TECNO MAGAZINE

by TECNOPOL

NEW

DESMOPOL-T

THE DESMOPOL AS ALWAYS

NOW IN TRANSPARENT!

Practical Case Studies

Two waterproofing projects using DESMOPOL polyurethane in Chile

Polyurea or poliurethane

Pure POLYUREA or POLYURETHANE? Which to use, and what are the differences?

Practical advice

How to achieve that "beach type" finish in the construction of decorative swimming pools.

Nº 4. October - December 2014


WE WILL PROVIDE ALL THE TECHNOLOGICAL KNOW-HOW TO ENSURE YOUR PROJECTS ARE FULLY COMPLETED ACCORDING TO HIGHEST STANDARDS.
TECNOPOL

SUMMARY

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WE PRESENT

DESMOPOL T, JUST AS EFFECTIVE AS DESMOPOL, NOW AVAILABLE IN TRANSPARENT FINISH

We are pleased to present **DESMOPOL T** with an improved formula. **DESMOPOL T** is an aliphatic polyurethane liquid membrane which once applied forms a continuous lamina which is completely waterproof and transparent, providing long lasting UV resistance and with excellent mechanical properties and surface durability for walking over.

All these characteristics combine to make **DESMOPOL T** especially suitable for waterproofing terraces, balconies, cornices etc. where preserving the original design aesthetic is a priority.

DESMOPOL T is designed for application on tiles, natural stone, wood and concrete surfaces. It may also be used on other materials, although we advise first consulting our technical department.

Before beginning the application, please ensure that the surface is clean, firm, dry and free from moisture. Do not apply if the surface is warmer than 35ºC. Also avoid applying if there is a possibility of moisture coming through from underneath the surface.

DESMOPOL T is especially designed for waterproofing where preserving the original aesthetic is a priority

To improve the adherence of **DESMOPOL T** we recommend first applying the **PRIMER T** surface activator using a clean cloth and allowing drying for 15 - 20min.

DEMOPOL T may be applied using a roller, brush or airless spray gun. Apply either 1 or 2 coats depending on the resistance required.

DESMOPOL T is supplied in 20kg metal tins.

We recommended using 1kg/m² of **DESMOPOL T** in 2 coats (0.5kg/m² per coat).

Technical data of liquid product

Viscosity	±250 cps
specific weight	1g/cm³
Flash point	≥42°C
Repainted time or time within layers	6 ~ 24 hours
Tack free at 25°C and 55% relative humidity	±6 hours
Dry extract	±80%

Technical data of membrane

Work temperature	-40 at 80°C
Surface temperature range	3 ~35 °C
Hardness	Shore A ≥80
Tensile strength at 23°C	> 2 MPa
Elongation at 23°C	> 100%
Potassium hydroxide contact 8% 10 days at 50°C	No significant changes in the elastomeric properties
Sodium hypochlorite contact 5% 10 days	No significant changes in the elastomeric properties
Thermal stability (100 days at 80°C)	OK
Water absorption	<1,4%
QUV Resistance to weather test (4hr UV, at 60°C (UVB light) & 4hr at 50°C)	OK 3000h

PRODUCTS

Polyurethane, polyurea or cold polyurea? Which to use?

HISTORY

In 1937, the research director, Otto Bayer, was working on the development of a synthetic fibre similar to the polyamides. During his experiments he used a reactive group which formed urethanes on contact with alcohol - and so polyurethanes were born. Initially however, no one knew what use to make of them, until 10 years later when the foundations were laid for current polyurethane foam products thanks to the invention of the first processing machine. In 1979 the first foam specifically developed for building insulation was formulated.

