product performances and durability.

**extruflex** raise the level to ensure flexible PVC strips and sheets high performances & durability.

### THERMAL ENERGY LOSS

Energy lost per hour by conduction through one Standard flexible PVC strip square meter separating areas with a temperature difference of 1°C.



(Values in Wh/m².°C extended from Standard flexible PVC thermal conductivity: 0,16 W/m.°C – ASTM C 177)

Use a 2 mm thick Standard flexible PVC strip instead of 1,5 mm allows to save **25%** more of thermal energy.

Decreasing thickness more and more is not a real cost save. It leads to decreased energy savings despite the fact that energy prices are growing up faster and faster to levels never met before.

**extruflex** respects precise production tolerances to provide high performances products to its customers.

The data contained in this technical specification is given for information only and is based on our current knowledge of the products concerned.  
This information given to our customer in good faith to inform him and to help him in his search, does not constitute any formal or implicit guarantees as to its use.

## REPORT

Requester :

EXTRUFLEX  
Usine du Planet  
05310 LA ROCHE DE RAME

Request date :

12 february 1996

Subject :

Characterization under cold of extruded PVC strips.

Reference document :

Standard NF.G 37-111.

The 5 pages shall be entirely presented if this document has to be reproduced.

## 1. OBJECTIVES

The aim of these tests was to give indications on the flexibility of materials at temperatures at which they are designed to be used.  
Shore A hardness measurements were also carried out.

## 2. TEST PRINCIPLE AND METHODOLOGY

The tests carried out consisted of shaping the samples into loops, following standard NF G 37-111, and submitting them to temperatures equal or lower than those at which they are designed to be used for a period of 2 hours.

Visual observations as well as Shore A hardness measurements were made at the end of this period.

The visual observations associated with manual "bending/unbending" tests allow an appreciation of whether or not the product shows any deformation and/or permanent degradation and whether it retains its ability to take its initial shape instantly after four or five manual looping operations.

Preliminary tests were first necessary in order to determine the suitable size of the samples, knowing that bending by 360° constitutes a penalising situation.  
These tests were carried out on the standard model.

The stress tests were then carried out on three product references, according to the values given below (§ 3).

## 3. SAMPLES RECEIVED, SERVICE AND TEST TEMPERATURES

Table 1, below, gives the characteristics of the samples, their minimal service temperatures as indicated by the requester and the temperatures at which they were tested.

Table 1: Reference values of tested PVC strips.

Reference	Qty	Thickness (mm)	Service temperature (°C)	Test temperature (°C)
Transparent ref. 100 Standard clear ref. 100	12	2	-10	-10 -15
Extreme cold ref. 105 Polar green ref. 105	12	2	-20	-20 -25
Super extreme cold ref. 106 Super polar green ref. 106	12	2	-60	-60





#### 4. TEST PERFORMED AND RESULTS

##### 4.1. CHOICE OF SAMPLE SIZES

The tests were carried out on samples of "Transparent ref. 100 - Standard clear ref. 100".

Three sizes were tested (40 x 100) mm, (40 x 150) mm and (40 x 200) mm.

Test conditions :

- A loop was made for each configuration by pinching the ends according to Figure 1.
- Test temperature: -10°C and -15°C
- Duration of test: 2 hours for each temperature

Results :

- At -10°C no sample showed deterioration.
- At -15°C, one sample out of three, the smallest (40 x 100) mm broke.

We chose the largest sample, i.e. (40 x 200) mm.

##### 4.2. CONDITIONING TESTS AND EVALUATION

###### 4.2.1. Transparent ref. 100 - Standard clear ref. 100

Test conditions :

- Three loops were made by pinching the ends.
- Test temperatures: -10°C and -15°C
- Duration of test: 2 hours for each temperature

Results :

- Soon afterwards, the impression of the pinching was visible to the naked eye. The two ends remained attached.
- 16 hours after the end of the test, the material had taken its original form. For each of the four manual looping operations, the sample recovered its original form instantly.



