EASTMAN

Improve efficiency with Benzoflex™ 172 plasticizer

A new formulation additive from Eastman

Benzoflex™ 172 plasticizer is a new Eastman additive that can more efficiently reduce viscosity and plasticize polyvinyl chloride (PVC). Based on monobenzoate chemistry, Benzoflex 172 can be used by formulating chemists for:

- PVC plastisols
- Other moderately polar polymers, including polyurethanes
- Lubricant oil packages

In PVC plastisols, Benzoflex 172 performs as a viscosity reducer. Two traditional viscosity reducers in Eastman's product line are Eastman TXIB™ formulation additive and Benzoflex 131. These additives not only reduce viscosity but also plasticize PVC. Benzoflex 172 is more efficient in both viscosity reduction and plasticizer efficiency. The data in this literature show the comparative performance between these additives.

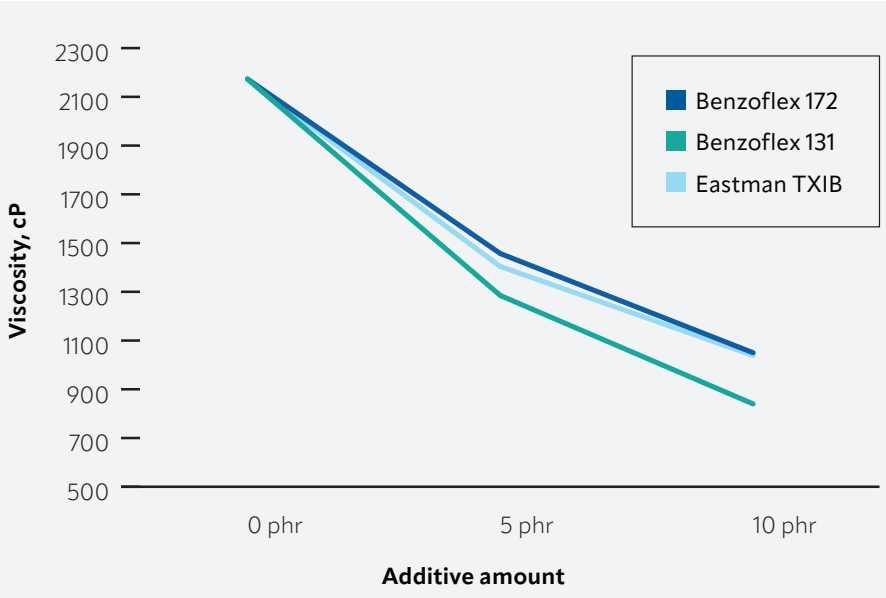
The following formulation was used to generate the data:

- 100 parts PVC homopolymer (k-value = 74)
- 60 parts Eastman 168™ non-phthalate plasticizer
- 3 parts epoxidized soybean oil
- 3 parts Ba/Zn stabilizer
- 0, 5 and 10 parts viscosity reducer additive

Viscosity reduction

Figure 1 shows the capabilities of each additive to lower the viscosity of PVC plastisols.

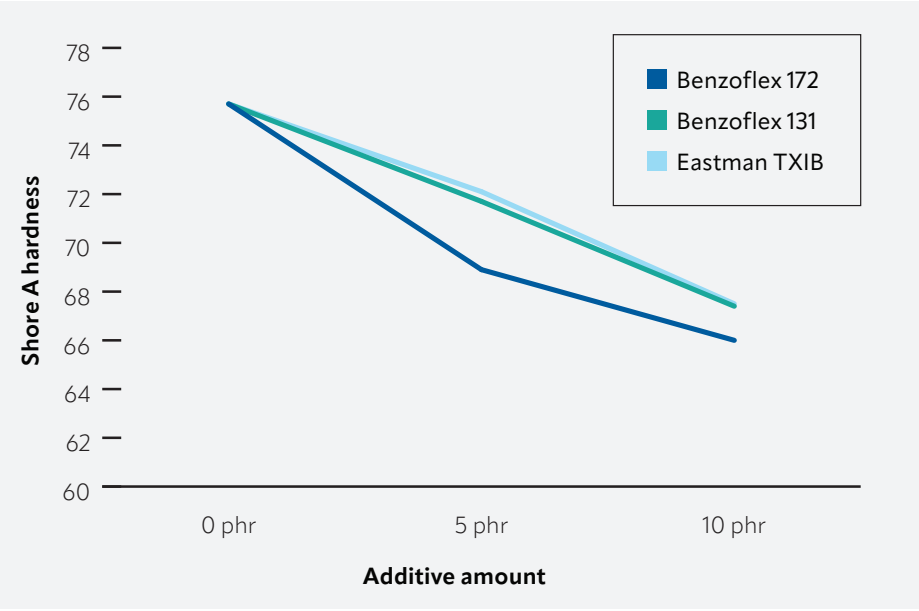
Figure 1. Viscosity reduction



Hardness reduction (flexibility)

Each additive is compatible with PVC and can act as a plasticizer. Figure 2 compares their effectiveness at lowering the Shore A hardness of a PVC film.

