gutta drytek®

The revolution in air gaps

Gutta produces high-quality materials in full respect of the environment.

ENVIRONMENTAL POLICY

Gutta Werke S.p.A. is sensitive to issues related to environmental protection, as it considers them an essential part of the quality of life and an indispensable condition for a healthy and constructive economic development.
Consequently, Gutta Werke S.p.A.'s main goal is to operate so that its production activities cause the least possible impact on the environment, incorporating the principles of environmental protection and pursuing constant improvement in order to prevent pollution

Specifically, Gutta Werke S.p.A. aims at:

1. Complying with the laws and all environmental regulations applicable to its own activities;

2. Systematically measuring the environmental impact of its own operations, understanding the effects and identifying the causes;

3. Committing itself to generating and managing waste so as to favor, anytime it is possible, its recovery and recycling instead of its disposal;

4. Minimizing the environmental impact of new products, technologies, activities and services by turning to procedures and planning systems aimed at such end;

5. Promoting the involvement and, if necessary, the training of its own associates as far as environmental issues are concerned;

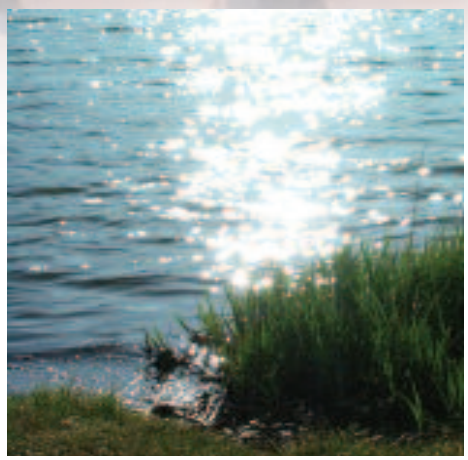
6. Assessing the environmental aspects of the goods and services used by the company and notifying the suppliers about requirements pertaining to them;

7. Maintaining open and constructive relationships with Public Administration bodies, with the community where the production facilities are located, as well as with the associations and groups operating on the territory.

RECYCLING OF MATERIALS

Gutta Werke S.p.A., driven by the moral obligation of a modern company to take environmental resources into account, and by the belief that the environment is an important economic competition factor, is committed to complying with strict environmental protection criteria.
In recent years, the company has achieved a significant improvement in the environmental performances of all core business activities.
One of these refers to the production of air gaps in polyethylene used in the construction sector.

A considerable portion of the HDPE used by Gutta in its production process derives from the recycling of "post-consumption" materials.
These materials come from products that we use in our daily lives, such as containers for detergents, creams, liquids, etc., which do not self-destroy and last a long time as waste.
Consequently, it is important that the post-consumption, non-degradable product re-enter the production chain without having to use other natural resources (oil), thus contributing to reducing non-degradable materials.
After collecting and selecting the plastic packaging, they are ground and turned into scales, which are then washed and dried carefully.
After completing this phase, the scales undergo a heat treatment aimed at converting them back into a uniform and fluid mass, which is then cut in many small pellets.
A new raw material is born, and by adding color masters, this material can take on different colors depending on customer requirements. All plastic products made by Gutta (Guttabeta®, Guttagarden and Guttadrytek) are designed with the environment in mind. In addition, at the end of their useful life they can be recycled again.
The advantages for the environment are clear!



Production lines of plastic materials are being constantly developed.

THE PRODUCTION

The enhancement of Gutta's production lines for plastic materials where recycled, and consequently eco-friendly, raw materials are used, brings the company to the highest levels in terms of quality, quantity and technical innovations. The increase in production and in product families have refined the industrial bond between the recovery and treatment of plastic materials coming from post-consumption and the transformation of raw materials used to manufacture Gutta products.
All these activities (recycling and production) are carried out in the three Italian plants of the Gutta Group, located in Filago (BG), Stradella (PV) and Paternò (CT). These plants are coordinated, in terms of pre- and post-production quality control, by Gutta's laboratory in Switzerland, which performs a complex series of tests, starting with the raw material up to the finished product.

PROCESS CERTIFICATIONS

Gutta Werke S.p.A is certified ISO 9001 and ISO 14001.

Standard UNI EN ISO 9001 specifies the requirements of a Quality System model adopted to demonstrate the ability to provide products/services that comply with specifications and satisfy the customer's needs.

Standard UNI EN ISO 14001 provides the company with the basics of an effective Environmental Management System in order to contribute to environmental protection, preventing and mitigating the impact that our activities have on the soil, the water and the atmosphere.

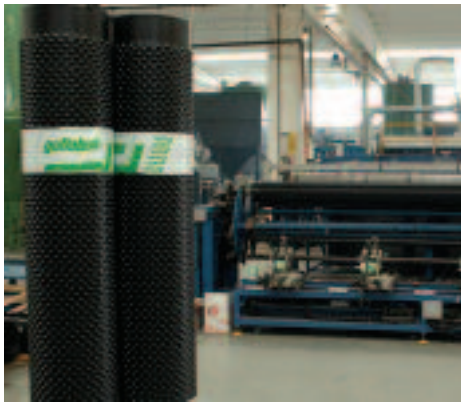
These certifications, combined with other management needs, help to reach the pre-established objectives in full compliance with the standards.

ISO 9001 and ISO 14001 certifications

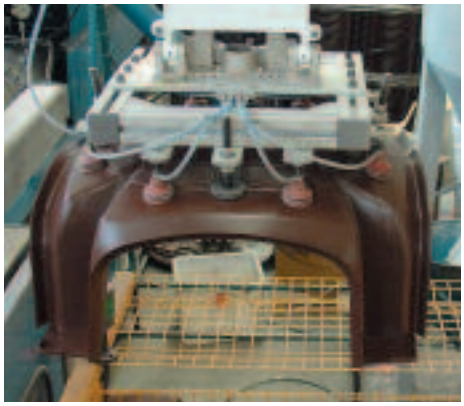
Plant in Filago (BG)

Plant in Stradella (PV)

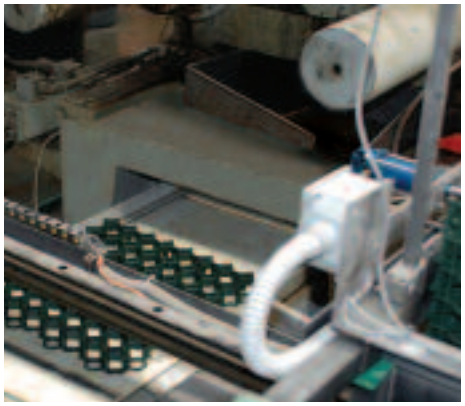
Plant in Paternò (CT)



