

BORGWARNER EMISSIONS SYSTEMS

MATERIAL FLOW AND WAREHOUSE OPTIMIZATION

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BorgWarner (annual sales \$8.3B) is a global supplier of automotive parts. BorgWarner Emissions Systems is a business unit that produces a wide variety of products ranging from EGR Systems and Advanced Actuators to Thermostats. The plant in Dixon, IL — Emissions Systems' sole plant in the United States — currently operates 20 different product lines. The highly diverse product mix offers material flow and warehousing challenges. With recent business expansions and further growth expected, BorgWarner foresees challenges in daily operations due to the lack of floor space and standardization in its material flow and warehousing processes.

BorgWarner Emissions engaged the Tauber Institute in a 14-week project to assess current operations at the Dixon facility and to propose recommendations aimed at standardizing processes to reduce line-side inventory and material handler labor utilization and also to improve warehouse utilization.

The team initially studied the plant's current state and identified product line-specific constraints that would have to be taken into account during the solution development process. Warehousing efficiency was analyzed and compared with industry benchmarks. However, the lack of a common database with pertinent data for each component part hindered the current state analysis. Because such a database would be quintessential to deliver a robust and sustainable solution, the team began building a Plan for Every Part (PFEP) for over 1000 component parts. The team also built into the PFEP the ability to automate key strategic decisions relating to material flow and warehousing.

In order to optimize material flow and warehousing, a solution concept for an in-plant milk-run system that facilitates consumption-based periodic line-side replenishment was devised. A pilot was implemented on one of the departments to assess its potential impact and any unforeseen challenges. Subsequently, a scaled up solution was developed for the Dixon plant. The warehouse was reconfigured into separate supermarket and reserve storage zones with freshly introduced slotting strategies aimed at enhancing picking efficiency. Structural modifications in the warehouse created additional capacity of over 100 skid spaces leading to higher storage density. The team also proposed visual enhancements to the shop floor to aid in the smooth functioning of the proposed material flow and warehousing systems.

As a result of the Tauber team recommendations, line-side inventory could be reduced by 75%. The team was also able to generate 1800 sq.ft of additional floor space for potential new business and to improve labor utilization by 15% leading to possible financial benefits of \$500,000 annually. Further, the creation of standardized work for material handlers provides BorgWarner Emissions the flexibility to easily adapt its material flow and warehousing plan to changes in its existing business.