

# INSTALLATION



## ► Recommendations for installation

Armstrong DLW Linoleum is manufactured from natural and replaceable raw materials. These provide linoleum with material properties which must be taken into account when installing and acclimating material pre installation. These are:

### A. Reaction to moisture

Excessive humidity in the air or moisture in the substrate or adhesive can cause changes in the dimensions of the linoleum. The subsequent points concerning sub-floors and adhesives, detailed below, should be closely observed.

### B. Veiling

The natural veiling caused during the curing process of linoleum in the drying chamber is visible as a yellowish discolouration. This disappears with exposure to light. Under artificial light or weak sunlight this process may take several days or even weeks. Sheets and tiles laid at the same time should be exposed to identical light conditions.

Installing Armstrong DLW Linoleum is simplicity itself if the following points are observed:

## ► 1/Sub-floor

Armstrong DLW Linoleum can be installed on all sub-floors that are permanently smooth, firm, free of cracks and dry (see relevant country standards for installation, together with other regulations applicable to all associated factors). Dense, non-porous sub-floors, poured asphalt, for instance, sand/cement screeds and wooden sub-floors must be smoothed with a self levelling compound of adequate thickness (minimum 3 mm); cement-bound, low-tension compounds are suitable for this purpose.

The following values for residual moisture for various sub-floors apply to substrates of normal thickness, i.e. not greatly in excess of the minimum requirements according to DIN 18560, BS 8203/4 or relevant country standards and serve as guidelines based on experience:

Subfloors	Maximum Permitted Moisture content in CM-%
Cement floor	≤ 2,0
Anhydrite and Anhydrite flooring	≤ 0,5
Surface moisture readings	≤ 75 % R.H.

## ► 2/Adhesives

Application of all adhesives suitable for linoleum is generally done with a B1 square-notched trowel, using approx. 400-500 g per m<sup>2</sup>. Please also observe the adhesive manufacturer's recommendations. When dispersion adhesives are used for linoleum 2 mm thick on very smooth floors an A2 notched trowel and approx. 350 g of adhesive per m<sup>2</sup> is generally required. Adequate transfer of adhesive to the backing material (jute) should be checked continuously. We recommend that solvent free adhesives such as dispersion or powder adhesives should be used.

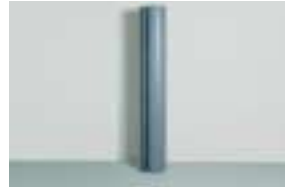
Information about adhesives suitable for laying linoleum may be obtained from the Armstrong Technical Department, telephone number 01235 554848 (or local country number).



One of the most important pre-conditions for successful installation is careful work according to preparation.



Testing the moisture content of the substrate and checking temperature and relative humidity in the room.



The sheets are cut to size, marked, loosely re-rolled and placed upright to acclimatize to conditions in the room.



The loosely-laid sheets are cut in, around a radiator in this case, after ensuring the subfloor is flat and smooth.



Trace the shape of a doorpost to the linoleum with the help of a scribing bar.



The floorcovering is cut along the scored contours.



Cutting the first edge of the sheet is best done with a linoleum edge cutter or strip trimmer.



The safest way of cutting a seam: mark the top sheet with an under and over scriber guided along the trimmed edge.



Trimming the top edge with a hooked knife.



The seam should never fit too tightly. There should be a space of approx. 0.5 mm between adjoining edges when sealing.



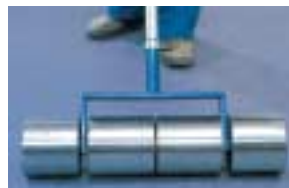
Folding back the trimmed sheets, either half-way back in the case of rooms or lengthways in the case of corridors etc...



Adhesive must be applied in such a way that the strips of adhesive cover the entire backing of the floorcovering.



Rubbing down the sheets with a rubbing iron, a device covered with needle felt...



... or with a lino roller which, due to the gauge of the rollers, exercises sufficient pressure even where slight irregularities occur.



Remaining air bubbles should be rubbed down with an appropriate smoothing tool.



A useful tip if the trapped air cannot be forced out laterally: make a small hole with the point of a blade in a dark section of the pattern, press out the air and once again firmly rub down the covering at this point.



Milling out the joint.



Sealing with a manual welder.



For large contract projects it is worth using an automatic welding machine.



The weld rod is trimmed in two operations, first with the trimming guide fitted, then with the bare blade.