Dimpled membranes production

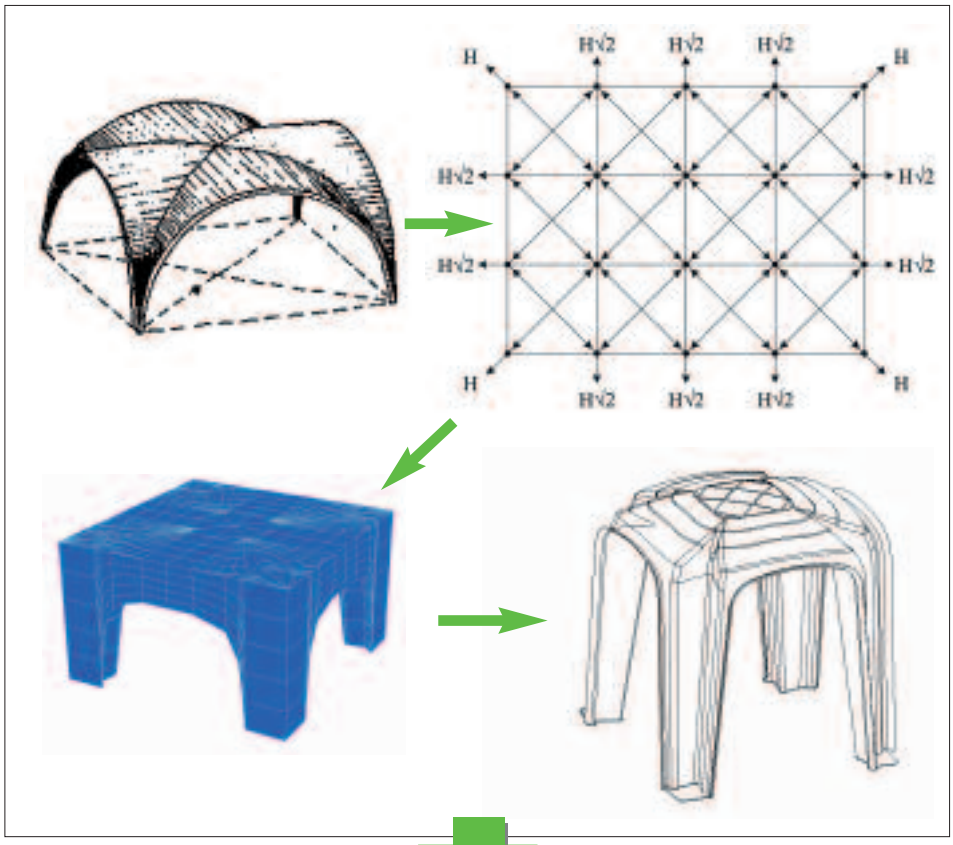


Air gaps production



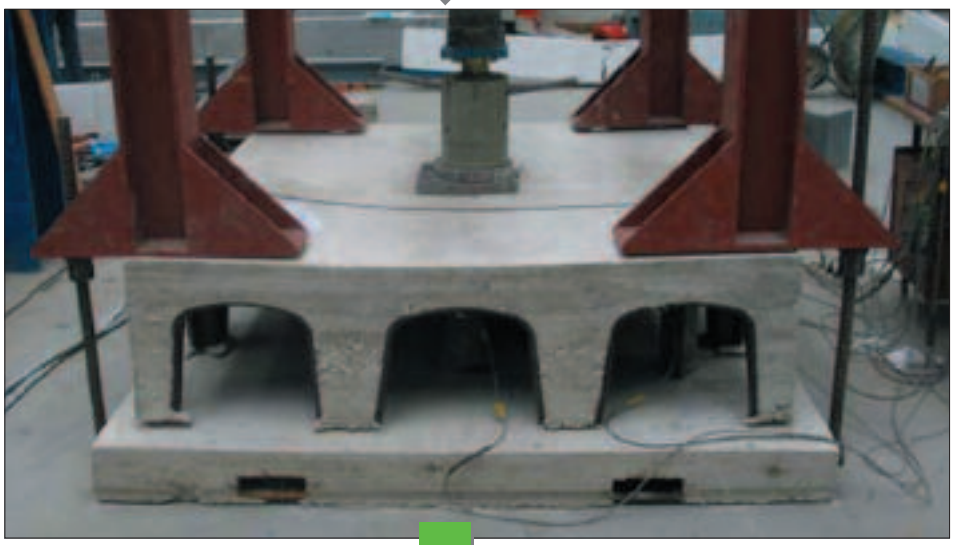
Lawn grids production

How Guttadrytek® was born



Before the advent of reinforced concrete, all floors subject to significant loads were built using structures featuring different types of arches: barrel, cross, domical and so on. This allowed for a balanced structure through a synergy of geometric conditions related to shape and side constraints even using the loads and the structure's own weight as stabilizing elements. Which structure more than an air gap can be subjected to heavy loads, both concentrated and distributed, without this requiring prior considerations on the part of the user?. Before positioning considerably heavy loads on a floor, we all ask ourselves if the floor is capable of carrying the weight. Yet when this happens on the ground floor, in many cases we are not even aware of the fact that there is an air gap since we typically buy a finished property or did not take time to consider the problem during the construction phase.

