



Humidity tested Supervision

Polyglass Spa has recently applied a new supervisory system to its main bituminous membrane production plant in Ponte di Piave (TV). This system is based on Movicon11 Scada platform.

A new bituminous membrane production line consents Polyglass Spa to increase its leadership in the market sector.

Polyglass Spa went into operation at the end of the 60's with the aim to produce polymer- bitumen membranes at an industrial level, in response to recognizing the crucial role of these products in buildings and infrastructures. The founders', the Zanchetta brothers, capability and experience in chemistry led them to mix together different compositions such as bitumen and polymer to

become a successful industrial production company, expanding their Polyglass production plants across the waters to the United States in the 80's. The company's **international size** continues to grow alongside scientific research and the willingness to offer new, more efficient and simpler solutions.

In October 2008, Polyglass Spa, international leader in bituminous waterproofing membranes, became part of the MAPEI group, world leaders in adhesives for the construction industry. Today, Polyglass is a reality with five production plants worldwide (2 in Italy and 3 in the USA) and is well known in North America, Great Britain and Romania. It has 320 employees and a world level turnover that reached 140 million in 2009 with an expected +10% increase for the 2010 turnover. The international size runs at parallel pace with scientific research, committed to offering innovative solutions. This has been demonstrated by replacing traditional membranes applied with torch flame with an innovative cold applicable "self-adhesives", (the ADESO® technology), which meets all security standards and are very versatile in use and quick application. What's more they do not produce any harmful fumes or odors while being applied. In addition to the self-adhesive membranes with ADESO® technology, Polyglass also launched REOXTHENE in 2009, ultra-light membranes, reduced in weight by 40% of traditional technological membranes. Transport costs and handling are reduced thanks to its light weight characteristic making it safer and quicker to work with on building sites. Within just one year, these innovative membranes have revolutionized the industry sector gradually overtaking their conventional counterparts, earning a 20 million euro turnover that is estimated to rise to 30 million by next 2012.

This revolutionary technology permits Polyglass to offer the market a wide range of elastomeric and plastomeric membranes, with cold flexibility resistance ranging from -5 ° C to -20 ° C and thickness ranging from 3 to 5 mm.

In 2009 Polyglass entered into the field of synthetic turf (PVC-C e TPO/FPO), particularly suitable for large civil engineering and

commercial waterproofing applications. By 2012, this new material will represent 30% of Polyglass productions and, according to CEO Pierluigi Ciferni, should gain an additional revenue of 40 million Euro.

The Production Plant

The bituminous membrane production process is divided into two macro-phases, the mixing process and the membrane production process, the origin of the final product. The bituminous membrane is unwound from the spool and fed through and along a series of rollers to undergo a series of processes such as surface treatment, impregnation, cooling, stretching, and leveling. The then finished product is cut, rewound and transferred into waiting pallets ready for



Polyglass is part of the Mapei group, leaders in bituminous membrane production, with 5 production plants worldwide.

shipment.

The mixing production phase is carried out in a plant equipped with large storage tanks containing the raw materials: bitumen, polymers, calcium carbonate, plasticizers, etc. Which are fed by pumps or pneumatic conveyors through a complex piping system to the primary mixers where they are mixed together according

to preset quantities and times. The mixture is then pumped into secondary mixers which keep the final mixture's temperature and viscosity at a constant rate until sent to the membrane production lines.

The membrane production lines have been designed for producing different types of end products according to material and/or working accessory type based on bitumen. The production line is built with a fabric feeder containing different materials which serve as the membrane's core obtained after various processes have been carried out.

The fundamental step involves passing through the immersion tank where the mixture is fed and kept at an appropriate temperature so that it adheres to the fabric. After this has been accomplished the fabric adhered with mixture continues through the calendaring, additivation, and cooling phases where the thickness, material covering type and the right membrane consistency are defined in order to continue on to next phases. The central production line area deals with finishing off the membrane with cleaning, adding accessories to facilitate product application and brand labeling. The final stage involves the packaging procedures such as cutting to size and winding into rolls, quality control then loading onto pallets ready for shipment.

