



ROADS & HIGHWAYS APPLICATIONS

TO PREPARE & MAINTAIN SURFACES ON ROADS & HIGHWAYS

BLASTRAC SURFACE PREPARATION TECHNOLOGIES

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BLASTRAC GREEN TECHNOLOGIES

All Blastrac technologies are purely mechanical and therefore very clean. None of our technologies create air pollution or use chemical substances. With all our equipment you are also able to work dust-free, meaning that each machine can be connected to a Blastrac dust collector which will collect all the dust and other small hazardous particles that are released during the surface preparation process. This creates a safe working environment!

SURFACE PREPARATION TECHNOLOGIES FOR ROADS & HIGHWAYS

ROAD SURFACE CONDITION GENERALLY AND SKID RESISTANCE IN PARTICULAR IS TODAY IN THE FOREFRONT OF ALL HIGHWAY AUTHORITY ENGINEERS AND HIGHWAY MAINTENANCE CONTRACTORS. THE TREND IS NOT TO REMOVE EXISTING SURFACES TO PREPARE NEW ONES BUT TO MAINTAIN AND EXTEND ROAD & HIGHWAY LIFETIME CYCLES AS MUCH AS POSSIBLE.

Blastrac is the leading global developer and manufacturer of surface preparation equipment. We have an extensive range with over 80 different machines for preparing & maintaining floors and other surfaces for all kinds of materials. Our innovative techniques are developed in-house and on demand by our strong R&D department.

Blastrac surface preparation equipment can be used on roads & highways for:

- **FRICTION IMPROVEMENTS**
- **LINE REMOVAL & SURFACE PREPARATION**
- **SURFACE PREPARATION OF BRIDGES & CIVIL ENGINEERING PROJECTS**
- **DECORATIVE SURFACES FOR URBAN PLANNING**
- **ASPHALT MILLING**
- **GROOVED SURFACES**
- **FOR SMALL SCALE ROAD APPLICATIONS**

The range of machines for surface preparation consists of:



TRUCK-MOUNTED SHOT BLASTER



TRUCK-MOUNTED ULTRA HIGH PRESSURE EQUIPMENT



WALK-BEHIND SHOT BLASTERS



SINGLE & TRIPLE DISC GRINDERS



SHAVERS & SCARIFIERS



DUST COLLECTORS & PRE-SEPARATORS



● FRICTION IMPROVEMENTS

IN ORDER TO REDUCE SLIPPERINESS ON ROADS & HIGHWAYS, THE ROUGHNESS AND SKID RESISTANCE HAS TO BE UPGRADED TO ITS ORIGINAL STATE. FRICTION NEEDS TO BE IMPROVED ON ASPHALT AND CONCRETE SURFACES WHICH HAVE BECOME POLISHED BY TRAFFIC (EITHER BY LORRIES, CARS, BIKES OR PEDESTRIANS) OR NEW SURFACES WHICH HAVE A COATING OF BITUMEN BINDER OVER THE AGGREGATE PARTICLES (ALSO CALLED FATTY ROADS).

Surface grip, is necessary to enable drivers to accelerate, decelerate and change direction on the road surface. This grip is provided by the friction generated between the vehicle's tyres and the road surface, and in turn this friction provides the force necessary to transmit the vehicles energy into the manoeuvre being attempted by the driver. If the friction generated is insufficient, grip is lost and control of the intended manoeuvre is lost.

Poor pavement friction or surface texture increases the amount of accidents and also contributes to wet weather accidents resulting in increased fatalities, more serious personal injuries, and significant traffic delays.

Blastrac continues to develop technologies in order to reduce the number of fatalities on roads & highways by making them safer for everyone. Over the years we have developed different technologies to maintain the roads and highways.

Improve the friction by applying Ultra-High-Pressure blasting or shot blasting technology which has been repeatedly demonstrated to be an important key for successful friction improvements.





FRICION IMPROVEMENTS ON CONCRETE & ASPHALT SURFACES SHOT BLASTING

The best way to improve the friction on new concrete and asphalt surfaces that just have been prepared or that have become polished by traffic over the years is to **expose fresh aggregates on the top of the surface**. **Shot blasting is perfect to remove the binder from the surface of the aggregate particles** and will give the road surface its maximum skid resistance in a uniform way.

When the aggregate has become polished and the skid resistance dropped below an acceptable level, **shot blasting can regenerate it by exposing fresh aggregate again and removing the polished surface**. This extends the lifetime of the road by several years.



