MILLIKEN-APPROVED INSTALLATION METHODS FOR:

REMIX

Installation methods not approved by Milliken are at the customer's discretion.

DESIGN	INSTALLATION METHOD
Bebop	Monolithic
Freestyle	Monolithic
Strut	Monolithic
Shimmy	Monolithic

Milliken Contract

Modular Carpet Installation Instructions

These instructions are for use ONLY with Comfort Plus® cushionback and Underscore™ cushionback modular carpet. DO NOT use these instructions or any Milliken Adhesive to install carpet containing PVC.
Except where exceeded by these instructions, Milliken recognizes CRI document104 as a minimum standard for installation.

NOTE: Installation contractor is responsible for reasonable inspection of the product prior to installation and for maintenance of dyelot integrity during installation. Milliken will not be responsible for visible defects after carpet has been installed.
GENERAL: All Milliken modular carpet is designed for installation without permanent adhesives. This allows easy removal and reinstallation. Installation contractor should review these instructions before starting the actual installation. As a first preference, Milliken **strongly recommends** the use of a **Milliken Certified Installation Contractor** to install its products. As an alternate source, Floor Covering Installation Board **(FCIB)** certified contractors as well as companies that can document that they employ installers certified at the C-2 level or higher by the International Certified FloorCovering Installers Association **(CFI)** are also recognized as viable sources of quality installation.
TILE ORIENTATION: Some Milliken designs require specific installation methods (Quarter-turn, Ashlar, etc.) to achieve the intended appearance. PRIOR TO INSTALLATION, always consult your local Milliken sales representative or Milliken Technical Services (1-800-528-8453 Option 3) if you have questions or concerns about the correct installation method. Due to the nature and construction of solution-dyed nylon, we are able to provide very unique, tufted design patterns. From time to time during installation, these products may require that tiles be shifted within the layout in order to avoid a dark line in one tile being positioned next to a dark line in another tile. The dark seam is not a carpet manufacturing defect and can be avoided by attention during the installation phase.

FLOOR PREPARATION:

NOTE: The following are guidelines. Financial responsibility for bringing any floor into conformance with these guidelines must be determined prior to beginning work.

- Concrete subfloors must be structurally sound, clean, dust free, smooth and level. Cracks and holes in excess of 1/8" (3.2mm) should be filled with a Portland Cement based floor patching material such as W.W. Henry 547 Unipro™, DAP "Webcrete 98", Maipei "PlaniPatch", Ardex "Featherfinish" or similar. Gypsum based compounds are not recommended.
- Milliken modular carpet backings are non-reactive and contain no P.V.C. or plasticizers. This greatly simplifies the floor preparation process and typically eliminates the necessity of old adhesive removal. All Milliken Modular carpets carry the "Lifetime Floor Compatibility" warranty. Milliken is not responsible for subfloor conditions. The installer has the responsibility for obtaining a successful installation.
- No chemical incompatibility exists between Milliken modular carpet or Milliken Modular Carpet Adhesive and any existing floor covering adhesive. This includes "cutback", asphalt emulsion, general-purpose adhesive, epoxy and any other commonly found flooring adhesives.
- The only physical requirement for existing adhesive films is that they be smooth, non tacky, and that residual trowel notches be reduced to 1/32"(0.8mm) or less. In most cases the removal of the existing floor covering accomplishes this with only normal sweeping, cleaning, and patching required prior to beginning installation.
- Regardless of adhesive type, the existing layer should have minimal residual tack. There is no chemical reaction; however, excessive tack may cause the carpet modules to become bonded too aggressively to the floor over time. This tack can be minimized or eliminated by sifting Portland Cement based patch powder into the existing film and sweeping away the excess or by applying a very thin layer of Portland patch. In cases such as this, a grid method of gluing is preferred if the product type allows.
- If additional smoothing is required and residual adhesive is black (cutback or asphalt emulsion) smoothing **must** be accomplished by applying a very thin layer of one of the above patching compounds.
- NEVER scrape, sand or mechanically abrade any exposed black adhesive or any existing resilient floor. These may contain asbestos.
- If residual adhesive is **not** black, scrape or sand until smooth and non-tacky as required.
- Protruding objects must be removed. Floor must be flat (not undulating) to within 1/4" in 12' (6.4mm across 3.66m) with no abrupt changes.
- Sealing or other post treatment of concrete floors is at the discretion of the installation contractor. In general, properly cured (90 days minimum) steel trowel finished concrete requires no additional treatment. Excessively porous or dusty concrete slabs are the only exceptions. Please call Milliken Technical Services if you have questions. Durabond D250 is a recommended product should this type of treatment be deemed necessary; however, any non-silicone based sealer will work acceptably with non-PVC backings. **This treatment is NOT intended to be a corrective for out-of-specification water vapor transmission levels.**
- When working with a Gyp-Crete or Gypsum subfloor, Milliken recommends sealing with a gypsum floor sealer prior to installation. Failure to do so will result in an unacceptable installation.
- Carpet should be stored between 40°F and 100°F (4°C to 38°C) and must be conditioned to between 60°F and 90°F (15°C and 32°C) prior to and during installation.
- Floor temperature should be 60°F (15°C) minimum for proper adhesive curing and performance. Relative humidity of the slab should not exceed 80% as measured by the RH Probe Test (ASTM F2170).
- Floor pH should not exceed 10.0. Floor should be acid washed using a 50/50 vinegar and water or a 1/20 muriatic acid and water solution if pH is greater than 10.
- Water vapor transmission should not exceed 5 lbs. per 1000 square feet (1.4 Kg/93m2) per 24-hour period as determined by the #625 Anhydrous Calcium Chloride test available from Taylor Tools, Denver, Colorado 800-525-3714. Equivalent tests (Vaprecision® or SINAK's "dome" test) are also available from various suppliers. Any test used MUST be performed to comply with ASTM F-1869-98.

