




**EASTMAN**

## Efficiency meets fast fusing

*Eastman Effusion™ plasticizer  
for plastisol applications*

PVC plastisols are used  
in textile printing inks.

# The efficient choice for plastisols



PVC Plastisols can be found in dipped molding applications including the grips on pliers and other tools.

Eastman Effusion™ plasticizer is a unique, fast-fusing solution that enables increased production line speeds and lower processing temperatures, allowing you to reduce your energy costs. Ideal for PVC plastisol applications, such as coatings and screen printing inks, it is both highly efficient and effective at lowering fusion temperatures.

And it outperforms traditional “fast fusers,” making Effusion a viable non-phthalate alternative—and possibly the only plasticizer you’ll need in applications where fusion speed

is paramount. When compared to traditional fast-fusing plasticizers, its improved efficiency allows Effusion to provide similar properties at lower loading levels. Also, Effusion enhances sprayability by providing an excellent shear-thinning effect to your formulations (Table 1). Effusion is a cost-effective replacement for less efficient plasticizers.

## Applications

- Coatings
- Textile printing inks
- Plastisol sealants
- Plastisol adhesives
- Plastisol molding compounds
- Plastisol foams
- Films
- Coated fabrics

Table 1

Mechanical properties: Fast-fuser comparison

Property	Eastman Effusion 36 phr	BBP 40 phr	Benzoate plasticizer 40 phr
	7.5 phr TXIB <sup>a</sup>	7.5 phr TXIB	7.5 phr TXIB
Fusion temperature, °C	103	103	103
Tensile strength, MPa	16.2	16.5	16.8
Elongation at break, %	252	244	260
Modulus at 100% elongation, MPa	9.0	9.4	9.1
Shore A hardness	72	72	73
Tear resistance, kN/m	65	67	63
Tear energy, N*mm	2597	2529	2674
Low shear viscosity (Brookfield), cP @ 24 hours	24400	23650	22900
High shear viscosity (Severs), cP @ 24 hours	12750	15900	23000
Brittleness temperature, °C	-14	-6	-6

<sup>a</sup>Eastman TXIB™ formulation additive

## Blend to optimize

Effusion can be blended with other plasticizers, such as Eastman 168™ non-phthalate plasticizer, allowing plastisol formulators to customize and optimize solutions for specific processing needs. Plastisols made by blending these two plasticizers, for example, exhibit lower initial and aged viscosities while maintaining similar properties to other fast-fuser blends (Figure 1 and Table 2).

Blending plasticizers can also give manufacturers more options when trying to target a replacement of traditional phthalate plasticizers (Figures 2 and 3).

## The flexibility you need

Whether your formulation requires a fast fuser as the sole plasticizer to achieve extremely low fusion temperatures or you're looking to blend a fast fuser with a general-purpose plasticizer, Eastman Effusion is your non-phthalate solution. And when you switch, an Eastman technical specialist will be by your side to help make your transition seamless.

