

CHEMICALS SUBSTITUTION

NEWSLETTER #17
JULY 2020

POSTPONEMENT OF THE WORKSHOP "CHEMICAL SUBSTITUTION IN THE TEXTILE SECTOR"

Due to Covid-19 Pandemic, the workshop on the substitution of chemical substances in the textile industry (jointly organized by Ineris and the Ministry of the Ecological and Inclusive Transition), initially scheduled for January 9, 2020, has been postponed. A date should be communicated by October.

For more information:
<https://www.ineris.fr/fr/ineris/actualites/enjeux-substitution-filiere-textile>
(in French)

MULTI-LAYER MEDICAL TUBING AS AN ALTERNATIVE TO PVC TUBING

RAUMEDIC produces custom-made multilayer medical tubes with up to four layers of different materials (among polyethylene, polypropylene, PVC, polyamide, thermoplastic polyurethane...).

Among all these combinations, an alternative to PVC medical tubing containing phthalates has been identified: Ethylene Vinyl Acetate (EVA) - Styrene-Butadiene-Rubber (SBR)

double-layer tubing. According to their producer, these tubes are suitable for the administration of light-sensitive treatments, as the outer layer can be tinted and the inner layer acts as a barrier between the active principle and the pigments of the outer layer.

According to the RAUMEDIC company, the cost of tubing composed of both EVA/SBR layers is about 25% higher than that of PVC tubing.

For more information:
<https://www.raumedic.com/medical-technology/pvc-free-plastic-solutions>

<https://www.raumedic.com/technologies/extrusion/co-extrusion>

Contact RAUMEDIC-France:
pascal.dumont@raumedic.com

POLYESTER PLASTICIZERS

Some polyesters have plasticizing properties and could be good candidates for some phthalates' substitution (particularly those used to produce flexible PVC or elastomers).

The unit of these polyesters is a glycol generally containing two to five carbon atoms (ethylene glycol, propylene glycol, butylene glycol, etc.) linked to an aliphatic diacid of 4 to 10 carbon atoms (succinic acid, glutaric acid, adipic acid, etc.).

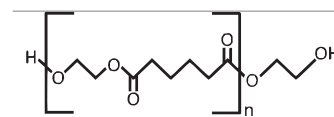


Figure 1/ Example of polyester plasticizer - Polyadipate ethylene glycol n°CAS 24938-37-2

Because of their low toxicity, polyesters are particularly suitable for certain medical applications (such as medical tubes), for food contact applications (cork seals, etc.), for the production of toys, etc.

The high molecular weight of these plasticizers (over 500 g/mol) makes them:

- / a low migration in the polymer;
- / an important resistance to oils and solvents;
- / low volatility.

Nevertheless, this property may also imply an increase in the viscosity of the materials and therefore a longer process time and/or require higher processing temperatures to obtain a homogeneous mixture when adding this plasticizer (and other additives).

In addition, the high molecular weight of polyester polymers can affect the performance of these plasticizers.

Therefore, they may require higher concentrations than some phthalates (particularly in relation to DOP) for equal performance. This constraint combined with longer process times could lead to additional costs. The [Specialchem site](#) confirms that the use of polyester polymers to produce flexible PVC would imply a high cost.

The weather resistance and low-temperature performance of polyester polymers, which are claimed by some producers, are the subject of reservations on the part of the [Specialchem site](#) for PVC applications.

Polyesters such as polyadipates (see example in Figure 1) are the most widely represented polymer plasticizers on the market: they are offered by the companies HALLSTAR (PLASTHALL PR-Series range), BASF (PALAMOLL range), EMERY Oleochemicals (EDENOL range) and DIC (Polycizer W-230-H and Polycizer W-1410-EL products). Polyadipates are used for the production of medical tubes, films, electrical wires and cables, joints...

HALLSTAR offers various polyester polymer plasticizers:

- / PARAPLEX G25 100%, a polysebacate used for high temperature applications, the production of coated fabrics, electrical cables and tapes, refrigerator seals, etc...
- / PLASTHALL P-550 and PLASTHALL P-7046, polyglutarates with the following uses: electrical tapes, O-rings, refrigerator seals for the PLASTHALL P-550 and conveyor belts, pipes, gaskets, O-rings, printing rollers, telephone cables for the PLASTHALL P-7046.

It should be noted that research work on branched and hyper-branched polymeric plasticizers is being widely developed, as their branching improves their performance without hindering their low volatility and resistance to oils and solvents.