#### 4.2.2. Extreme cold ref. 105 - Polar green ref. 105

**Test conditions :**

- Three loops were made by pinching the ends.
- Test temperatures: -20°C and -25°C
- Duration of test: 2 hours for each temperature

**Results :**

- Soon after the end of the test, the impression of the pinching was visible to the naked eye. The two ends remained attached. The material had taken its original form. The impressions had disappeared.
- For each of the four manual looping operations, the sample recovered its original form instantly.

#### 4.2.3. "Super extreme cold ref. 106 - Super polar green ref. 106"

**Test conditions :**

- Three loops were made by pinching the ends.
- Test temperature: -60°C
- Duration of test: 2 hours for each temperature

**Results :**

- Soon after the end of the test, the impression of the pinching was visible to the naked eye. The material softened. The two ends remained attached.
- One hour after the end of the test, the material took its original form. The impressions had disappeared.
- For each of the four manual looping operations, the sample recovered its original form instantly.



#### 4.3. SHORE A HARDNESS TEST

The tests were carried out according to Standard NF ISO 868 (September 1986).

Test conditions:

- Samples: stacking of 3 thicknesses of sheet.
- Test conditioning and atmosphere:  $(23 \pm 2)^{\circ}\text{C}$  and  $(50 \pm 5)\%$  RH.
- Duration of measurement:  $15 \text{ sec} \pm 1 \text{ sec}$ .
- Number of measurements: 5 per sample.

Results obtained:

Reference	Individual values	Average
Standard clear ref. 100	81.5 - 81 - 80 - 80.5 - 81	81
Extreme cold ref. 105	67.5 - 67 - 67 - 66.5 - 66.5	67
Super extreme cold ref. 106	65 - 64 - 65 - 64.5 - 64	64

#### 5. CONCLUSION

Considering the severity of the tests to which the products were submitted (bending  $360^{\circ}$ ) with regard to probable deformations in service, and considering the results obtained, we can give the following temperatures for a reasonable flexibility of the products:

- Ref. Standard:  $-10^{\circ}\text{C}$  to  $-15^{\circ}\text{C}$
- Ref. Extreme cold:  $-20^{\circ}\text{C}$  to  $-25^{\circ}\text{C}$
- Ref. Super extreme cold:  $-60^{\circ}\text{C}$

Trappes, 20 June 1996

The Head of Department  
MATERIALS

  
Loïc CHESNE



Test carried out by



Carine COSTA

The results given apply only to the samples, products or materials submitted to LNE and as they are defined in this document.







<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>



**CLASSIFICATION REPORT FOR  
FIRE BEHAVIOUR OF A MATERIAL**

(Free translation of French test report)

Established according to the Department State Order dated on 21 November 2002

**VALIDITY 5 YEARS FROM 29 September 2005****N° F090862 - CEMATE/2**

and 4 pages appendices

**Material submitted by** : SN EXTRUFLEX SAS  
Usine du Planet  
05310 LA ROCHE DE RAME

**Commercial trademark** : Ref.170

**Brief description** :  
**Composition** : Fire-retarded flexible polyvinyl chloride.  
**Mass** :  $(3600 \pm 10 \%) \text{ g/m}^2$   
**Thickness** :  $(3 \pm 10 \%) \text{ mm}$   
**Colours** : Transparent colourless

**Test report** : N°F090862 - CEMATE/2 dated on 29 September 2005

**Type of tests** : Electric burner test

**Classification** : **M2**

**Durability of classification** : Non limited a priori

Considering the criteria resulting from the tests described in the appended Test Report N° F090862 - CEMATE/1.

The indicated classification prejudices in no way the conformity of the materials commercialized to the samples submitted to the tests and can in no way be considered as a certificate of qualification.

This is not a product certification according to the L115-27 article of the consumption code and to the law dated on 3<sup>rd</sup> June 1994.**Note** : Only full reproduction and by photocopy of the present classification report or the whole classification report and the appended test report are authorized

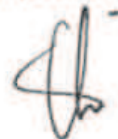
Trappes, 29 September 2005

The Head of Fire  
Behaviour Division

Alain SAINRAT



Responsible for test



Catherine BASSI

cofrac



ESSAIS

Accréditation

N° 1-0608

Portée disponible

Sur [www.cofrac.fr](http://www.cofrac.fr)**Laboratoire national de métrologie et d'essais**