FRICION IMPROVEMENTS ON "FATTY" ASPHALT SURFACES UHP WATER BLASTING

A "fatty" or "bleeding" surface is a surface which has a thin film of free bituminous binder on the top of the road surface, this creates a shiny glass-like reflecting surface of bituminous pavement. Such a film of binders tends to become soft in hot weather and slippery in cold and wet weather.

A very efficient and cost effective method for improving friction from a "fatty" / "bleeding" asphalt surface is **Ultra High Pressure (UHP) Water Blasting**. Because pavement quality varies, equipment that enables variable pressure settings should be selected to avoid surface damage.



THERE ARE PRINCIPALLY 2 TYPES OF TEXTURE WHICH ARE IMPORTANT FACTORS IN THE PERFORMANCE OF ROADS & HIGHWAYS SURFACES: **MACROTEXTURE & MICROTEXTURE.**

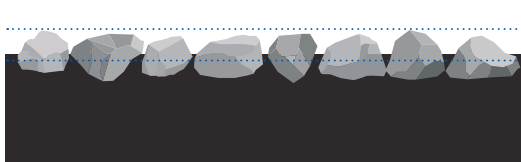
MACROTEXTURE

Macrotexture is the space or voids between the aggregate particles.

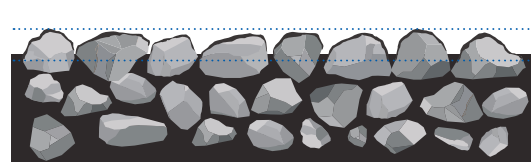
The texture depth / macro texture of an asphalt road surface will normally be between 1 mm to 1,5 mm. It is this macrotexture which **allows the water to drain away from the surface and greatly contributes to skid resistance in wet conditions.**



MACRO TEXTURING | HRA (HOT ROLLED ASPHALT)



MACRO TEXTURING | SMA (STONE MASTIC ASPHALT)



Both Shot Blasting and Ultra High Pressure Water Blasting are a very cost effective, environmentally friendly and high performance technology for improving the macro texture of a surface. It will remove dirt deposits and will bring the surface Macro texture back to that of the aggregates ability. In some cases when friction recovery maintenance has been neglected, macro texturing can only be accomplished with shot blasting. Macrotexture can be measured by laser profilometers traveling at normal speeds.

MICROTEXTURE

Microtexture is the fine component of surface texture formed by the tiny interstices on the surface of the aggregate particles.

It is the main contributor to **providing grip or skid resistance with the tyre**, particularly at low speeds. Microtexture is measured by PSV using the British Pendulum Tester or by mobile methods such as the Griptest or SCRIM.



MICRO TEXTURING



Shot blasting is the only technology that will restore Micro-Texture values to pavement surfaces. Improvement of Micro texture with the shot blasting process is extremely effective. It will in all cases bring back the full benefit of the PSV of the aggregate as per its original properties.



● LINE REMOVAL & SURFACE PREPARATION

IN THE PAST BLASTRAC HAS RECEIVED NUMEROUS REQUESTS TO DEVELOP A FAST AND EFFECTIVE SOLUTION FOR THE REMOVAL OF EXISTING PAVEMENT LINE MARKINGS. ROAD & HIGHWAY MAINTENANCE CONTRACTORS WORLDWIDE ARE SEARCHING FOR ENVIRONMENTALLY FRIENDLY MACHINES WHICH ARE MORE MOBILE TO REMOVE MARKINGS FROM CONCRETE OR ASPHALT SURFACES.

Nowadays the two main standard application materials for marking lines are thermoplastic and cold paint.

THERMOPLASTIC

Thermoplastic is generally a homogeneous dry mix of binder resins, plasticizers, glass beads (or other optics), pigments, and fillers. Their use has increased over cold paint mainly due to the performance benefits of increased durability and retro-reflectivity. Thermoplastic markings are applied hot using specially designed vehicles. The coating then becomes a hard, resulting in a polymer line after cooling. Thermoplastic turns out to be a very thick and elastic material.

COLD PAINT

Cold paint consists of three main components: pigments, resins or binder sand water or solvents. It is generally used to mark travel lanes. It is also used to mark spaces in car parks or special purpose spaces for disabled parking, loading areas, or time-restricted parking areas. Colours for these applications vary by locality. Paint is a low-cost marking and has been in widespread use since approximately the early 1950s.

The most important point to consider when removing existing marking lines is to completely remove them without causing any damage to the road surface. Over years of experience in this industry, Blastrac has determined that specified methods have to be used depending on the type of floor you want to remove, either thermoplastic or cold paint.



