

New packing line at Tarmac's Alfreton plant improves employee safety and production efficiency

In the ever-developing world of AAC production, the optimization of equipment stands out as a key factor in improving operations and product quality. This article explores the transformative journey of Tarmac (UK) partnering up with Aircrete, to upgrade Tarmac's existing cutting line in the factory in Alfreton in the United Kingdom. The newly implemented packing line introduces a more reliable packing concept that not only ensures the integrity of the products but also facilitates easier maintenance procedures. One of the key highlights is the significant improvement in the cycle time of packing, streamlining the entire production process. Careful planning and the use of Building Information Modelling (BIM) allowed Aircrete to smoothly install the new packing line within limited available space and very tight deadlines to ensure minimized factory downtime. This article unravels the background, scope, challenges and highlights of Tarmac packing line upgrade project, offering insights into the collaborative endeavors and technological strides of Aircrete's and Tarmac's cooperation.

Project background

In 2023, the journey to renovate the packing line of the Alfreton plant has begun with Tarmac approaching Aircrete to lead the project. The older Alfreton packing line was using the concept of a "crawler" system wherein a series of beams along the packing line moved back and forth, systematically lifting and transporting pallets with packs in incremental steps. Such system poses certain limitations within the production process. Firstly, it lacked the capability to process packs of AAC blocks on different pallets simultaneously, resulting in a sequential and time-consuming approach to pallet handling. Secondly, the pace of the machine struggled to attain the desired production capacity, impeding the ability to meet increasing demands of the market in a timely manner. Lastly, the maintenance requirements of the existing packing line were notably complex, posing challenges for routine upkeep and potentially causing downtime. These combined challenges emphasized the critical requirement for a more advanced, efficient and safer packing solution, leading to the exploration and subsequent adoption of the innovative Aircrete packing line.

Project scope and process description

The scope of the packing line upgrade project encompassed the installation of a new system within the existing factory, comprising of a steel pallets circular conveying system, guiding AAC blocks from

the existing infeed unloading manipulator through strapping, stretch hood foiling, ink jet label printing to the existing outfeed unloading manipulator. With the desired goal of having an optimized process of blocks packaging. The following paragraph outlines a more detailed description of the upgraded packing line.

After the infeed unloading manipulator places half of the autoclaved cake on the steel pallet at the beginning of the forward conveyor line (Figure 1), the pallet then advances to the pack splitter, a component responsible for separating the incoming half of the cake into two distinct packs. With precision, the splitter lifts one pack, moves it away from the other, and positions it on the same pallet, ensuring sufficient spacing for the subsequent stretch hood machine to ascend between the two packs (Figure 2). Following this, the two packs undergo strapping via an automatic horizontal strapping machine, enhancing the integrity and stability of the packaging. Subsequently, the pallet moves through the stretch-hood foiling process, carefully timed to stop when each pack is precisely underneath the foiling machine. This allowed for methodical foiling of each pack, ensuring optimal protection and presentation. As the pallet continues its forward movement, an ink jet printer imprints the essential information on both foiled packs. At the last stage of the forward conveyor line, where the pallet pauses, and both packs are swiftly removed by the outfeed unloading manipulator.



Fig. 1: Infeed grabbing manipulator putting a fresh half cake onto the packing line



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Fig. 2: Half cake split in packs

At the end of the forward conveyor line, the so-called crossing table transposes the pallet onto the return conveyor line through a brush that cleans the pallet of remaining AAC waste (Figure 3). The packing line design also incorporates an effective waste management system. Beneath the forward conveyor line lay a waste conveyor belt, strategically positioned to collect any AAC waste during pallet transportation and brushing. AAC waste falls onto the belt and is transported away to a waste collection bin. The contents of this bin could then potentially be recirculated into the production process, highlighting an efficient approach to waste utilization. Critical to the entire operation was the implementation of a new control system, leveraging Siemens PLC technology. The new control system orchestrates and synchronizes the intricate dance of machinery, ensuring a seamless and efficient packaging process.

Project challenges

The project encountered its fair share of challenges, with very limited available space within the existing building posing a significant hurdle. The con-

finied space was aptly addressed through the project team's extensive engineering experience and the application of BIM. The utilization of BIM proved instrumental in navigating the spatial constraints, preventing potential collisions and ensuring a seamless fit for the new packing line. Additionally, the project faced the rigorous constraint of a tight downtime requirement, demanding thorough planning and execution – the success of the project within these stringent timelines can be attributed to careful and experienced planning. The collaborative synergy of engineering expertise and technological solutions collectively triumphed over the dual challenges of limited space and tight downtime constraints.

Matt Jenkinson, Senior Operations Manager – Blocks, at Tarmac Building Products, commented: "I am very satisfied with yet another successful project of Aircrete and moreover, very proud of the project teams that worked together very effectively to install this upgrade in a very confined space and under extreme tight planning deadlines. With this upgrade, we remain on top of our game in today's dynamic and demanding market."



Fig. 3: Crossing table with the pallet brush

Future proof

The upgrade of the packing line in the Alfreton factory resulted in a substantial reduction in maintenance requirements, offering a more streamlined, safer and efficient operational model. The incorporation of entirely new control system enhance the precision and coordination throughout the packaging process. The featuring project also boasts an increase in the reliability and capacity of the packing line, attributing to ever-evolving market demands, making the Alfreton packing line future proof again.



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