

Are all flexible PVC strips & sheets the same?

focus on

STABILIZERS & DURABILITY

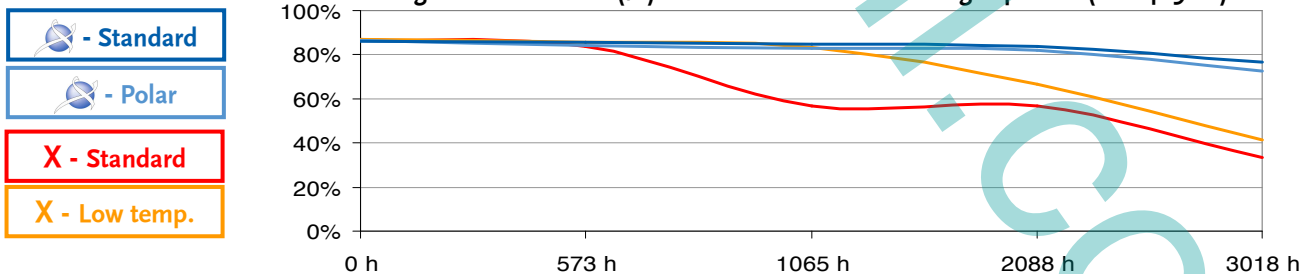
In use, flexible PVC strips and sheets are exposed to harmful constraints coming from surrounding environment. UV sun radiations (Ultra Violet) can break down polymer chemical bonds, degrading its mechanical performances and transparency. This phenomenon can be largely delayed by adding UV stabilizers 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>
extruflex Standard Clear (Ref. 100)					
extruflex Polar (Ref. 105)					
OTHER PRODUCER Standard (not UV stabilized)					
OTHER PRODUCER Low temp. (not UV stabilized)					

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

Light transmittance (%) after accelerated weathering exposure (ISO 4892-2)



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.

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PLASTICIZERS & DURABILITY

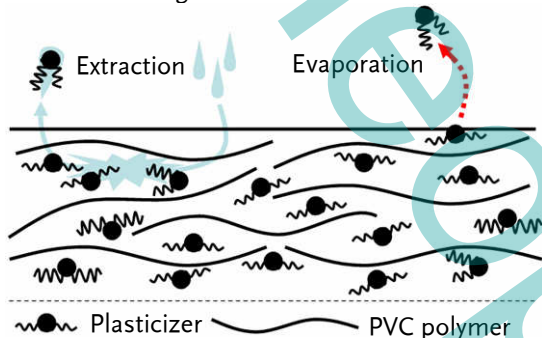
Flexible PVC is a complex material made from different substances (PVC resins, plasticizers and additives) conferring it specific properties. The substances allowing its extra suppleness are plasticizers. A lot of different plasticizers are available, but about 80% of the worldwide consumption is comprised of three plasticizers: di-2-ethylhexyl phthalate (DEHP) also referred as di-octyl phthalate (DOP), di-isononyl phthalate (DINP) and di-isodecyl phthalate (DIDP). Those plasticizers, present in high concentration in flexible PVC strips and sheets (30 to 45%wt), have very different impacts on products durability due to their different migration speeds.

Plasticizer migration into air: Evaporation

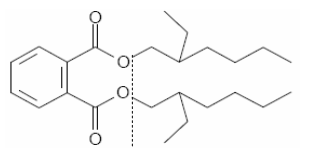
Evaporation of plasticizers from PVC into the surrounding air.

Plasticizer migration into liquid: Extraction

Liquid diffused into plasticized PVC, dissolves the plasticizers, and diffuses together with it out to the surface.

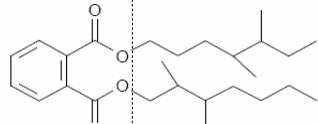


**DEHP
(DOP)**



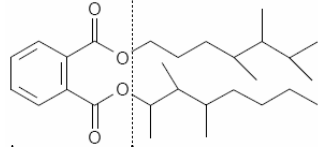
$C_{8}H_{17}$
 $C_{8}H_{17}$

DINP



$C_{9}H_{19}$
 $C_{9}H_{19}$

DIDP

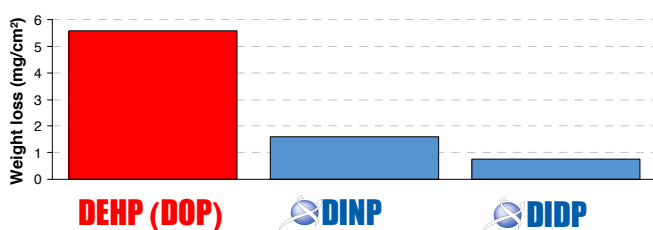


$C_{10}H_{21}$
 $C_{10}H_{21}$

Head Carbon chains

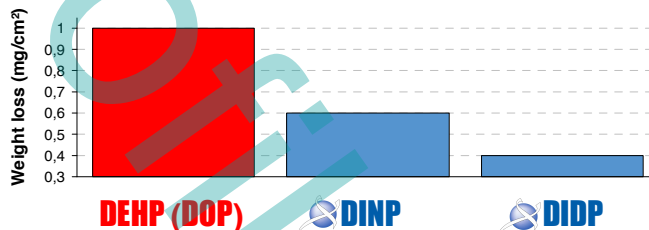
Plasticizers migration speeds are directly related to their carbon chains length. Longer the chains are, more stable the polymer is.

Evaporation



Plasticizers phr70 in PVC (K value 71) in oven 7 days @ 100°C

Extraction by soapy water



Plasticizers phr70 in PVC (K value 71) in soapy water 1 day @ 75°C

Due to its short carbon chains length, DEHP (DOP) plasticizer migrates quickly out of the material. Flexible PVC strips and sheets plasticized with DEHP can be recognized easily due to their strong smell and they lose their flexibility extremely rapidly. High quality DIDP or DINP plasticizers, which remain much longer into the material, ensure durable products performances.

extruflex uses only high quality, safe and environment friendly plasticizers DINP and DIDP in its products.

extruflex do not use any DEHP (DOP) plasticizers in its products. Such not durable, smelly and toxic plasticizer is often used in order to make more profits to the detriment of environment, human health and 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.