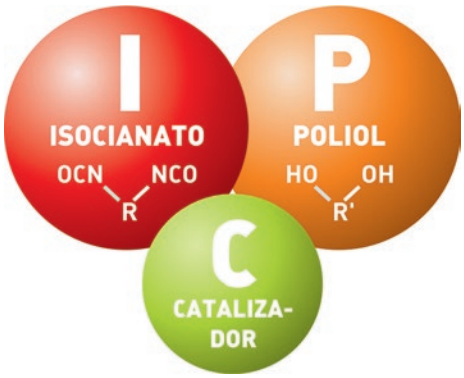
The initial polyurethane membrane was subsequently developed as a product specifically designed for continuous and completely adherent waterproofing. This process revolutionized waterproofing techniques by offering a system with no joins, which could be adapted to any surface shape whilst providing excellent mechanical properties and long lasting durability. It was a significant improvement on existing acrylic systems, which presented difficulties when applied to flat areas (slope 0)

It wasn't until the 1990's that Mark S Barton and Mark Schlichter developed and patented two-component polyurea. Its quick drying properties and resistance to moisture made it ideal for large surface area waterproofing projects.

COMPOSITION

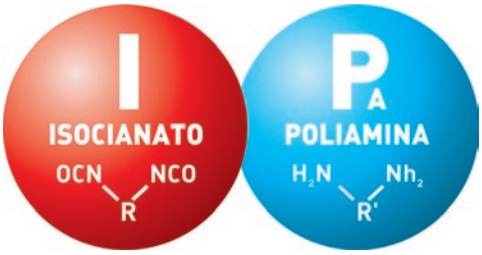
POLYURETHANE

Polyurethane membrane is formed by the reaction of an isocyanate and a polyol in the presence of a catalyst. Polyurethanes represent one of the most versatile polymer families around; depending on the polyol and isocyanate used, it is possible to obtain an infinite range of products, from the most rigid to the most flexible, with polyurethane membranes making up the latter end of the scale.



POLYUREA

Polyurea is the product of a union between an isocyanate and various polyamines. In contrast to polyurethane it does not require a catalyst, as the union is stronger and faster with double chemical bonds. It is resistant to high temperatures and moisture (the membrane may even form under water), although it is essential that the surface is dry to ensure proper adherence.



CHOICE OF PRODUCT

Finally we come to perhaps the most interesting part:

WHICH IS THE BEST PRODUCT FOR YOUR NEEDS?

To give the correct answer, and compare the two types of membrane, we will take the example of 2 of our best selling products:

- **DESMOPOL** aromatic polyurethane for cold application
- **TECNOCOAT P-2049**: 100% pure polyurea for hot application

These are two waterproofing membranes which present very different chemical and mechanical properties. Due to their characteristics, cost and application methods they are designed for different purposes.

The first questions we need to ask are these: what type of surface requires waterproofing? Do we have spraying equipment available? Can we reach the surface with this equipment? What are the requirements for the job? What is the budget?....after answering these questions, and with the following table as a guide, we will be able to make a decision on the product best suited for our purposes.

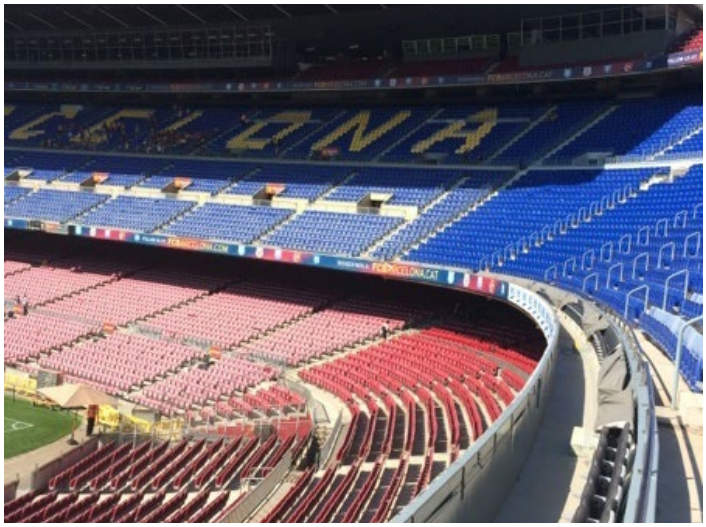
	POLYURETHANE DESMOPOL	**POLYUREA TECNOCOAT P-2049**
What type of surface requires waterproofing?	All types of project, especially medium and small projects.	All types of project, especially large & medium sized projects
Do we have spraying equipment available?	Optional (Graco GH-833)	Essential (Graco H-XP2)
Can we reach the surface with this equipment?	Optional	Essential
What are the specific requirements?	• Contact with drinking water (requires TECNOTOP 2CP) • Contact with chlorinated water (requires TECNOTOP 2CP) • Pedestrian traffic	• Contact with drinking water • Contact with chlorinated water (requires TECNOTOP 2CP) • Contact with chemicals • Contact with ethanol • Pedestrian traffic • Occasional rolling or intense traffic
Drying time	Medium	Ultra-fast
Transport	Easy. 20kg tins.	Requires vehicle. 225kg containers
Resistance to traction	5 ~ 7 MPa	23 MPa
Elongation	> 600 %	> 300 %
Preparation (initial)	± 4 ~ 5 horas	± 3 ~ 5 segundos

