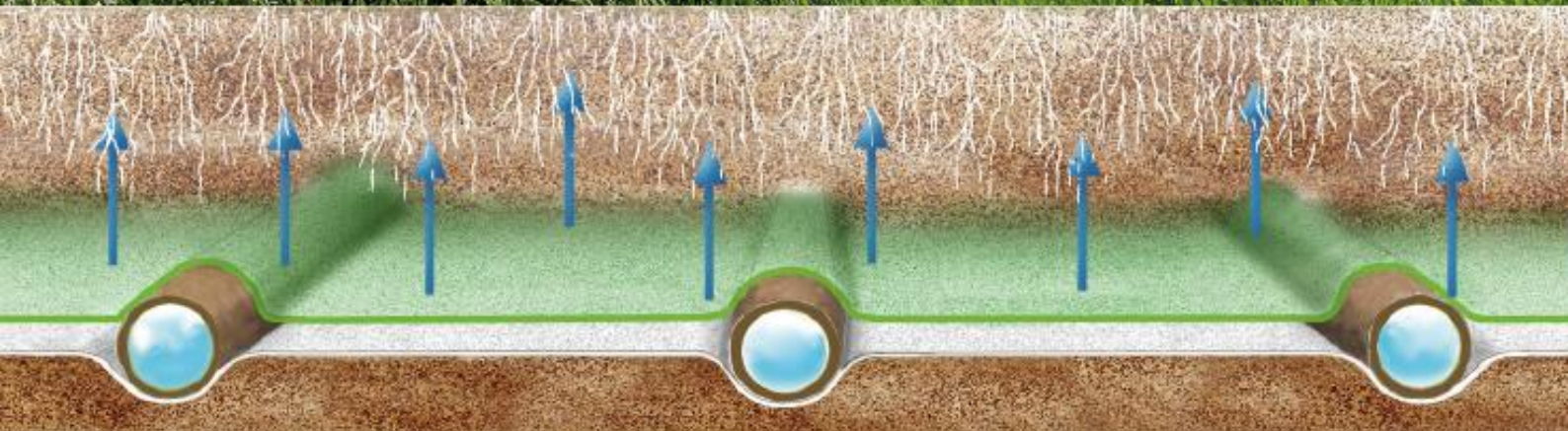


iMat Textile Irrigation Mat

INSTALLATION MANUAL



www.ecorain.de

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1 PRELIMINARY NOTES

Many thanks for choosing the iMat irrigation mat of ECO Rain AG!

1.1 About this manual

This installation manual will be updated as soon as this becomes technically necessary. The current version of the installation manual applies. It is exclusively available at ECO Rain AG upon request (contact, see point 10).

1.2 About ECO Rain AG

Active in the irrigation business since 1989, based on this experience, we are one of the main inventors of irrigation mat technology and we have introduced this innovative and new product to the market. Our comprehensive knowledge about

- raw materials, production processes, ...
- irrigation design, sales, installation and maintenance
- applied in so many projects and applications in the past

make us a key player in this new technology.

ECO Rain AG continuously develops this technology, making its know-how available to its customers and supporting them in major irrigation projects.

2 BASICS

2.1 Area of application

The iMat irrigation mat has been developed for subsurface irrigation and is suitable only for this application area.

The iMat irrigation mat can be used in general for all regular drip irrigation applications, such as

- lawn sod and seed
- perennials and small plantings
- groundcover
- small shrubs
- small bushes
- hedges



Subsurface installation of iMat

and in all kind of applications such as residential gardens, public parks and green areas, green roofs, track greenings, sport and hotel facilities, ...

Large trees and palms... have an excessively high water demand that cannot be delivered through the iMat irrigation mat. These plants can be irrigated with the same irrigation systems, but need an extra irrigation zone with a suitable irrigation product (e.g. a root watering system).

The iMat irrigation mat is also used in very specific applications. ECO Rain AG provides the necessary support in these projects.

2.2 Functionality

The iMat irrigation mat is installed below the entire plant area. Special driplines inserted between two layers of special fleece fill the mat with water. Due to the capillary effect the water is dispersed throughout the available soil to the entire area and directly to the plants' roots.



Functional principle of the iMat

The combination of the fleece and driplines of the iMat irrigation mat represents an independent irrigation system that functions only in this combination as iMat textile irrigation mat. If these components are separated or if the fleece and/or dripline is replaced with other components, this will cause the termination of all warranties.

2.3 Planning

Each irrigation system must be planned individually in order to take the local water-hydraulic aspects into account. When planning an irrigation system with iMat textile irrigation mats, also the particular aspects of this technology must be taken into consideration

Therefore, ECO Rain AG offers a dedicated planning service.

2.4 Water quality

High quality water is required to prevent blocking the drippers in the dripline. The water used with the iMat irrigation mat must comply with the following table:

Description	Blockage risk with the following concentrations		
	Low	Moderate	High
Suspended matter *	< 50	50 - 100	> 100
PH value *	< 7.0	7.0 – 7.5	> 7.5
Dissolved salts *	< 500	500 – 2.000	> 2.000
Iron*	< 0.1	0.1 – 1.5	> 1.5
Manganese *	< 0.1	0.1 – 1.5	> 1.5
Calcium*	< 40	40 – 80	> 80
Carbonate*	< 150	150 - 300	> 300
Hydrogen Sulfide*	< 0.2	0.2 – 2.0	> 2.0
Bacteria (count/ml)	< 10,000	10,000 – 50,000	> 50,000
*Concentration in milligrams per liter (mg/l) or parts per million (ppm)			

Required water quality with the use of iMat irrigation mat

If the irrigation system is connected to the public drinking water supply system, you can assume that the above values are met.