THERMOPLASTIC LINE REMOVAL | UHP WATER BLASTING



Because of its thickness and flexibility, thermoplastic is not an easy material to remove. **The best method to do so is the Cyclone Ultra High Pressure Water Blasting machine.** It removes markings in a very efficient way without damaging the pavement or asphalt. It doesn't create any dust and leaves a clean surface. In addition, it avoids exposing any chemicals into the environment.

Our UHP water blasting system blasts the surface with ultra-high pressure water (from 413 bars up to 2.758 bars), removing markings from the surface. The paint removal head comes with an adjustable cleaning path from 15 to 41 cm in order to be able to remove any thermoplastic markings.

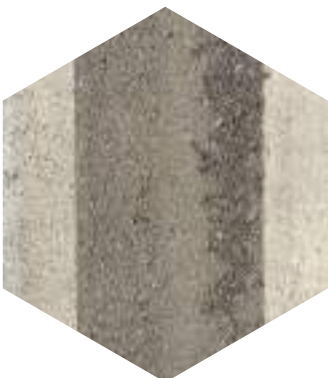
COLD PAINT LINE REMOVAL | SHOT BLASTING



Cold paint is much easier to remove than thermoplastic because of its thinness and properties. **Blastrac shot blasting systems are highly effective in removing thinly painted striping and line markings on roadways and parking surfaces.** For most of our shot blasters, we've developed blast pattern reducers to reduce the working width.

Blastrac shot blasting technology leaves the surface clean and dry, which means that it is immediately ready for new painting or other surface treatments. The surface does not get damaged by the shot impact and it doesn't leave any dust on the floor. **Shot blasting is purely mechanical and there is a wide variety of sizes and models available.**

SURFACE PREPARATION | CREATING A SURFACE COHESION TO APPLY PAINT & MARKINGS



It is important to remove marking lines in a good way, however it is also important to apply them right. **The key of a good cohesion between the surface and the applied paint / coatings / thermoplastic is the surface preparation.** And Blastrac, as the innovator in surface preparation, is able to help you!

Depending on the floor you have to prepare; a wide variety of profiles can be carried out. Ultra High Pressure Water Blasting and Shot Blasting are two perfect methods to prepare the surface and to ensure a surface cohesion before applying paint, markings and line materials on concrete and asphalt surfaces. For further information about alternative techniques please do not hesitate to get in touch with us!



● SURFACE PREPARATION OF BRIDGES & CIVIL ENGINEERING PROJECTS

WHEN NEW BRIDGES ARE BUILT OR WHEN CONSIDERING CIVIL ENGINEERING PROJECTS, EITHER IN CONCRETE OR STEEL, THEY NEED A WATERPROOF MEMBRANE THAT WILL PREVENT WATER INGRESS AND CORROSION AND SHOULD OFFER MECHANICAL RESISTANCE TO LONG-TERM VEHICULAR TRAFFIC. THE SURFACE PREPARATION IS THE MOST IMPORTANT PROCESS WHEN APPLYING A WATERPROOF MEMBRANE. THIS PROCESS ENSURES A GOOD COHESION BETWEEN THE SURFACE AND THE MEMBRANE AND THUS A GOOD LIFETIME.

In the 21st century, bridges and civil engineering projects are made of concrete or steel. **The surface preparation methods are performed in accordance with SSPC standards. Concrete surfaces are prepared in accordance with SSPC-SP13/NACE No. 6, and steel surfaces are prepared in accordance with SSPC-SP10. Shot blasting and steel blasting are the standard preparation methods.**



SHOT BLASTING

Shot blasting of a concrete road structure before application of a waterproofing membrane



STEEL BLASTING

Steel blasting of a steel bridge before application of a waterproofing membrane



● DECORATIVE SURFACES FOR URBAN PLANNING

THE USE OF COLOURS AND NATURAL FINISHES IS NOW WITHOUT DOUBT AN EXTREMELY IMPORTANT ELEMENT IN THE MODERN CONSTRUCTION AND LANDSCAPING OF ROADS AND HIGHWAYS. TO SATISFY THIS DEMAND FOR DECORATIVE SURFACES, BLASTRAC HAS DEVELOPED VARIOUS METHODS TO CARRY OUT A LOT OF DIFFERENT DECORATIVE FLOORING SOLUTIONS ON CONCRETE AND ASPHALT.

When talking about surface preparation for decorative flooring we make a distinction between two main applications: preparing concrete and asphalt.