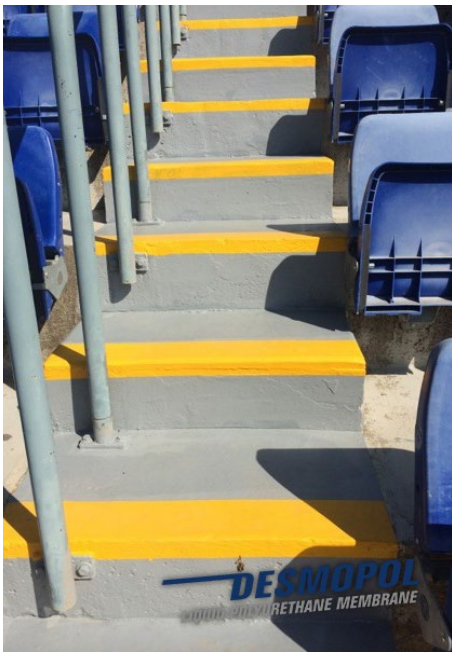
CONTAINERS

POLYUREA
Metal drums of 225+225 kg

POLYURETHANE
Metal drums of 25 kg

APPLICATIONS





PRACTICAL ADVICE

How to achieve that “beach type” finish in the construction of decorative swimming pools

We will now offer a step by step look at how to achieve a non-slip or “beach type” finish as required for swimming pools. There is a now a strong demand for swimming pools in private homes, hotels and water parks to be installed with this particular type of finish.

This type of decorative solution can be easily obtained on top of waterproofing with polyurethane, polyurea or directly over the tiles or other finishing material (if in doubt, please consult our technical department).

PROCESS OPTION A (with silica sand)

1. **Adherence coat.** If more than 48 hours have passed since the application of polyurethane or polyurea membrane, or when working directly on top of ceramic or mosaic tiling, it will be necessary to first apply PRIMER EPw-1070 using a roller or airless spray equipment.
2. **Base coat.** Using a roller or airless spray equipment, apply a first coat of TECNOTOP 2CP aliphatic polyurethane, suitable for complete submersion, in the required finish colour.
3. **“Anti-slip” coat.** Spray silica sand using the saturation level required.
4. **Fixing coat.** Apply one or two coats of TECNOTOP 2CP in the desired colour.
5. **Sealing coat.** Finish with a last coat of TECNOTOP 2CP in neutral finish.

PROCESS OPTION B (with quartz color)

1. **Adherence coat.** If more than 48 hours have passed since the application of polyurethane or polyurea membrane, or when working directly on top of ceramic or mosaic tiling, it will be necessary to first apply PRIMER EPw-1070 using a roller or airless spray equipment
2. **Base coat.** Using a roller or airless spray equipment, apply a first coat of TECNOTOP 2CP aliphatic polyurethane, suitable for complete submersion, in the neutral (colourless) finish.
3. **“Anti-slip” coat.** Spray coloured quartz, normally 100% saturation.
4. **Sealing and fixing coat.** Finish with a last coat of TECNOTOP 2CP in neutral finish.