Otherwise, ECO Rain AG recommends carrying out a water analysis in advance.

This water analysis can be ordered directly through ECO Rain AG.

If the water analysis shows values that exceed the above mentioned limits, but the irrigation system will still be installed, this must be taken into consideration when planning the overall system (e.g. installation of a deferrization or de-calcification system).

2.5 Subsurface installation

For subsurface irrigation, only components can be used that guarantee that roots will not grow into the irrigation system, as they would clog it.

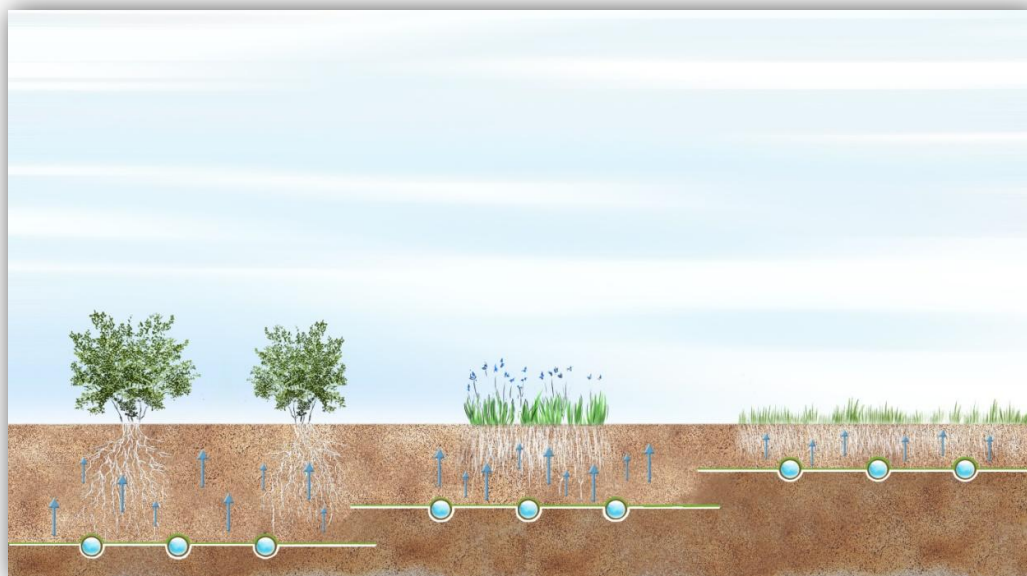
The iMat textile irrigation mat was developed specially for this area of application and fulfills these requirements with a very high quality standard.

In addition, much more care must be taken when installing subsurface irrigation in comparison to an above-ground irrigation system. Because once the system has been installed and backfilled with soil/substrate, it is difficult and time-consuming to identify and fix any errors / defects.

2.6 Installation depths

The suitable installation depth depends on various factors:

- Location and position of the planting area
- Type of planting
- Which substrate is used for backfilling
- What equipment is to be used later to care for the planting area (scarifier, aerator,...)
- The deeper the installation level is, the longer it will take until the roots have grown down to the irrigation mat, and therefore after start-up, it will be necessary to provide additional irrigation from above for a longer period of time



Installation depth up to 30 cm:

Shrubs
Small bushes

Installation depth 15 - 30 cm:

Lawn seed
Lawn sod
Shrubs

Installation depth 10 - 15 cm:

Lawn seed
Lawn sod

Depending on the application, the iMat textile irrigation mat is laid between 5 - 30 cm below ground. In particular applications, it is installed even down to 40 cm, however this must be coordinated in advance with ECO Rain AG.

2.7 Soil / substrate

The iMat irrigation mat functions with any regular soil, substrate, ... as backfill that has a sufficient capillary action.

When using special materials to backfill the iMat irrigation mat, this must be coordinated in advance with ECO Rain AG or it must be tested if there has been no experience with this soil/substrate.

ECO Rain AG also has a special substrate available that has an ideal capillarity and therefore is particularly suitable for use with the iMat irrigation mat.

When using the local soil, it is necessary to check that it does not contain any large and/or sharp-edged rocks or other debris that could damage the iMat irrigation mat driplines.

It must also be ensured that the filtration stability of the soil is ensured.

2.8 Load

For the functionality of the iMat irrigation mat, it must be backfilled from above, thereby creating the accompanying load.

Especially in the case of roof greening, the drainage elements that are used must have a sufficiently large bearing surface so that the iMat irrigation mat receives the required pressure also from below.

In general, it is also possible to drive over areas that have a properly installed iMat irrigation mat with heavy equipment (tested up to 8 t with an installation depth of 10 cm) without damaging the iMat. In the case of special requirements, this should be coordinated in advance with ECO Rain AG.

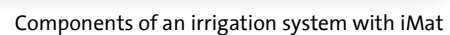
2.9 Limits

While the iMat irrigation mat offers many advantages in comparison to an above-ground irrigation system, there are also limits that must be taken into consideration, such as:

- It is not possible to irrigate large trees with the iMat, as the iMat cannot provide the amount of water that large trees need
- At the beginning, it is necessary to irrigate also from above until the roots have grown down to the iMat
- Additional irrigation from above is also necessary temporarily
 - if plants must be freed from dust, salt or other "soiling"
 - to liquefy fertilizer for above-ground use
 - to encourage seeds to germinate
- The iMat does not create that well-known "feel-good climate" during irrigation, as the irrigation takes place completely underground

3 COMPONENTS

The following diagram shows the principle according to which the iMat irrigation mat is installed and the components that are used in order to create a complete irrigation system:



- Furthermore, additional components can be incorporated, such as the manual or completely automatic addition of fertilizer.

The irrigation mats must also be stored in a dry location, protected against UV light.