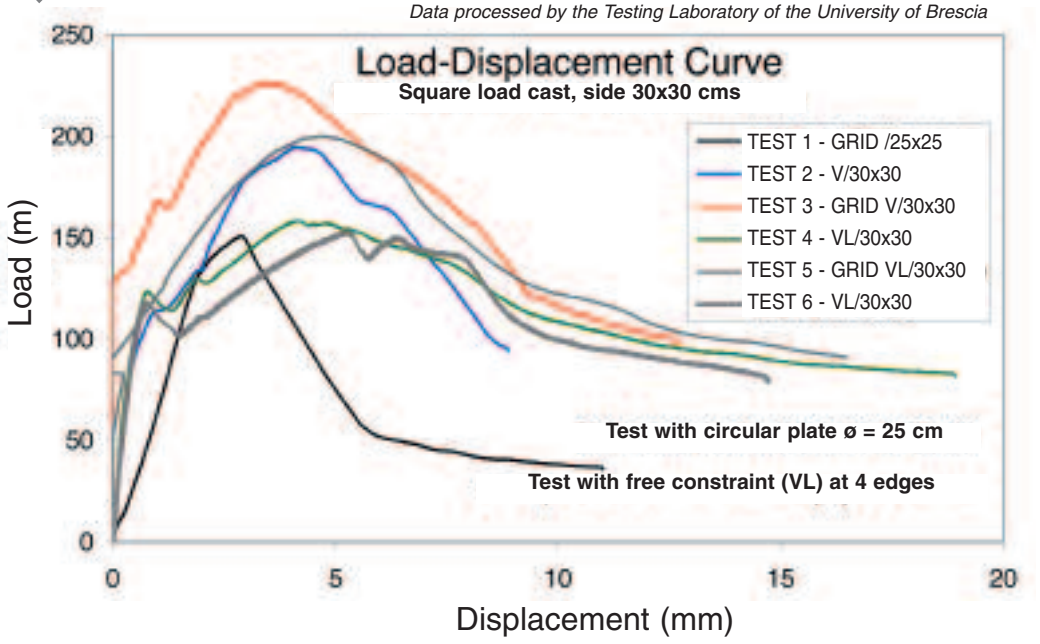
When designing **Drytek**, Gutta intended to achieve the goal of making a component entirely with recycled materials that could be used as disposable formwork and act as a barrier against dampness and Radon. A component capable of shaping the cement used to cast the air gap in such a way as to guarantee the maximum exploitation of its performances, as cement is always subjected to compression stress along the entire section for all loads of common use. Evenly distributed loads, or in any case extending over surfaces bigger than the size of the single component become stabilizing forces in terms of concentrated loads arranged along the same area.



The designed element guarantees the construction of an intermediate structure between a series of barrel, cross and domical arches. Such a structure is perfectly balanced for all internal elements, while the external elements require a contrasting structure, always present in buildings, consisting of the edge of the perimeter foundations and/or of the walls.
The resulting design minimizes the use of cement in relation to the proper construction of the mechanism described above. The use of electro-welded nets positioned at the intrados level of the thinnest cement section no longer has a static function and does not provide the reinforcement that determines the carrying capacity of the floor.
After designing the element, air gap samples were manufactured and subsequently subjected to laboratory tests in order to compare the actual behavior with the theoretical one.
Parameters necessary to refine the study of the structure's behavior were acquired through the application of a finite elements model. This has made it possible to prepare technical dimensioning sheets that are reliable and easy to consult.

Compression test certificate

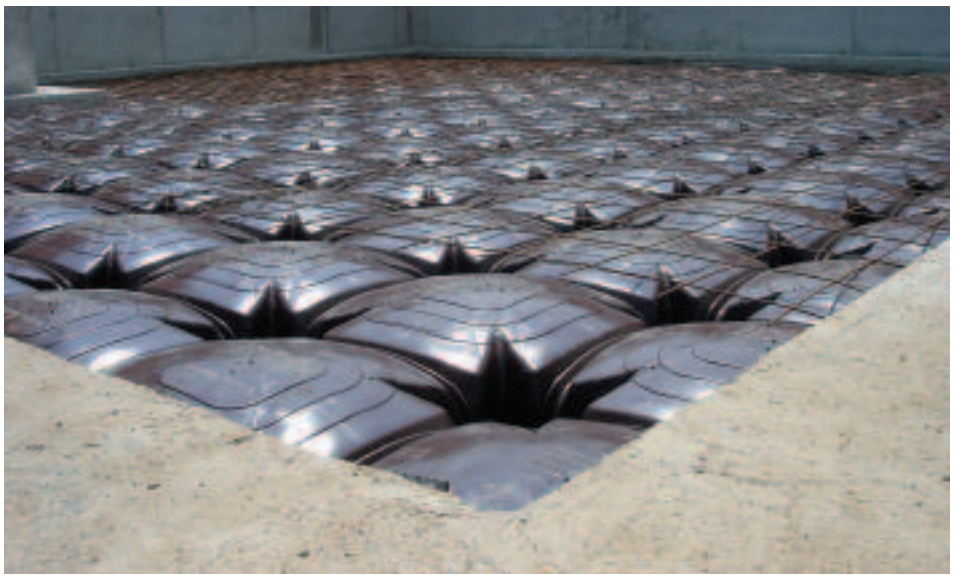
Data processed by the Testing Laboratory of the University of Brescia



Why use a plastic air gap

WHY BUILD AN AIR GAP

For all rooms featuring walls and/or floors in contact with earthworks, it is good practice to leave a ventilated space between the soil and the surface that delimits the room. This eliminates the unpleasant and unhealthy effects caused by the formation of condensate and molds, as well as the risk of radon gas infiltrations from the soil. The sanitary regulations of the various Italian regions require, for all premises where the presence of people is expected, the use of technical devices aimed at ensuring proper ventilation of the surfaces, both laterally and underneath. Specifically, the Sanitary Regulations of the Lombardy Region – Resolution no. 4/45266 of 25.07.1989 – Chapter 6 item 3.6.4. "Utilization characteristics of half-basements and basements" recites: "…*b) technical devices such as to ensure, both laterally and internally, good waterproofing and ventilation of the surfaces: said requirements are considered satisfied when the rooms feature an air gap 0.50 m high, a waterproof and unified floor, walls that are effectively protected against soil dampness, thermal resistance equal to or greater than 1 Kcal/m2/h/°C for both the floors and the walls* …."
In addition, for the sake of argument, we mention Guideline no. 4/0 "*Prevention and protection against humidity and radon pollution in buildings*", issued on 30 May 2003 by the Directorate of the Department of Prevention of ASL (Local Health Agency) of Bergamo, which considers the regulations in force to be insufficient in terms of guaranteeing timely and effective requirements pertaining to protection against radon gas, and consequently prescribes that a mapping be carried out for the purpose of defining the presence and concentration of radon gas, and establishes general regulations with specific building criteria. The foregoing points, more than ever, to the need to build a ventilated air gap with a waterproof floor.