CASE STUDIES

University of San Sebastián and La Católica University, two waterproofing projects using DESMOPOL polyurethane in Chile

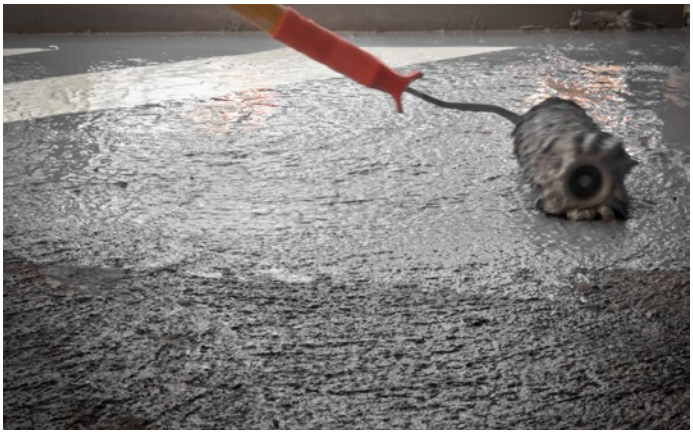
The **DESMOPOL** polyurethane continuous waterproofing system has been used for protective coatings on various different areas of these two university sites in Santiago de Chile. The versatility of the product and the different finish options have combined to provide perfect solutions for a range of specific requirements on these projects.

UNIVERSITY OF SAN SEBASTIÁN

- System employed: DESMOPOL polyurethane
- Square metres of application: 12,000
- Year 2012.
- Type of use:
  - » Garden flagstones
  - » Roof garden tiles
  - » Central patio tiles

LA CATÓLICA UNIVERSITY: ANACLETO ANGELINI BUILDING

- System employed: DESMOPOL polyurethane
- Square metres of application: 6,900
- Year 2013.
- Type of use
  - » Garden flagstones
  - » Roof garden tiles
  - » Terrace tiles
  - » Underground ramp access



RANGE

DO YOU KNOW THE ENTIRE TECNOPOL RANGE?

Since 1996 we have been immersed in a continuous process of research and development of new highly technological products and systems. We adapt to the times and the needs of the sector - the use of TECNOPOL products guarantees the best results for your projects.

POLYUREA MEMBRANE

TECNOCOAT P-2049
Membrane 100% pure polyurea

TECNOCOAT P-2049 LV
Membrane 100% pure polyurea low viscosity

TECNOCOAT P-2049 EL
Membrane 100% pure polyurea stretchable (↑600%)

TECNOCOAT CP-2049
Cold polyurea membrane

POLYURETHANE MEMBRANE

DESMOPOL
Polyurethane membrane

DESMOPOL T
Transparent polyurethane membrane

ACRYLIC MEMBRANES

SETIPOL
Acrylic waterproofing

INDUSTRIAL FLOORING

TECNOFLOOR T-3020
100% solids epoxy coating

TECNOFLOOR T-3020 AS
Antistatic 100% solids epoxy coating

TECNOFLOOR TW-3040
Water based epoxy coating

FOAM OF PROJECTION POLYURETHANE

TECNOFOAM G-2008
Polyurethane foam density 8 kg/m^3

TECNOFOAM G-2048
Polyurethane foam density 33 kg/m^3

TECNOFOAM G-2040
Polyurethane foam density 40 kg/m^3

TECNOFOAM G-2050
Polyurethane foam density 50 kg/m^3

TECNOFOAM S-401
Polyurethane foam density 40 kg/m^3. Fire reaction M1.