4.2 Professional qualifications

Irrigation systems with iMat textile irrigation mats must be installed by professionally qualified companies/ employees that have suitable technical knowledge and practical experience with the installation of professional irrigation systems.

The particular aspects regarding the installation of an irrigation system with iMat textile irrigation mats can be found in this installation manual.



Installer during installation of the iMat

If the installation company does not have the technical knowledge or practical experience, an installation supervisor from ECO Rain AG during installation can provide support during installation.

4.3 Tools

Beside the necessary tools for the installation of a regular irrigation system, you will need the following special tools for the installation of an irrigation system with iMat:

PE pipe scissors	Special textil cutter	Professional utility knife
		
for the cutting of PE-pipe	for the cutting of large sections of iMat	to cut small pieces of iMat
Gas burner	Cordless drill	Pliers
		
to heat the driplines	for installation of clamp saddles	to fix time-saving clamps

Special tools for the installation of the iMat irrigation mat

5 INSTALLING THE IRRIGATION SYSTEM

5.1 Planning documents

As with every irrigation system, the installer requires planning documents in order to install the iMat irrigation mat.

Before starting with the installation, he must first check/measure that the water-hydraulic values that were provided to the planner and that were used as the basis for planning the irrigation system reflect the actual on-site situation. If this is not the case, the installer must first clarify the installation with the planner, owner, etc.

Furthermore, the installer must also check if all the other local conditions coincide with the assumptions in the plan, or if adaptations must be made. If the adaptation also has effects on the water hydraulics, we recommend coordinating the adaptation in advance with the planner.

5.2 Preparing the area

The installation depth must be defined first (see point 2.6).

After digging, stones and other debris are removed from the area and then the surface is leveled.



Preparing the area

5.3 Main water supply

Then the ditches are dug in order to lay the main water supply line.

5.4 Rolling out the iMat strips

In the next step, the iMats are rolled out and cut to size. The following aspects must be kept in mind:

- the iMat is rolled out with the green fleece facing up and the white fleece facing down
- the matting strips are rolled out in the direction of the longest length, to minimize the offcut
- on sloped surfaces, the iMat is rolled out transversally to the slope, and depending on the gradient, the strips are fastened with locking hooks or even with anchor elements



Roll out iMat with green fleece facing up

- the iMat strips are laid with a 8-10 cm lateral overlap to guarantee water distribution between the mat strips
- when overlapping the strips, make sure that they do not overlap by more than 8-10 cm, otherwise the amount of iMat calculated by the planner would not be sufficient
- do not exceed the maximum lengths of the matting strips in order not to impair the water hydraulics; we recommend laying mat blankets with a maximum length of 100 m
- when laying the iMat, make sure that it lays exactly to the edge of the planting area, so it will be watered to the edge, preventing the formation of unattractive brown edges
- If the planting area is bordered with lawn edging stones, metal border edgings, etc., pull up the iMat a bit on this edge, which will help reduce the transfer of heat during summer from the edging stone or the border edging to the planting area, which will reduce brown edges
- Use a special textile cutter or a professional cutter-knife to cut the matting strips and create the shape of the area to be irrigated
- The smaller and/or more winding the area to be irrigated is, the more excess is needed to compensate for the offcuts (more than the above mentioned 10%)
- If the iMat must be laid on a curved area, it will always be cut slightly inside and outside on the sides in order to adapt to the curve
- Due to production factors, the dripline inside the iMat roll may be bent in the first 1-3 windings; these kinks are smoothed out when rolling out the mat; if the kinks are too sharp, they should be repaired in this phase (see point 8)
- As soon as the matting strips are laid, they should not be walked on, or only very carefully, in order not to damage the driplines



Lay iMat strips with lateral overlap

Inlet pressure in bar	Maximum lateral length of driplines in m
1.0	79
1.7	104
2.4	121
3.1	126
3.8	147

Maximum lateral length of driplines



Lay the side of the matting strips right up to the edge or even pull them up to the side on the edge to prevent the formation of brown edges.



Cutting the matting strips



Installed iMat cut to the area
to be irrigated



Installing the iMat in curves

5.5 Connecting the iMat to the pipeline system

On the inlet side, the iMat driplines are connected to the main water supply. On the outlet side, the iMat driplines are connected together with a soft PE line. The result is a complete pipeline system, which can also be regularly flushed during maintenance work (see installation principle point 3).

Observe the following when connecting the dripline:

- Typically, the driplines are connected with 32/16 clamp saddles to the main water supply line
- When installing the 32/16 clamp saddles, make sure that they are installed properly, that the sealing ring is not forgotten and that each clamp saddle is also “drilled open”
- The 32/16 clamp saddles are installed “within the iMat”, so that also this installation area is covered with the iMat and can be irrigated
- If this is not technically possible, additional fleece strips can be laid to ensure that all the soil is covered with fleece
- In order to guarantee the highest possible level of reliability for the subsurface installation, all pipe connectors are secured with pipe clamps (according to the quality standards of ECO Rain AG, even for connectors whose manufacturers indicate that a pipe clamp is not required)



Installing the clamp saddle



Do not forget the sealing ring



Drilling the PE pipe open through the clamp saddle



Connecting the dripline and securing with a pipe clamp

**Incorrect installation!**

- Connection to the pipeline system outside of the mat
=> leads to brown edges
- Pipe clamps forgotten!

**Correct installation!**

- Dripline connection to the pipeline system within the iMat.
- Use of pipe clamps
- iMat pulled up on the side edge

5.6 Bypassing obstacles

Areas on which the iMat cannot be laid must be bypassed. To do so, the driplines from the iMats are either connected together with a simple distribution line (if irrigation is not necessary) or with driplines for subsurface installation (if these areas should also be irrigated). Make sure to maintain the pipe dimensions necessary with regard to the irrigation design.