Établissement public à caractère industriel et commercial • Siège social : 1, rue Gaston Boissier 75724 Paris Cedex 15 • Tél : 01 40 43 37 00

Fax : 01 40 43 37 37 • E-mail : [info@lne.fr](mailto:info@lne.fr) • Internet : [www.lne.fr](http://www.lne.fr) • Siret : 313 320 244 00012 • NAF : 743 B • TVA : FR 92 313 320 244

Barclays Paris Centrale IBAN : FR76 3058 8600 0149 7267 4010 170 BIC : BARCFRPP



# Prüfungsbericht

## Test report

**Nr./ No. 2007-B-3744**

### 1. Ausfertigung

1. execution

**Auftraggeber:** Extruflex GmbH  
*Client:* Ettore- Bugatti- Straße 13  
51149 Köln

**Hersteller:** Extruflex S.A.  
*Manufacturer:* Usine du Planet  
05310 LA ROCHE DE RAME  
Frankreich

**Inhalt des Auftrages:** Prüfung auf Normalentflammbarkeit  
*Matter of order:* (Baustoffklasse B 2) nach DIN 4102 Teil 1  
reaction to fire acc. DIN 4102 part 1 to the proof of the normal- combustibility  
(building material class B2)

**Klassifizierung:** B 2 nach DIN 4102-1  
*Classification:* B2 acc. to DIN 4102-1

**Versuchsmaterial:** weiches Polyvinylchlorid (PVC) Ref. 100  
*Test object:* soft polyvinyl chloride (PVC) Ref. 100

**eingeliefert am:** 05. Oktober 2007  
*Date of sample receipt:* 05<sup>th</sup> October 2007

**Probenahme:** nicht amtlich  
*Sampling procedure:* not official

**Kennzeichnung:** keine  
*Designation:* none

**Der Prüfungsbericht umfasst 5 Blatt.**  
*This report comprises 5 pages.*



Die Prüfergebnisse beziehen sich ausschließlich auf die Prüfgegenstände.  
*The test results exclusively refer to the test objects.*

Die Prüfung erfolgte gemäß DIN 4102 Teil 1 sowie den Zulassungsgrundsätzen für den Nachweis der Normalentflammbarkeit von Baustoffen (Baustoffklasse B2 nach DIN 4102) in der zur Zeit gültigen Fassung.  
*The tests took place in accordance with DIN 4102 part 1 as well as the principles of permission for the proof of the normal-combustibility from building materials (building material class B2 according to DIN 4102) in the at present valid version.*

Anmerkung: Dieser Bericht ersetzt nicht ein notwendiges allgemeines bauaufsichtliches Prüfzeugnis.  
*Note: This report does not replace a necessary official approval "allgemeines bauaufsichtliches Prüfzeugnis".*

Veröffentlichungen von Prüfungsberichten, auch auszugsweise und Hinweise auf Prüfungen zu Werbezwecken bedürfen in jedem Einzelfalle der schriftlichen Einwilligung der Prüfstelle. Die einzelnen Blätter dieses Prüfungsberichtes sind mit dem Firmenstempel der MPA Dresden GmbH versehen.  
*Publications of test reports and information on tests for publicity purposes require the written approval of the institution in every isolated case. Every page of this report is stamped with the seal of the test institution.*

MPA Dresden GmbH  
Fuchsmühlenweg 6F  
D-09599 Freiberg  
Tel.: +49(0)3731-2 03 93-0  
Fax: +49(0)3731-2 03 93-110

Geschäftsführer: Thomas Hübler  
Steuernummer: 220/114/03011  
Amtsgericht Chemnitz HR B 21581  
Internet: [www.mpa-dresden.de](http://www.mpa-dresden.de)  
E-Mail: [info@mpa-dresden.de](mailto:info@mpa-dresden.de)

Kreissparkasse Freiberg  
Poststraße 1a  
D-09599 Freiberg  
Kto.: 3115024672  
BLZ: 870 520 00

USt-IdNr.: DE234220069  
IBAN DE68 8705 2000 3115 0246 72  
BIC: WELADED1FGX



# Certificate of Assessment

HF07ANK5225

No. 748

"Copyright CSIRO 2005 ©"  
Copying or alteration of this report  
without written authorisation from CSIRO is forbidden.