FOAM OF POLYURETHANE OF INJECTION

TECNOFOAM I-2008
Polyurethane foam density 10 - 15 kg/m^3

TECNOFOAM I-2035
Polyurethane foam density 35 - 40 kg/m^3

PRIMER

PRIMER EP-1020
100% solids epoxy based primer

PRIMER EPW-1070
Water based epoxy primer

PRIMER PU-1000
Polyurethane primer solvent based

PRIMER PU-1050
Polyurethane primer 100% solids

PRIMER PUC-1050
Polyurethane primer 100% solids for low temperatures

PRIMER T
Primer for DESMOPOL T

PROTECTIVE COATINGS

TECNOTOP 2C
Aliphatic polyurethane resin

TECNOTOP 2CP
Aliphatic polyurethane resin suitable for full immersion

PREPARATION

DESMOSEAL MASILLA-PU
Mono-component polyurethane mastic

G80
Mesh for reinforcing of waterproofing membranes

TECNOBAND 100
Support band

AUTONOMOUS EQUIPMENT OF PROJECTION OF FOAM OF POLYURETHANE

HANDI FOAM
Polyurethane foam projection kit: density 28 kg/m^3

ADDITIVE

DESMOPOL ACELERADOR
DESMOPOL membrane Accelerant

DESMOPOL SOLVENT
Special solvent for DESMOPOL membrane

PIGMENTOS
Special ink for TECNOTOP varnishes range

TIXOPOL L
Thixotropic additive for Desmopol membrane

TIXOPOL S
Thixotropic additive for systems TECNOFLOOR-T-3020, TECNOCOAT CP-2049, PRIMER EP-1020 and PRIMER PU-1050

CHARGES

ARENA DE SILICE
Antislip finishes

QUARTZ COLOR
Decorative antislip finishing

TECNOPLASTIC C
Industrial antislip finishing

TECNOPLASTIC F
Decorative antislip finishing

DESCRIPTIONS AND DATA SHEETS IN WWW.TECNOPOL.ES

THE NEAR FUTURE

ASIAN CAIRNS, urban ecosystems in China

The Vincent Callebaut Architectures firm is internationally renowned for transforming grey concrete landscapes into vibrant green ecosystems, with a clear ecological message.

One of their latest projects was inspired in response to the great rural exodus that China is currently experiencing and the growth of its ever more densely populated cities. The Asian Cairns project was drawn up for the Chinese city of Shenzhen and envisages a solution based on vertical farms, which would actually produce more energy than they consume through efficient exploitation of wind and solar power in addition to the cultivation of food products.

The Asian Cairns design incorporates three intertwined spirals representing fire, earth and water. Each spiral winds around two towers.

By the end of 2011, for the first time in Chinese history, the number of inhabitants in its cities outgrew the rural population. It is forecast that by 2020 the population will reach 800 million with the majority living in urban areas. On the basis of these figures it seems likely that Asian Cairns and similar projects will soon become reality.

BUSINESS

The city of Barcelona is promoting the creation of green roof gardens and terraces

The Town Council is promoting initiatives to convert terraces and roof gardens throughout the city for communal use.

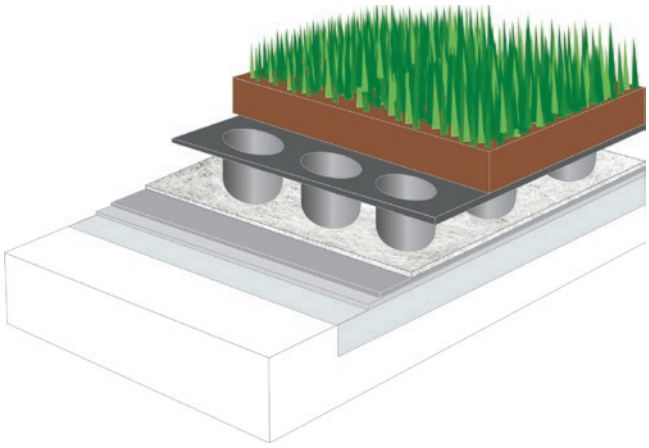
67% of roof terraces in Barcelona are flat surfaces suitable for either gardens or green energy producing purposes.

The purpose is not merely aesthetic, but forms an essential part of the Green City Strategic Plan, an initiative aimed at promoting biodiversity and the use of terraces and rooftops open to the public for leisure, environmental and energy purposes.

In addition, they are encouraging the remodelling of buildings from an energy point of view and an increase in the employment of green spaces, with the long-term objective of creating a more self sufficient city and reducing the energy consumption of urban buildings.