DECORATIVE ASPHALT

Natural exposed aggregate asphalt gives the architect or designer the option to use locally available aggregates to compliment, contrast and enhance roads, car parking areas, footpaths, residential developments, town centres and urban areas. The big potential benefit of only using naturally coloured aggregates is they will not fade and if incorporated in a standard asphalt mix design the colour will be all through the material, not just a coating on the top.

DECORATIVE CONCRETE

Decorative floors are a new fast developing market trend. Concrete floors are no longer considered as sole supports, they have become part of the decoration itself. Concrete can be bush hammered, brushed, grooved and more depending on the desired finish. It can also be prepared in order to apply a new coating.



ASPHALT WITH EXPOSED AGGREGATES | SHOT BLASTING

Exposed aggregate asphalt provides a unique, new generation of distinctive asphalt surfaces with greatly increased aesthetic appeal and improved skid resistance while still giving all the functional qualities and durability of traditional asphalt.

By using Blastrac shot blasting technology the surface binder is removed to allow the natural properties, specificities or colours of the aggregates to appear. Dust and contaminants are removed by an air wash separator and are removed to a dedicated Blastrac dust collector. **This makes the process dust-free in operation and environmentally friendly.** This is a perfect answer to architects and cities permanent quest for innovation at a reasonable cost.



BUSH-HAMMERED CONCRETE | GRINDING

Bush-hammering concrete is a process which enables you to achieve a similar effect as natural cut stone, with a concrete surface as basis. **The concrete is poured and mechanically abraded with bush hammer tools in order to give an authentic effect to outdoor areas.**

This type of retexturing process performs its task by impacting surface aggregate with numerous small hardened steel hammers (often referred to as “bush hammering”) to roughen the aggregate surface, in order to create new “sharp” angular edges on the surface of the aggregate. The Blastrac grinders can be equipped with different sizes of bush-hammering discs in order to satisfy every need of our customers.



BRUSHED CONCRETE - DRY PROCESS | GRINDING

This technique aims at « exposing » the upper surface of your concrete slab, in order to let the aggregates show up and have an irregular, very natural, stone looking surface, the final effect varies according to the initial colour and texture of the implemented concrete.

There are several chemical suppliers with a water- based emulsified surface retarder. **It respects the environment and is eliminated by dry brushing**, since it only generates solid residue that can be quickly and easily removed from site thanks to a Blastrac dust collector. **With a surface retarder, no more water is required; thus preserving the environment and protecting sewage networks.**





● ASPHALT MILLING

ASPHALT MILLING IS AN AFFORDABLE SOLUTION FOR ASPHALT PAVEMENT RESTORATION AND IS OFTEN USED AS A CHEAPER ALTERNATIVE TO COMPLETE DEMOLITION AND REPAVING. IT IS MOST APPROPRIATE FOR PAVEMENTS WHICH HAVE WIDESPREAD SURFACE DAMAGE LIKE CRACKING OR AN UNEVEN SLOPE. BECAUSE THE SUB BASE IS INTACT, THERE'S NO NEED TO CONDUCT A FULL DEMOLITION AND REPAVING.

If your parking lot or other asphalt structure has significant damage that is limited to specific areas of the structure, asphalt milling allows you to correct that damage without repaving the entire area. Asphalt milling can be used to remove the asphalt to an appropriate depth and can be replaced so that it is at the same level as the rest of the pavement.

In many cases, milling is a better alternative to complete demolition or other costly pavement removal processes.