NOTE: If your subfloor is contaminated with an oily residue either from removal of "cutback" during asbestos abatement or from a previous end use such as metal fabrication, this residue MUST be totally removed or covered prior to applying modular adhesive and carpet. In addition, If residual adhesive – either "cutback" or general purpose - has been damaged/reactivated by previously installed PVC-backed carpet, call Milliken Technical Services for guidance. **The "Lifetime Floor Compatibility" warranty does NOT apply in these situations.**

RECOMMENDED ADHESIVES:

- ***Milliken Modular Carpet Adhesive 100V*, packaged in 4-gallon (15.1 liter) pails (Order as 3000013099)**, and ***Milliken Modular Carpet Spray Adhesive*, packaged in 35# pressurized canisters (Order as 3000015602)**, are recommended for the installation of all Milliken modular products regardless of backing. For installations with up to 90% in-situ relative humidity (ASTM F2170) and pH up to 11.0, Milliken recommends XL Dyna-Mix NPB pressure sensitive adhesive (XL Brands, 1-800-367-4583).

- **Use of non-Milliken adhesives does not affect carpet product warranties, however, any claim related to adhesive performance or workmanship and any damage caused by this would be the total responsibility of the party responsible for using the non-recommended product.**
- These adhesive products are especially formulated to give superior performance with Milliken's non-PVC backing systems, contain no hazardous ingredients, and provide the best indoor air quality environment available. Adhesive should be purchased and shipped with the carpet for maximum convenience and lowest total cost.
- **Remember, when using the spray adhesive system, you MUST have the adhesive (3000015602), the cleaner (3000015603) and the Spray Applicator (3000015601) for the system to be operational.**
- **Spray adhesive canisters are under pressure and as such fall under DOT hazard class 2.2. This means they can ONLY be shipped via ground transport and that no more than 1000lbs (454kg.) can be put on any one truck. There are NO hazardous ingredients in the product itself. Detailed use instructions are included in each package.**

COVERAGE RATES/APPLICATION METHODS:

Recommended target coverage rates are averages based on years of performance experience with various backing types and end use environments. The installation contractor MUST determine and be responsible for the exact coverage rate for a particular project. When **estimating** adhesive requirements for a project, it is recommended that the lower end of the coverage rate range be used. It is always better to have an extra pail or canister than to run short. **As a general rule when installing modular carpets, use the LEAST adhesive that will satisfy the requirements of the "adhesive verification" test outlined below.**