The Town Council is offering grants for the rehabilitation of flat roofs and stairwells for the purpose of improving waterproofing and thermal and acoustic insulation. They are also promoting the use of such spaces where possible for a range of activities (urban vegetable gardens, energy production systems, sports facilities and communal areas etc.)

Surface waterproofing clearly plays an essential part in the creation of such spaces. Inadequate waterproofing, or the use of low quality products, can easily result in expensive repair work in the future and often require the lifting or removal of whole terraces or gardened areas.



Example of garden area system using TECNOCOAT P-2049 polyurea

Our proven experience in the design of waterproofing products for terraced areas permits us to guarantee that our DESMOPOL polyurethane and TECNOCOAT P-2049 polyurea membranes will minimize the risk of problems in the future.

Our systems come with a 25 year ETA certification guarantee. ETA certification is based on the performance of the product under the conditions for which it was designed. Among other considerations, this guarantees that the product is resistant to plant root penetration (UNE-EN 13948). Our technical department will gladly supply any further information you require. Please get in touch with us.

Do you need an applicator for our garden rehabilitation systems? Please call us on:

TECHNOLOGY

What is the "dew point", why is it so important for polyurethane or polyurea applications and how is it calculated?

A simple definition of the "dew point" would be the temperature the air needs to drop to for natural humidity to condense. As the temperature falls, relative humidity increases, and when it reaches 100% (saturation) water condenses in the form of mist or dew.

In order to calculate the dew point we need to know both the relative humidity and the ambient temperature in order to provide a result measured in degrees: a dew point of 3oC, for example, will tell us that moisture in the air will condense at that temperature.

If we talk in meteorological terms, the dew point will determine the probability of dew, mist or frost forming, as well as an indication of the altitude of the cloud base.

In our sector, the dew point will determine **the minimum temperature at which we can apply the product,** which for safety purposes should always be at least 3oC above the dew point. This applies to all primer coats, **DESMOPOL** polyurethane membranes, **TECNOFLOOR** epoxy paving and **TECNOFOAM** polyurethane foam.

IMPORTANT

As a guideline, our products may be applied with a surface humidity below 5-8% and a temperature of 3oC above the dew point. Please always consult the technical specifications of the product supplied.

To calculate a approximation of the dew point we use the following formula:

$$Pr = \sqrt[8]{\frac{H}{100}} \cdot (112 + 0,9 \cdot T) + (0,1 \cdot T) - 112$$

Pr (dew point)
T= Surface temperature in oC
H = Relative humidity

For example. let us imagine a temperature of 14oC with a relative humidity of 65%.

Pr =($\sqrt[8]{65/100}$) x (112 + 0.9 x 14) + (0.1 x 14) - 112

Pr = 0.947 x 124.6 + 1.4 - 112

Pr = 7,47

As a safety margin of at least 3oC should be applied: (7.3 + 3) = **10,47ºC** will be the minimum temperature at which the product should be applied in this case.

Although it may be a little impractical to work on the basis of mathematical formulas on a daily basis, we may also use the following table:

	RELATIVE HUMIDITY										
Air Temp.	**45%**	**50%**	**55%**	**60%**	**65%**	**70%**	**75%**	**80%**	**85%**	**90%**	**95%**
2ºC	-8,81	-7,44	-6,19	-5,04	-3,97	-2,96	-2,02	-1,13	-0,29	0,51	1,27
6ºC	-5,15	-3,74	-2,45	-1,26	-0,15	0,88	1,85	2,77	3,64	4,46	5,25
10ºC	-1,49	-0,04	1,29	2,52	3,66	4,72	5,73	6,67	7,57	8,42	9,23
14ºC	2,16	3,66	5,03	6,29	**7,47**	8,57	9,60	10,57	11,49	12,37	13,20
18ºC	5,82	7,36	8,77	10,07	11,28	12,41	13,47	14,47	15,42	16,32	17,18
20ºC	7,65	9,21	10,64	11,96	13,18	14,33	15,41	16,42	17,39	18,30	19,17
22ºC	9,48	11,06	12,51	13,85	15,09	16,25	17,34	18,37	19,35	20,28	21,16
24ºC	11,31	12,91	14,38	15,74	17,00	18,17	19,28	20,32	21,31	22,25	23,15
26ºC	13,14	14,76	16,25	17,62	18,90	20,10	21,22	22,28	23,28	24,23	25,13
28ºC	14,97	16,61	18,12	19,51	20,81	22,02	23,15	24,23	25,24	26,20	27,12
30ºC	16,80	18,46	19,99	21,40	22,71	23,94	25,09	26,18	27,20	28,18	29,11
34ºC	20,45	22,16	23,73	25,18	26,52	27,78	28,96	30,08	31,13	32,13	33,09
38ºC	24,11	25,87	27,47	28,96	30,34	31,62	32,84	33,98	35,06	36,09	37,07
40ºC	25,94	27,72	29,34	30,85	32,24	33,55	34,77	35,93	37,02	38,06	39,05
45ºC	30,51	32,34	34,02	35,57	37,01	38,35	39,61	40,81	41,93	43,00	44,03

Example. Let us imagine a temperature of 14oC with a relative humidity of 65%. According to the table we can see that the dew point is 7.47oC, indicating that we should not apply the product below (7,47 + 3) in other words **10,47ºC**

These days, electronic dew point gauges are available, which determine the temperature at which air moisture will start to condense. In most case these devices are included within a hygrometer, so if we are considering buying one of the latter, it would be worthwhile choosing a model which includes this function. This type of hygrometer would provide all the information required to ensure effective application – temperature, humidity and dew point.

ECOLOGY

Uruguay will have the World's first sustainable airport

The balance between aesthetics and sustainability has reached a point where a cleaner World is becoming a reality.

The concept of sustainable development emerged towards the end of the 20th century with the aim of protecting the environment and the social landscape while also encouraging economic growth, ensuring a commitment to the quality of life on the planet.

The most sustainable cities in the World currently include Reykjavik (Iceland), Vancouver (Canada), Melbourne (Australia) and San Francisco (USA).

We should now add Uruguay to the list, a country committed to the use of green energy sources which do not require petroleum.

With the building of Carrasco international airport in Montevideo, Uruguay has become the first country to have a 100% sustainable airport thanks to the construction of a 4 hectare solar park and the installation of 3 wind turbines.

The airport is now operating and work is due to be fully completed over the course of 2016

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WEBSITE

We are updating the website at www.tecnopolgroup.com, improving mobile phone access

We have recently improved and updated our Website for easier browsing and user access.

The most notable innovation is the adaptation of the website for mobile phone applications. From your smart phone you can now easily consult all the technical information on our products, a particularly useful function on the worksite.

A range of new Website functions will be available soon

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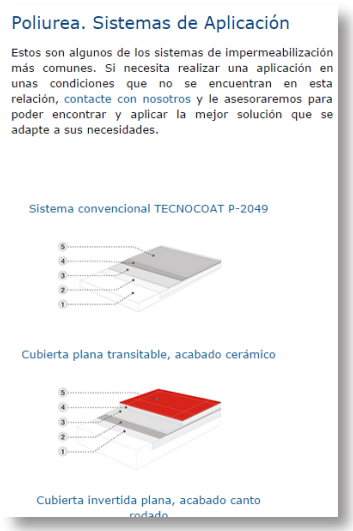

WE WOULD LIKE TO BE YOUR TECHNICAL ADVISOR!!

We are inaugurating a new section with which we seek to help or provide solutions for any queries our readers may have.

If you are not sure how to apply a product, how to deal with a specific aspect, how to prepare a substrate, what **TECNOPOL** best suits your needs, etc., send us your query and we will answer you as quickly as possible. We are looking to provide a speedy and efficient service.

Furthermore, we will publish the queries we think hold the greatest interest, together with the answer, in the following number of **TECNONEWS**.

SEND YOUR QUESTIONS! news@tecnopol.es

www.tecnopolgroup.com

TECNO MAGAZINE by TECNOPOL

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