This is to certify that the specimen described below was tested by the CSIRO Division of Manufacturing and Infrastructure Technology in accordance with Australian/ New Zealand Standard 3837, Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter, 1998, at 50 kW/m<sup>2</sup>, on behalf of:

SN Extruflex SAS  
Usine du Planet  
05600 La Roche De Rame  
HAUTES ALPES  
FRANCE

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FNK 0431.

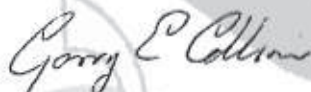
**SAMPLE IDENTIFICATION:** Flexible PVC (Ref. 170 Transparent)

**DESCRIPTION OF SAMPLE:** The sponsor described the tested specimen transparent flexible PVC sheet.  
Nominal thickness: 2.8 mm  
Nominal mass: 3.4 kg/m<sup>2</sup>  
Colour: clear

**SAMPLE CLASSIFICATION:** Group Number: Group 3  
(In accordance with Specification A2.4 of the Building Code of Australia.)  
Average specific extinction area: 782.2 m<sup>2</sup>/kg  
(Refer to Specification C1.10a section 3(c) of the Building Code of Australia.)

**Testing Officer:** Russell Collins **Date of Test:** 13 December 2005

Issued on the 31<sup>st</sup> day of January 2006 without alterations or additions.



Garry E Collins  
Manager, Fire Testing and Assessments



This laboratory is accredited (Accreditation No. 3632) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.



**CSIRO Manufacturing & Infrastructure Technology**  
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA  
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555

# Certificate of Assessment

HF07ANK5225

No. 747

© Copyright CSIRO 2005  
Copying or alteration of this report  
without written authorisation from CSIRO is forbidden.

This is to certify that the specimen described below was tested by the CSIRO Division of Manufacturing and Infrastructure Technology in accordance with Australian/ New Zealand Standard 3837, Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter, 1998, at 50 kW/m<sup>2</sup>, on behalf of:

SN Extruflex SAS  
Usine du Planet  
05600 La Roche De Rame  
HAUTES ALPES  
FRANCE

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FNK 0430.

**SAMPLE IDENTIFICATION:** Flexible PVC (Ref. 100 Transparent)

**DESCRIPTION OF SAMPLE:** The sponsor described the tested specimen transparent flexible PVC sheet.  
Nominal thickness: 2.8 mm  
Nominal mass: 3.4 kg/m<sup>2</sup>  
Colour: clear

**SAMPLE CLASSIFICATION:** Group Number: Group 4  
(In accordance with Specification A2.4 of the Building Code of Australia.)  
Average specific extinction area: 470.6 m<sup>2</sup>/kg  
(Refer to Specification C1.10a section 3(c) of the Building Code of Australia.)

Testing Officer: Russell Collins Date of Test: 13 December 2005

Issued on the 31<sup>st</sup> day of January 2006 without alterations or additions.

  
Garry E Collins  
Manager, Fire Testing and Assessments

 NATA

This laboratory is accredited (Accreditation No. 3632) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.



**CSIRO Manufacturing & Infrastructure Technology**  
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA  
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555





