

Efficient Material Transport in Lean Production

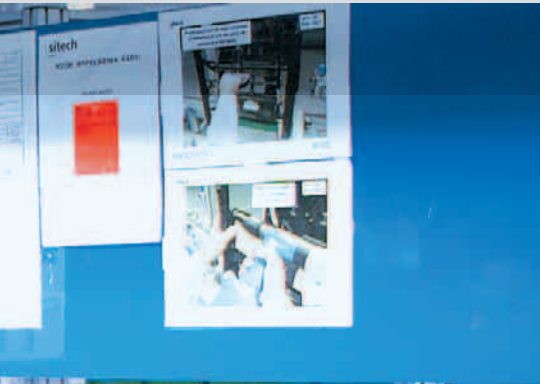
The Drive & Control Company



Avoiding waste with lean production

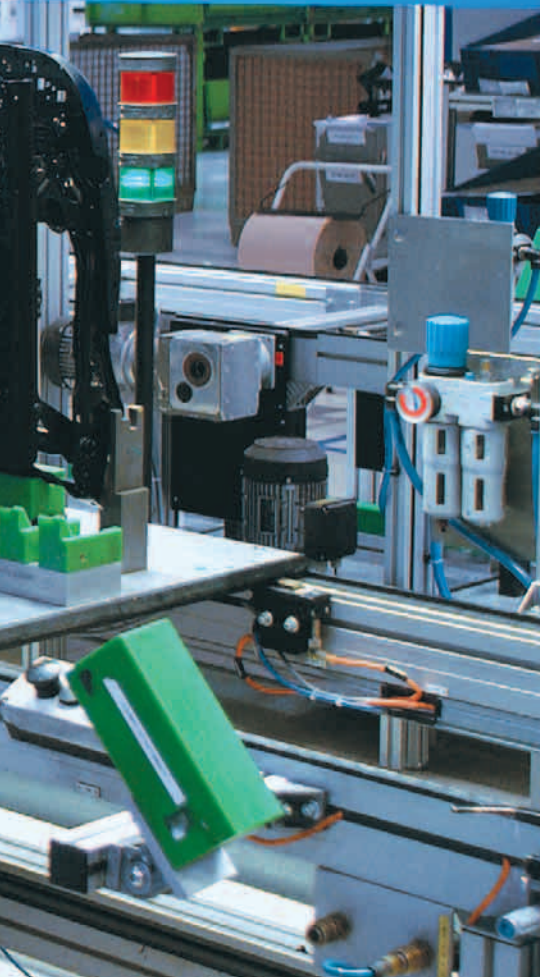
The global trend towards “lean production” continues to gain strength. This manufacturing concept provides an optimum framework for efficient, competitive production and is based on a philosophy of consistent waste avoidance.





How to become “lean”:

- Reduce inventory
- Eliminate downtime
- Reduce space requirements
- Avoid errors
- Avoid inefficient processes
- Avoid overproduction
- Shorten transport routes