## ► 3/Estimating requirements

### 3.1 Rolls

In order to establish requirements for material supplied in rolls, the required lengths and widths of the rolls must be determined. Before taking measurements, the direction in which the material is to be laid must be determined. Head seams are only recommended with roll lengths of more than 5 metres. Allowances must be made for rolls, which run up to door openings, or recesses etc. Strips can be used for covering door openings at the sides, recesses and so on.

### 3.2 Tiles

Tiles are generally laid in a chequerboard pattern. But they can also be laid, if desired, in a parallel manner. With regard to the way the joins run, either parallel or diagonal layouts are possible. For measuring-up, the nett floor surface is calculated, allowing an extra percentage amount for wastage, based upon experience. The amount of waste material is greater with diagonal laying methods than with a parallel design and greater also with oblique angled or rounded surfaces than it is with straight edges.

### 3.3 Staircases

Coverings for stairs are cut from rolls of material. When laying coverings with patterns that run lengthways, these should run parallel with the edge of the stair. This applies also to landings. The requirements are calculated from the number of stairs that can be cut, respectively, from one roll. Special templates are made up to enable accurate measurements and cutting in for angled staircases.

## ► 4/Storage, acclimatisation and conditions for installing

Correct storage is essential to ensure that the technical laying properties of Armstrong DLW Linoleum are retained.

As a rule, rolls of linoleum are stored upright in a dry room at normal temperatures. Tiles may not be piled more than eight boxes high. Once cut to size, store the loosely re-rolled sheets upright with the top surface facing outwards for at least 24 hours at a temperature of at least + 18 °C in the room in which they are to be laid (see B Veiling). This allows the material to acclimatise to the ambient humidity and temperature of the room. When the linoleum is being installed, it is important that the temperature not only of the room but also of the sub-floor should be at least 15°C and the maximum relative humidity 65 % (ideally between 40 % and 60 %).

Make sure that, in each room, only one and the same factory batch number of floorcovering is installed in the sequence of roll numbers. This applies both to tiles and sheets.

## ► 5/Cutting linoleum

### 5.1 Trimming the edges of sheets

Even if sheets are to be joined at a later stage, we recommend trimming both edges of the sheet. The first edge is easily trimmed using a linoleum edge-cutter. The second edge may be trimmed by two methods:

a) In the case of small rooms  
(before adhesive is applied)

The lower sheet is scribed with a knife along the trimmed edge of the upper sheet. The resulting strip of waste is then cut in the opposite direction with a hooked blade.

b) In the case of large rooms  
(after adhesive has been applied)

The upper edge is scribed along already trimmed edge of the glued bottom sheet with an under-and-over scribe or a lino-cutter, and the resulting waste strip is then cut in the opposite direction with a hooked blade.

#### 5.1.1 Cutting the seams

In either case, the cut should be done in such a way that a gap of about 0.5 mm is left open between the sheets. The cut should be vertical or slightly diagonal so that the joint is loose, i.e. without contact between the two sheet edges.

#### 5.1.2 Top ends

When the seams are cut, possible alterations in the dimensions of the floorcovering should be taken into account. When long sheets are being joined it is a good idea not to trim the top ends before the linoleum has been installed in the adhesive bed.

#### 5.1.3 Fitting around door thresholds, radiators etc.

Once acclimatised, the sheet is installed and cut to fit around door thresholds, radiators etc. with the help of a recess scribe. The sheets should then be rolled back and the adhesive applied.

### 5.2 Tiles

Linoleum tiles are manufactured to order and should be laid within a maximum of 8 weeks after delivery. The tiles should be stored in a dry area.

For recommendations regarding adhesives see under point 6.

## ► 6/Installation

It is recommended that linoleum is fully adhered throughout. With this the operational guidelines of the adhesive manufacturer should be followed. Selecting the correctly notched trowel as well as the basic rubbing-in procedures are vital elements to ensure that the adhesive is correctly transferred to the material backing. Lift up the tiles to check that the adhesive is spread on the underside, when the work is being carried out.

### 6.1 Rolls

Rolls should be folded back and adequate adhesive is to be applied to the floor. The rolls should be laid in sequence onto the area where the adhesive has been spread, within the time that is specified by the adhesive manufacturer and then immediately rubbed in or rolled. This will depend on the room temperature and air moisture as well as the absorbency and dampness of the subfloor. When rolls are being laid in corridors, they are to be folded back crossways. During the laying procedure, no pockets of air should be allowed to remain and these should be pushed out of the sides. Any hollow spots found when tapping down on the covering with a hammer, can be pierced and the air then pressed out.