WHY BUILD AN AIR GAP USING GUTTADRYTEK

The air gap that can be built using as disposable formwork the **Guttadrytek®** product made by Gutta exclusively in HDPE ensures waterproofing of the structure due to its elasticity and the guarantee that the product will maintain its physical characteristics in time. Thanks to its shape (the result of accurate structural design inspired by ancient vault structures used to build slabs with high carrying capacity prior to the advent of reinforced concrete), the cement used for the completing cast becomes, after it sets, a structure consisting of a set of small cross vaults that guarantees high resistance in all load conditions, making the most of the structural characteristics of cement. This structure is self-balanced in terms of the internal elements, and requires a limited reinforcing ring around the edge in order to balance the external vaults. This is in fact sufficiently guaranteed by an edge trim that completes the module and/or by the adhering foundations. In the most common load conditions, all cement stays completely compressed, guaranteeing the absence of cracks and consequently making electro-welded nets unnecessary. The absence of cracks combined with the bottom waterproof barrier consisting of **Guttadrytek®** is the best guarantee for the perfect functionality of the air gap in terms of durability and waterproofing. In all reinforced concrete structures subject to bending, the metal reinforcement is arranged so as to absorb any traction. Its action is implemented and becomes essential only when the cement cracks, and consequently you have the conditions and conventions used for the calculation of reinforced structures. The design, combined with laboratory tests on the air gap samples, demonstrates how the electro-welded net, arranged in a single sheet at the center of the hood portion with the smallest thickness, intervenes only under special conditions and for loads that are uncommon in terms of the usual structure commitment. Tables have been prepared which can be used to immediately check the loads carried by the air gap on the foundation and on the soil with respect to its height, total thickness and applied loads. The size and shape of the bearing points allow for air gaps with loads that are suitable even for industrial- and road-type floor systems, building a cement foundation of 20 cm at the most. Thanks to the waterproof quality of the structure, resin treatments can be applied to it without additional treatments or, alternatively, a barrier can be built in its intrados. Granted that the desire for better quality in living quarters is always a good reason to search for construction solutions that feature higher quality, and the various choices made should not always be the result of regulatory requirements, there are many other cases in which the use of **Guttadrytek®** is recommended. For example, in case the sub-floor has to be large enough to allow the laying of large-size tubing, or there is a need to reduce the load on underground floors in cases where one is required to maintain slab intrados and top soil level quotas, etc.

Model	Hood thickness	Weight of Drytek + Hood	Overload		Total weight	Foundation Thickness	Pressure on the soil
			Category	Overload			
	cm.	Kg/m²		Kg/m²	Kg/m²	cm.	Kg/cm²
H 15	5	246		400	646	10	0,151
	5	246		600	846	10	0,197
	8	321		800	1121	10	0,262
	15	498		2000	2498	10	0,583
H 20	5	257		400	657	10	0,153
	5	257		600	857	10	0,200
	8	332		800	1132	10	0,264
	15	507		2000	2507	10	0,585
H 27	5	273		400	673	10	0,157
	5	273		600	873	10	0,204
	8	348		800	1148	10	0,268
	15	523		2000	2523	10	0,589
H 35	5	288		400	688	10	0,161
	5	288		600	888	10	0,207
	8	363		800	1163	10	0,272
	15	538		2000	2538	10	0,592
H 40	5	296		400	696	10	0,162
	5	296		600	896	10	0,209
	8	371		800	1171	10	0,273
	15	546		2000	2546	10	0,594
H 45	5	345		400	745	10	0,174
	5	345		600	945	10	0,221
	8	420		800	1220	10	0,285
	15	595		2000	2595	10	0,606
H 50	5	357		400	757	10	0,177
	5	357		600	957	10	0,223
	8	432		800	1232	10	0,287
	15	607		2000	2607	10	0,608
H 55	5	366		400	766	10	0,179
	5	366		600	966	10	0,225
	8	441		800	1241	10	0,290
	15	616		2000	2616	10	0,611
H 60	5	372		400	772	10	0,180
	5	372		600	972	10	0,227
	8	447		800	1247	10	0,291
	15	622		2000	2622	10	0,612

Guttadrytek® dimensional sheets

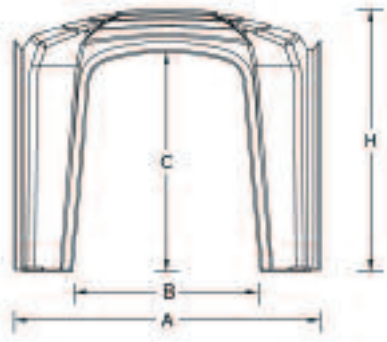
	H 5	H 10	H 15	H 20	H 27	H 35	H 40	H 45	H 50	H 55	H 60
A cm	58,4	58,4	58,4	58,4	58,4	58,4	58,4	58,4	58,4	58,4	58,4
B cm			29,7	30,6	31,8	33,2	34,1	35	35,8	36,7	37,6
C cm			6,9	11,9	18,9	26,9	31,9	36,9	41,9	46,9	51,9

1

2

1, Guttadrytek H5 - 2, Guttadrytek H10 - 3, Guttadrytek

3



Item specification:
Guttadrytek®*-type disposable formwork, square shaped and 58.4x58.4 cm in size, made in regenerated HDPE with less than 25% mineral charge, with brown color master added for protection against UV rays. The product must possess the official walkability certification (test of the single piece without cement) with regards to a fastened element and a free one, as well as the compression resistance certification carried out with a thrust jack plate smaller than 30x30 cm.*

	model										
	H 5	H 10	H 15	H 20	H 27	H 35	H 40	H 45	H 50	H 55	H 60
Gross dimensions cm	58x58	58x58	58x58	58x58	58x58	58x58	58x58	58x58	58x58	58x58	58x58
Net dimensions cm	56x56	56x56	56x56	56x56	56x56	56x56	56x56	56x56	56x56	56x56	56x56
Raw materials	HDPE	HDPE	HDPE	HDPE	HDPE	HDPE	HDPE	HDPE	HDPE	HDPE	HDPE
Color	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Piece weight Kg	0,65	0,93	1,51	1,59	1,68	1,88	2,06	2,51	2,63	2,74	2,85
Thermal stability	-40° +80°	-40° +80°	-40° +80°	-40° +80°	-40° +80°	-40° +80°	-40° +80°	-40° +80°	-40° +80°	-40° +80°	-40° +80°
Cement consumption m^3/m^2	0,0111	0,0162	0,0435	0,0476	0,0533	0,0587	0,0615	0,0792	0,0832	0,0866	0,0889
N° of pieces per pallet	444	444	276	264	252	228	216	184	176	168	160
m^2 per pallet (gross)	149,36	149,36	92,85	88,81	84,77	76,70	72,66	61,90	59,20	56,52	53,82
m^2 per pallet (net)	139,23	139,23	86,55	82,79	79,02	71,50	67,63	57,70	55,19	52,68	50,17
PAllet dimensions (cm)	120x120	120x120	120x120	120x120	120x120	120x120	120x120	120x120	120x120	120x120	120x120
L-section total height (cm) with fold			22	27	34	42	47	52	57	62	67