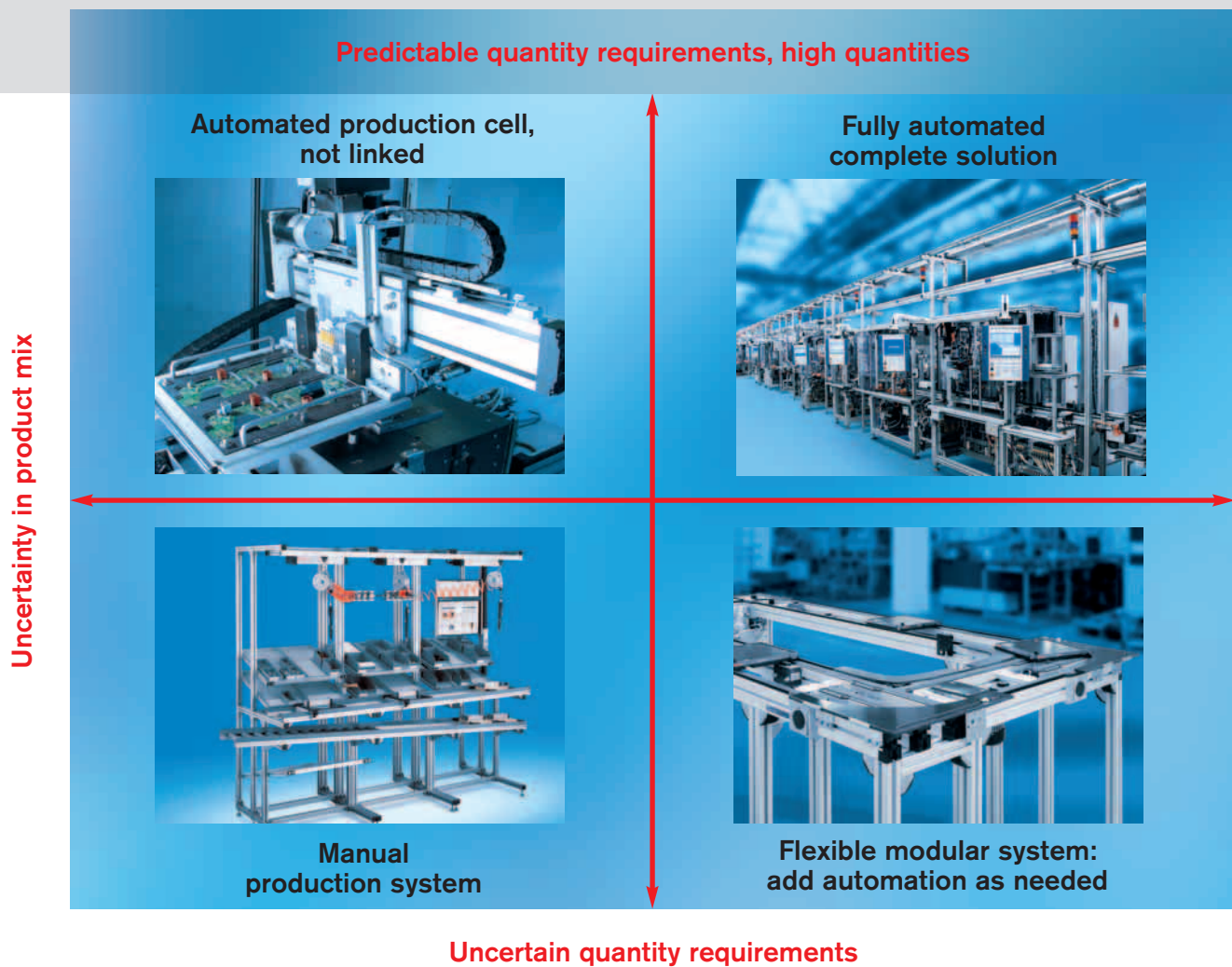
Lean production and automation: a contradiction in terms?

Today, lean production is usually associated with manual production systems. Such systems are currently in trend and are successfully integrated into numerous assembly processes and in various sectors of industry. Lean production does not, however, eliminate automated transport. Transferring parts manually can cause a drop in quality, for example, or a loss of valuable time resulting in an increase in per piece costs. Finding the most economically efficient transport solution depends on the following production factors:

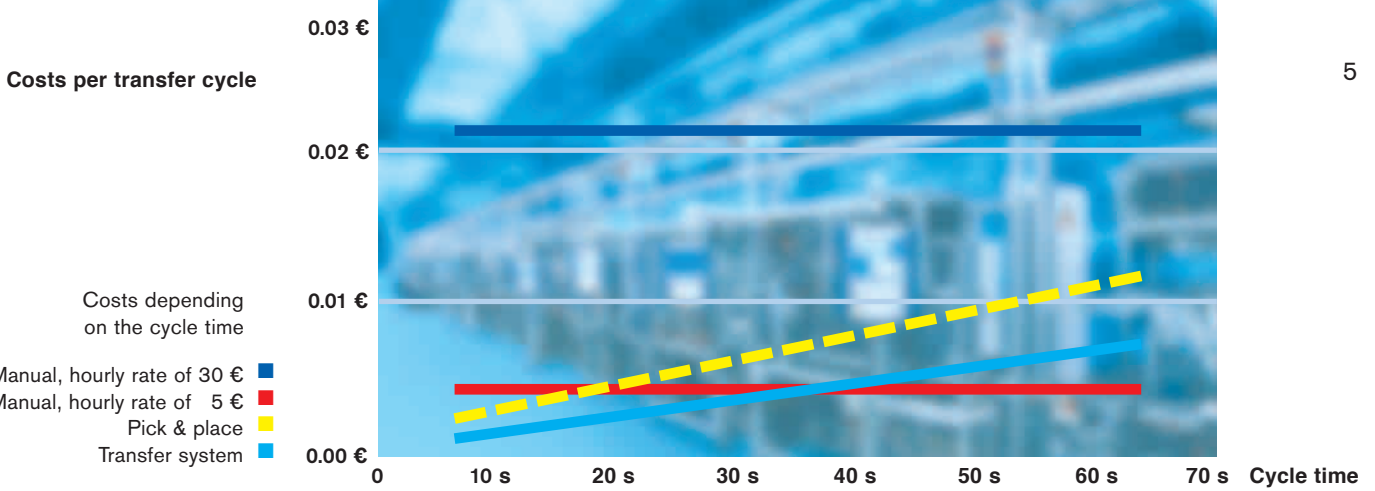
- Batch size and variety of models
- Production cycle time
- Part weight and size
- Takt time

When does automation make sense?

Automated production or, in other words, the automated transfer of parts, is always the right choice if one can cut costs and increase process reliability in comparison to a manual solution. The savings gained through automation must offset the higher investment costs. Of course, in many situations, the best solution is a combination of manual workstations linked by automatic systems. Finally, certain production processes are simply economically “unautomatable” – for example when quantities are too small or the product mix changes too frequently.



Selecting the most suitable production system: the decisive factors are product quantities and variants as well as the predictability of these requirements.



Efficient transport ensures economical production

Each production process involves materials or workpieces which are transported from point A to point B. However, as no value is added to the product during transport, investments in this part of the process chain are usually ruled out from the outset. This is a serious mistake: the manual forwarding of parts from one station to the next, as well as the coordination of individual production processes, represents a critical factor in terms of time and cost. Therefore, the efficiency of a transfer system is also a key factor in assessing the economic viability of a production system.

Cost comparison of individual systems

The diagram above compares the costs per transfer cycle of a manual material transfer system, a “pick & place” solution and an automated transfer system. For both of the automated solutions, the comparison assumes a straight-line depreciation over a period of five years and 3500 operating hours per year (two-shift operation).

Under these conditions, with a 10 kg part weight, the manual solution performs well with cycle times > 35 sec – however, this applies only to low-wage countries. Automated transfer systems clearly represent the most cost-effective solution when shorter cycle times are required.

Other advantages of automated transfer systems

Avoiding overproduction

- Transfer systems can be used to regulate production cycles, sup-

port lean production flow principles and ensure continuous production based on the volume of customer demand.

Accelerating production

- Reduces transfer and handling time in comparison to manual transport

Higher, more consistent product quality

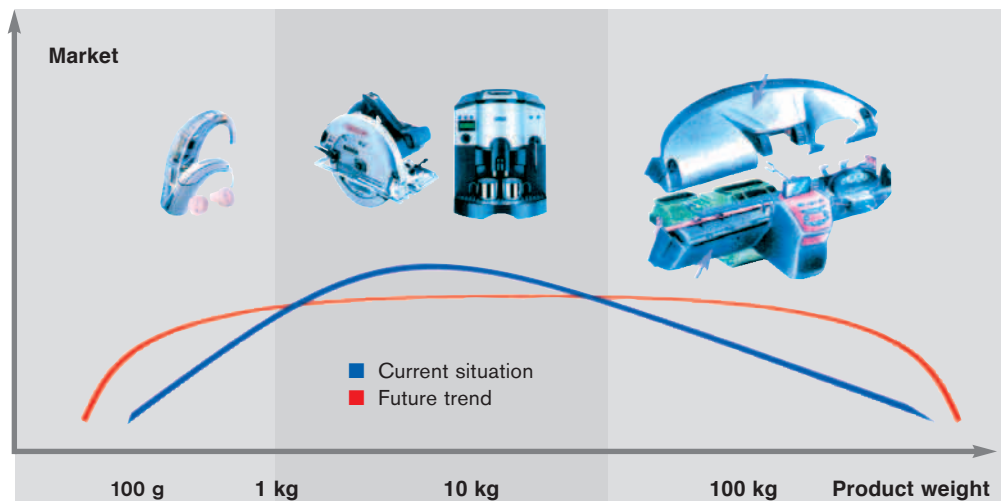
- Better protection of product surfaces and exact precision during parts processing, due to the stable position of the workpiece on the pallet