- ***Milliken Modular Carpet Spray Adhesive*** is applied with the #500541applicator noted above. In a normal commercial environment without extreme rolling loads, coverage should be **400 to 450 square yards (330 to 380 sq. meters) per 35lb(15.9Kg.) canister in a full spread application. This product has NO plasticizer resistance and must NOT be used with any carpet containing PVC**
- ***Modular Adhesive 100V*** is applied with a long nap (3/4 to 1 inch – 19mm to 25mm) paint roller or a 1/32" x 1/32" x 1/16" (0.8mmx0.8mmx1.6mm) notched trowel. It may also be applied by attaching a scrap of carpet to the trowel blade and spreading the adhesive with the nap. 100V may also be sprayed using various types of commercially available equipment. See below for coverage rates:
- **If coverage is required in square feet to conform to NIST standards, simply multiply square yards by 9 or square meters by 10.72.**
- **The 100V product and the spray product are milky white and milky beige respectively as they come from the container. Both products become transparent or translucent as they dry. This change is one of the indicators that the adhesive film is ready to receive carpet.**
- **In ALL situations, adhesive is allowed to dry completely before installing carpet – See "Adhesive Verification" test outlined later in these instructions for details on determining exactly when an adhesive film is ready to receive carpet. These coverage rates apply regardless of whether the adhesive is applied with a paint roller, trowel or sprayer.**

100V TARGET COVERAGE RATES BY PRODUCT:

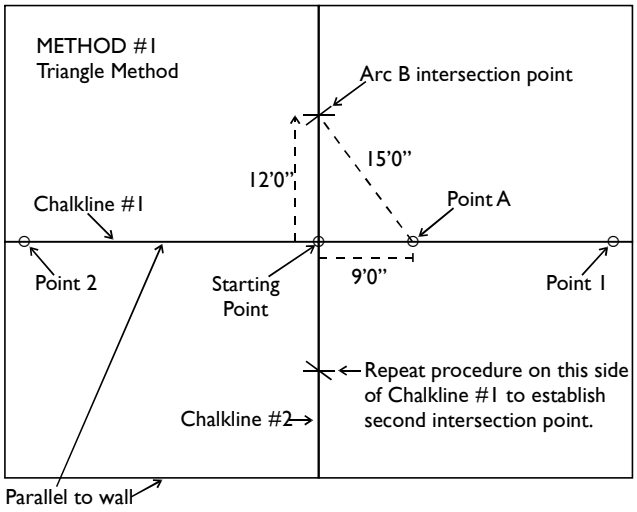
- Comfort Plus® and Underscore cushionback full spread for all tile sizes: 35 to 40 sq.yds/gallon (9.5 to 10 sq.m/liter).
- In extreme environments - such as casinos and convention centers - which will routinely experience extreme rolling loads in excess of 5,000lbs (2272Kg.), a heavier full spread of adhesive is recommended. Target coverage for this end use would be 20 to 25 sq.yds/gallon(5 to 6 sq.m/liter) for the 100V product or 300 to 350 sq.yds(250 to 290 sq.m) per canister for the spray product.

INSTALLATION INSTRUCTIONS:

GENERAL: The most important part of any modular installation occurs before the first module goes on the floor or any adhesive is applied. **Proper planning and layout is crucial to the success of all modular installation.**

CHALKLINE APPLICATION: Once floor preparation is completed, two working chalklines must be applied to the floor to insure a straight, square, and properly aligned installation. These chalklines intersect at the starting point and are exactly 90º to each other. Following are two methods for applying chalklines:

METHOD #1 - TRIANGLE METHOD:



Chalkline #1: Regardless of method, chalkline one – also referred to as the "baseline" - is snapped roughly parallel to some architectural feature (outside wall, column line, etc.) and generally runs the longer dimension of the area. This is done by placing two and only two points on the floor as far apart as

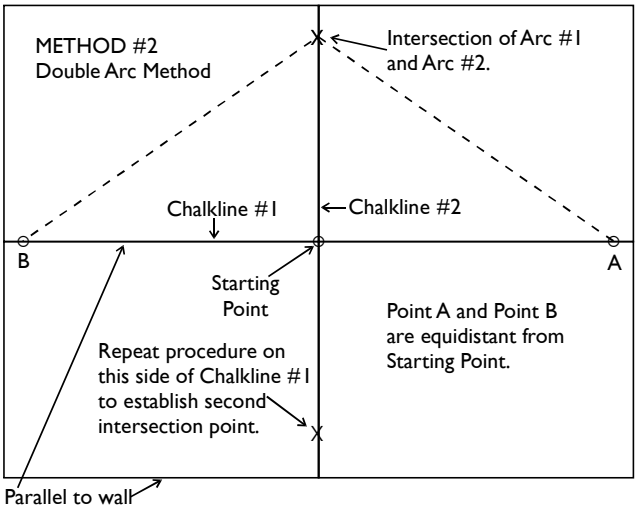
possible within the area at the same distance from the selected architectural feature. (See Point "1" and Point "2" on the diagram.) This distance is determined by the installer to optimize cut sizes and minimize waste.

