

Intelligent Manufacture, Connected by Molex

----- Bekaert Jiangyin chosed a Molex CES solution

The Company

Bekaert is a world market and technology leader in steel wire transformation and coating technologies. The Company's ambition is to be the preferred supplier for steel wire products and solutions by continually delivering superior value to customers worldwide. Bekaert (Euronext Brussels: BEKB) is a global company with almost 30,000 employees worldwide, its headquarters in Belgium and €4.4 billion in annual revenue. During the 1990s, Bekaert began investing in China and established production facilities, since when it has invested €1.4 billion in China and now owns 20 operational sites in 10 different cities.

The Industrial 4.0 Concept

Industrial 4.0 or the '4th Industrial Revolution' – not to be confused with the evolution of new industrial technology - combines industrial-related technology, sales and product experience to establish flexible, efficient and ergonomic intelligent plants, which are based on the integration of intelligent sensor control systems and the IOT (Internet of Things). Industrial 4.0 enables organizations to create an intelligent industrial world with perceptual consciousness, leveraging Big Data which directly generates product solutions for customers (demand customization); timely and accurate production or relocation of existing resources with consideration for conditions such as weather conditions, public transportation and market research data in its calculations ultimately reduces unnecessary costs and eliminates waste.

Project

As a leading company in steel wire transformation and coating technologies, Bekaert established the first Joint Venture plant in China in 1992. They introduced global production standards, modern technology and equipment into the Chinese market and were one of the first Belgian companies invested in China. Bekaert's leadership in China's manufacturing industry earned them a huge share of the market plus global recognition for advancing Industrial 4.0 practices. They have already started to upgrade plants realizing benefits from the intelligent control of production processes; optimization of resource allocation and improved production efficiency. Jiangyin Bekaert Alloy Material plant, which produces new alloy materials for semiconductor radio technologies, became the first plant to trial this concept in the China Bekaert Group.

The Challenges

- Until now, Molex Connected Enterprise Solutions' (CES) product deployments in China were primarily in commercial enterprise facilities such as hotels, hospitals or data centers - stable environments with respect to constant temperatures and humidity. However, at the Bekaert Jiangyin Alloy Material facility, the environment required that Molex product solutions operated in the workshop, where the harsh environment was not suitable for ordinary structured cabling products. For example, the electromagnetic environment in the workshop is very complex, the power system (lighting, power supply etc.) is far stronger than would be found in a normal commercial buildings. This presented significant performance challenges for the structured cabling.

Project Overview

- Intelligent industrial project – 'Industrial 4.0'
- 30,000 square meters workshop
- IP67-rated series products
- PowerCat 7 FTP cable and OS2 armored fiber cable
- MIIM™ Automated Infrastructure Management (AIM)



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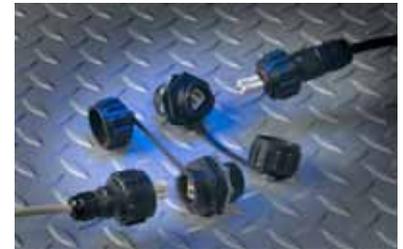
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- The workshop's high temperature and humidity, oil, dust and other contaminants can pollute and corrode network interfaces, which also impacts the reliability of data transmission networks.
- The huge size of the production equipment and distance between devices decreases the number of network outlets but increases the length of links in a very limited space, driving the need for a high-quality, high-performance structured cabling solutions.
- Industrial 4.0 objectives dictate greater IT intelligence gathering and the workshop's large footprint required increased IT operating efficiency – both of which supported the requirement for an Automated Infrastructure Management (AIM) system.
- In order to accommodate future goals for intelligent production, reserved bandwidth needed to be built into today's network.

