Phthalates Information

About Phthalates Commonly Used to Soften Vinyl

Phthalates are a family of compounds some of which primarily are used to soften or "plasticize" polyvinyl chloride (PVC), or vinyl. The phthalates commonly used to give vinyl its flexibility are diisononyl phthalate (DINP), diisodecyl phthalate (DIDP) and dipropylheptyl phthalate (DPHP). These phthalates are tightly bound in the structure of the vinyl. This fact, together with their low vapor pressure, contributes to their long service life to keep products flexible. These phthalates are specifically chosen as plasticizers because they are resistant to extraction, evaporation and migration.

Unique Benefits and Uses

Today, DINP, DIDP and DPHP are employed in flexible vinyl applications across a broad range of industries, including the building and construction, automotive, flooring, and wire and cable industry sectors. One of the most important attributes of these phthalates is that they are not simple additives like pigments; they are colorless, odorless liquids that, when combined with PVC, change and improve vinyl's physical properties. This creates opportunities for new products that demand high performance and benefit consumers in a variety of ways.

The chemical properties of DINP, DIDP, and DPHP make them not only cost-effective, but highly suitable for many flexible vinyl products. Some of their key characteristics include:

- Durability— extends a product's lifetime wear
- Flexibility— allows vinyl to bend and twist without cracking, an essential safety feature in products such as electrical and automotive cables
- Low volatility— using phthalates in applications where products are exposed to high temperatures enables products to be more resistant to degradation
- Weather resistance— makes products especially suitable for many outdoor applications

With a wide range of physical and chemical properties, these phthalates are used in a multitude of consumer and industrial products that demand high performance, long-lasting wear and durability. They can be found in a range of everyday items consumers depend on to function properly, including: electrical cables, automobile interiors, flexible hoses, flooring, wall coverings, coated textiles, luggage, sports equipment, roofing membranes, pool liners and footwear.

While they can be employed in a variety of applications, these phthalates are not necessarily interchangeable. The characteristics of an individual phthalate often make it well suited to a particular product, allowing manufacturers to meet unique requirements for its use (function and safety specifications), appearance (texture, color, size and shape), and durability and wear. For this reason, substitutions could sacrifice the functionality, quality, longevity, cost or performance of a product.

Weight of Scientific Evidence Supports the Safety of DINP, DIDP and DPHP

The safe use of DINP, DIDP and DPHP in consumer and industrial applications has been supported by scientific bodies of government and independent agencies in both Europe and the United States. Exposures to these phthalates are extremely low as indicated by data collected by the U.S. Centers for Disease Control and Prevention and others.

Government scientific agencies and regulatory bodies in the United States and Europe that have reviewed the safe use of these phthalates include:

- *National Toxicology Program's Center for the Evaluation of Risks to Human Reproduction (NTP-CERHR)* (concluded that there was "minimal concern" regarding risk of developmental or reproductive effects from current exposure levels to DINP, that there was "minimal concern" regarding risk of developmental effects and "negligible concern" regarding risk of reproductive effects from current exposure levels to DIDP).
- *Consumer Product Safety Commission (CPSC)* (the Chronic Hazard Advisory Panel on DINP in 2001 and the CPSC staff in 2002 both concluded that exposure to DINP from mouthing soft plastic toys would be expected to pose a minimal to non-existent risk of injury for the majority of children).
- *European Chemicals Bureau* (both DINP and DIDP have undergone a comprehensive risk assessment by the European Union (EU) under the Existing Substances Regulation).
- *EU's Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)* (DINP, DIDP and DPHP are each REACH registered and are not listed on the REACH Candidate List, meaning DINP, DIDP and DPHP can be placed on the European market without any additional authorization).
- *Organization for Economic Cooperation and Development (OECD) High Production Volume (HPV) Chemicals Program* (DPHP was part of the OECD HPV Chemicals Program review of the High Molecular Weight Phthalate Esters (HMWPE) category in 2004. The review found that toxicity studies indicate that chemicals in HMWPE category have a low order of toxicity and do not present health or environmental hazards. The review concluded that chemicals in the category are "currently of low priority for further work because of their low hazard profile.").

For more information, please contact

Eileen Conneely

High Phthalates Panel

American Chemistry Council

Email: Eileen_Conneely@americanchemistry.com