Starting point and Chalkline #2: Select a starting point somewhere on Chalkline #1. Location of starting point is usually but not always close to the true center of the area. It may be offset to optimize cut sizes. Using the largest possible multiple of a 3-4-5 triangle (6-8-10,9-12-15,12-16-20, 15-20-25, 18-24-30, 30-40-50 etc.) construct a chalkline through the starting point exactly 90º to chalkline #1 as follows:
Note: in this example we will use a 9-12-15 triangle measured in feet and inches, however, units of measure used do not affect the validity of the procedure.

Construct Chalkline #2 as follows:

1. Measure exactly 9'0" from the starting point along chalkline #1.
2. Measure exactly 12'0" from the starting point approximately perpendicular to the line #1. Mark an arc (line) on the floor parallel to chalkline #1 four to five inches long as indicated by Arc "B".
3. Measure exactly 15'0" diagonally from point "A" to Arc "B" as indicated.
4. That point on Arc "B" exactly 15'0" from point "A" when connected with the starting point gives a line exactly 90º to chalkline #1. For maximum accuracy, this procedure should be repeated on the opposite side of chalkline #1. A chalkline or a dry line should be stretched between the two intersection points created. If measurements are accurate, the string will go directly across the starting point.

METHOD #2 - DOUBLE ARC METHOD:



Chalkline #1 - same as in triangle method.

Chalkline #2 - select starting point same as triangle method and proceed as follows:

1. From the starting point measure any convenient distance both directions along chalkline #1 and mark point A & B on the floor (see diagram). These points should be as close as possible to the end walls of the area and must be the same distance from the starting point.
2. From points A & B, measure diagonally as indicated by the dotted lines allowing the tape measure to feed out until you are close to the side wall. Place a framing square or a carpet module at the starting point aligned with chalkline #1 to act as a visual guide to tell you when you are close to 90 degrees. Once you feel you are close pick a distance and remember it.
3. Strike an arc (Arc #1) measuring the distance determined above from point "A". Now working from point "B", measure diagonally using exactly the same distance used to strike Arc #1 and strike Arc #2. This intersection point connected to the starting point is a 90 degree angle to line #1.
4. As in the triangle method, this procedure should be repeated on the opposite side of line #1. Once accurate chalklines are applied, put down adhesive and install carpet as follows:

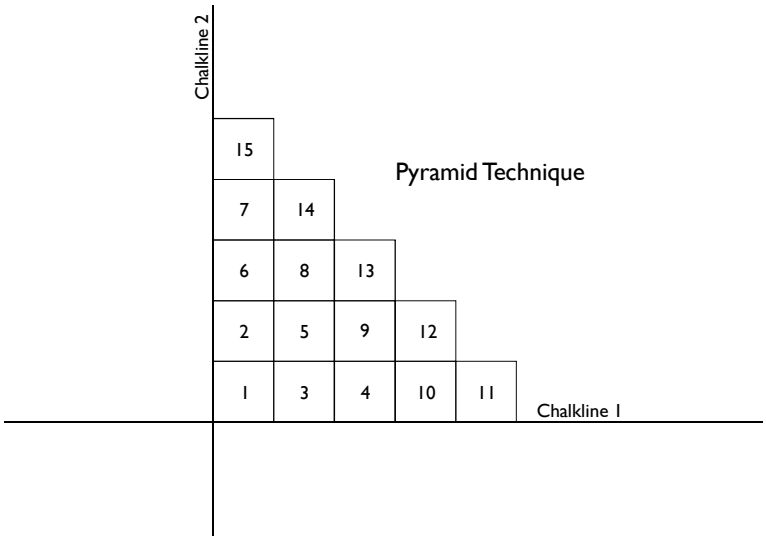
ADHESIVE READINESS SHOULD BE VERIFIED AS FOLLOWS BEFORE BEGINNING INSTALLATION.