Bypassing obstacles

5.7 Additional valve boxes

The shut-off valve at the end of each pipe system is installed in a small valve box so that it can be operated easily.

Due to the underground installation of the iMat, we recommend also installing one air/vacuum relief valve per irrigation circuit so that neither an excess pressure nor a low pressure arises in the pipe system when the irrigation system is switched on and off. This prevents dirt particles from getting into the fine labyrinths of the dripper. This air/vacuum relief valve is likewise installed in a small valve box, namely at the highest point of the respective irrigation circuit.



Additional small valve box with shut-off valve and air/vacuum relief valve

The shut-off valve and air/vacuum relief valve can also be installed in just one single valve box.

Additionally, it has proven to be practicable to install the aforementioned valve box upright on the iMat. That way, despite the underground installation, one still has convenient access to the iMat and can control if the iMat is also sufficiently soaked with a simple movement of the hand. For highly critical customers, this inspection shaft can also be installed at multiple points distributed around the irrigated area.

5.8 Test operation before backfilling

When the iMat with its pipe system has been completely installed, we strongly recommend putting the irrigation system into operation on a test basis in order to

- Check that all fittings have been installed securely and tightly
- Check that the water is dispersing in the iMat as desired
- Flush the pipe system and clean it of dirt



Test operation before backfilling

We know that at this point of the installation there is often not yet any water available at the site! In this case, a temporary water connection should still be laid and the installation should be tested in this way.

If the area is first backfilled and planted, errors in the installation are very difficult to identify and can only be remedied with great expense. Therefore, it is essential to check the installation before backfilling.

For this test operation, each irrigation circuit is allowed to run for 20-30 min, either via the controller (if it is already connected) or by manually opening the solenoid valve. All pipe systems and matting strips are visually checked in the process. The matting strips soak circularly, going out from the drippers in the driplines. When the matting strips get wet for the first time during this test operation, the soaking during this "initial filling" takes quite a bit longer. Once the iMat has been completely soaked, and the required pressure from above and below exists through the backfilling, the water distributes into the matting strips noticeably faster.

Areas that become wet unusually quickly or become very wet must be checked for leaks.

We recommend taking pictures of the installation, the pipe system, the laid matting strips as well as of this test operation in order to document the installation in this way and make it transparent.

5.9 Backfilling

- Only use a suitable substrate for backfilling (see point 2.7).
- Backfilling either by hand or with the suitable device (big bags, blowing up substrate, mini-excavator, excavator, wheel loader, truck).
- Make sure that the matting strips do not slip during the backfilling.
- Compact the fill material well so that the ground receives a good capillarity. Loose substrates contain air pockets which would prevent a uniform distribution of the water in the substrate.
- For wide areas, backfilling must occur matting strip by matting strip, so that the areas already laid do not have to be accessed for the backfilling.



By hand



With an excavator



With a crane



Blowing up substrate

- If the area must still be accessed, this must be done very carefully so that the matting strips are not moved and the driplines are not damaged (protect matting strips/driplines with wooden planks if necessary).
- If the driplines of the iMat will not be connected to the pipe system until after the backfilling, make sure that
 - the driplines are temporarily closed during the backfilling so that no dirt gets into the lines and clogs them
 - there is sufficient free space available for the installation at the ends of the matting strips

5.10 Planting

During planting, particularly when laying sod, it must be ensured that it is attached especially firmly to the ground so that the roots can quickly connect with the ground.



Laying sod

6 INITIAL OPERATION

- Before the initial operation, the entire pipe system is flushed once again.
- The guideline values for the irrigation times are set in the controller (cf. point 7).
- Immediately following the installation / initial operation, irrigation must temporarily also occur from above until the roots have grown down to the iMat and are then only supplied from there.
- Also if lawn seeds or other seeds have been sowed, irrigation must temporarily also occur from above so that the seeds can germinate.
- ECO Rain AG strongly recommends performing regular checks for the duration of the first irrigation season immediately following the initial operation and handing over of the system, namely for the following reasons:
 - General check of the functionality of the irrigation system, i.e. if it starts up well
 - Check whether the irrigation times set on the controller are sufficient
 - Check that during the starting time, additional irrigation from above actually takes place
 - Check if the owner is able to increasingly handle its irrigation system alone and operate it
 - Successive reduction of the irrigation times in the controller as soon as the roots have grown down to the iMat
 - In order to achieve the highest possible level of customer satisfaction overall
- ECO Rain AG provides a maintenance manual in which the correct handling of the iMat is explained
- ECO Rain AG recommends the conclusion of a maintenance contract; it should contain regular checks / maintenance intervals, and depending on the region, dates for winterizing and spring start-up

7 IRRIGATION TIMES

- The subsequently mentioned irrigation times are rough guideline values and are based solely on the water requirements of the individual plants, without taking into account the climatic conditions, the existing grounds, ...
- The correct time and the appropriate irrigation duration are influenced by a number of other factors: climate zone, time of year, ground conditions, ...
- During the selection of the correct irrigation time, local conditions, such as shade due to buildings, trees, etc., must be taken into account.
- The subsequently stated irrigation times relate to the irrigation months from April to October; however, they will vary depending on the plant selection, the ground conditions, the climate zone, the weather conditions, ...
- Provided that no individual specifications for programming the controller are available from the landscape architect, gardener or planner, the following irrigation times are to be understood as a type of guideline value to program the controller for the first time.