Advantages offered by Guttadrytek®

- Design of an element that statistically allows cement to work as a vault structure, reducing or eliminating the use of the electro-welded net on the extrados in the hood;
- Use of HDPE during the production phase instead of polypropylene or other raw materials, since the HDPE is used to make products that are highly flexible, impact-resistant, less sensitive to temperature changes and with no “vitric effect”;
- Use of color masters during the molding phase for an attractive look and, most importantly, for excellent protection against UV rays resulting in a significant reduction of deterioration and ageing, which are the main causes for broken pieces;
- Easy to lay thanks to the appropriate male-female interlocking system, which allows cut pieces to also be used in other positions;
- **Guttadrytek®** is equipped with a triple certification by the University of Brescia:
  - compression behavior on reinforced concrete floor without electro-welded net
  - compression behavior on reinforced concrete floor with electro-welded net
  - resistance to being walked on of the single pieces.

ACCESSORIES

Foot stop hook for Guttadrytek®

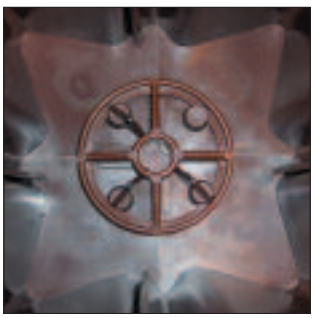
Plastic element for the optional fastening of the air gap feet, 45 to 60 cm in height.

Gettostop – Fibro-bituminous section used to contain the cement casting

An important accessory for **Guttadrytek®** is the section used to contain the cement while it is being cast along the outer edges of the air gap. In fact, it is recommendable to cast the beams and the slab at the same time; afterwards, a flat element must be positioned between the beam reinforcement and the first piece of **Guttadrytek®** in order to prevent the cement from percolating inside the air gap. Gutta has designed and developed Gettostop, a fibro-bituminous and waterproof (as it is vacuum bituminized) L-shaped element, flexible but much more resistant to loads and impacts compared to traditional elements present on the market. Gettostop is available in different heights to match the various types of **Guttadrytek®**.

Detail of the foot

Laying phase of the hook



Laid hook

Laying instructions

VENTILATED AIR GAPS

The proper laying of an air gap using **Guttadrytek®** and the subsequent finishing cast must be carried out according to the following phases:

1 – Level the foundation soil adding filling materials, if necessary, that can make it homogeneous.

2 – Lay the **Guttabeta® Star 320 kN** sheet with the studs facing downward and cast a layer of lean concrete at least 10 cm thick as support for the elements. (The function of **Guttabeta® Star 320 kN** is to facilitate the leveling of the foundation cement which, due to its limited thickness, may percolate inside the soil or the gravel used to prepare the laying surface).

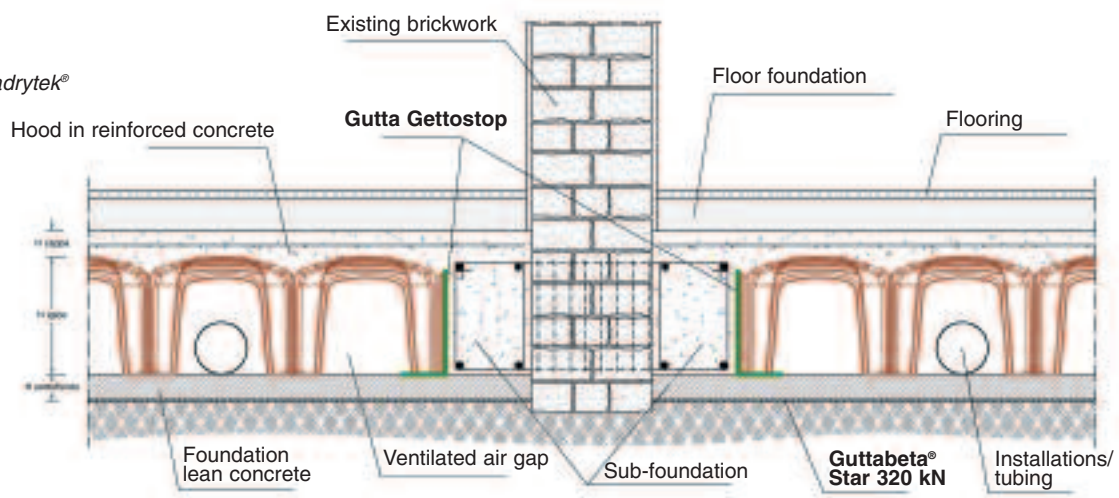
3 – Lay **Guttadrytek®** being careful to formwork the headers using Gettostop. To ensure a greater solidity of the structure, it is recommended to build the air gap at the same time as the foundation beams or as the trims integrating the foundations of existing walls in case of restructurings (see Figure 1). (In seismic areas, the prescribed connection of the foundations can be carried out by building an air gap equipped with suitable connecting reinforcements between the various foundation beams.)

Foto 1 - Laying of Guttadrytek®

Photo 2 - Laying of Guttadrytek®

Photo 3 - Casting of the floor

Figure 1 - Guttadrytek®



Laying instructions

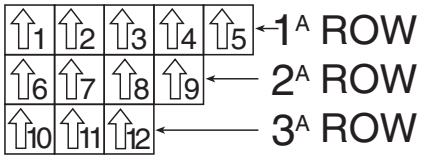
4 – If requested, lay the electro-welded net, which should be sized by the project manager who designed the structures.
Carry out the casting in the required thickness with respect to the structural commitment of the air gap.

For the sake of argument, some tables were prepared for an initial sizing and verification of the minimum characteristics requested in reference to the soil and the foundation (see Table on page 7).
If the sizing of the air gap is considered structurally significant, it must be done by the project engineer who designed the structures.