<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>

To whom it may concern

## CERTIFICATE

### **screenflex® EN 1598**

**Health and safety in welding and allied processes**

**Transparent welding curtains, strips and  
screens for arc welding processes**

**screenflex®** flexible PVC strips and sheets listed below comply with the European standard EN 1598 requirements.

<b>screenflex® flexible PVC strips and sheets</b>			<b>comply with EN1598 section 4 requirements</b>	
Reference	Designation	Thickness	Testing laboratory	Test report
137E	Screenflex EN 1598 Light green	1 mm	DIN CERTCO	11401-PZA-08
138E	Screenflex EN 1598 Light green	2 mm	DIN CERTCO	11402-PZA-08
139E	Screenflex EN 1598 Light green	3 mm	DIN CERTCO	11871-PZA-08
301E	Screenflex EN 1598 Red	1 mm	LNE	E013563/CMI18
302E	Screenflex EN 1598 Red	2 mm	LNE	E013563/CMI17
302E	Screenflex EN 1598 Red	3 mm	LNE	E013563/CMI11
311E	Screenflex EN 1598 Green Matt	1 mm	LNE	E013563/CMI16
312E	Screenflex EN 1598 Green Matt	2 mm	LNE	E013563/CMI15
313E	Screenflex EN 1598 Green Matt	3 mm	LNE	E013563/CMI14
321E	Screenflex EN 1598 Bronze	1 mm	LNE	E013563/CMI13
322E	Screenflex EN 1598 Bronze	2 mm	LNE	E013563/CMI12
323E	Screenflex EN 1598 Bronze	3 mm	DIN CERTCO	11271-PZA-08
330E	Screenflex EN 1598 Dark green	2 mm	DIN CERTCO	00063-PZA-09
361E	Screenflex EN 1598 Dark bronze	2 mm	DIN CERTCO	00061-PZA-09
361E	Screenflex EN 1598 Dark bronze	3 mm	DIN CERTCO	00062-PZA-09

*Test reports are available on request.*

**screenflex®** flexible PVC strips and sheets are stamped every 2 meters with the "SCREENFLEX" brand name, the standard reference "EN 1598" and the year and the month of manufacturing.

Thank you for your concern and support to our environmental and safety policy.

01/04/2009



Robert MOULLET  
Technical director

01/04/2009



Julien GERARD  
R&D Engineer

**screenflex® range****INFORMATION FOR USERS**

According to EN1598:1997/A1:2001, section 6

**a) Name and address of the manufacturer:****extruflex**

16, rue Baudin, 92300 Levallois-Perret, FRANCE

**b) Number and year of publication of the standard:**

EN1598:1997 and its amendment A1:2001

Health and safety in welding and allied processes

Transparent welding curtains, strips and screens for arc welding processes

**c) Models identification:**

<b>screenflex® range's flexible PVC strips and sheets</b>		
<b>Reference</b>	<b>Designation</b>	<b>Thickness</b>
137E	Screenflex EN 1598 Light green	1 mm
138E	Screenflex EN 1598 Light green	2 mm
139E	Screenflex EN 1598 Light green	3 mm
301E	Screenflex EN 1598 Red	1 mm
302E	Screenflex EN 1598 Red	2 mm
302E	Screenflex EN 1598 Red	3 mm
311E	Screenflex EN 1598 Green Matt	1 mm
312E	Screenflex EN 1598 Green Matt	2 mm
313E	Screenflex EN 1598 Green Matt	3 mm
321E	Screenflex EN 1598 Bronze	1 mm
322E	Screenflex EN 1598 Bronze	2 mm
323E	Screenflex EN 1598 Bronze	3 mm
330E	Screenflex EN 1598 Dark green	2 mm
361E	Screenflex EN 1598 Dark bronze	2 mm
361E	Screenflex EN 1598 Dark bronze	3 mm

**d) Instructions for storage, use and maintenance:**

- Storage: Store at a temperature between 10°C and 40°C in a dry environment.  
Do not stock with solvents.
- Use: Spread the welding curtains, strips or screens between the workplace where arc welding processes are used and the one to protect.
- Maintenance: Curtains, strips or screens with defects have to be replaced or repaired.

**e) Specific instructions for cleaning:**

Wash curtains, strips or screens with soapy water or alcohol solution.

**f) Details of the fields of use, protection capabilities, performance characteristics, minimum distance of use:**

Products are designed to be used for shielding of workplaces from their surroundings where arc welding processes are used. They are designed to protect people from hazardous radiant emissions from welding arcs and spatter.

Products are not intended to replace welding filters. Appropriate welding filters for intentional viewing of welding arcs from a distance of less than 2 m are specified in the standard EN 169.

Do not use products at a distance of less than 2m from the welding arcs (Indicative value).

Products are not certified for welding processes where laser radiation is used.

**screenflex®** flexible PVC strips and sheets comply the Requirements of the European standard EN1598:1997/A1:2001 section 4 (Transmittance (§ 4.1), Reflectance (§ 4.2), UV-Stability (§ 4.3) and Resistance to ignition (§ 4.4)). Test reports are available on request for more details.

**g) Details of suitable accessories and spare parts, and instructions for fitting:**

Accessories and spare parts used to spread the welding curtains, strips or screens have to be suitable for their use and respect laws in force.