## Formulation features

- Non-phthalate
- Fast fusing
- Highly efficient

Figure 1

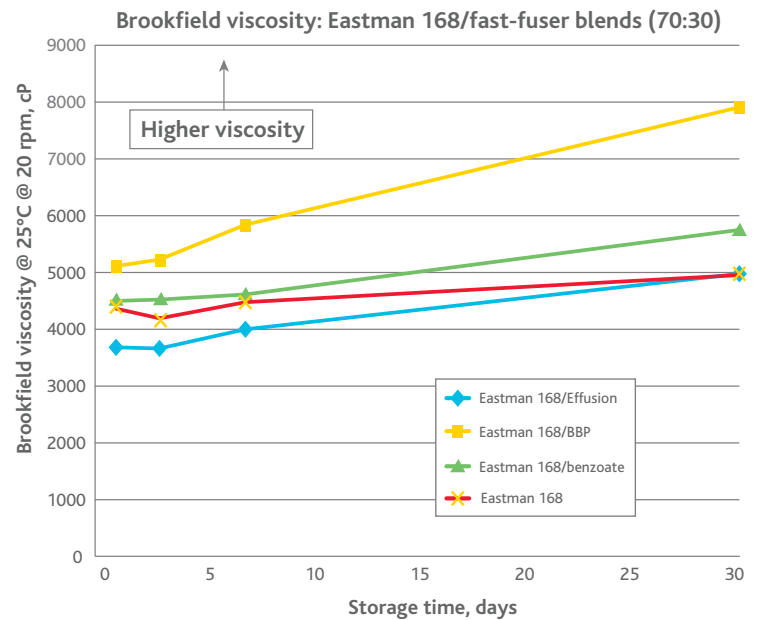


Figure 2

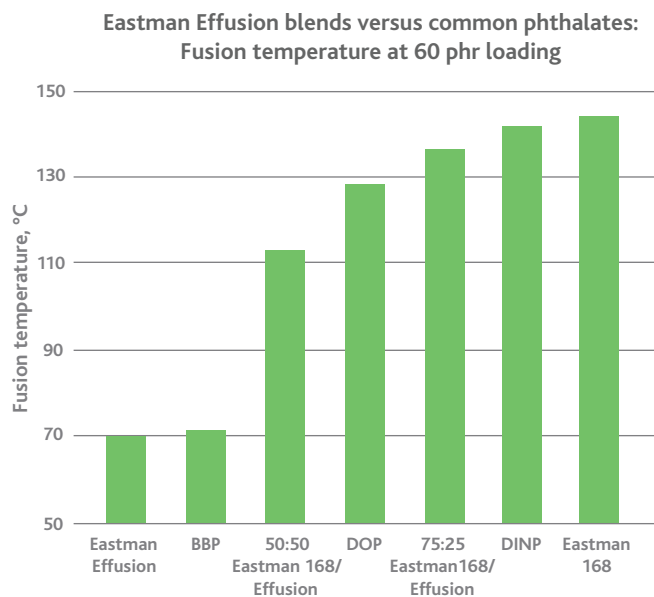
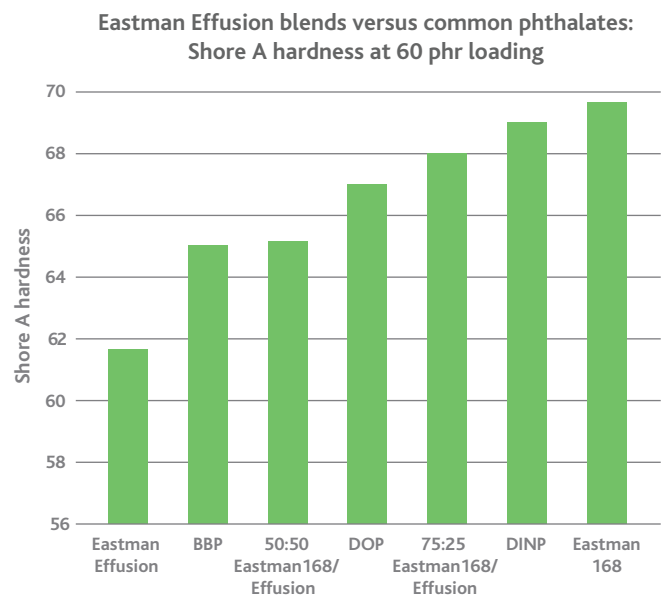


Figure 3



To find out more about the secure supply and efficiency of Eastman Effusion as a fast-fusing non-phthalate plasticizer for plastisol applications, call your Eastman representative today or visit [www.eastmanplasticizers.com](http://www.eastmanplasticizers.com).

**Table 2**

**Mechanical properties: Eastman 168 blends**

Property	Eastman 168/ Effusion 70/30 at 60 phr	Eastman 168/ BBP 70/30 at 60 phr	Eastman 168/ benzoate 70/30 at 60 phr	Eastman 168 at 60 phr
Fusion temperature, °C	128	131	134	148
Tensile strength, MPa	17.4	17.2	17.5	17.9
Elongation at break, %	299	304	298	321
Modulus at 100% elongation, MPa	9.4	8.5	8.6	9.1
Shore A hardness	67	67	67	71
Tear resistance, kN/m	65	65	65	64
Tear energy, N*mm	1191	1250	1123	1136
Brittleness temperature, °C	-45	-36	-39	-47

**Performance benefits**

- Excellent solvating ability in PVC
  - Lower-temperature processing of PVC
  - Faster fusion speeds
  - Wider processing windows
- Excellent viscosity stability when formulated with general-purpose plasticizers such as Eastman 168
  - Excellent shear thinning for improved sprayability
  - Lower density, which can be a benefit when selling by volume
  - Improved in-process heat stability
  - Greater efficiency at lowering hardness
    - Reduction of plasticizer usage in formulation
    - Better low-temperature flexibility



PVC plastisols are used in coated fabrics such as raincoats.

**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 C, No. 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.**

MetLife Aoyama Building 5F  
2-11-16 Minami Aoyama  
Minato-ku, Tokyo 107-0062 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.

© 2013 Eastman Chemical Company. Eastman, Eastman 168, Effusion, The results of insight, and TXIB are trademarks of Eastman Chemical Company.