Flexible application range

- Able to transport extremely small, very sensitive, and even very large products safely
- Easily integrated into existing – even manual – production lines without difficulty
- Easy to expand or adapt to changing production requirements

Predictable product mix, long production cycle

Current manufacturing trends lean toward extremely small, lightweight products on the one hand, and toward heavy components and modules on the other. Automated transfer systems can be used effectively in both areas of production.



Rexroth – the “lean recipe” for your production

Regardless of industry segment, product, quantity, or manufacturing technique, Rexroth always offers the most efficient, most cost-effective solution for your production. Whether Manual Production Systems, or automated transfer or handling systems – we have the right products for every situation, and the relevant know-how to make your manufacturing leaner.



No two systems are the same

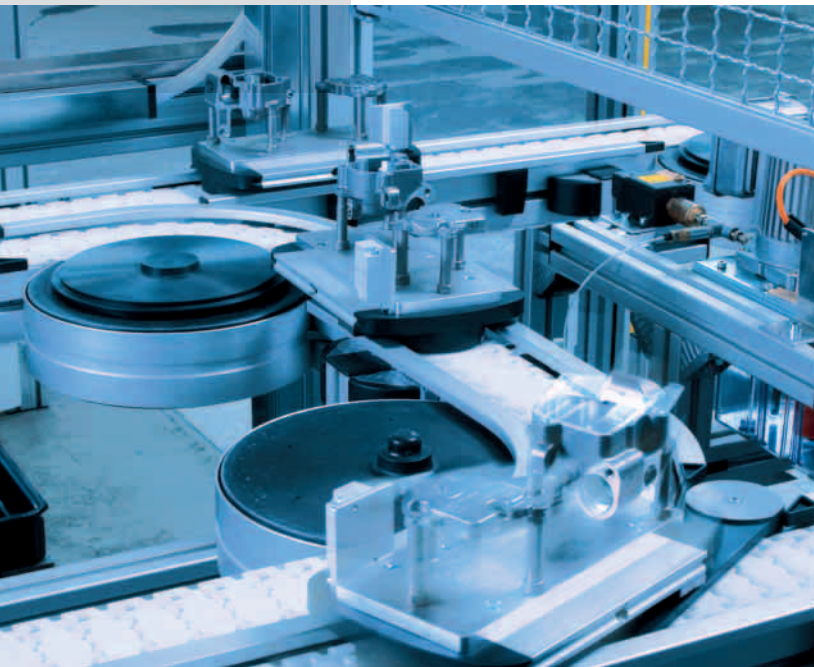
For the reasons mentioned above, there is no easy answer as to which is the most efficient transport solution to ensure lean production. A rash decision against automation without a careful evaluation of its

potential benefits risks causing waste – and this is exactly what lean production seeks to avoid. Individual factors throughout the production process must be considered carefully before a decision is made – whether in favor of

manual parts transport or automated parts forwarding via transfer or handling systems.

Rexroth – everything you need for lean production

We will gladly help you find the right system to meet all your requirements by offering completely neutral and objective support. At Rexroth, you can profit from our knowledge that goes far beyond single-system solutions,



and from a range of products which covers all aspects of lean production. Whether manual production or automatic transport systems – we have the solution you need.

Increasing levels of automation in production:
From manual workstations to interlinked workstations with EcoFlow, to the VarioFlow workpiece pallet system and the TS 2plus transfer system

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