For welding curtains made from a succession of adjacent welding strips, the edges of adjacent welding strips have to overlap each other sufficiently in order to not create a gap between the adjacent welding strips.





<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>



## TEST REPORT

N° 41737010BC1

English version – Original in french

**DELIVERED** : EXTRUFLEX  
Usine du Planet  
05310 LA ROCHE DE RAME  
FRANCE

**SUBJECT** : - **TESTS PERFORMED** : Surface resistivity.  
Determination of sparks generated by friction

- **REFERENCE DOCUMENTS** : IEC 60093 Standard dated 1980  
IEC 1087 Technical Report dated 1991

- **TEST SUBJECTS** : Four transparent PVC referenced: Antistatic  
clear ref 180

**Test date** : 26 June 2002

This document is composed of 3 pages + 1 annex

**Test manager** : R Le Bihan

Document initially released on : 10 July 2002

Corrected on : 23 July 2002

Fontenay-aux-Roses,  
Technical manager,

P.O.



B. Pasquien

ROGER LE BIHAN

Reproduction of this document is authorized only in the form of a full photographic facsimile. For any partial reproduction or any insertion of results in an accompanying text with a view to dissemination, the prior formal approval of the LCiE is required. This document is the result of test performed on a specimen, a sample or a test tube. It does not prejudice the conformance of all manufactured products with the test subject.

■ **LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES**

Société anonyme à Directoire et Conseil de surveillance au capital de 15 745 984 euros - RCS Nanterre B 408 383 174

33, avenue du Général Leclerc - BP n° 8 - F 92266 FONTENAY-AUX-ROSES CEDEX - Tél. : +33 1 40 95 60 60

## 1. – TEST SAMPLES

Transparent PVC

Reference : Antistatic clear ref 180

Test samples :

Dimensions : 300 mm x 200 mm  
 Thickness : 1.9 mm (measured)  
 Number : 4

## 2. – TEST PERFORMED

Electrostatic characterization by means of the following measurements :

- Surface resistivity according to IEC 60093 standard dated 1980 "Method for determination of transversal and surface resistivity of solid electric insulating materials".
- Charge acceptance according to IEC 1087 Technical Report dated September 1991 " Evaluation guide for sparks issued from charged surface".

## 3. – INSTRUMENTS NEEDED

Surface resistance measurements :

- High voltage power supply
- Keithley 617 Electrometer used as a pico-ammeter
- Fluke 25 Multimeter
- Resistivity calculation:  $\rho_s = (2\pi / (\ln(D2 / D1))) * R_s$

Sparks energy measurements :

- Mobile electrode moving at 5cm/s
- Keithley 617 Electrometer
- Drawing table.

## 4. - RESULTS

The measurements were performed after the samples stayed for 48 hours or more in an air conditioned room where temperature and relative humidity levels were  $23\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$  and  $25\text{ \% RH} \pm 2\text{ \% RH}$  respectively.  
 Tests were performed in the same conditions.

#### 4.1. Resistivity

##### Surface resistivity

###### Tests conditions :

- Electrodes : 30 mm circular electrode with a 3 mm wide and 57 mm internal diameter annular ring and a conducting guard plate under the sample.
- Power supply : 500 V
- Time before measurements : 1 minute
- Atmospheric conditions : 23°C, 25%HR

Reference	Test power supply (V)	Surface resistivity ( $\Omega/\square$ )	
		Individual values	Mean value
Antistatic clear ref 180	500	$1.75 \cdot 10^{12}$	$2.03 \cdot 10^{12}$
		$2.68 \cdot 10^{12}$	
		$1.64 \cdot 10^{12}$	

#### 4.2. Charge acceptance

###### Tests conditions :

The samples were placed on a metallic surface connected to ground.

The operator connected to ground applied a strong friction to the sample surface by means of cotton, polyamide or acrylic material. Immediately after friction a spherical electrode connected to a known capacitance was neared to the surface.

The voltage at the capacitor terminals was measured. If sparks were present while the electrode was approaching the surface, the charge quantity transferred in the spark was determined, in nano-coulombs (nC) as well as the spark length, in millimeters. The spark energy was calculated, in micro-joules, from these values.

