

diamond saw cut textures

Improving Pavement Performance and Customer Satisfaction

Diamond saw cut textures optimize performance at a competitive cost



Increasingly, specifiers around the world are recognizing the benefits of diamond grinding and other diamond saw cut textures for their pavement and bridge deck surfaces. While most properly designed and constructed portland cement concrete pavements (PCCP) can last for decades with minimal structural damage, functional issues such as ride quality, noise and skid resistance can manifest over time due to surface abrasion and subgrade settlement. In the past, agencies used asphalt overlays to smooth and quiet their pavement. Roadway owners can no longer afford to address their concrete pavement repair needs with short-term solutions such as bituminous patches and thin asphalt overlays. Experience has shown that concrete pavements can achieve their maximum longevity through the use of diamond saw cut textures.

» DIAMOND GRINDING

Diamond grinding existing concrete pavement leaves a surface that is often as good as a new pavement. In reducing the bumps in the pavement surface, the dynamic loading from heavy wheel loads is decreased, resulting in lower stresses in the pavement. Diamond grinding reduces road noise by providing a longitudinal texture, which is quieter than transverse textures. The longitudinal texture also enhances surface macrotexture and skid resistance in polished pavement surfaces.

Diamond grinding uses closely spaced diamond saw blades that gently abrade away the top surface of the concrete. On average, the diamond cutting media will contact the pavement surface nearly 27,000,000 times per square yard. This accounts for the gentle removal action, unlike carbide milling operations. The optimized surface is achieved by running the blade assembly at a predetermined level across the pavement surface. The uncut layer between each saw cut breaks off, leaving a flat surface (at a macroscopic level) with longitudinal texture. The result is a pavement that is smooth, safe, quiet and pleasing to ride on.

Diamond grinding is increasingly used by roadway owners as a final surface texture on newly placed concrete pavements due to its smooth ride and low noise characteristics. This smooth ride translates into greater longevity by decreasing the effects of dynamic loading.

» SAFETY GROOVING

Pavement grooving is a process where specially designed grooving machines equipped with circular diamond-tipped saw blades are used to saw discrete drainage channels into the pavement's surface. The blades are mounted and spaced on a horizontal shaft, and are cooled constantly by water pumped from a tanker, which is then





recovered by an on-board vacuum system. These discrete channels can be constructed transversely or longitudinally into both concrete and asphalt surfaces. Longitudinal grooving is often performed to provide safer driving on a pavement surface. Studies conducted by the California Department of Transportation showed wet pavement accident rates decreased an average of 70 percent on all the grooved pavements studied, as compared to the control sections, where there was only a 2 percent reduction in accident rates. Dry pavement accident rates did not change as a result of the grooving. The study concluded that grooving produced an overall average 69 percent decrease in accident rates for the highways studied, in both wet and dry conditions.

» NEXT GENERATION CONCRETE SURFACE

This innovative grinding technique, the Next Generation Concrete Surface (NGCS), is a long-lasting, economical, noise reducing surface texture developed for concrete pavement. It is a diamond saw-cut surface designed to provide a consistent profile absent of positive or upward texture, resulting in a uniform land profile design with a predominantly negative texture. Conventional diamond-ground surfaces produce a positive or upward texture, although they are still quieter than most other concrete pavement surface textures. NGCS is a hybrid texture that resembles a combination of diamond grinding and longitudinal grooving and is the quietest exposed concrete surface available today.

» CONCLUSION

The use of conventional diamond grinding, safety grooving, and the Next Generation Concrete Surface all provide specifiers with long lasting surface treatments that will help keep

pavements quieter, cost effective, safer and smoother. Motorists will appreciate the lack of orange cones during their daily drive to work as these methods allow roadways to be treated in phases using short lane closures during off peak hours.

In the end, the taxpayers appreciate the higher road quality and fewer closures for repairs. Enlightened specifiers across the nation are adding these procedures as part of their pavement preservation toolbox.



ABOUT IGGA

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 form what is now referred to as the Concrete Pavement Preservation Partnership (IGGA/ACPA CP3). The IGGA/ACPA CP3 now serves as the lead industry representative and technical resource in the development and marketing of optimized pavement surfaces, concrete pavement restoration and pavement preservation around the world.