

EASTMAN

Standing the test of time

*Eastman 168™ non-phthalate
plasticizer for flooring*



Building on a foundation of trust

Eastman 168™ non-phthalate plasticizer

A trusted choice for PVC applications for 40 years, Eastman 168™ non-phthalate plasticizer is a general-purpose plasticizer that offers a ready replacement to general-purpose phthalate plasticizers. Ideal for resilient sheet flooring, luxury vinyl tile, vinyl composite tile, PVC-backed carpet applications, and cove molding, it is compatible with current pressure-sensitive adhesives used in flooring applications. Eastman 168 also offers the advantage of similar efficiency and fusion properties and promotion of consistent foam quality in foamed layers.

For a simple unfilled formulation, as shown in Figure 1, Eastman 168 is a preferred replacement for diisononyl phthalate (DINP). Shown in Table 1, the fusion properties, efficiency, and mechanical properties are all very similar to DINP and—in some cases—superior to diisononyl cyclohexane-1,2-dicarboxylate (Hexamoll® DINCH®). In addition, PVC made with Eastman 168 shows improved heat stability compared to both DINP and Hexamoll® DINCH® in both plastisol and compound formulations.

Performance benefits

- Good migration resistance into the adhesive
- Non-phthalate
- 40 years of reliability
- Improved heat stability
- Often a drop-in replacement
- Lower fusion temperature than Hexamoll® DINCH®
- Global availability

Table 1

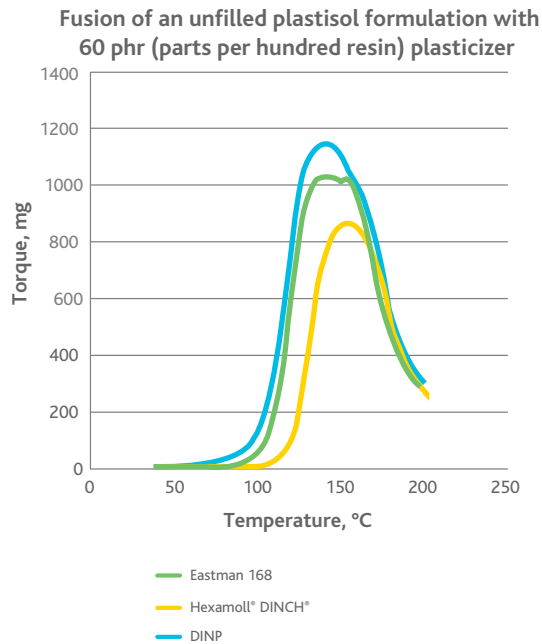
Physical properties: General-purpose plasticizer comparison

| Plasticizer | Eastman 168 | DINP | Hexamoll® DINCH® |
|--|-------------|-------|---------------------|
| Typical plasticizer properties | | | |
| Molecular weight | 391 | 421 | 425 |
| Specific gravity @ 20°C/20°C | 0.984 | 0.972 | 0.949 |
| Viscosity @ 25°C, cP | 63 | 52 | 52* |
| Flash point, COC, °C | 238 | 232 | 224 |
| VOC, % (TGA 1 hour @ 110°C) | 0.11 | 0.18 | 0.15 |
| PVC from 60 phr plasticizer in unfilled plastisol formulation | | | |
| Gel temperatures, °C | 121 | 116 | 132 |
| Fusion temperatures, °C | 142 | 139 | 154 |
| Shore A hardness | 74.1 | 73.4 | 73.0 |
| Mechanical properties** | | | |
| Modulus of elasticity, psi | 1379 | 1329 | 1368.0 |
| Elongation at break, % | 293 | 292 | 253.0 |
| Tensile strength at break, Mpa | 17.5 | 16.2 | 16.0 |
| Viscosity, cP | 3300 | 4740 | 2680 |

*@ 20°C

**ASTM D412 and D624

Figure 1



The Brabender torque rheometer fusion data for the 60 phr plastisol formulations in Figure 1 show similar fusion curves for Eastman 168 and DINP versus the significantly higher temperatures required to fuse diisononyl, cyclohexane-1,2-dicarboxylate (Hexamoll® DINCH®).