### 6.2 Tiles

After the adhesive has been applied, tile laying begins with the predetermined first line of tiles. With large rooms, laying of the tiles in stages is recommended in order to avoid any misalignment. When applying the adhesive to the under side, the tiles are to be carefully smoothed or pressed on. It may be necessary to repeat this process.

Adhesive	Trowel notching	Amount required
2 component dispersion adhesive	B1	400-500 g/m <sup>2</sup>

## ► 7/Welding of seams

As per Code of practice 2/93 of the Technical Committee for Architectural Adhesives (TKB) in the Trade Association of the Adhesives Industry in Düsseldorf, the sealing up of joins with welding rod is always to be recommended. This is particularly applicable for areas where wet cleaning and/or basic cleaning is carried out frequently and with flooring bases that are sensitive to damp. The welding operation itself is carried out either with a hand-welding device or automatic welder. This is done basically after the adhesive has bonded, e.g. 48 hours after laying (see recommendations of the adhesive manufacturer). Sealing the joints too soon can lead to changes in the adhesive in the area of the join due to the effects of heat, and this may impair adhesion.

The flooring joint should be grooved with a grooving tool and jointing plane to a depth of about 2/3 of the thickness of the floorcovering. The groove should then be cleaned carefully. The width of the join should be around 3.5 mm.

Armstrong DLW weld rod can be applied using a hand-held welder with a 5mm diameter quick welding jet attachment. Operating temperature is around 400-450 °C, and the running speed about 2.5-3 metres per minute. The protruding part of the weld rod is removed in two operations: immediately after application the weld rod is removed while still warm using the crescent-shaped cutter and the attached removal slide; once the weld rod has cooled the weld rod is removed flush to the upper edge of the covering using the crescent-shaped cutter.

Note: With linoleum that is not exposed to light (see B → veiling), there can be differences in colour between the rolls and the welding rod. The colour of the covering should be compared with that of the welding rod after the veiling process has completed.

## ► 8/Armstrong DLW Korkment as an underlay

Korkment is the only insulation underlay recommended for Armstrong DLW Linoleum. Armstrong DLW Korkment can be installed on all prepared substrates. The direction of the sheet can be the same as that of the main floorcovering. Seams should be offset by at least 50 cm. Korkment may also be installed at right angles to the linoleum sheet. Seams may be formed by a so-called double-cut, using a hooked blade run along a straight-edge. Linoleum dispersion adhesive or 2K dispersion adhesives are used for glueing down. The amount of adhesive required depends on the thickness of the floorcovering and its subsequent use. The floorcovering should only be installed after sufficient time has elapsed to allow the adhesive to bond fully. For floors subjected to heavy wear (in hospitals, for example), Korkment can be installed with the jute backing facing upwards.

Recommended adhesives for Armstrong DLW Korkment

Adhesive	Trowel notching	Amount required
Powder-adhesive	B1/B2	400 – 600 g/m <sup>2</sup>
2 component dispersion adhesive	B1	400 – 500 g/m <sup>2</sup>
Dispersion adhesive	B1	300 – 400 g/m <sup>2</sup>

## ► 9/Armstrong DLW Linoleum with underfloor heating

Armstrong DLW Linoleum is suitable for installing on substrates above underfloor heating systems (see the leaflet "Resilient floorcoverings and parquet flooring on heated floor constructions" issued by the Central Association for the German Building Industry or refer to relevant country standards).

### 9.1 Dry constructions

Dry constructions can consist of anhydrous gypsum or brick plates. The floorcovering can be installed once the joints have been skimmed over with a levelling compound.

### 9.2. Wet constructions

With wet constructions, the heating pipes or cables are bedded into a floating cement or anhydrous gypsum screed. Before the floorcovering is installed, care must be taken to ensure that any residual moisture generated by the heated elements is removed. This is generally the responsibility of the heating engineer, who should issue a report on the required heating-up and cooling-down measures undertaken. This report replaces the moisture tests required of the flooring installer, who may not carry out these tests where there is underfloor heating systems installed unless the sub-floor installer has left marked measuring points.

## ► 10/ installation of Armstrong DLW conductive Linoleum

The requirement for floors with a maximum electrical resistance to earth of  $1 \times 10^8$  ohms is fulfilled by the installation of Armstrong DLW conductive Linoleum LCH. The earthing of the conductive flooring is a matter for an electrical installation engineer, who must observe the relevant regulations.