For more information:
https://www.dic-global.com/en/products/modifier/env_pvc_plasticizer/lineup/w230h.html

<http://www.plasticizers.basf.com/portal/load/fid266211/Portfolio%20brochure.pdf>

<https://www.hallstarindustrial.com/webfoo/wp-content/uploads/hallstar-plasticizers-for-pvc.pdf>

https://www.impag.ch/fileadmin/user_upload/CH/Files/Performance_Chemicals/Fokusberichte/Green-Polymer-Additives_EMERY_IMPAG-AG.pdf

https://www.researchgate.net/publication/273531730_Perspectives_on_alternatives_to_phthalate_plasticized_polyvinyl_chloride_in_medical_devices_applications

RUBBER: A NEW ALTERNATIVE TO TNPP

In the last newsletter, we presented the reasons for the inclusion of TNPP at greater than 0.1% (w/w) of branched and linear 4-nonylphenol on the list of Substances of Very High Concern (SVHC). TNPP is a stabilizer/antioxidizer used in the production of various polymers including rubbers. However, due to its incomplete synthesis reaction, TNPP may contain residues of branched and linear 4-nonylphenol.

To overcome the residual presence of branched and linear 4-nonylphenol, BASF proposes an antioxidant that can replace TNPP in certain rubbers: Irganox 1520 L (4,6-Bis(octylthiomethyl)-o-cresol- n°CAS 110553-27-0).

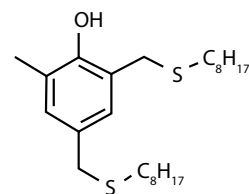


Figure 2/ Irganox 1520 L - n°CAS 110553-27-0

According to BASF, Irganox 1520 L can be used to treat various rubbers: polybutadiene (BR), styrene-butadiene copolymer (SBR), nitrile rubber (NBR), synthetic polyisoprene (IR), Styrene-Butadiene-Styrene (SBS) and Styrene-Isoprene-Styrene (SIS) copolymers and natural rubber.

According to its producer, Irganox 1520 L has the advantage of preserving the rubber both during processing and during use (protection against thermal ageing).

BASF states that its product is low volatile, light and heat stable, does not stain or discolour.

For more information:
https://polymer-additives.specialchem.com/_/media/production/polymer-additives/basf-antioxidant/tds/ti_evk_1030_irganox1520_e.pdf

https://polymer-additives.specialchem.com/_/media/production/polymer-additives/basf-antioxidant/techlibrary/tech-paper/stabilization_of_rubber_with_basf_irganox_1520_l.pdf

RECENTLY PUBLISHED ON THE CHEMICALS SUBSTITUTION WEBSITE...

- / 5 phthalates will soon be restricted for use in textile articles
- / DIHP: a Substance of Very High Concern (SVHC) according to the European REACH Regulation
- / Implementation of the restriction on bisphenol A in thermal papers
- / Inclusion of three phthalates in Annex XIV of the REACH Regulation

COMING SOON

FESPA 2020 in Madrid (Spain) from 06 to 08 October 2020

The global federation of national associations for the screen printing, digital printing and textile printing will organize the FESPA Global Print Expo 2020 in Madrid (Spain) from 6th to 8th October 2020. FESPA is a trade fair for professionals in the field of printing industry, which will offer the opportunity to learn about new technologies and innovative solutions in the different fields of printing that could potentially replace ethoxylated nonylphenols.

<https://www.fespa.com/en/events/2020/global-print-expo-2020>

EUROCOAT 2020 in Paris (France) from 15 to 17 September 2020

The international exhibition EUROCOAT (15 to 17 September 2020, Paris), dedicated to coating professionals (paint, printing ink, varnish, glue and adhesive industries), will bring together suppliers of coatings, raw materials, equipment and services. Numerous branches of the coating industry, packaging and material handling equipment will be present.

<https://www.eurocoat-expo.com/en/>

POLYMERS IN FLOORING in Atlanta (USA) from 16 to 17 September 2020

Innovations in the field of polymer flooring, with potential alternatives to phthalates, will be presented for residential, commercial, industrial, sanitary, sports and leisure applications ... The conference will be held in Atlanta (USA) from 16th to 17th September 2020.

<https://www.ami.international/events/event?Code=C1078>

Updated daily to communicate any changes that could arise due to the COVID-19 spread.

If you have any questions,
please contact us:
<https://substitution.ineris.fr/en/contact>

<https://substitution.ineris.fr/en>