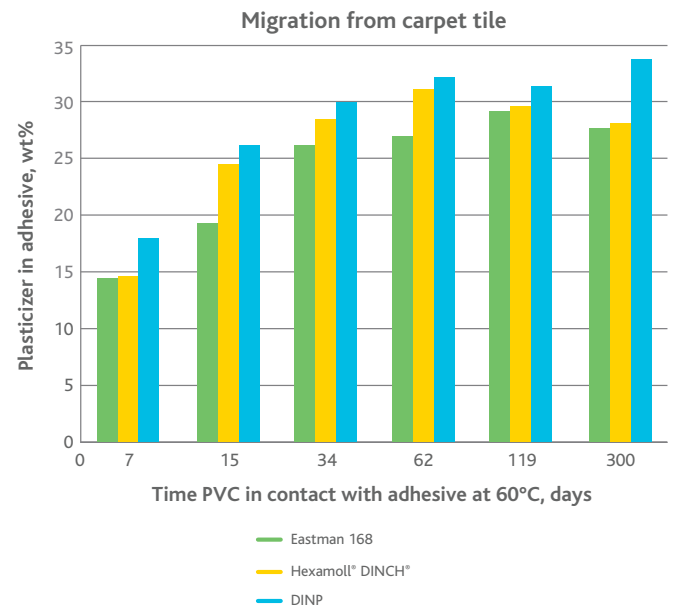
Blend to optimize

Eastman 168™ non-phthalate plasticizer can be blended with a non-phthalate fast-fusing plasticizer, such as Eastman Effusion™ plasticizer or Benzoflex™ RF-532 plasticizer. The blended formulation provides desired rheology and fusion characteristics in a completely non-phthalate solution. By blending fast-fusing and general-purpose plasticizers, manufacturers have more processing options during production.

Staying true to the application

Eastman 168™ non-phthalate plasticizer is a reliable option for manufacturers who need to minimize migration into their adhesive backing. Pressure-sensitive adhesives hold carpet tiles and vinyl tiles in place; yet they still allow relatively easy removal of individual tiles if they need to be replaced. These adhesive formulations typically consist of some combination of isobutyl, butyl, and 2-ethylhexyl acrylates; methyl methacrylate; and styrene monomers along with other additives. The adhesives are very compatible with the typical plasticizers contained in PVC so a certain amount of migration of plasticizer into the adhesive should be expected. In most cases, Eastman 168 migrates less when compared to DINP, as shown in the accelerated test data in Figure 2.

Figure 2



Your next step: contact us

Whether your formulation requires only a general-purpose non-phthalate plasticizer or a blended solution with a fast-fusing plasticizer, Eastman 168 is a trusted and market-proven solution. And when you switch, an Eastman technical specialist will be by your side to help make your transition seamless.

To find out more about Eastman 168™ non-phthalate plasticizer for flooring, call your Eastman representative today or visit www.EastmanPlasticizers.com.

Applications

- Resilient sheet flooring
- Luxury vinyl tile
- Vinyl composite tile
- PVC-backed carpet applications
- Cove molding

EASTMAN

The results of insight™

Eastman Chemical Company Corporate Headquarters

P.O. Box 431
Kingsport, TN 37662-5280 U.S.A.

Telephone:
U.S.A. and Canada, 800-EASTMAN (800-327-8626)
Other Locations, (1) 423-229-2000
Fax: (1) 423-229-1193

Eastman Chemical Latin America

9155 South Dadeland Blvd.
Suite 1116
Miami, FL 33156 U.S.A.

Telephone: (1) 305-671-2800
Fax: (1) 305-671-2805

Eastman Chemical B.V.

Fascinatio Boulevard 602-614
2909 VA Capelle aan den IJssel
The Netherlands

Telephone: (31) 10 2402 111
Fax: (31) 10 2402 100

Eastman (Shanghai) Chemical Commercial Company Ltd.

Building 3, Yaxin Science & Technology Park
Lane 399 Shengxia Road,
Pudong New District
201210, Shanghai, P.R. China

Telephone: (86) 21 6120-8700
Fax: (86) 21 5027-9229

Eastman Chemical Japan Ltd.

Anzen Building 16F
1-6-6 Moto Akasaka
Minato-ku, Tokyo 107-0051 Japan

Telephone: (81) 3-3475-9510
Fax: (81) 3-3475-9515

Eastman Chemical Asia Pacific Pte. Ltd.

9 North Buona Vista Drive
#05-01 The Metropolis Tower 1
Singapore 138588

Telephone: (65) 6831-3100
Fax: (65) 6732-4930

Although the information and recommendations set forth herein are presented in good faith, Eastman Chemical Company makes no representations or warranties as to the completeness or accuracy thereof. You must make your own determination of their suitability and completeness for your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. Nothing contained herein is to be construed as a recommendation to use any product, process, equipment, or formulation in conflict with any patent, and we make no representations or warranties, express or implied, that the use thereof will not infringe any patent. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND NOTHING HEREIN WAIVES ANY OF THE SELLER'S CONDITIONS OF SALE.

Safety Data Sheets providing safety precautions that should be observed when handling and storing our products are available online or by request. You should obtain and review available material safety information before handling our products. If any materials mentioned are not our products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed.

© 2015 Eastman Chemical Company. Eastman, Benzoflex, Eastman 168, Effusion, and The results of insight are trademarks of Eastman Chemical Company. Hexamoll and DINCH are trademarks of BASF.