1. Place a module into the dried (transparent or translucent) adhesive film and press the entire module down firmly. Kneel beside the module and attempt to slide it across the glue by grasping the opposite edge and pulling. **No** lateral movement should be possible.
2. Lift the corner of the module and peel it from the floor. There should be no adhesive transfer to the back of the module. If slipping or transfer of adhesive occur, the cause MUST be determined and corrected prior to proceeding. In general, 30 to 45 minutes are required for these conditions to be met. This time can be longer or shorter depending on humidity level and amount of air movement. A fan is helpful to speed the drying process.

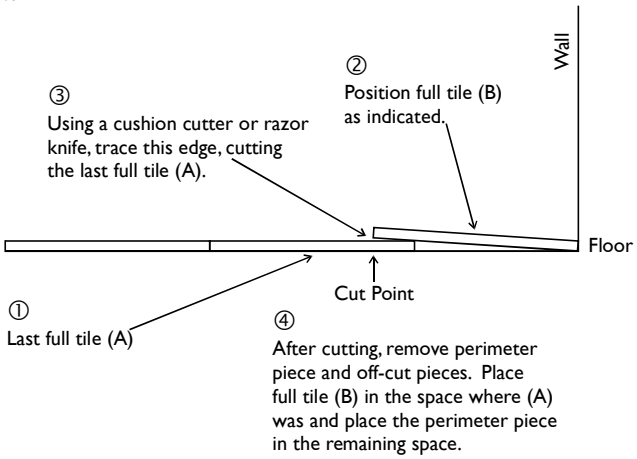
NEVER INSTALL ANY MILLIKEN MODULAR CARPET INTO WET ADHESIVE.

GENERAL:

- The pyramid technique (see diagram below) gives three alignment checkpoints on each tile placed and should be used on ALL products regardless of module size or backing. This technique also helps control spacing or "growth" and keeps the entire layout closely referenced to the chalklines. Strict attention should be paid to corner alignment. Tiles out of alignment by more than 1/8" (3.2mm) on 36" or 1m product should not be installed. Some "wandering" of edges due to undulation in the floor is unavoidable. This will be gradual and tend to come and go randomly, however, if corners become misaligned and this misalignment continues to increase, this indicates an out of square condition. The problem should be immediately determined and corrected.



- Always **SLIDE** each module into position from the side to prevent trapped yarn. Set each module by firmly rubbing both joints. With 1m x 1m and 36" x 36" (.91m x .91m) products, a very fine mist of water applied to the dry adhesive will facilitate sliding and positioning the product. Do not overwet. It should not be possible to slide the module after 30 to 40 seconds.
- Modules should be tight but not compressed. Peaking will occur when modules are too tight. Too loose an installation will never achieve the best possible overall appearance and, on grid installations, modules can slip, "snowplow" and create obvious gaps with use.
- Tightness or "growth" should be determined by measuring the distance covered by 11 full modules (10 joints). This measurement should be no more than 1/8" (3.2mm) over the calculated distance for eleven tiles. In some cases this distance may be less than calculated. This distance may also vary between the length and width of the product. Once this "growth" figure is determined, it must be maintained throughout the installation.
- Directional arrows are applied to the back of each tile indicating pile direction. This allows the customer/installation contractor to choose the method of installation preferred – Parquet (Quarter-Turned), Monolithic (Corner-to-Corner or Ashlar), Random, 180-Degree Turned, Checkerboard, Mosaic or a mixture. **Some Milliken designs REQUIRE that specific installation methods be used to achieve the desired visual. Always check with your Milliken representative or call Technical Services if there is any question.**
- Whenever possible it is recommended that arrows be run parallel to major traffic lanes. Unless it is unavoidable, arrows should not run across hallways.
- The parallel or "scribe" cutting technique is one method of easily and accurately cutting modular carpet. (See diagram below.) This method is valid regardless of backing system.