Reference	Friction stick	Result
Antistatic clear ref 180	Cotton	No spark transferred
	Polyamide	No spark transferred
	Acrylic	No spark transferred

#### 5. COMMENTS RELATIVE TO USE IN EXPLOSIVE ATMOSPHERE

For the tested samples, no spark was observed, whatever the friction stick . This material includes no risk related to static electricity, provided that all components are connected to earth

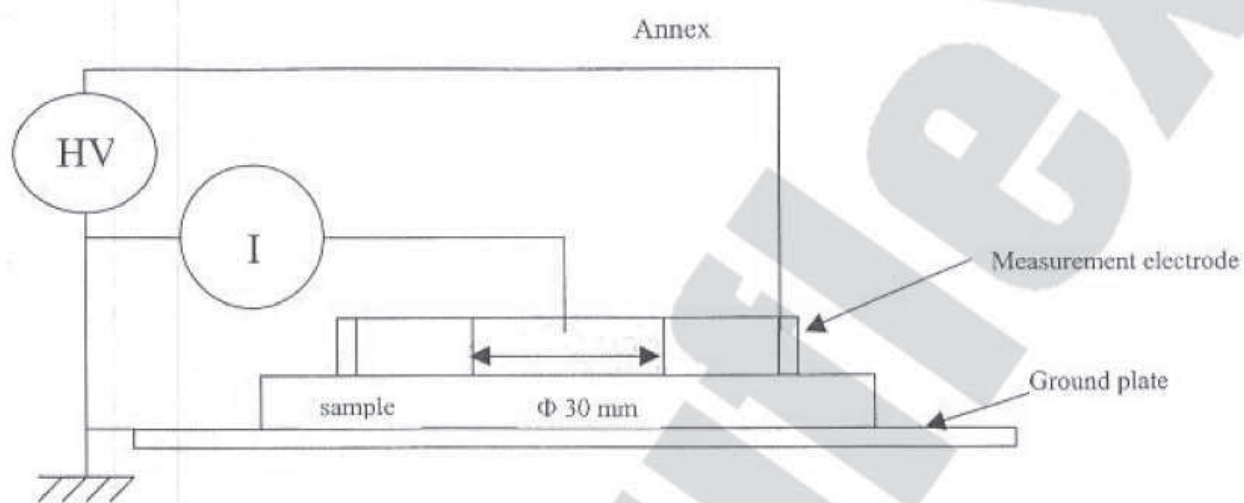


Fig 1 : Surface resistance measurement



# Why to use flexible PVC strips & sheets?

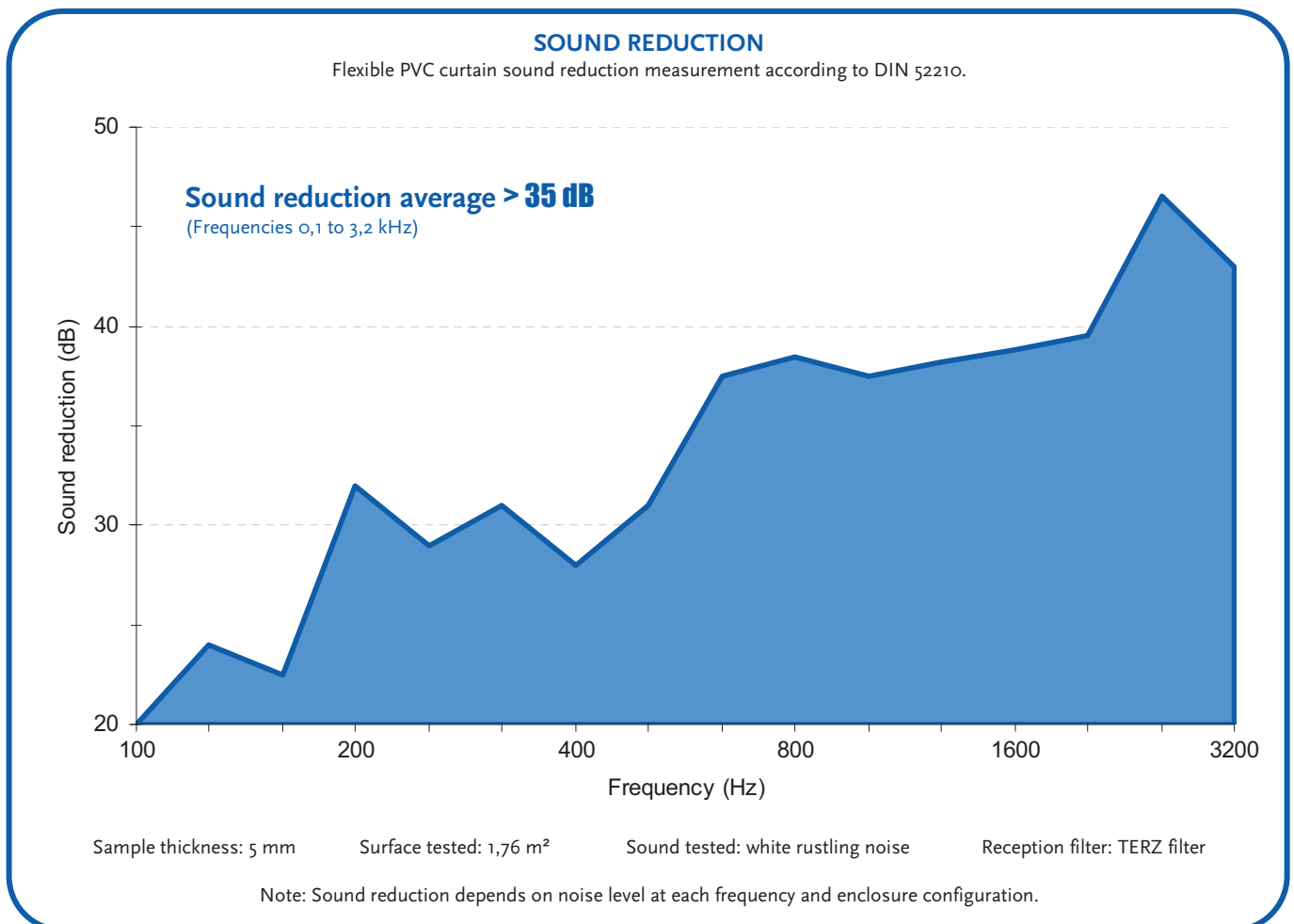
focus on

## FLEXIBLE PVC & SOUND REDUCTION

People are often exposed to noise in their environment. Loud working environment can lead to workers tiredness, communication misunderstanding and exposure to sound level over 80 dB during 8 hours/day is harmful for people as described in the directive 2003/10/EC which regulates noise exposure in working environment.

Due to its softness, **extruflex** flexible PVC is a very efficient noise absorber. **extruflex** flexible PVC strips and sheets are often used as noise insulators in factories, around machines and industrial lines, as conveyor enclosures or insulator sheets. Used as doors or curtains they separate front and back office in supermarkets and shops. They lead to protect workers in industrial and noisy environments, increase people's comfort and make communication efficient.

Used as partitions, doors or insulation sheets, **extruflex** flexible PVC strips and sheets allow high sound reduction.



**extruflex** flexible PVC strips and sheets absorb noise to create safe, comfortable and efficient working environment.

The data contained in this technical specification is given for information only and is based on our current knowledge of the products concerned.  
This information given to our customer in good faith to inform him and to help him in his search, does not constitute any formal or implicit guarantees as to its use.



<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>





<b>CORPORATE BROCHURE</b>	<b>1</b>
<b>FLEXIBLE PVC STRIPS &amp; SHEETS</b>	<b>2</b>
<b>HARDWARE</b>	<b>3</b>
<b>PRODUCTS SPECIFICATIONS</b>	<b>4</b>
<b>SAFETY &amp; ENVIRONMENT</b>	<b>5</b>
<b>Durability &amp; Resistance</b>	<b>6</b>
<b>Thermal properties</b>	<b>7</b>
<b>Reaction to fire</b>	<b>8</b>
<b>Welding screens</b>	<b>9</b>
<b>Other properties</b>	<b>10</b>
<b>Vinamold®</b> Reusable flexible mould compound	<b>11</b>
<b>Annex</b>	<b>12</b>