Type of vegetation	Climate	1 st - 2 nd month after initial operation	Starting from the 3 rd month after initial operation
Lawn sod	humid	30 - 40 min / day (10 - 13.3 l / day and m ²)	10 - 20 min / day (3.3 - 6.6 l / day and m ²)
	arid	40 - 50 min / day (13.3 - 16.6 l / day and m ²)	10 - 30 min / day (3.3 - 10 l / day and m ²)
Lawn seed	humid	40 - 50 min / day (13.3 - 16.6 l / day and m ²)	10 - 20 min / day (3.3 - 6.6 l / day and m ²)
	arid	50 - 60 min / day (16.6 - 20 l / day and m ²)	10 - 30 min / day (3.3 - 10 l / day and m ²)
Shrubs	humid	30 - 40 min / day (10 - 13.3 l / day and m ²)	7 - 30 min / day (2.3 - 10 l / day and m ²)
	arid	40 - 50 min / day (13.3 - 16.6 l / day and m ²)	10 - 30 min / day (3.3 - 10 l / day and m ²)
Low bushes	humid	30 - 40 min / day (10 - 13.3 l / day and m ²)	7 - 30 min / day (2.3 - 10 l / day and m ²)
	arid	40 - 50 min / day (13.3 - 16.6 l / day and m ²)	10 - 30 min / day (3.3 - 10 l / day and m ²)

- At the start, it is better to set the irrigation times too high than too low, until the roots have sufficiently grown down to the iMat. Then the irrigation times can gradually be reduced in order to save water in terms of the iMat.
- It is better to set several shorter irrigation times per day than one single, long irrigation time. This way the ground is continuously and uniformly soaked and does not dry out.
- With several shorter irrigation times, the ground also does not get waterlogged. Since the iMat stores up to 4 l / m², the mat cannot store any amounts of water that exceed this; i.e. it would be lost and, contrary to the purpose of the iMat, water would be wasted.
- In the growing-in phase, immediately following the installation, initial operation and handing over of the iMat irrigation system, the planting area must always also be temporarily irrigated from above until the roots have grown down to the iMat. This applies all the more if
 - the soil layer above the mat is relatively high
 - the system is put into operation during an especially hot time
- As soon as the plants have properly grown, their roots have sufficiently grown down to the iMat and are being supplied with water from there, the irrigation times are gradually reduced to save water in terms of the iMat.

8 CARE AND MAINTENANCE

An iMat irrigation system is an automatic system and usually functions without complications due to its underground installation. Nevertheless, it is a technical system which cannot be simply left to itself after the initial operation. If it is to have a long service life, it must be regularly checked and maintained.

- During the current irrigation season, the driplines of the iMat should be regularly flushed so that they do not become clogged through dirt.
- In order to control the soaking of the iMat, ideally small valve boxes were installed as inspection shafts. Otherwise suitable points must be dug up or the moisture of the ground and iMat must be measured with an appropriate device.
- The irrigation system must be emptied before the frost period.
- At the end of the frost period, the irrigation system is put back into operation, its general functionality is checked and required maintenance work is performed.
- If the fleece was damaged, e.g. through care work, the affected area is simply covered with a new piece of fleece (do not forget 8-10 cm overlap). ECO Rain AG provides rolls with fleece strips for this.
- If the dripline in the iMat was damaged, e.g. through excavation, the defective piece of the dripline is cut out and a new piece of dripline is inserted by means of two couplings incl. pipe clamps. Only the original dripline used with iMat may be used for this; it is available at ECO Rain AG.
- If the drippers for the driplines are consistently clogged due to poor water quality, e.g. due to iron, etc., you can try to flush them clean again using a mobile mixing device and a special solution. ECO Rain AG provides both of these items and has had good experiences with them in the past.

9 WARRANTY & CO.

- The warranty for the iMat textile irrigation mat is 2 years.
- If it is installed and maintained by a specialist company authorized by ECO Rain AG, the warranty can be increased to 5 years on a case-by-case basis. This is to be coordinated with ECO Rain AG in advance and be confirmed by ECO Rain AG in writing.
- ECO Rain AG assumes the aforementioned warranty only under the conditions that the transport, storage, installation and maintenance of the iMat irrigation mat
 - has occurred according to the current state of the art, and
 - according to this installation manual in the currently valid version, and
 - the iMat was installed with the appropriate connection parts recommended by ECO Rain AG, which were either directly purchased from ECO Rain AG or are of equivalent functionality and quality, and
 - the installation took place through an installer experienced in the installation of irrigation systems
- Each irrigation system with iMat textile irrigation mat is to be planned and installed individually, according to the local conditions. Therefore, the information in this installation manual can also only be standard specifications and must be adapted to the conditions on site. If required, planning and installation must take place differently from this manual. Unclear situations must be coordinated with ECO Rain AG in advance.

10 CONTACT

We are gladly available for further questions.

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E-mail: info@ecorain.de, www.ecorain.de

Name of irrigation project:

Test , executed by (name):

Date of test:

Water connection

- ☐ water tap 3/4"
- ☐ water tap 1/2"
- ☐

Static pressure

..... bar

Working pressure

2,0 bar l/min m³/h

2,5 bar l/min m³/h

3,0 bar l/min m³/h

3,5 bar l/min m³/h

4,0 bar l/min m³/h

Please note: During the test, no further appliances (washing machine, shower, toilet, ...) shall be used.