- Off-cut pieces should be used elsewhere if possible. NOTE: Always mark an arrow on the back of off-cut pieces to facilitate using them in another area. Any piece that is large enough to fill the available space and maintain arrow direction and pattern match should be trimmed and used. It is permissible to carefully re-trim a cut piece and use this field cut edge to butt to a factory edge. Quality of cut, and pattern match MUST be maintained for this to be done.
- Properly installed full spread installations can begin receiving foot and rolling traffic immediately. Exposed edges should be protected when rolling heavy loads such as pallets of carpet across the installed portion. Plywood or masonite should be positioned on carpet when heavy furniture or supplies are moved on jobs.
- The recommended casters for desk chairs should have a tread width of 3/4" to 1" (19mm to 25mm), and a wheel diameter of 2"- 21/2" (5cm - 6cm) tapered. Hard polyolefin composition is recommended. For more detailed information, contact Milliken Technical Services.

TRANSITIONS AND STAIRS:

- For the most attractive finish with its modular products Milliken recommends the use of top set cove base after carpet installation is completed.
- Appropriate transition strips MUST be installed wherever there is a potential for an edge to be exposed or where Milliken modular carpet finishes to another flooring type. The increased total thickness of Comfort Plus®- and Underscore -backed products requires a transition treatment capable of accepting the carpet without the necessity of modifying or adapting the edge. Johnsonite's EG-XX-W edge guard and

CRS-XX-D reducer have proven successful for edge protection for Comfort Plus- and Underscore-backed products. Equivalent products from other manufacturers are also acceptable.

- For best long term performance on stairs, a double undercut nosing such as Johnsonite part SVCD-XX-A or equal should be applied to each step with modules cut to fit on both the tread and the riser. This method of installation on stairs protects the carpet from receiving the impact present at the nose and helps in holding the riser carpet in place. Generally a Cove Base type adhesive is also used to adhere the riser piece to insure that the carpet stays in place.
- It is possible to install both Underscore - and Comfort Plus®-backed modules on stairs without the use of a separate nosing. This requires modifying and/or removing the backing and results in placing a structurally compromised product directly on the nose of the stair with no protection from the severe impact and abrasion that will occur. This is not recommended.
- Johnsonite transition treatments, stair nosings and similar products from other manufacturers are sold through distributors. For the location of the nearest Johnsonite distributor, call 800-899-8916. When obtaining transition/nosing treatments from other manufacturers, always be sure to specify the total thickness of the carpet product being installed to insure the correct transition product is used. **USE OF IMPROPER AND/OR INADEQUATELY INSTALLED TRANSITION TREATMENTS WILL RESULT IN EDGE FAILURE. SELECTION AND INSTALLATION OF THESE PRODUCTS IS THE RESPONSIBILITY OF THE INSTALLATION CONTRACTOR.**

PROTECTING CARPET AFTER INSTALLATION:

Milliken & Company recognizes CRI 104 (The Carpet and Rug Institute Standard for Installation Specification of Commercial Carpet) as the standard guideline for protecting carpet and associated materials after installation. It is recommended that carpet be the last trade on any job site. However, if it is required to protect the finished floor covering from soil or paint, or if any additional work is required to be done after the installation, the carpet should be covered with a non-staining building material paper. Protect the installation from rolling traffic by using sheets of Masonite in the potentially affected areas. Do not use a self-adhering plastic film such as Visqueen to protect your carpet installation. It may leave residues that result in rapid soiling after removal. Do not use non-adhesive plastic sheeting over your carpet installation because it may present a slip hazard. Plastic coverings may also trap moisture, which may promote mold growth, and retard adhesive curing.

NOTE: THE ABOVE INSTALLATION INSTRUCTIONS ARE GENERAL IN NATURE AND ARE NOT COMPLETE FOR EVERY MILLIKEN MODULAR CARPET PATTERN. SOME MILLIKEN PATTERNS REQUIRE SPECIFIC INSTALLATION METHODS (QUARTER-TURNED, ASHLAR, ETC.) TO ACHIEVE THE DESIRED APPEARANCE. ALWAYS CONSULT YOUR MILLIKEN REPRESENTATIVE OR TECHNICAL SERVICES IF THERE ARE QUESTIONS ABOUT THE CORRECT INSTALLATION METHOD.

This information is supplied by Milliken & Company
300 Lukken Industrial Drive West, LaGrange, Georgia 30240
Backed by the largest, most productive research and development facility in the carpet industry.
Call Technical Services Team Toll Free 1-800-528-8453 – Select Option #3

The above instructions represent the best available data and are deemed to be correct and complete; however, Milliken assumes no liability for installation-related problems.

03/2011