EASTMAN

Well-grounded stability

Benzoflex™ RF-532 plasticizer for flooring

Durability meets fast fusing

Benzoflex™ RF-532 plasticizer

Benzoflex™ RF-532 plasticizer is a fast-fusing non-phthalate plasticizer for use in PVC flooring applications. PVC plastisols with a fast fuser allow for faster line speeds and wider processing windows than plastisols with only a general-purpose plasticizer. When used in resilient sheet flooring, luxury vinyl tile, vinyl composite tile, and PVC-backed carpet, Benzoflex RF-532 demonstrates good stain resistance and resistance to degradation by ultraviolet light. Compared to butylbenzyl phthalate (BBP), Benzoflex™ RF-532 also offers improved in-process heat stability, excellent efficiency, and good low-temperature flexibility, making it an effective replacement for traditional fast-fusing plasticizers.

Blend to optimize

In many flooring applications, Benzoflex RF-532 can be used in combination with a general-purpose plasticizer. Blending plasticizers allows manufacturers to have more processing options during production. The efficiency of a general-purpose plasticizer, such as Eastman 168™ non-phthalate plasticizer, can be improved by blendiing it with Benzoflex RF-532.

PVC produced with a Benzoflex RF-532 and Eastman 168 blend retains the same tensile and tear properties, as shown in Table 1. Blends with Benzoflex RF-532 result in similar fusion temperatures compared to BBP, allowing manufacturers to increase line speeds as effectively as with traditional phthalate options.

Performance benefits

- Non-phthalate
- Fast fusing
- Excellent weatherability
- Superior heat stability

Table 1

Physical properties: Eastman 168 blends

Property	Eastman 168/ Benzoflex RF-532 70/30 at 60 phr	Eastman 168/ BBP 70/30 at 60 phr	Eastman 168 at 60 phr
Fusion temperature, °C	134	131	148
Tensile strength, MPa	17.5	17.2	17.9
Elongation at break, %	298	304	321
Modulus at 100% elongation, MPa	8.6	8.5	9.1
Shore A hardness	67	67	71
Tear resistance, kN/m	65	65	64
Tear energy, N*mm	1123	1250	1136

Mechanical properties

In a simple formulation with low plasticizer content, PVC containing either Benzoflex RF-532 or BBP has similar Shore A hardness, tensile strength, and brittleness temperature properties, as shown in Table 2. The Brabender torque rheometer curves in Figure 1, clearly show that the plastisols made with Benzoflex RF-532 and BBP gel and fuse virtually identically.

Table 2

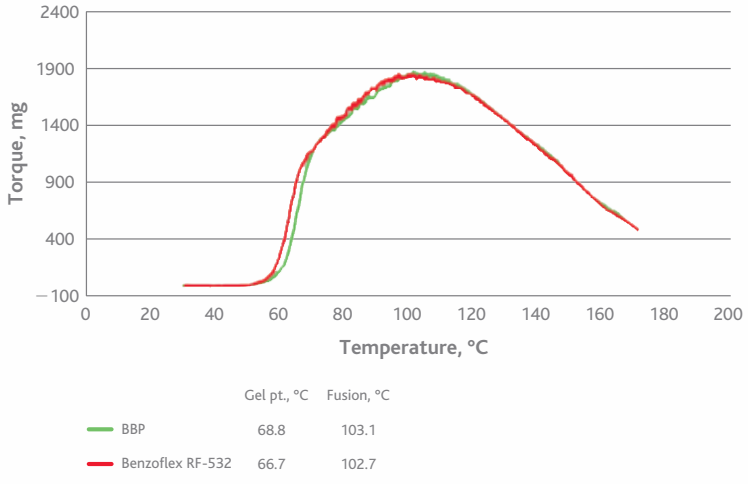
Mechanical properties: Fast-fuser comparison

Property	Benzoflex RF-532 40 phr	BBP 40 phr
	7.5 phr TXIB[a]	7.5 phr TXIB
Fusion temperature, °C	103	103
Tensile strength, MPa	16.8	16.5
Elongation at break, %	260	244
Modulus at 100% elongation, MPa	9.1	9.4
Shore A hardness	73	72
Tear resistance, kN/m	63	67
Tear energy, N*mm	2674	2529
Brittleness temperature, °C	−6	−6

[a]*Eastman TXIB™ formulation additive*

Figure 1

Brabender torque rheometer fusion curves for plastisols containing fast-fuser plasticizers and Eastman TXIB



Heat and UV stability

A PVC formulation with Benzoflex RF-532 develops less color when heated to 350°C than does a PVC formulation containing BBP. Weather properties are also improved when using Benzoflex RF-532. Weathering of 70-mil-thick PVC in a weatherometer with 0.89 W/m^2/nm of fluorescent UV, and a peak irradiance at 340 nm results in less yellowing of the PVC samples containing Benzoflex RF-532 as compared to the significant yellowing of the BBP sample. In the industry standard CIE Lab colorspace weatherability test, the yellowness-blueness index b* increased from an initial point of approximately 0 to 11 for Benzoflex RF-532 and 0 to 39 for BBP at 1500 h exposure. The samples were cycled between 8 h of light at 50°C and 4 h of dark at 45°C with condensation.

Your next step: contact us

If your formulation requires a non-phthalate plastisol, resistance to degradation from ultraviolet light, or blending with a general-purpose plasticizer, Benzoflex™ RF-532 plasticizer is your 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 Benzoflex RF-532 as a fast-fusing non-phthalate plasticizer for flooring, call your Eastman representative today or visit www.EastmanPlasticizers.com.

EASTMAN

The results of **insight**™

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