The Supervision system

A new supervision system has recently been installed with the aim to monitor all the bituminous membrane production processes, acquire process and production data, and manage diagnostics and maintenance efficiently. The project was commissioned to Eureka system from Treviso, a project engineering company that designs and creates automation systems for the manufacturing industry.

The company boasts outstanding experience in software engineering in multiple industrial

automation and process control sectors, with continuous research for innovative solutions to the advantage of clients.

The company uses Movicon as a project engineering platform for all its industrial supervision application solutions uses, whether simple HMI applications or big SCADA applications such as the case with Polyglass Spa.

The Architecture

The supervision system architecture, based on Movicon 11, consists of a main server station on PC Window 7 Server with CPU Intel dual-core E5300, Nvidia 4Gb RAM graphics card con **55" monitor** 1920x1080 resolution. The client emphasized the need to have a solution with powerful graphical impact both in terms of display and visibility.

Five PC Client workstations are connected to the company LAN network, dislocated in various points of the establishment (office and departments), each with a 22" PC-Monitor" with a 1920x1080 resolutions.

The supervision system is connected in ethernet network to 3 main plant management and control PLC systems.

During the development phase, special attention was given to the system's resource load that, as noted, represents a major threat when a great number of sophisticated graphical animations are involved such is the case with this system. According to on site test runs on Movicon platform project efficiency and potentiality, showed that content load never peaked more than 50% of CPU total use. System performances were not at all affected when configurations with a maximum of five clients connected at the same time. Performances remained excellent both in terms of screen refresh time and fast communication with the PLC.



The "Polymer bitumen membrane

", is a composite

The main production plant supervision, in Ponte di Piave, architecture is based on Movicon 11 with a server station with a 55" monitor and 5 client stations connected in the company's LAN network system.

The biggest challenge was to represent continuous production processes with various animations to ensure component functionality (usefulness, userfriendliness, efficient for maintenance staff) and communication activity (graphical effects, captivating graphics). The solution exploited the Movicon graphics engine's potentiality to the maximum. The Movicon graphic's editor provided easy and efficient use of the platform's graphical object library, as well as creating new customized ones with just as much ease, to represent parts of the plant in more detail.

The graphical animations are particularly accurate in every detail, making full use of the system's features for executing dynamic functions in objects with varying movements, rotations, translation motion along non-linear paths representing the movement of materials used in process, movement of mechanical parts, and membrane flows. The final result was represented to the operator as an incredible identical real-life production process, made easier to understand in its complexity. All client expectations were met with improved management efficiency and increased productivity returns due to continuous production cycles.

Waterproofing bituminous membranes:



product derived from two elements: bituminous compound, based on bitumen modified with thermoplastic polymers, reinforced with a various fibers (fiberglass or non woven fibers).

The bonding of these two elements formed a waterproofing bituminous membrane, in which the bitumen previously modified with polymer corrects the undesired properties to determine the natural limits in duration and reliability by acting as a waterproofing agent to ensure better mechanical resistance.

The Bitumen, if not modified, is greatly influenced by temperature changes and premature ageing when exposed to Ultraviolet rays for too long and cracks at low temperatures.

The polymer, best identified as atactic polypropylene (APP), thermoplastic rubber styrene - butadiene - styrene (SBS) polymer or polyalphaolefin (PAO), precise function is to improve the above mentioned characteristics, conferring to the elastic characteristics of the bituminous mass, protecting it against heat resistance, deformation and aging by making it more resistant in the most severe temperature conditions.

It should be noted that all the Polyglass membranes are composed from distilled bitumen, derived from natural hydrocarbons. Polyglass considers sustainability as a major factor in strategic choices and tactics and is committed to increasing the use of recycled components, improving their product biodegradability, reducing production air pollutant emissions and cogenerating energy. Therefore it comes to no surprise that Polyglass, together with Mapei have been members of the US Green Building Council since 2007 and Green Building Council Italy since 2008 with the mission to promote eco-sustainable buildings. Furthermore the Polyglass membranes contribute to obtaining credits in different categories for the LEED certificate (Leadership in Energy and Environmental Design).

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