Photo 4 - Casting of the floor

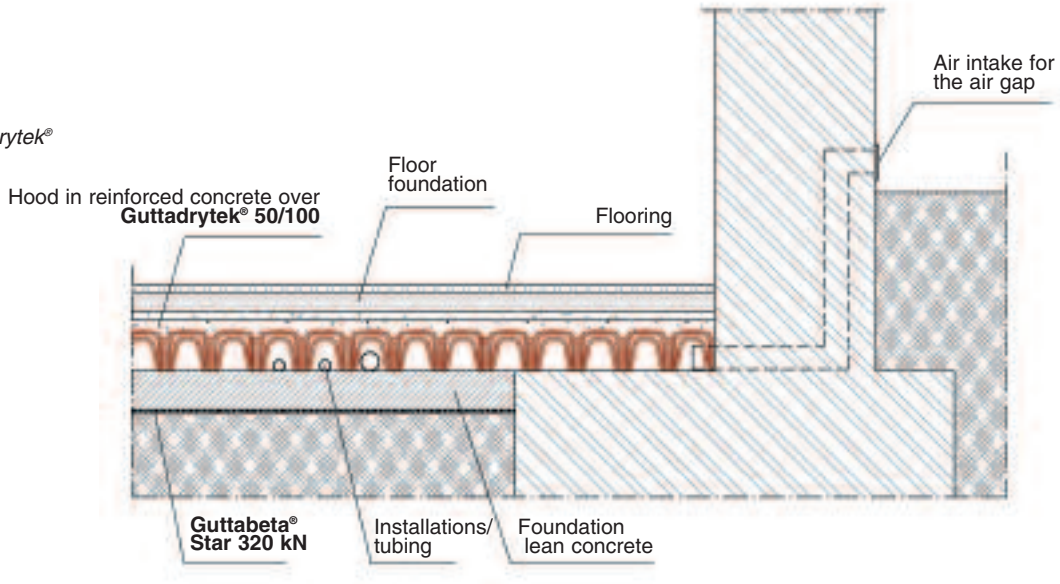
Photo 5 - Casting of the floor

Photo 6 - Finished floor



Laying instructions

Figure 2 - Guttadrytek®



Laying instructions

FLAT COVERINGS

When building flat roofs, **Drytek®** performs multiple functions. In fact, creating an air chamber 5-10 cm thick by means of a disposable formwork offers many advantages for the covering of the building.
A) The air chamber created between the structural covering elements and the external finish contributes to an effective thermal insulation of the roof, allowing considerable savings in terms of thickness, and therefore of costs and insulation to be laid underneath the floor.
B) The air present in the intrados of the **Drytek®** elements offers good thermal insulation due to the theory of sound wave refraction, which is typical of irregular elements that form air chambers, through which the sound wave passes.
C) **Drytek®** contributes to waterproofing the flat roof since both the raw material used to produce it, the HDPE, and its interlocking pieces make it an excellent ally for the traditional waterproofing.

Laying instructions

1 – Arrange for any installations, drainpipes and so on in the extrados of the floor.

2 – Lay the 5 or 10 cm **Drytek®** elements, then cast the finishing hood with a minimum thickness and the reinforcement, if any, in relation to the operating loads of the covering.

3 – While the hood is being cast, if possible, it is recommended to arrange for the inclined surface to form the necessary inclinations, so that the special sloping base course can be omitted.

4 – Lay a sheet of **Guttasilent® N100**, closed-cell cross-linked polyethylene, as thermal-acoustic insulation, being careful to overlap the edges of the various sheets by at least 10 cm, welding them at the end with hot air in order to make the structure solid. Welding must be carried out only at the time of the overlying base course because in the summertime, due to the heat of the sun, the cross-linked polyethylene needs a few cm on the side for the movement. After this phase is complete, cast the base course and during these operations calculate the necessary inclination.

5 – After completing the sloping base course, carry out an effective waterproofing.

6 – In order to protect the sheath, position a layer of **Guttabeta® Star 400 kN** with the star-shaped studs facing upward.

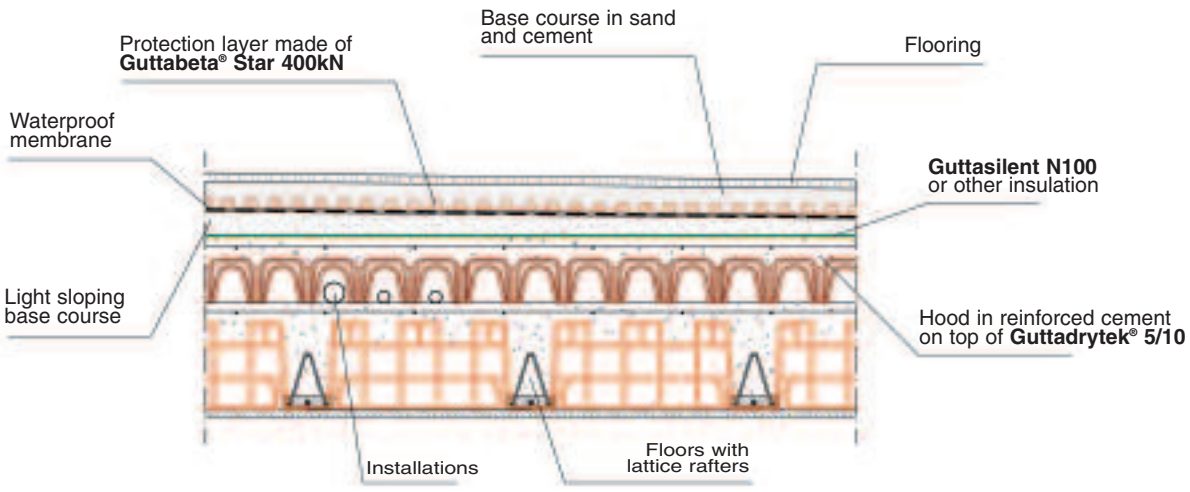
7 – Finish the job by casting the foundation base course and the subsequent flooring.

Depending on the intended use of the covering and the underlying premises, it may be advisable to arrange for a nonconductor panel, with suitable density and crushing resistance, immediately underneath the waterproofing layer as an alternative to **Guttasilent®**.

FLAT GARDEN COVERINGS

Roof gardens are becoming more and more popular, both to cover underground garages without having to give up a garden, but also to cover portions of residential terraces, etc. In addition to satisfying requirements of an aesthetic nature and the pleasant use of additional green spaces, this choice also guarantees the underlying premises the advantages resulting from high levels of thermo-acoustic insulation, the mitigation of sharp temperature changes and an efficient protection of the waterproofing system. For structural reasons, in many cases it is not possible to adopt a sufficiently large layer of cultivation soil, consequently this type of garden suffers from dry spells as the scarce amount of soil cannot accumulate water, while the excess water is eliminated by the underlying drainage. Consequently, these types of roof gardens need to be watered a little and very often. In order to avoid this and to guarantee optimal conditions for the survival of the garden, a technology must be adopted which is

Flat roof diagram



capable of carrying out various functions at the same time: protection of the sheath, drainage of the excess water released by the overlying soil and water reservoir, which is the same as laying a larger layer of soil. The use of **Gutta® T20** garden creates an important water reservoir in the underlying cultivation layer, consisting of the 20-mm high studs arranged at a rate of 400 studs per square meter. Therefore it becomes a fundamental advantage, during the dryer season, to be able to count on a water reserve within the layer that makes up the roof garden so as to guarantee a better hydrometric ration of the soil. Moreover, the sheet also features a set of small holes which allow the excess water to flow into the underlying waterproofing layer after the water has already filled up the reservoir studs. These small holes are also important as they allow ventilation of the bottom root layer located above the air chamber formed by the studs with respect to the waterproofing layer. The sheets are light enough to be easily carried to the top floors of buildings, and they eliminate the high cost of using traditional draining layers in gravel.

