

INSTALLATION & HANDLING MANUAL



DURA-BASE[®]
ADVANCED-COMPOSITE MAT SYSTEM

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The DURA-BASE® Advanced-Composite Mat System provides a safe, cost-effective surface for year-round, all-weather performance. The mats are made of high performance thermoplastic for a strong, durable, uniform surface that can be used for any industry that requires access in special environments, the stabilization for heavy equipment or simple ground protection.

Engineered for performance and strength, the interlocking mats distribute weight across a large surface area, while remaining stable and strong through all weather conditions. The tread pattern improves safety and traction for load-bearing vehicles, while the interlocking system reduces the chance for drift and slippage. The mats provide years of reusable performance and an endless shelf-life with proper use and maintenance.

DURA-BASE[®] MAT FEATURES

GENERAL SPECIFICATIONS

DURA-BASE [®] MAT	CHARACTERISTIC	ENGLISH UNITS	METRIC UNITS
Large Mat	Overall Dimensions	8' x 14' x 4"	2.44m x 4.27m x 10.2cm
	Usable Area	7' x 13'	2.13m x 3.96m
	Weight	1000 lbs.	454 kg
Small Mat	Overall Dimensions	8' x 7'6" x 4"	2.44m x 2.29m x 10.2cm
	Usable Area	7' x 6'6"	2.13m x 1.98m
	Weight	525 lbs.	238 kg

*All measurements and weights are nominal.

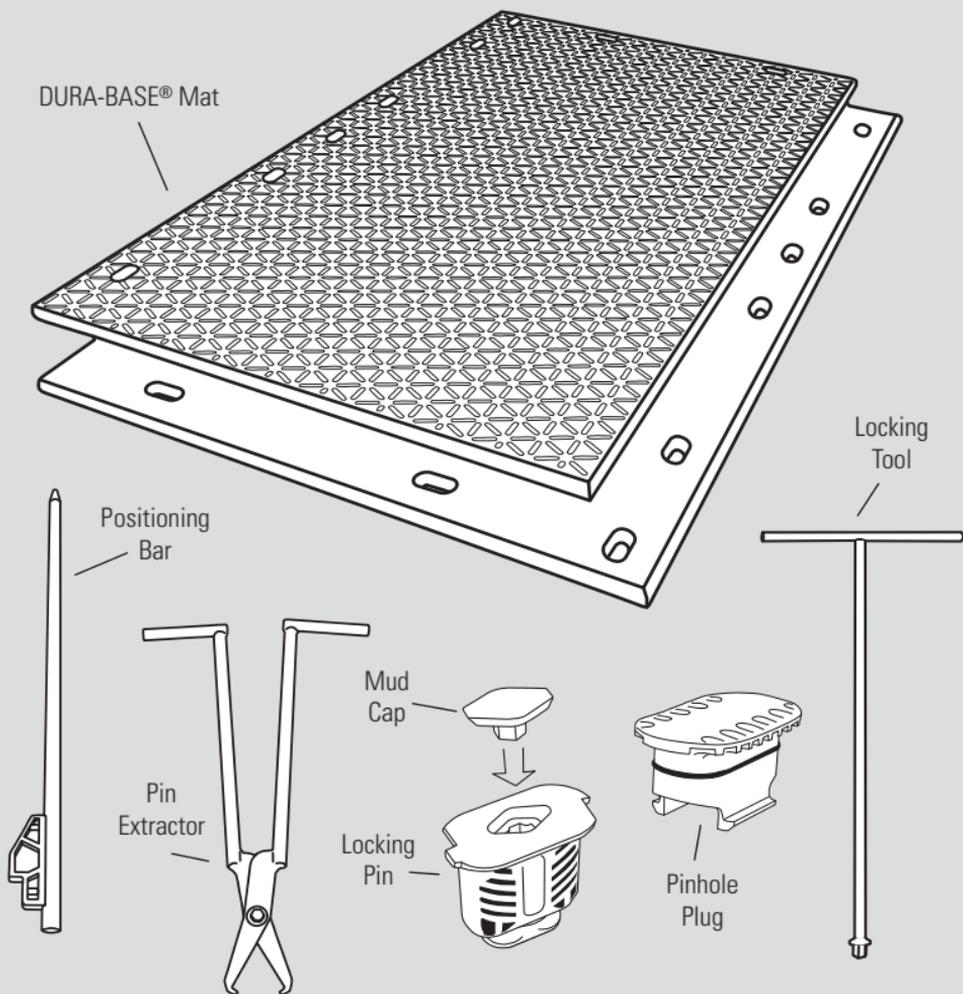
DURA-BASE[®] mats are available in two sizes: The 8' x 14' (2.44 m x 4.27 m) and the 8' x 7'6" (2.44 m x 2.29 m). Both mat styles are 4" (10.2 cm) thick. The large mat weighs approximately 1,000 lbs (454 kg) while the small mat weighs approximately 525 lbs (238 kg). Each mat is equipped with a lip on two sides that creates an overlapping joint with an adjoining DURA-BASE[®] mat. Each mat is also equipped with 16 slots (10 for small mat) into which the locking pins are inserted and engaged in order to fasten multiple mats together.

