ArcelorMittal Europe showcases its breakthrough innovations and new products for sustainable constructions from floor-to-roofing at Batimat

With the upcoming United Nations Climate Change Conference (COP21) in Paris addressing the global issue of climate change, ArcelorMittal has been participating to the change by proposing since a long time high quality products and innovative solutions. At the occasion of Batimat trade show in Paris, ArcelorMittal showcases its sustainable products and breakthrough initiatives for construction.

ArcelorMittal's innovative approach incorporates a systematic life-cycle analysis for construction by looking into the "life" of a product. This approach is both holistic and complex, involving multiple parameters.-

The group has developed a number of life cycle analysis tools for steel products in order to identify the points in the product life cycle and it has developed effective solutions or alternatives whenever necessary. These tools can also be used to compare the performance of a steel product to other materials, such as concrete, plastic or aluminum.

Regarding products in a more concrete way, ArcelorMittal is also strongly involved in offering a wide range of solutions for the main sustainable development challenges in construction: insulation, power generation and renewable energies, use of material, long-lasting, health friendly materials/coatings and "recyclable" products.

Insulation: ArcelorMittal launches new features:

- **"Eclectic":** the new line of cladding for animated façades. The new "Eclectic" asymmetric cladding is made to accompany the new architectural trends in a market dominated by the thermal insulation from the outside.
- The new sandwich panel range in polyisocyanurate foam PRT-HEXACORE® is ACERMI certified. **Arval** by ArcelorMittal now offers a new range of insulated sandwich panels. These panels are intended for use in roofing and facades, and walls. Several thicknesses, various finishes (grooved, smooth, ribbed, etc.) and a palette of over 100 colors (color chart Colorissime) are offered to meet all specifications.
- Steel sub-frame window for **Promisol®** panel in partnership with Groupe DEYA

Promisol® S architectural panels with hidden fixings, Promisol® V allows great freedom of design, while meeting the new RT 2012 thermal regulations (official thermal regulation). The system of seals with double sockets (Promisol®® S and V) ensures perfect air-tightness in accordance with RT 2020 (next thermal regulation) dedicated to the positive energy building.

- The development of **Archisol** is based on a desire to design freedom in architecture and high-performance insulation. Real wall "all in one" Archisol combines a sandwich panel facade finishing profile, and leverages the combination of these two complementary elements to simultaneously address the issues of thermal insulation, air tightness and aesthetic facades. Archisol is specifically designed or seismic areas.

Archisol is easy to install and allow a thinner construction by saving 3% of available surface.

- The **sandwich panel Ondatherm®** is in accordance with the highest thermal regulation requirements: extreme low or high temperatures, for instance.

Producing energy thanks to innovative material is another major focus

- The **Phoster** (Photovoltaic Steel Roof) research project started in July 2013, developed in cooperation with the Centre de Recherches Métallurgiques in Liège, Belgium, consists in the development of highly efficient eco-designed building integrated photovoltaic (BI-PV) roofing element using innovative and greener manufacturing processes. This innovation, which endows steel with new properties, will be introduced to assist the evolution of the market towards a model that directly integrates renewable energy sources into buildings. A real technological breakthrough is made possible thanks to ArcelorMittal's expertise in metallurgy and steel structures, as well as its experience in vacuum coating technologies to endow steel with optoelectronic properties. The Phoster project, involving an integrated photovoltaic (BI-PV) roofing element, is part of this initiative.

ArcelorMittal has also developed a whole new range of innovative steel for European solar construction market – steel that will serve as construction material while simultaneously producing energy. From December 2015 ArcelorMittal moves into the second phase of the project consisting in making the first prototype of a new universal solar steel roof.

- **SolarWall®**: a path to achieving Europe's 2020 energy targets. In 2014, ArcelorMittal entered into a partnership with the world leader in solar air heating, Conserval Engineering, to manufacture SolarWall®, a technology that uses solar radiation to heat buildings while reducing a building's heating costs by up to 50%. This "superstar" technology, entirely made of steel, is installed as an additional skin on a building and produces up to 600 watts/ m2 of thermal energy per year, thus making a major contribution to meeting the EU's 2020 energy targets. SolarWall® is already being used in thousands of commercial, industrial and agricultural buildings around the world.