Laying instructions

1 – Arrange for installations, drainpipes and so on at the extrados of the floor.

2 – Lay the **Drytek®** components at the requested height, then build the finishing hood with minimum thickness and reinforcement, if any, in relation to the loads applied to the covering during operation.

3 – When building a roof garden, the first thing that must be done is to calculate the inclination needed to allow excess water to flow, which shall be equal to or greater than 1.5%. In addition, if the overall surface of the roof garden is rather larger, it is advisable to divided it into sectors, which shall have a maximum surface between 90 and 120 square meters. The number and arrangement of the flowing surfaces determine the quantity of discharge channels, which always have to be at least two for each flowing sector in order to avoid possible flows into a channel that may damage the discharge capacity of the water. The openings must be positioned in the lowest point of the flowing surface to which they belong, and it must be possible to inspect them. Consequently, a sump with removal cover must be fitted around the discharge.

4 – After completing the laying surface, the sloping base course must be waterproofed with a double layer of anti-root bituminous sheaths. In this phase, a layer of insulating material can be laid between the base course and the sheath. The waterproofing has to rise up for about 20 cm along the sides, beyond the edge of the finished garden.

5 - Afterwards, position the **Guttabeta® T20** sheaths on the entire surface, with the male studs facing downward and overlapping each sheet by about 15-20 cm, folding them up along the side walls to the level of the bituminous sheath applied previously.

6 - Cover the **Gutta®T20** garden with a layer of **Guttatex® 400** grams geotextile fabric, overlapping the various strips by at least 30 cm. The function of the high-weight fabric is indispensable as a separating and filtering layer between the HDPE membrane and the soil for the purpose of avoiding the clogging of the holes that govern the flow of excess water.

7 - After this phase is complete, fill with the cultivation soil and apply the relevant flashings along the side walls.

In case you wish to plant medium or large-size trees, and therefore there is a chance that heavy machinery will be used and/or excavations will be carried out removing the soil completely, it is advisable to protect the waterproofing with a layer of **Guttabeta Star® 320 kN** and a base course 5 cm thick and reinforced with electro-welded net. After the base course, you can proceed with the laying of Gutta T20 garden and cultivation soil.

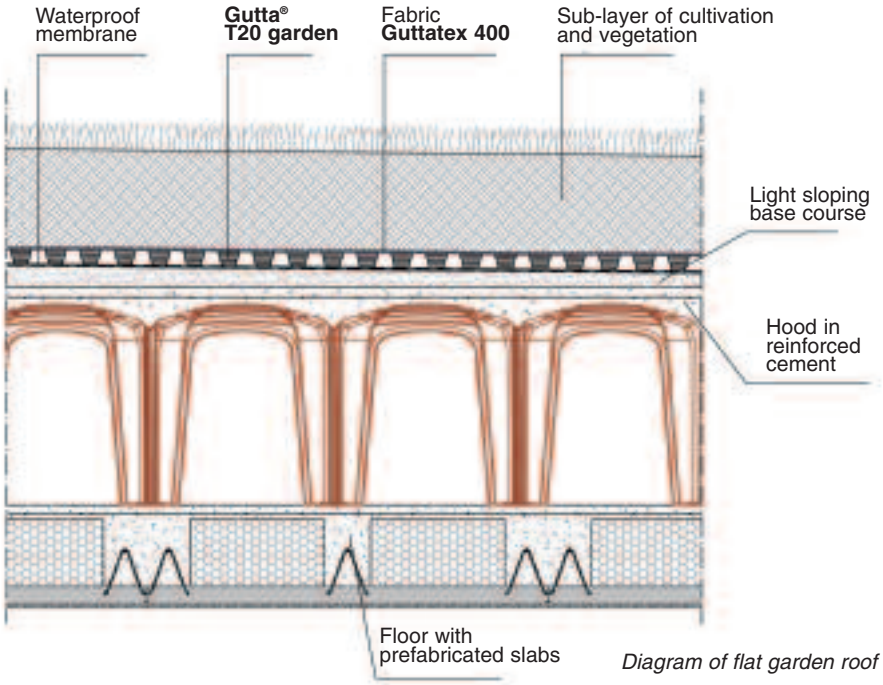
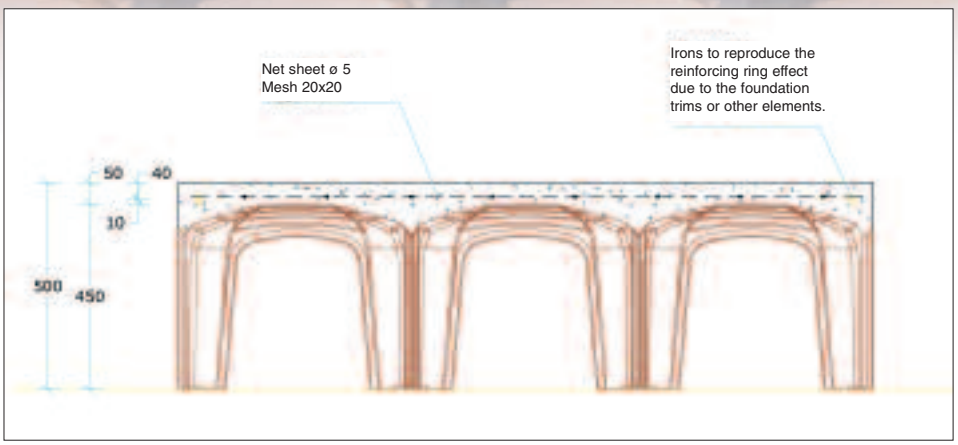