DURA-BASE[®]

ADVANCED-COMPOSITE MAT SYSTEM

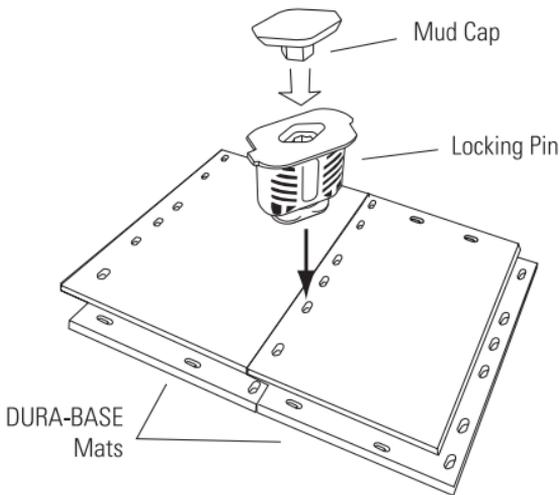
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LOCKING PINS

The locking pin feature of the DURA-BASE® Advanced-Composite Mat System is the key element to providing a safe and secure matted surface. Proper use, including turning the pin to its locked position, is essential for proper function of the entire system. The pins join multiple mats together to distribute weight over a large surface area so that even the heaviest loads are supported by a network of mats rather than having a single point of contact to distribute the pressure. Only when the pins are turned 90° and locked into position can the mats be fully secured, thus ensuring they won't slip or drift under load. Mud caps are available to protect the pin wrench connection slots from filling with mud.



For projects that last beyond 6 months, consider the optional semi-permanent locking pin which is available from the Newpark Mats & Integrated Services (1-877-628-7623). This pin utilizes a clamp-load to lock mats together and requires additional time to install and remove. However, if your long-term project will experience high traffic and severe loads or usage, the additional installation time will be compensated through the added strength and security the semi-permanent pins will provide.

PINHOLE PLUG

Once mats have been properly secured with locking pins, install these pinhole plugs to dramatically reduce mud flowback onto the mat surface.



INSTALLATION TOOLS

Three tools are included with the system – the Positioning Bar, the Locking Wrench, and the Pin Extractor. Convenience and efficiency will be improved through the use of these DURA-BASE® tools, but in case of lost or damaged, a crow-bar and 5/8" (15.8 mm) hex tool , readily available at most hardware stores, will suffice.



Positioning Bar

The positioning bar, can be used to align and adjust the mats once they are set in place. The positioning bar features two specialized tool ends. The narrow end is used to roughly align the mats. The flanged end is used for final alignment of the holes to allow the pin to slide smoothly into the hole.

