conserving fuel

when rehabilitating concrete roads

How the choice of road repair methods can save fuel and reduce our dependence on oil imports

WITH MORE ATTENTION THAN EVER being focused on energy conservation, vehicle fuel efficiency and new alternatives such as hybrid cars and biodiesel, few people realize the significant impact that road rehabilitation methods can have on energy use. The difference is black and white:

Just How Much Fuel is Consumed Rehabilitating Pavements ...

>> BY DIAMOND GRINDING?

935 Gallons
(fuel use per mile)

BY REMOVING FAULTING, slab warping, studded tire wear and unevenness resulting from patches, diamond grinding creates a smooth, uniform pavement profile. Diamond grinding also reduces road noise by providing a longitudinal texture, which is quieter than transverse textures. The longitudinal texture also enhances macro texture and skid resistance in polished pavements. Further, joint and crack resealing minimizes the infiltration of surface water and incompressible material into the joint system. Minimizing water entering the joint reduces sub-grade softening, slows pumping and erosion of the sub-base fines, and may limit dowel bar corrosion caused by deicing chemicals. Diamond grinding can be completed with a short lane closure for a shorter period of time than the typical asphalt overlay project.

In comparison, asphalt pavements require a large amount of energy to heat materials to 325-degrees-Fahrenheit at the production plant. Hot asphalt is delivered by a diesel powered truck to the construction site where diesel powered pavers and compaction rollers use even more fossil fuel to place the overlay.

THE RESULT: Diamond grinding and joint resealing a concrete pavement is three times more energy efficient than a typical asphalt overlay.

>> BY ASPHALT OVERLAY?

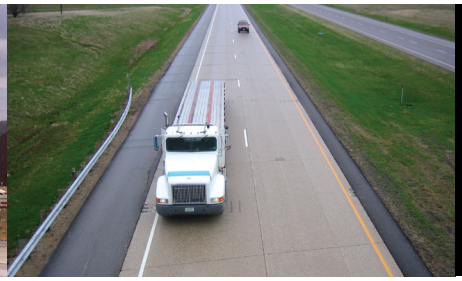
3,215 Gallons
(fuel use per mile)

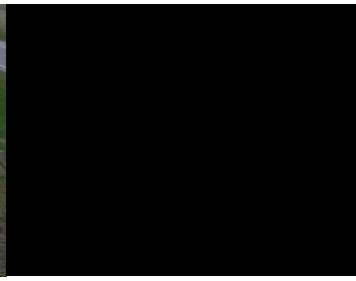
It is also important to consider the life-cycle cost of paving and rehabilitating both types of pavement surfaces. An asphalt surface should be replaced approximately 8 to 15 years into its life with a new layer of asphalt. This reality dramatically increases the fuel usage per mile of road for asphalt roads over the road's life.

Since concrete roads can be rehabilitated by much more cost-effective techniques, life-cycle fuel consumption is dramatically less for concrete pavements. Further, concrete pavements often last 30-40 years before diamond grinding becomes necessary and a road can usually be rehabilitated up to three times using this technique, taking the potential life-cycle for a concrete pavement out to the 50 to 70 year range.

Please visit the ACPA's website at www.pavement.com or the IGGA's website at www.igga.net for more information on the best rehabilitation methods for concrete roads as well as further data on additional environmental advantages to choosing concrete roads!

INTERNATIONAL GROOVING & GRINDING ASSOCIATION®





>> HOW MUCH FUEL?

THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) provides data about the fuel used in various aspects of highway construction including hauling, site preparation, producing materials and placing (construction). Using FHWA's information, the diesel fuel used to build a mile of asphalt and concrete pavements can be calculated and is compared in the ACPA document QD023P. Using that FHWA information, as well as information from actual diamond grinding and joint resealing operations, the table to the right compares the fuel consumption of a typical 3-inch asphalt overlay over an existing concrete pavement. It also compares the fuel consumption of a typical milling and 2-inch overlay operation that repairs a concrete road previously overlaid with asphalt. It then compares the fuel consumption for both of these options to diamond grinding and joint resealing.

COMPARE:

- It takes an average of 3,215 gallons of fuel per mile to place a 3-inch asphalt overlay over an existing concrete pavement.
- It takes an average of 3,043 gallons of fuel per mile to mill and overlay with 2-inches of asphalt, a concrete pavement previously overlaid.
- It takes an average of 935 gallons of fuel per mile for diamond grinding and joint resealing.

DIESEL FUEL USED DURING REHABILITATION

(Gallons per mile on a 12-foot-wide pavement)

Asphalt Overlay (3")	Low	Average	High
Production	1940	2694	3880
Hauling (0-10 miles)	310	366	377
Placing	66	155	221
Asphalt Total	**2316**	**3215**	**4478**

Mill & Asphalt Overlay (2")			
Mill & Sweep	785	900	1035
Production	1350	1796	2510
Hauling	215	244	250
Placing	43	103	145
Mill & Asphalt Overlay Total	**2393**	**3043**	**3940**

Diamond Grind & Joint Reseal			
Diamond Grinding Operation (includes all support vehicles)	585	670	825
Joint Sawing & Resealing	255	265	280
Grind & Reseal Total	**840**	**935**	**1105**

consider this ...

Milling an asphalt overlay off of an existing concrete road and then diamond grinding can be even more fuel efficient than milling and replacing with a 2-inch new overlay!

INTERNATIONAL GROOVING & GRINDING ASSOCIATION®

The International Grooving & Grinding Association (IGGA) is a non-profit Trade Association founded in 1972 by a group of dedicated industry professionals committed to the development of the diamond grinding and grooving process for surfaces constructed with Portland cement concrete and asphalt. In 1995, the IGGA joined in affiliation with the American Concrete Pavement Association (ACPA) to represent its newly formed Concrete Pavement Restoration Division. The IGGA / ACPA CPR Division now serves as the technical resource and industry representative in the marketing of optimized pavement surfaces, concrete pavement restoration and pavement preservation around the world. The mission of the IGGA is to serve as the leading promotional and technical resource for acceptance and proper use of diamond grinding and grooving as well as PCC preservation and restoration. For more information, visit www.igga.net.

12573 Route 9W • West Coxsackie, NY 12192 • www.igga.net • (518) 731–7450