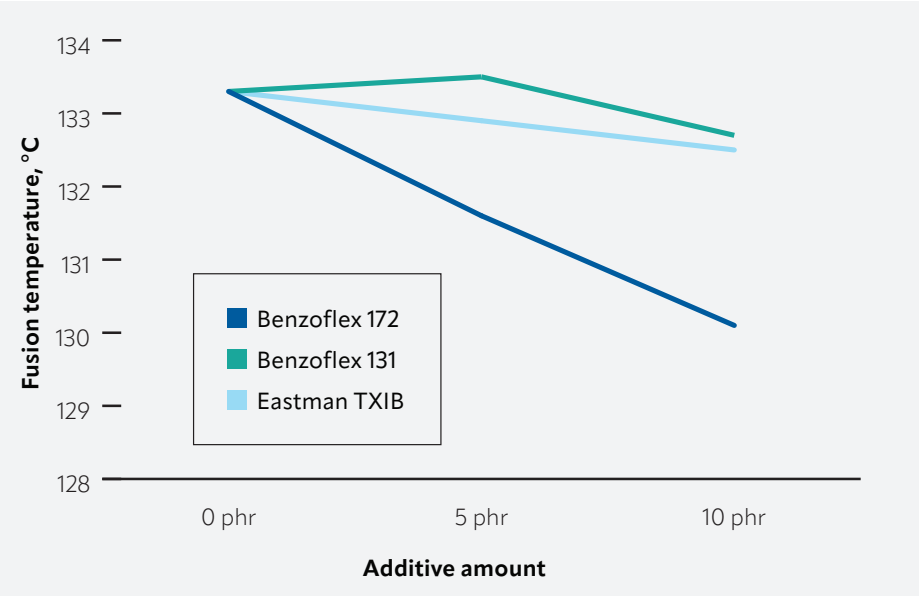
Figure 2. Plasticizer efficiency



Fusion properties

Another property of a plasticizer in PVC is its ability to solvate the PVC and lower the fusion formulation temperature during processing. Figure 3 shows that the fusion temperature of the standard formulation (without viscosity reducer) is about 133°C. Adding 10 phr of either Eastman TXIB or Benzoflex 131 does not affect the fusion temperature much. However, adding 10 phr of Benzoflex 172 dropped the temperature by about 3°C, which could be helpful when considering process throughput or processing minimum temperatures.

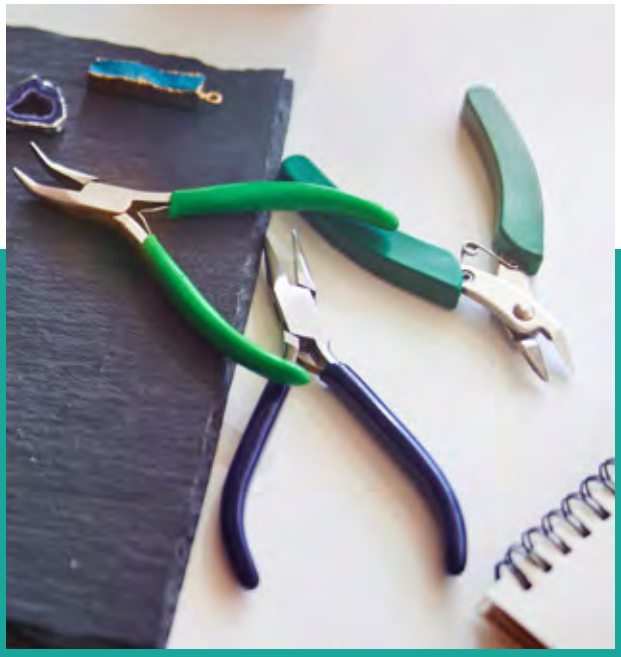
Figure 3. Solvating power



Summary

These data show that Benzoflex 172 is an effective viscosity reducer for PVC. The results show that a formulator may be able to use a lower amount of this additive when compared with traditional additives. The amount of additive reduction will depend on the exact formulation and processing conditions.

This data reflects how Benzoflex 172 can perform in PVC plastisols. However, we expect that this monobenzoate additive will be used in a variety of other formulation types. We look forward to working with formulators as they incorporate this additive into diverse types of formulas and applications.



Contact us to learn more about Benzoflex 172.

EASTMAN

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

U.S.A. and Canada, 800-EASTMAN (800-327-8626)
Other locations, +(1) 423-229-2000

eastman.com/locations

CI-PZ-17668 8/23