Locking Wrench

The waist-high locking wrench is equipped with a $5/8$ " hex-head designed to fit into the hex-receiver in the top of the pin. A 90° turn will engage the locking mechanism, while the indicator line on the pin should be perpendicular to the length of the slot to insure a complete fit.



Pin Extractor

Once pins have been unlocked with the locking wrench, the extractor is then used to remove the

pins. The steel alloy tongs of the extractor's end points can be inserted between the pin and the slots to grab the pin body and remove it from the mats.

SAFETY WHEN HANDLING MATS

All personnel should meet the safety requirements of your particular department and job description prior to handling the mats on or off your work site. Proper use of Personal Protective Equipment (PPE) is highly recommended.

Storing & Stacking Mats

When storing your DURA-BASE® mats, care should be taken to ensure that the ground is level and stable beneath the stack. The surface and size of your storage site as well as equipment capabilities will determine the optimal height of the stack. Clear any major obstructions from the surface before stacking the mats. The mats are designed with a shape memory and will return to their flat



position even if there are surface irregularities or obstructions. Over time, a mat may conform to a depression in the surface. To restore it to its original shape, either turn the mat over and allow its own weight to return it to its flat condition or lay the mat down on a hard, flat surface and it will flatten out.

Loading & Transporting Mats

When loading the mats onto a trailer, care should be taken to make neat, even stacks that meet weight and height requirements for local transportation. Remove any major debris or obstruction that would hinder the mats from resting evenly on top of each other or on top of the trailer bed surface. To assist the loader, blocks or 4" x 4" timbers can be placed at even intervals on the bed of the trailer. The gap created between the



mats and the trailer bed will allow the forks of the loader to slide under the stack.

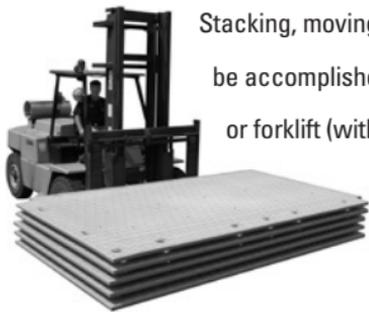
The mats should be secured with straps before transporting them just as you would any other load of manufactured material. Refer to the safety manager or an experienced driver for specific details about how to properly secure the load.

INSTALLATION & REMOVAL OF THE DURA-BASE® ADVANCED- COMPOSITE MAT SYSTEM

Personnel Requirements

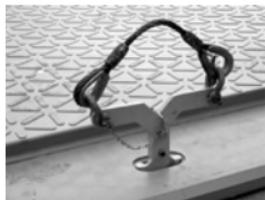
A crew size of two is recommended for simple installation. One crew member will operate the loader and bring mats to the area and the second will be on the ground guiding the mats into place, inserting then locking the pins. For increased efficiency and speed, a third crew member can assist the installer by supplying pins at each mat assembly and handling the pin extraction tool while the first installer is unlocking the pins during take-up or de-installation.

Equipment



Stacking, moving and placement of the mats should be accomplished by heavy equipment. A loader or forklift (with 5 ft minimum fork length) typically serves the purpose. However, any lifting device (crane, bobcat, etc) may also be used to maneuver mats into place. In addition, Newpark Mats & Integrated

Services (NMIS) has a Lifting Tong available to help facilitate mat movement. Always be certain that proper rigging is used with Lifting Tongs.

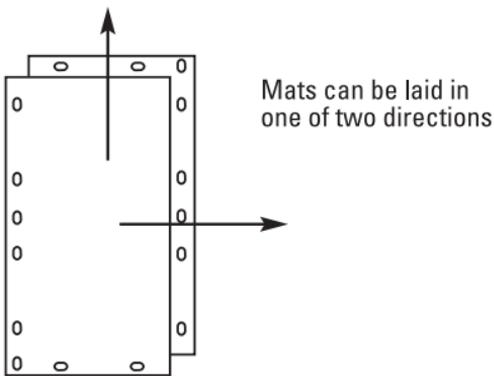


Site Survey & Project Objectives

Questions about the soil condition of your site, the bearing capacity of the sub-grade, the load and traffic requirements and duration of the project will all impact the number of mats and the configuration of your road or work site. These issues are best addressed by geo-engineers or project managers prior to installation. Our experienced staff is ready to assist with any technical challenges you might face as you install or remove the mats.