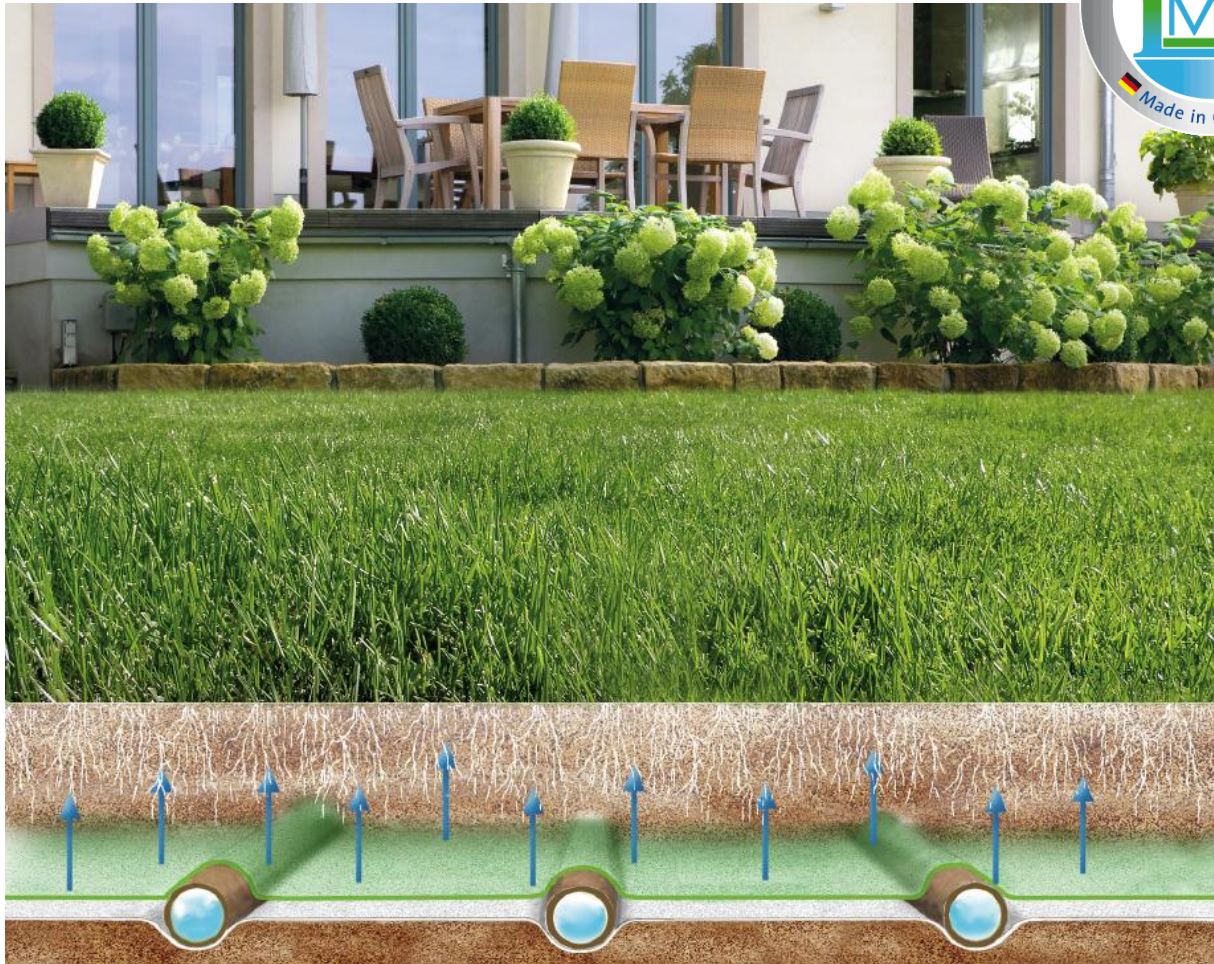
l/min	20	30	40	50	60	70	80	100
m ³ /h	1,2	1,8	2,4	3,0	3,6	4,2	4,8	6,0

Customer:
Checklist, filled in by (name):
Contact for further questions (tel/ext):
1. Irrigation project	
▪ Name / city:
▪ Type of project:	<input type="checkbox"/> private <input type="checkbox"/> public <input type="checkbox"/> park / green space <input type="checkbox"/> residential garden <input type="checkbox"/> roof greening <input type="checkbox"/> track greening <input type="checkbox"/> sports field <input type="checkbox"/> hotel green space <input type="checkbox"/> sculpted greenery / extreme slopes <input type="checkbox"/> other:
▪ intended maintenance work (e.g. aerating, ...) and impact on necessary installation depth
2. Type of field	
▪ size of total field to be irrigated	approx. m ²
▪ type of project	<input type="checkbox"/> new green space <input type="checkbox"/> existing green space <input type="checkbox"/> rather large, contiguous fields <input type="checkbox"/> many smaller fields <input type="checkbox"/> many curves
▪ difference in altitude	<input type="checkbox"/> no <input type="checkbox"/> yes, approx. m (marked in plan)
▪ areas with significant sunshine / shade	<input type="checkbox"/> no <input type="checkbox"/> yes (marked in plan)
▪ shall the irrigation system be extended in the future?	<input type="checkbox"/> no <input type="checkbox"/> yes (marked in plan)
3. Soil	
▪ type of soil	<input type="checkbox"/> sandy <input type="checkbox"/> loamy <input type="checkbox"/> clayey
▪ field moisture capacity	<input type="checkbox"/> high <input type="checkbox"/> medium <input type="checkbox"/> low