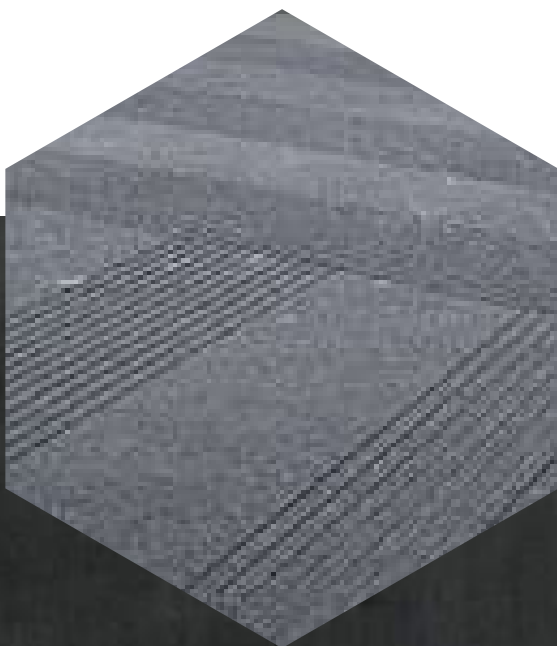


GROOVED SURFACES

GROOVING OF CONCRETE OR ASPHALT PAVEMENTS ON ROADS & HIGHWAYS IS THE METHOD USED WHERE IT IS NECESSARY TO DRAIN AWAY WATER QUICKLY. THE OBJECTIVE IS TO CREATE CHANNELS TO REMOVE WATER FROM THE TIRE/ROAD CONTACT AREA. THIS PROCESS HELPS TO REDUCE AQUAPLANING AND SKIDDING ON WET ROAD SURFACES. WE OFTEN ENCOUNTER THESE GROOVED SECTIONS ON ROADS THAT HAVE A HISTORY OF MANY WET WEATHER CRASHES.

Although grooved concrete surfaces seem to be more common, this road surface technique also is used on asphalt. Wet weather grooves are applied in two ways: perpendicular to the flow of traffic or parallel. **Both functions are similar to the rain grooves on your tires.** The depth of the rain grooves and spacing between grooves are typically uniform.

In addition, the method of grooving surfaces creates or restores skid resistance of the roads and highways. That's why grooving is the best solution to avoid accidents in risky areas, such as curves or exits.





● FOR SMALL SCALE ROAD APPLICATIONS

ROADS, HIGHWAYS, BRIDGES, CAR PARKS, CYCLE TRACKS AND OTHER PUBLIC SPACES ENDURE A LOT OF TRAFFIC ALL DAY LONG. TO ENSURE THAT THE SURFACES MAINTAIN A LONGER LIFETIME IT IS IMPORTANT TO MAINTAIN THEM ON A REGULAR BASIS. BLASTRAC CAN PROVIDE SMALL MANAGABLE EQUIPMENT FOR SMALL ROAD MAINTENANCE OPERATIONS SUCH AS THE REMOVAL OF ZEBRA CROSSINGS, BUMPS DUE TO THE TREE ROOTS, LEVELING OF TILES AND GRINDING OF IMPERFECTIONS...

With a small Blastrac single disc grinder it is possible to can carry out many different types of road maintenance operations depending on the tools you use. It could be a diamond disc, a star wheel cutter plate, a bush hammering plate or a PCD disc. **This wide variety of tools can offer many solutions.**

The star wheel cutter plate enables the operator to remove lines (thermoplastic and cold paint) without damaging the surface. It is perfect for small line removal jobs, such as the removal of zebra crossing. With the diamond disc, it is possible to grind small imperfections on roads and to grind bumps that might be created because of the roots of trees. It is also possible to level tiles and bricks in order to make the surface more comfortable when walking or operating a wheelchair. In addition the PCD disc and the bush hammering plate enable you to remove thermoplastic marking lines on small areas.





BLASTRAC CHART FOR ROADS & HIGHWAYS APPLICATIONS

APPLICATION	TECHNOLOGY	EQUIPMENT
FRICITION IMPROVEMENTS		
Macro-texturing	Shot Blasting	2-45DTM Walk-Behind Shot Blasters
On "fatty" asphalt surfaces	UHP Water Blasting	4006HT
LINE REMOVAL & SURFACE PREPARATION		
Thermoplastic line removal	UHP Water Blasting	4006HT
Cold paint line removal	Shot Blasting	2-45DTM Walk-Behind Shot Blasters
Surface preparation	Shot Blasting & UHP Water Blasting	2-45DTM Walk-Behind Shot Blasters & 4006HT
SURFACE PREPARATION OF BRIDGES & CIVIL ENGINEERING PROJECTS		
Concrete bridges	Shot Blasting	2-45DTM Walk-Behind Shot Blasters
Steel bridges	Shot Blasting & Steel Blasting	2-20DT 2-48DS Full line of steel blasters
DECORATIVE SURFACES FOR URBAN PLANNING		
Asphalt with exposed aggregates	Shot Blasting	Full line of shot blasters
Bush-hammered concrete	Grinding	Full line of triple disc grinders
Brushed concrete	Grinding	BMG-435
ASPHALT MILLING		
Asphalt milling	Scarifying	BMP-4000
GROOVED SURFACES		
Grooved surfaces	Sawing	BMC-335ELITE BMP-4000
FOR SMALL SCALE ROAD APPLICATIONS		
Small scale road applications	Single Disc Grinding	BGS-250 BG-250

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