Installation

DURA-BASE[®] mats are designed to connect to each other in a way that forms a tight and secure load-distributing surface. Once the basic technique for connecting the mats with locking pins is mastered, countless road and site configurations are possible.



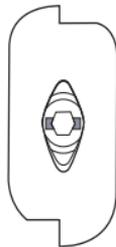
First, lay one mat down with the lap joint exposed. Make sure all the holes and lips are free of any debris prior to laying the next mat, as this will prevent a smooth and secure fit. The next mat should be placed alongside the first mat with the overhang of the lap joint resting on the first mat's exposed lap joint. One installer should be present during this process to guide the second mat into place and, with the positioning bar,

line up the mats so that the two mats have their sides matched to each other. As the second mat is lowered into place, the installer inserts the positioning bar into the top mat and “threads” the tool into the matching pin slot of the first mat.

The installer can then drop in one locking pin at a time into the slots and, with the locking wrench, lock each one in place with a 90° turn. The number of pins used is determined by the bearing ratio (softness) of the ground, the type of loads, frequency of use and the duration of the project. Refer to engineering or management personnel to obtain specific requirements for your project. For example, soupy conditions or loamy soil may require the maximum number of pins.



UNLOCKED POSITION



LOCKED POSITION

Mud Caps

The optional mud caps keep the pin hex-nuts clear of dirt and debris that can make removal difficult. The mud caps are inserted into the top of the pin once it is in the locked position; they can *only* be secured when the pin is locked and can be removed simply with a flat-head screwdriver inserted under either end of the cap. NMIS has developed a mud cap remover tool in order to aid customers who install and remove mud caps periodically. Please contact NMIS or your local distributor for information on purchasing this tool.



Basic Removal

To disassemble the mats, all mud caps must be removed, then all pins must be unlocked and removed. Do not attempt to disassemble the mat system without removing pins. The result could be damaged pins, damaged mats, harm to equipment and possibly injury to personnel. Have a bin ready to accept the loose pins for future use. Pick up the last mat first so that the sequence in which the mats were first laid is reversed.

Note: If the pins become difficult to secure or remove, the mats might not be laying properly due to uneven ground or there might be soil build-up or foreign objects on the overlapping lips between the two mats. Use the forklift to press the two mats together while locking the pin. The weight of the equipment will assist you to unlock or lock the mats together.

Once the pins are removed, the forklift or loader operator will be able to slide the forks beneath the mat that was laid last. As the operator squares up to the board edge of the mats, the forks should be spaced evenly under the mats in order to maintain a balanced load. Many of the removal techniques depend on the type of equipment used and the skill or experience of the operator. The manufacturer recommends that you strictly adhere to safety standards as you lift and move any number of mats.

USES & APPLICATIONS

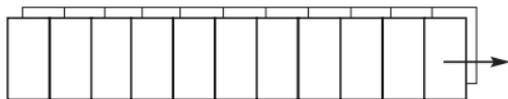
The DURA-BASE[®] mats were originally developed in the oilfield service industry in response to the demand for all-weather performance, consistent strength and durability from matting products. Primary uses of DURA-BASE[®] include jobsite access roads, work pads, helipads, bypasses, heavy haul and sub-grade protection.