The adhesive used must be homogeneously conductive. This requirement is not generally fulfilled by light conductive adhesives with fibre additives. Inquiries about the type of adhesive to be used and the conduction system which is to be employed may be obtained direct from the manufacturers or from the Armstrong Floor Products Technical Department, telephone number 01235 554848.

### 10.1 Installing on copper strips

A continuous copper strip is run under each row of tiles or sheet of linoleum. These copper strips are connected via two strips running at right angles. For the installation of Armstrong DLW conductive Linoleum LCH, Armstrong offers copper strips as follows: Supplied as: 50 m rolls. Amount required: As a rough guide for ordering, about one 50 m roll is needed for 80 m<sup>2</sup> of floor-covering or 25 m<sup>2</sup> of tiles. This must be connected to the main building earth by a qualified electrician.

### 10.2 Installation on a primed conductive subfloor

The sub-floor is first primed with a conductive primer in accordance with the manufacturer's instructions for use. A one-metre length of copper strip is glued to the prescribed earth connection on the substrate. Please consult the supplier of the material before using. For installing anti-static linoleum to other sub-floors contact Armstrong technical department for specialist advice. Frequency of earth connection points: At two points in the room – more in the case of rooms over 40 m<sup>2</sup> in size. The maximum distance from an earth connection point may not exceed 10 m.

### 10.3 Installing in dual requirement areas

Armstrong DLW Linoleum LCH is capable of efficient discharge of any static electricity and at the same time meets the location insulation requirements as per DIN 57100/VDE 0100 T410. Because of the overall difficulty, it is basically recommended to obtain information from the Armstrong Floor Products Technical Department on telephone number 01235 554848 (or local country number).

## ► 11/Cleaning and maintenance

The contractor has to hand over to the client the written maintenance instructions for the floor-covering as part of the project handover. The following printed pamphlets are available free of charge:

- Cleaning and maintenance recommendations for Armstrong DLW Linoleum
- Maintenance tips for continuous beautiful floor-coverings (Domestic users)

Details are available from the Armstrong Floor Products Technical Department on 01235 554848 (or local country number).

► **12/Special notes**

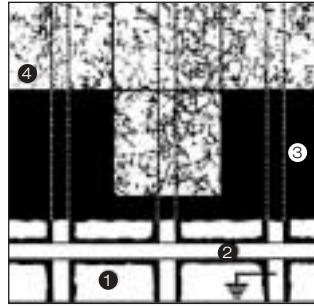
**12.1 Office castor chairs**

Office castor chairs for use on resilient floorcoverings must be fitted with Type W castors in accordance with EN 12529 (DIN 68131), i.e. with soft castors. This should be taken into account when new castor chairs are purchased when castor chairs are used or before they are purchased.

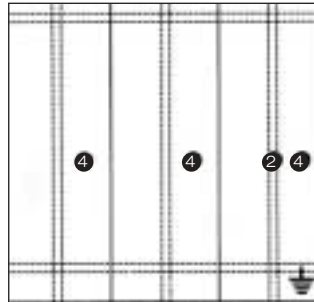
**12.2 Discolouration in use**

Through long periods of contact, rubber can leave discoloured marks on all resilient floorcoverings. These cannot then be removed. The causes of such discolouration include: car tyres, castors, the feet of washing machines and refrigerators, and pram tyres. These discolourations do not appear immediately, but are the result of the transfer of substances and their subsequent exposure to light. To avoid such discolouration, use polyurethane castors. If this is not possible we recommend the use of protective plates.

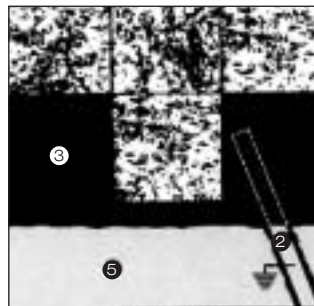
Tar, asphalt, mineral oils, grease and coloured floor polishes that can be ground into the flooring with footwear can result in discoloured marks in heavily used areas on lightly coloured flooring, for example, in rooms accessed from tarred roads, in kitchens, or in the offices of petrol stations and car workshops.



Tiles on copper strip



Sheets on copper strip



Tiles on conductive subfloor  
(Frequency of earth connection points)

- 1 Subfloor
- 2 Copper strip
- 3 Conductive adhesive
- 4 Conductive flooring
- 5 Earthing strip

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