The Challenges

In order to guarantee success at the Bekaert Alloy Material facility and to meet the requirements of this future-proof deployment, the Molex CES team travelled regularly between the Molex headquarters in Shanghai and the Bekaert plant in Jiangyin. This support team made up of Molex Greater China Product Manager William Zhou and Technical Manager Jim Liu actively engaged with the customer's production team to understand the existing environment and their objectives. This consultative approach, catering to unique customer requirements, meant that the Molex team was able to deliver a perfect solution to Bekaert, first time. The following product solution was designed and deployed:

1. Bekaert chose Molex PowerCat 7 S/FTP tinned copper braid plus individual pair aluminum shield structured copper cable because it could achieve an end-to-end, full link, 360 degree shielded function. This is a perfect solution for their complex electromagnetic interface environment. It is also a much better value than a Cat 7A solution, resulting in cost savings for the customer. The full range of IP67-rated products was utilized for the exposed network outlets in the workshop - wall plates, bottom boxes, patch cords, together with bayonet-style latch receptacle structured IP67-rated RJ45 modules. This deployment of IP 67-rated products seals and protects the entire link from oil and dust ingress.
2. Because of its good compression and tensile properties OS2 single mode armored fiber cable was used for the backbone. Each production device is equipped with a metal equipment box with a metal din rail inside and network modules mounted on the din rails to ensure accurate positioning. Armored cable eliminates the need for incremental grounding, which reduced installation costs and ensured safe link usage.
3. All links - including outlets and attached-devices - are real-time monitored by the Molex MIIM Automated Infrastructure Management (AIM) system, significantly reducing the workload on Bekaert's IT managers - a significant value, given the workshop's huge physical space coupled with Bekaert's commitment to building a solid foundation for future Industrial 4.0 intelligent production.
4. The PowerCat 7 copper cable installed in the workshop supports up to 1.2GHz bandwidth in a 100 meter link. To meet the customer's requirement for a future-proof solution, the backbone OS2 single mode fiber has the capability to support upgrades to 40G/100G/400G, which means that the network can easily be upgraded without the need to change or add new fiber or copper cables.



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Installation

After six months of intense construction Zhong Da Intelligence, the installer, successfully finished the Bekaert Alloy Material plant project. An overview of installed products in the 30,000 square meters workshop follows:

- 30km SM OS2 fiber backbone connecting the office building, data center and workshop IT equipment room
- 35km PowerCat 7 FTP copper cable connecting IT equipment and production devices
- 161 AP and exposed workshop monitor outlets are connected by IP 67-rated series products (wall plates, bottom boxes, patch cords and modules)
- 285 sets of din rails and PowerCat 6A shield modules are installed in metal equipment boxes connected to all production devices
- 4 MIIM scanners monitor 32 MIIM PowerCat 6A shielded patch panels and 32 MIIM fiber patch panels
- 731 PowerCat 6A shielded patch cords and 1050 fiber patch cords are installed in the IT equipment room

Zhong Da Intelligence' Project Manager, Mr. Ye, comments: "The Bekaert factory project is the first time our company has been involved in an industrial intelligent upgrade project. With the great help from Molex employees, especially Technical Manager Jim Liu and Project Manager William Zhou, we successfully finished the installation. This experience was a good example of Molex's outstanding product and service strength. We will keep our close relationship with Molex in the future and help other Bekaert factories successfully move to an Industrial 4.0 platform as well."

Conclusion

Molex Connected Enterprise Solutions' Greater China Sales Director, Timothy Lam, comments, "The Bekaert project is not only the first time we have helped a customer upgrade their facility following the Industrial 4.0 concept but it's also a great example of how Molex CES can provide consultative support services, as well as customized product design and manufacture to major organizations in the China market. Our custom-designed and produced din rails in metal equipment boxes have perfectly solved the module's installation and location challenges in a highly complex workshop environment. By successfully supporting the Bekaert project, we gained experience about Industrial 4.0 and discovered how this exciting new concept is perfectly complemented by Molex Connected Enterprise Solutions service capabilities. I believe that our service solutions will significantly improve the growth and evolution of Industrial 4.0 in the China market."