Roadway Installation

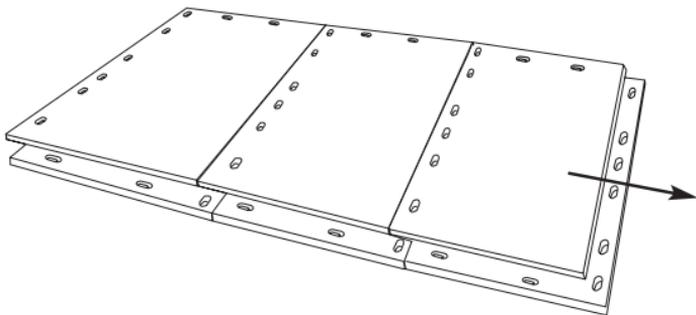
DURA-BASE[®] mats are designed to accommodate two basic roadway configurations: Transversal and Longitudinal. Of the two designs, the transversal method installs more rapidly.

Single Width Transverse Road

The single width transversal method requires the mats to be installed long side to long side in the direction of the road. Mats installed in this manner have 5 out of 6 slots for locking pins, adding strength to the joints between mats, as well as a road width of 13'.

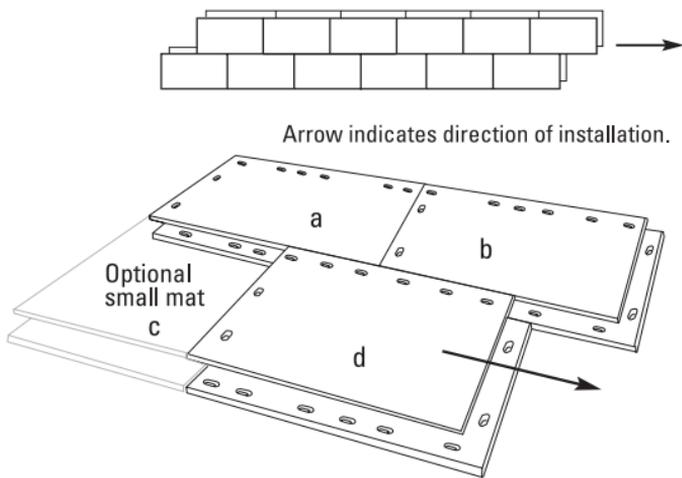


Arrow indicates direction of installation.



Double Width Longitudinal Road

The longitudinal method requires that the mats lay end to end in a straight line, with the edges of the two adjoining mats lined up evenly so that both will accept the two locking pins. Many roadway projects would benefit from using the double-width configuration as opposed to a single string of mats simply because of the added strength that staggering the mats provides.



By staggering the mats, road strength and stability is increased because weight is directed away from the joints and distributed throughout the body of the mats.

A two-mat wide longitudinal road can be installed by laying mats end to end in two parallel but staggered lines so that the mats resemble brickwork. The mats should be laid in place so that the lips of the laid mats are always exposed to receive the over-hanging lip of the next mat.

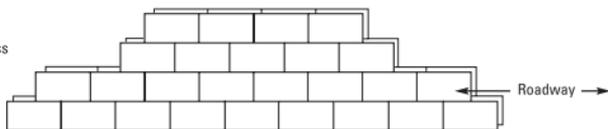
To do this, you must begin with two mats joined end to end. If you have a small mat (8' x 7'6") you can attach it to the (right of the first mat "a") with the lip exposed to the right and forward in the direction of the built road. Attach a third full-size mat to the small mat in the direction of the road. Now that the staggered configuration has been established, the rest of the mats laid into position will follow the brickwork pattern.

Note: The use of right and left is for illustration purposes. The mat orientation can be reversed.

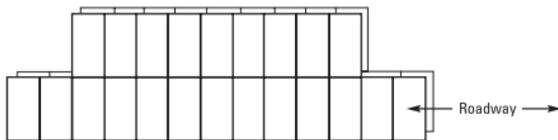
Bypasses, Passing Lanes & Turnouts

For safety around curves and convenience over a long straight road, passing lanes are recommended. A passing lane or turn-out can be configured by attaching one or more mats along side and parallel to the linear road. To do this, lay one mat lengthwise, lip facing down beside the road on the side of the mats that has the exposed lip, in such a way that the mat straddles the seam of two mats. The staggered configuration is