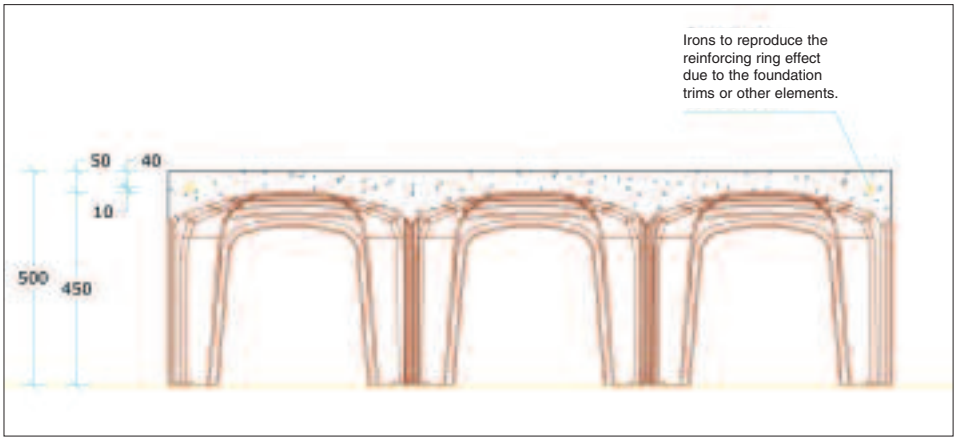
Diagram of flat garden roof

Guttadrytek® certifications

Gutta Werke has started to cooperate with the Department of Civil Engineering of the University of the Studies of Brescia for research that provides for the execution of experimental tests on air gap samples for the purpose of preparing numerical studies capable of simulating the static behavior of the structure even under extreme conditions. The studies and experiments carried out will allow the preparation of technical manuals with all application instructions and utilization tables of the structure. Such continuous cooperation with the university falls within the work philosophy of Gutta Werke, which intends to provide its customers with constantly updated products and technical assistance, with the technical and scientific skills that concern the sector.

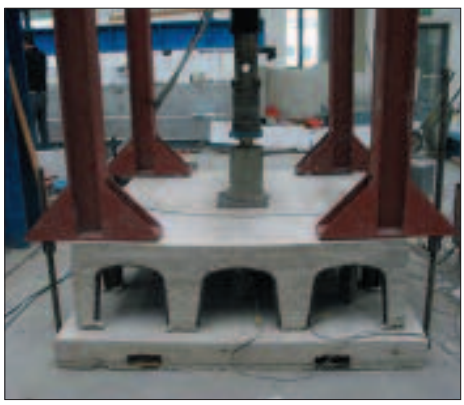


Geometry of the structural elements tested

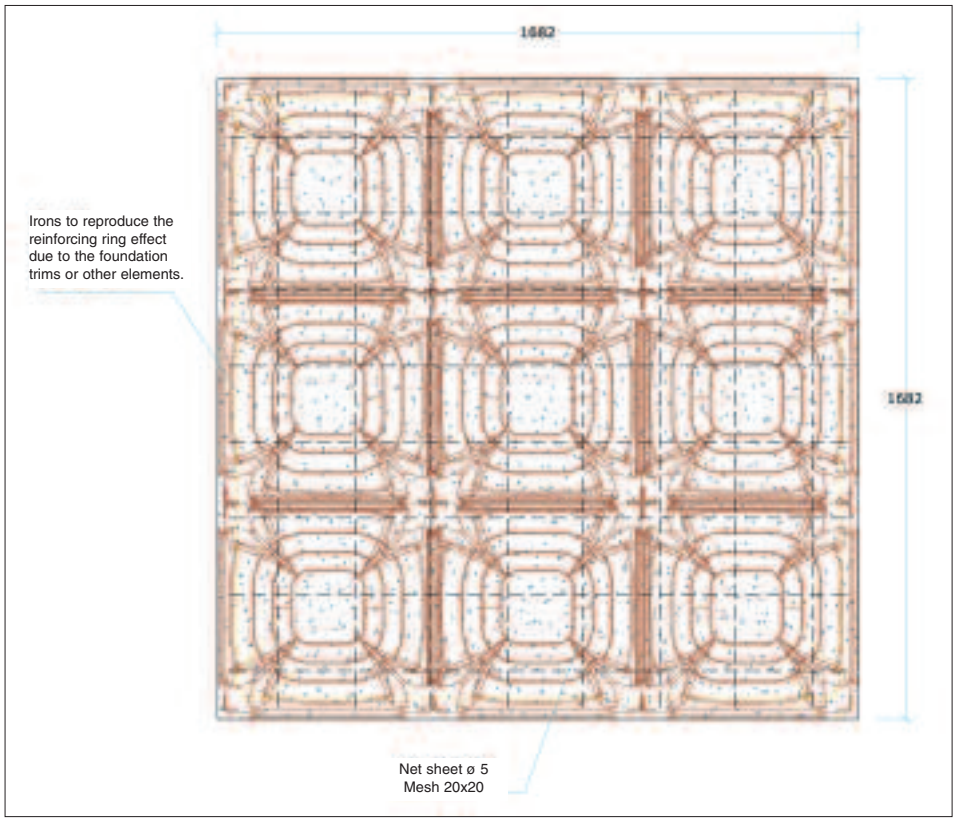


Geometry of structural elements tested without the electro-welded net.

Detail of the instrumentation in the center of an element.

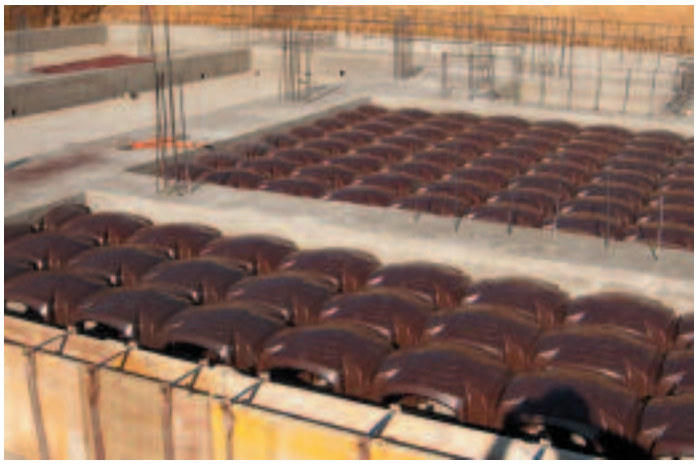


Crack and deformation framework at the end of the test.



Geometry of structural elements tested.

Laying examples of Guttadrytek®



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