4. Water	
<input type="checkbox"/> public water net	measured static water pressure: bar size of pipe cross-section: type of interface:
<input type="checkbox"/> cistern	size / volume: m ³ type of material:
<input type="checkbox"/> water well	internal width of well: m how deep is the lowered water level: m if you take out: m ³ /h
<input type="checkbox"/> other (e.g., lakes, creeks, rivers, ...)	type: (please enclose photo) written permission to take out water: <input type="checkbox"/> yes <input type="checkbox"/> no approved max. quantity (also in dry season): m ³ /h
5. Pump	<input type="checkbox"/> required <input type="checkbox"/> existing (please fill in the following details!) name: type: output: hoisting depth: number of revolutions: engine performance:
6. Controller	<input type="checkbox"/> manually <input type="checkbox"/> battery powered <input type="checkbox"/> electronically <input type="checkbox"/> rain sensor <input type="checkbox"/> wind sensor <input type="checkbox"/> mini weather station (rain + wind sensor)
7. Special customer requirements	visual appearance important? <input type="checkbox"/> no <input type="checkbox"/> yes type of design: <input type="checkbox"/> best technology <input type="checkbox"/> low budget
8. Other information
9. Plan Please make sure that all relevant information is included in the plan that you are sending to us:	<u>Required information/documents:</u> - correct scale - differences in altitude - source of water - location of control, rain sensor and valve boxes - which areas shall be irrigated (please indicate the type of plants, i.e. lawned area, flower bed, hedge row, ...) - which areas shall not be irrigated, but may become wet - which areas may not become wet at all - (digital) photos

iMat Irrigation Mat

Second Generation launch takes proven technology one step further!
New product features and advantages!



THE BENCHMARK OF SUBSURFACE IRRIGATION!

Water shortage is one of the most important environmental and developmental issues. About 80% of the global water is used by artificial irrigation in agriculture, landscaping and horticulture. To meet these requirements, ECO Rain AG offers the iMat, an innovative subsurface irrigation technology, proven since 2007 and saving up to 70% of water compared to conventional irrigation systems.

Special drip lines inserted between two layers of special fleece are filling the mat with water. Due to the capillary effect the water is dispersed throughout the soil available to the entire area and directly at the plants' roots.

PRODUCT FEATURES AND ADVANTAGES

ECO Rain AG launches now the second generation of subsurface iMat irrigation system, with many product advantages compared to those currently available on the market:

- Fully combined bonded fleece layers, no threads
- New, innovative dripline, no wrapping of dripline necessary
- Enlarged width
- Easier and faster installation
- Improved water storage and dispersion throughout the entire mat
- Less expensive than prior system

MAT / FLEECE

- Two layers of hydrophilic polyester fleece, 300 g/m² each
- Both fleece layers are fully combined and bonded throughout the entire area

SPECIAL DRIPLINE FOR SUBSURFACE INSTALLATION

- OD: 0.634" (16.1 mm), ID: 0.536" (13.6 mm), thickness: 0.049" (1.2 mm)
- Flow rate: 0.6 gph (2.3 l/h) per dripper
- Distance between drippers: 12" (30.5 cm)
- Distance between driplines: approx. 13.8" (35 cm)
- Max. lateral length (depending on terrain and pressure): up to 328 ft. (100 m)
- Pressure: 8.5 to 60 psi (0.59 to 4.14 bar)
- Required filtration: 125 Mesh
- Qualified for LEED credit 4.2

STANDARD ROLLS

- 2.6 x 164 ft. (0.80 x 50 m) = 426 ft² (40 m²), 2 driplines, H x Ø per roll: 31.5 x 31.5" (0.80 x 0.80 m), approx. 30 kg
- 3.9 x 164 ft. (1.20 x 50 m) = 639.6 ft² (60 m²), 3 driplines, H x Ø per roll: 47.2 x 31.5" (1.20 x 0.80 m), approx. 45 kg

Pressure in psi / bar	Max. lateral length in ft. (m)
15 / 1.0	273 (83.2)
20 / 1.4	318 (96.9)
30 / 2.1	360 (109.7)
40 / 2.8	395 (120.4)
50 / 3.5	417 (127.1)
60 / 4.1	460 (140.2)