Longitudinal bypass

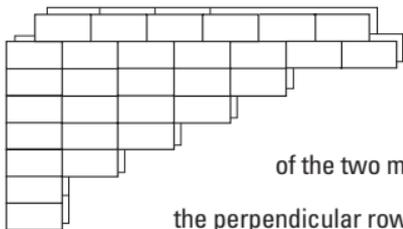


Transversal bypass



essential to maintaining the highest strength of the road. Once the pin holes are lined up, the locking pins can be placed in the appropriate slots and locked into place. To lengthen the bypass lane, another mat should be placed with the lip over-hang side on top of the exposed lip of the secured mat and secured with the pins. Note that the seams of the parallel roadways are staggered like brickwork.

Turnout or corner



To round out a 90° degree turn into a turnout, lay additional mats outward from the exposed lip

of the two mats that form the "L". By starting

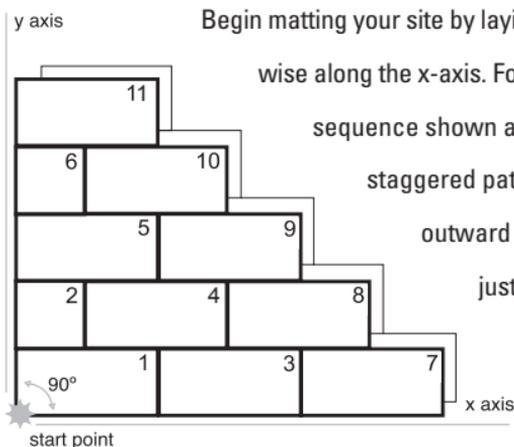
the perpendicular row of mats in the middle of the approaching mat you gain strength with the use of the staggered

configuration. Small mats also can be used to accomplish this.

Site Installation

DURA-BASE® mats can be fastened together to cover large surface areas to be used as work sites or drilling pads. Installation will begin with the basic staggered method used in the double width longitudinal road configuration. In this case, begin by laying one mat at the outside corner of the proposed site, nearest to the access road. The mat should be aligned with the edge of the site so that the pad, when constructed, covers the appropriate square area and won't have to be moved or reassembled. In other words, lay out and mark the site beforehand so that you can maintain proper alignment of the mats.





Begin matting your site by laying a large mat length-

wise along the x-axis. Follow the number

sequence shown at left to maintain the

staggered pattern. As you lay the mats

outward from the corner you've

just created, begin at the

x-axis and work up

and back toward the

y-axis, as seen in the

sequence 3, 4, 5 & 7,

8, 9, 10, 11. Keep the x and y axis perpendicular with a string or landmark to ensure that the mats will align properly for an easy, secure fit with the locking pins. By laying the mats from the corner outward, you will be able to work on the matted surface and have more room to maneuver.

Other Site-Building Techniques

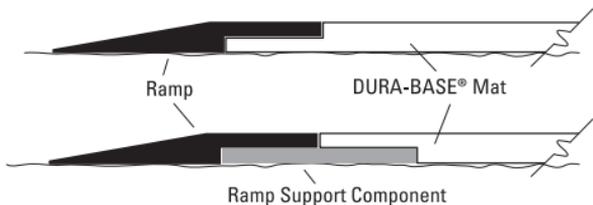
For basically level ground that requires matting, consider "crowning" or "turtle-backing" the site with fill dirt or other sub-grade preparation in order to allow the water to drain to the outside of the matted location.

Conversely, if your project requires the maintenance of a strict separation of liquid or debris generated during operations from the underlying surface, the mats may serve as a collection point for liquids to be isolated and easily removed. The mats can then be cleaned or decontaminated for immediate re-use.

