

EXECUTIVE SUMMARY

Due to reported health problems associated with the use of asbestos, the Office of Toxic Substances has proposed a regulation to ban the use of asbestos over a 10-year phase-down period. Since asbestos is currently a critical constituent in some vehicle friction products, the Environmental Protection Agency is interested in determining whether the proposed ban could have adverse effects on vehicle braking safety.

In order to assess the potential effects of the proposed ban on vehicle brake system operation and vehicle safety, a panel of individuals knowledgeable in the various aspects of vehicle brakes and friction materials was assembled by the American Society of Mechanical Engineers (ASME). The panel addressed technological issues associated with the removal of asbestos from friction materials, specifically:

- (1) Identification of substitute brakes and systems,
- (2) Compatibility of the ban with motor vehicle safety standards,
- (3) Problems associated with replacing asbestos friction materials in aftermarket vehicles, and
- (4) Pace of research and commercialization and effects on phase-out.

This report addresses the technical issues related to the proposed ban considered by the panel to be the most important.

Conclusions

Issue 1: Identification of Substitute Brakes and Systems

Vehicle controllability during braking is affected by both driver and brake system performance. Generally, vehicle front-to-rear braking ratios are adjusted on a per-model basis to provide optimal braking. Too much braking on an axle results in premature wheel lock-up, and this can lead to loss of steering control (front lock-up) or spin-out (rear lock-up). While the effectiveness of disc brakes is directly proportional to pad-disc friction levels, the effectiveness of drum brakes can be greatly affected by changes in lining-drum friction. Friction materials that exhibit reduced effectiveness also can result in brakes having insufficient