The challenge of lighter structures and use of materials

The starting point for this challenge is that construction that requires less material means less impact on the environment and less global warming.

- **Histar®** - high-strength steel for low-carbon construction
  ArcelorMittal's Histar® steel grade, developed in cooperation with the Centre de Recherches Métallurgiques in Liège, Belgium, is ahigh-strength steel that combines very high-yield strength, outstanding resistance to low temperatures and highly effective weldability, properties that were unavailable in older steel. Compared with basic steel, Histar® provides average weight reductions of 32% in steel columns and 19% in beams[1]. These characteristics satisfy the needs of the construction industry for light and economical structures that meet both safety and sustainability criteria. Histar® steels also reduce carbon dioxide (CO_2) emissions. Substituting Histar® for regular steel achieves a CO_2 reduction of around 30% in steel columns and around 20% in steel beams. The 50,000 tonnes of Histar® produced by ArcelorMittal each year represent a saving of 14,000 tonnes of CO_2, equivalent to the annual emissions of around 4,000 cars.

Three projects supported and supplied by ArcelorMittal around the world using Histar®:

- ArcelorMittal is supplying 4,200 tonnes of steel for the D2 Tower, the first steel-framed tower in Paris' La Défense business district, and one of the first steel-framed skyscrapers in France. Once completed, the skyscraper will stand 171m tall with 37 floors, and is set to become one of the Défense's most striking office buildings. The D2 Tower is part of a bigger urban renewal project underway in La Défense.
- For Euro 2016 in France, the city of Bordeaux will receive a new stadium designed by the renowned Swiss architectural practice Herzog & de Meuron. ArcelorMittal supplied steel sections and tubes for its structure.
- ArcelorMittal supplied 10,345 tonnes of steel for an ambitious project to construct a 57-story skyscraper in a record-breaking 19 days.

Broad Sustainable Building made headlines for constructing the high-rise in Changsha, China, at the equivalent rate of three stories per day, using a total of 10,345 tonnes of HISTAR® beams, supplied by ArcelorMittal Europe's long products plant in Differdange, Luxembourg.

Long-lasting, health friendly materials/coatings and "recyclable" products:

The question of toxic emissions and recycling is also a key topic and the use of pre-painted steel raises the question of the limitation of the environmental impact of material once the product is delivered. ArcelorMittal is involved in this segment with products such as:

- Clearing the air – **Estetic® BioAir** offers decorative health friendly coated steel for interior applications
  - 100% bio-based paint
  - With the lowest VOC emission for indoor product certified by the French A+ label for interior air quality
  - With equivalent performances versus petroleum based products
  - Following three years of painstaking development, ArcelorMittal is proud to launch Estetic® BioAir, abreakthrough pre-painted steel for interiors which releases almost no volatile organic compounds (VOC). Estetic® BioAir is a steel strip coated with a completely bio-sourced organic resin. The result is a finish which looks beautiful, and which is gentle on both the environment and the people who occupy the space.

- **Magnelis®** is ArcelorMittal's leading zinc-aluminium-magnesium coating which offers unbeatable corrosion resistance in even the harshest environments. It is now recognised as compliant with the new European standard EN 10346:2015. The European standard EN 10346, related to hot dip galvanized (HDG) products, was extended in July 2015 to include zinc-aluminum-magnesium coatings. Whenever norm compliance is a prerequisite, architects, engineers and construction companies can now propose Magnelis®. Magnelis® is the preferred material for an increasing number of applications, including solar support structures," light steel framing in construction, agricultural applications and road infrastructures.

In terms of cost-efficiency, Magnelis® provides the best alternative to galvanized products, as well as stainless and aluminum. Magnelis® coatings offers the possibility to drastically increase the corrosion performance or to offer with a strongly reduced coating layer the same level of corrosion resistance of standard galvanized products Magnelis® is also much better for the environment, notably demonstrating significantly reduced zinc runoff into the soil.