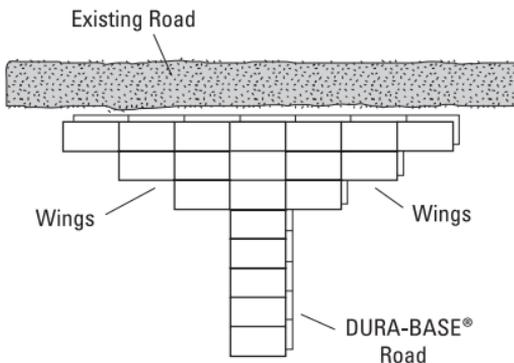
The use of geo-grid or geo-fabric should be determined before installing the mats but will not affect the techniques described above in any significant way. Simply install the fabric over the site and then commence with the mat installation. You may find that installing and removing mats with the use of geo-fabric is much cleaner and more efficient.

Road Entrances & Transitions

A smooth transition from the mat road to an existing surface can be accomplished with the use of a DURA-BASE® Ramp component. Alternatively, simply by mounding earth, gravel or lumber against the edge of the mat, you can facilitate a smooth transition from an existing surface to a mat surface.



When your DURA-BASE® road meets an existing road where traffic enters and exits at hard angles, wings should be constructed to accommodate the turning radius of vehicles.



Using the transversal method, build the apron out in the direction of the road with the lips exposed. Increase the number of mats per row as you approach the perpendicular road. Anticipate the length that will be required to make the gradual left and right hand turn onto the connecting roadway. A staggered road transition can also be built using the longitudinal method. The small mats may prove useful in several areas of your transition and can be used to fill out more difficult road sections or tighter turns. For questions concerning this or any other mat-laying technique, please contact Newpark Mats & Integrated Services (NMIS) at 1-877-628-7623.

Equipment & Storage Pads

Single mats or two and three mats joined as one unit can be used throughout a work site to accomplish special tasks or to support equipment as needed.



Mat Deflection – Precaution About Bridging

The mats are not designed for bridging or spanning gaps. The mats are intended to be used with a sub-grade or underlying surface of some sort, no matter how soft. A particular feature of DURA-BASE® is its ability to conform to inconsistencies of any surface. This means that the mats are slightly flexible by themselves and increasingly more flexible with additional conjoined mats. To match the undulation and irregularities of the ground, DURA-BASE® has approximately one foot of deflection either up or down per eight feet of mat.

Soft Soil Installation

When the location you are matting permits only working from the mats themselves, you must place the mats sequentially in front of the loader while the loader rests on the previously placed mats. In this case, the installer must stand in front of the loader on a previously laid mat and



thread the positioning bar through the mats to align them. The installer must remain in view of the equipment operator at all times, particularly during

this type of installation. Observe strict safety standards when performing this procedure.

MAINTENANCE

The DURA-BASE® mats are relatively maintenance free. However, keeping the mats clean can keep work-site morale high and contribute to a safe and successful project.

If a pin is damaged in such a way that it no longer can hold part of the mats together, it should be replaced as soon as possible so that the mat grid does not shift. Shifting mats may prevent proper re-alignment and make pin insertion more difficult.

If a mat is punctured or torn by debris or equipment, the mat will continue to function in the network of mats, provided the damage is limited to the inside area of the mats and not the edges. If the damage appears irreparable, remove the damaged mat and replace it with another mat.

Surface Precautions

Personnel should take the same safety precautions when working on DURA-BASE® mats as they would any other work site. If the mats become slick with mud during heavy rainfall or if ice forms during cold weather, sand can be spread on the mat surface to aid traction in special situations. After snow has accumulated on the mat surface, a snow plow or shovel can be used to clear the mats. Make sure that the direction the plow travels, minimizes the impact against any protruding edges. Examine the road or work site to see the pattern of bumps that naturally occurs as the mats are overlapped and joined. Ensure that the plow blade does not scrape the surface of the mat.



Cleaning & Decontaminating Mats After A Project

DURA-BASE[®] mats are constructed from high performance thermoplastic material which prevents absorption of any contaminants into its structure and provides a barrier between the ground and mat surface. The mats can be steam washed or pressure washed to restore optimal traction, aid the removal process or to maintain a clean worksite. Oil, fuel or other contaminants can be contained and isolated on the mats for specialized remediation. The mats can then be washed in preparation for the next project.