STORAGE

- Dry storage and upright standing required
- Do not expose to UV light

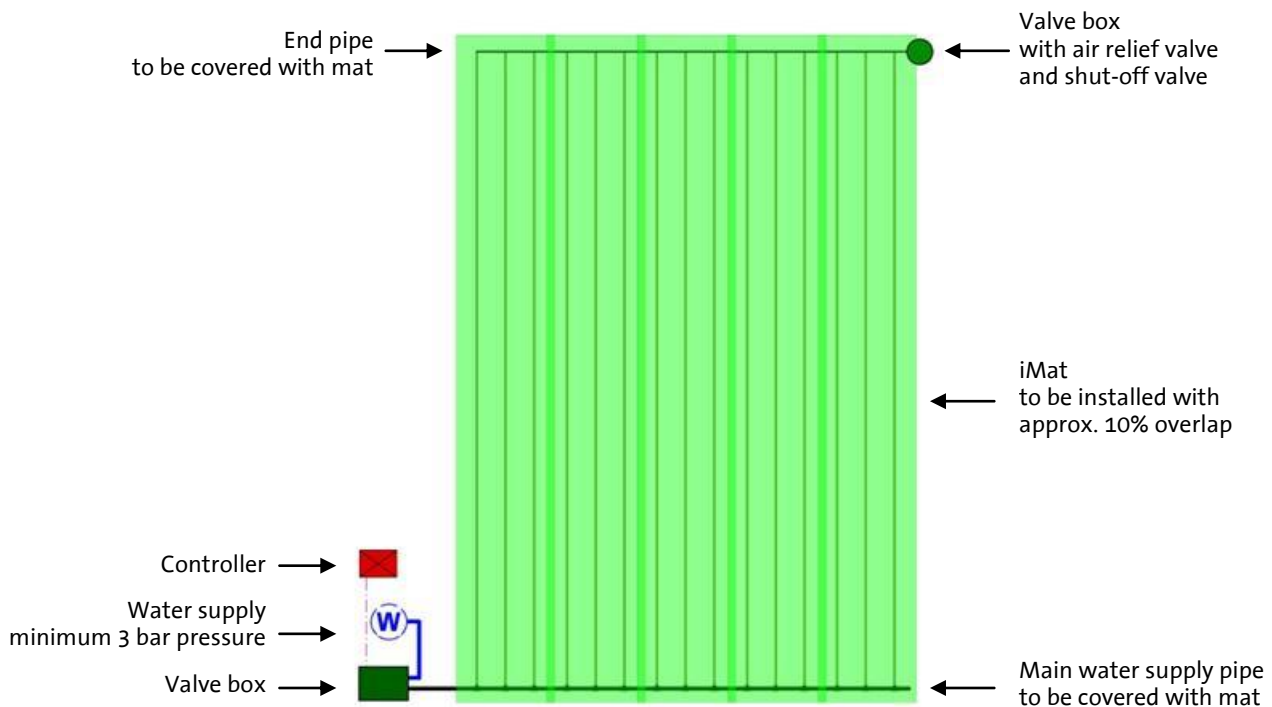
MORE INFORMATION / CONTACT

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INSTALLATION SCHEME



iDrip fleece-wrapped dripline

Special dripline for subsurface installation!



In order to install driplines subsurface, they need to be furnished with a special protection against root intrusion into the dripper. Standard subsurface driplines do have such a protection within the drippers. But with these products, the water is distributed only around the drippers.

With the iDrip fleece-wrapped dripline, a standard dripline is wrapped with fleece. The fleece does not only protect the dripper from root intrusion, but distributes also the water along the dripline. This improves the root and plant growth.

If a 100% water distribution is required ECO Rain AG recommends the installation of the iMat irrigation mat.



TECHNICAL INFORMATION

- Outer Ø: 16.1 mm, inner Ø: 13.6 mm, wall thickness: 1.2 mm
- Dropper spacing: about 30 cm
- Water flow: 2.3 l/h per dripper, pressure-compensated
- Working pressure: 0.58 bis 4.1 bar
- Necessary filtration: 120 mesh
- Tightly wrapped with 100 g/m² fleece



STORAGE

- Keep in dry storage
- Do not expose to UV-light

INSTALLATION

- Recommended distance between iDrip driplines, depending on ground permeability from 15 to 30 cm
- Max. lengths (depending on area and pressure): up to 100 m

pressure in bar	maximum length of dripline in m
1.0	83.2
1.4	96.9
2.1	109.7
2.8	120.4
3.5	127.1
4.1	140.2

MEASURES / WEIGHT

- Roll à 100 m
- About 0.75 m outer Ø, 0.54 m inner Ø, 30 cm width, 8.25 kg weight
- Max. per pallet 1.20 x 0.80 m: 14 rolls, about 135 kg

MANUFACTURER

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iMat Textile Irrigation Mat

Quick Reference Installation / Initial Operation



An irrigation system with iMat irrigation mat is installed basically like a regular drip irrigation system, with the following special features:

Delivery and storage

- ☐ Store iMat rolls in upright position
- ☐ Store in dry location, protect against UV light
- ☐ Avoid kinks in dripline

Necessary tools

- ☐ PE pipe scissors
- ☐ Special textil cutter
- ☐ Professional utility knife
- ☐ Gas burner
- ☐ Cordless drill
- ☐ Pliers

Requirements

- ☐ Check/measure that water hydraulic parameters of the irrigation plan are the same as measured on site
- ☐ Check adequate water quality
- ☐ Check adequate substrate / soil

Prepare irrigation area

- ☐ Define installation depth
- ☐ Level the ground surface
- ☐ Remove sharp edged stones and other debris

Install main water supply pipe

Roll out the iMat

- ☐ Green side of iMat facing up
- ☐ Roll out in the direction of the longest length
- ☐ Do not exceed maximum lateral length, max. 100 m
- ☐ Lay iMat strips with lateral overlap of 8-10 cm
- ☐ Lay iMat strips exactly to the edge of the planting area
- ☐ If necessary, pull up the iMat a bit on this edge to reduce/avoid brown edges
- ☐ On sloped surfaces, use locking hooks or anchor elements, if necessary
- ☐ Smooth out or repair slight kinks that occasionally may appear in the dripline

Connecting the iMat

- ☐ On the inlet side, connect driplines of iMat to the main water supply pipe

- ☐ On the outlet side, connect driplines of iMat to the collecting end pipe
- ☐ Install all pipe connections "within the iMat" so that also this installation area is covered with iMat
- ☐ Secure all pipe connectors by using pipe clamps

Install valve boxes

- ☐ With a shut-off valve, necessary to flush the pipe system
- ☐ For air/vacuum relief valves to avoid low/excess pressure in pipe system
- ☐ Inspection shaft to control if the iMat is sufficiently soaked

Test operation before backfilling

- ☐ All fittings have been installed securely and tightly
- ☐ Pipe system installation is 100% watertight
- ☐ Water is dispersing in the iMat as desired
- ☐ Flush piping system

Backfilling and planting

- ☐ Use adequate substrate / soil
- ☐ Avoid damaging the driplines in the mats
- ☐ Make sure that matting strips do not slip during backfilling
- ☐ Substrate must be compacted carefully and evenly so that it can develop the necessary capillarity

Initial operation and handing over

- ☐ Flush piping system
- ☐ Program controller with appropriate watering times
- ☐ Additional irrigation from above until the roots have grown down to the iMat

After installation

- ☐ Regular inspections to make sure that the irrigation system works properly
- ☐ Empty the irrigation system before the frost period and put it back into operation at the end of the frost period

Questions, answers and the complete installation manual are available upon request at:

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