DURA-BASE[®] Mat Repair

DURA-BASE[®] mats can be repaired. If damage occurs to a mat, set it aside to be repaired. Continued use of a damaged mat can compromise its load carrying capability. Mats can be repaired using a portable handheld extruder along with other simple hand tools. Please contact NMIS for a copy of the DURA-BASE[®] Repair Manual which contains instructions on how to reform common repairs as well as a list of tools needed. NMIS also offers Mat Repair Tool kits which contain all tools needed to perform mat repairs. Please contact NMIS for more information.

QUESTIONS & COMMENTS

For further details or specific answers to mat application questions, please contact Newpark Mats & Integrated Services (NMIS) at 1-877-628-7623 or log onto our web site at www.newpark.com.



DURA-BASE[®]

ADVANCED-COMPOSITE MAT SYSTEM

RECEIPT CONFIRMATION

I acknowledge that I have received a copy of Newpark Mats
& Integrated Services Installation and Handling Manual

Co. Name _____

Rec'd By _____
Print Name

Signature  _____

Date _____

Newpark Rep. _____
Print Name

Signature  _____

DURA-BASE® Advanced-Composite Mat System LIMITED WARRANTY

Newpark Mats & Integrated Services, LLC (NMIS) warrants, for a period of one (1) year after delivery, that the items delivered hereunder will be free from defects in workmanship and materials supplied by NMIS, specifically excluding, however any third party manufactured items. As to any third party materials, NMIS hereby assigns any assignable warranties to the purchaser, without warranty or recourse to NMIS. Should any item delivered be found defective or deficient within the specified warranty period provided, and such defect or deficiency is the result of NMIS faulty workmanship, NMIS will replace or repair the defective or deficient item. In no event shall NMIS's warranty obligation exceed repair or replacement of the defective or deficient items. As a condition precedent to NMIS's obligation to perform any remedial warranty work, the purchaser must notify NMIS in writing within sixty (60) days of the discovery of any defect or deficiency in the item for which the purchaser wishes to make a warranty claim. This notice shall specify the exact nature of the claimed defect or deficiency and afford NMIS a reasonable opportunity to inspect the claimed defect or deficiency before any corrective work is undertaken. The warranty only covers normal use of the product if the usage is undertaken using recommended handling techniques and adhering to limitations as referenced in the DURA-BASE® – Installation Manual. NMIS shall determine whether corrective work shall be undertaken by NMIS at the current location of the product or if the product will be returned to NMIS at NMIS's expense (Continental U.S.A. only) for corrective work. In no event shall NMIS be liable to the purchaser for any sum in excess of the cost of repairs or replacements as specified above, even if such defect of deficiency in the item is attributable to or caused by NMIS's negligence or fault, defect or deficiency in the materials, tools, machinery or equipment of NMIS.

IT IS SPECIFICALLY UNDERSTOOD AND AGREED TO BY THE PURCHASER THAT THE FOREGOING WARRANTY IS THE PURCHASER'S EXCLUSIVE REMEDY FOR WARRANTY CLAIMS AND NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARE OR WILL BE DEEMED TO HAVE BEEN MADE BY NMIS EXCEPT THE WARRANTY SET FORTH HEREIN. NMIS DOES NOT WARRANT EQUIPMENT OR SUPPLIES MANUFACTURED BY OTHERS. THIS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTIES OR ANY ACTION IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR CONTRACT AGAINST NMIS. THERE ARE NO WARRANTIES GRANTED TO THE PURCHASER, WHICH EXTEND BEYOND THOSE CONTAINED HEREIN.

DURA-BASE®

ADVANCED-COMPOSITE MAT SYSTEM

A Product of NEWPARK MATS & INTEGRATED SERVICES

The Leader In Temporary Road & Jobsite Technology For More Than Five Decades



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