



CONWIP: a simple method to improve planning

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Reduce WIP and improve your production planning with CONWIP

In a [previous article](#) we discussed the many advantages of limiting **Work In Progress** (WIP). Reducing WIP helps shorten and stabilise lead times in production. Stable lead times make production more predictable and planning simpler. In short, they increase overall efficiency. Less Work In Progress is achieved first of all by releasing fewer orders.

In this article we present two more advanced, card-based methods for limiting WIP: **Kanban** and **CONWIP**.

Kanban: one card per item in production

CONWIP stands for **CON**stant **W**ork **I**n **P**rogress and is inspired by the Japanese **Kanban system**. Kanban comes from the Japanese 'kan' (visual) and 'ban' (card or board). The system was developed by Taiichi Ohno at Toyota to increase efficiency.

The Kanban system controls the material flow by attaching **cards to the materials**. These cards contain at a minimum the necessary information about the material:

- Item number
- Quantity
- Internal or external supplier
- Consumption site
- etc.

The accompanying card is detached as soon as a material unit enters production. The card is then returned to the supplier or to the previous work centre. The arrival of a Kanban card is the signal for production or delivery of a new quantity of the item in question.

A big drawback is that the Kanban system is less suitable for production processes with more different products. As the product variety rises, the number of cards will also rise proportionally. That makes the system less efficient.

CONWIP: one card per amount of work

In a **CONWIP system** there is a **limit on the number of products** that are in the entire production process at the same time. This limit is **enforced with CONWIP cards**. Unlike Kanban cards, these cards are **not product-specific**, but represent an amount of work, corresponding to for example a number of items, a gutter box, a cart or a number of working hours. That means that the number of cards does not increase as more different products are produced.

When a product reaches the end of the production process, the accompanying CONWIP card is released and goes back to the first process step. Only then may a new order go into production.

The card itself does not determine which product will be produced; the planning list with orders is consulted for this. The CONWIP card released is allocated to the next order.

In other words, CONWIP is a '**pull system**'. Work orders are only started when there is demand and WIP is also available. The orders are 'pulled' on the basis of availability of production capacity, and not 'pushed' by the process. That ensures a constant and processable workflow. Furthermore it helps against waste, overproduction, waiting times and a needlessly high inventory.

The biggest difference between the two systems is the function of the cards. In Kanban the cards stand for the stock of materials and products. In CONWIP the cards follow the products through the process. If no CONWIP cards are available, no new orders can be started.

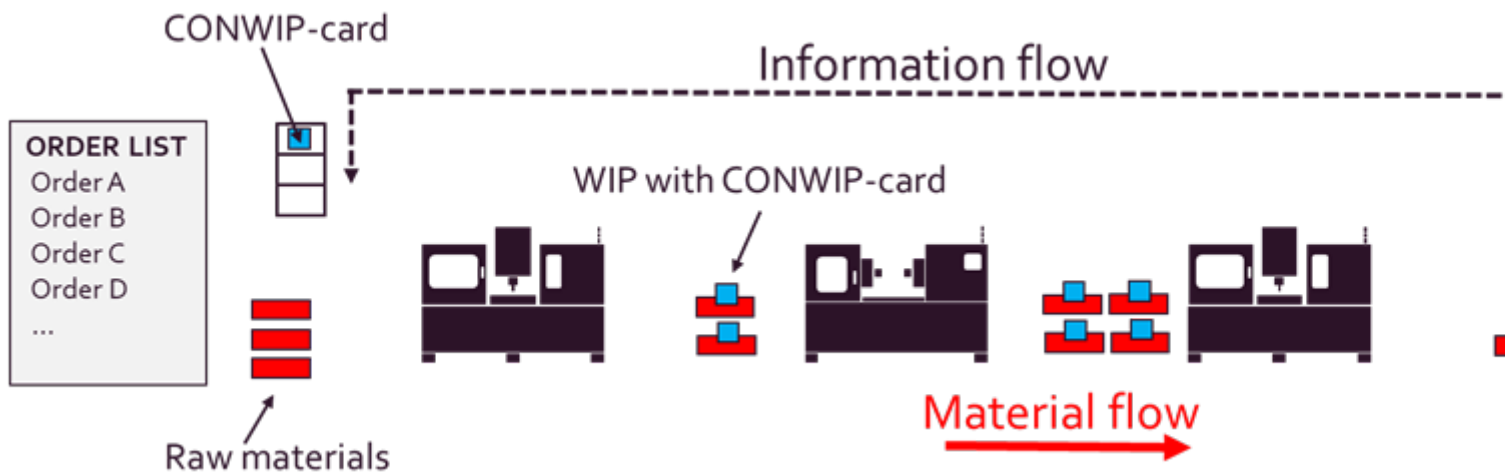


Figure 1: Production line with 4 stations with a CONWIP system and 8 blue CONWIP cards. Four units of work are at the third station, indicating that this station is the bottleneck.

The advantages of CONWIP

CONWIP offers many advantages compared to the traditional Kanban system:

- **Not product-specific and flexible**

Unlike Kanban cards, CONWIP cards are not linked to specific products. In Kanban an increase in product variety leads to a greater number of cards and consequently to more stock. This problem does not arise in CONWIP, which makes it much more flexible.

- **Automatic bottleneck detection and protection**

CONWIP cards move freely through the entire production flow and will naturally accumulate at the bottleneck. This makes the problem area visible immediately and at the same time ensures that adequate WIP is available to protect the work station from upstream disruptions such as machine failure. When the accumulation shifts, the WIP automatically moves with it. Thus CONWIP is a self-managing system that dynamically adapts to protect the bottleneck.

- **Easy implementation**

CONWIP is very easy to implement because the CONWIP cards can assume different forms. In fact, the system need not make use of physical cards per se. It can for example also be set up by limiting the number of material carts or pallets in circulation.

Start with CONWIP today, and share the success

CONWIP is the ideal method for optimising your process planning. You can implement the system immediately thanks to the free form of the cards. Limit the number of carts or print temporary cards, and explain the system to your employees. If everyone sees its advantages and follows the right principles, success is guaranteed, which everyone will appreciate.

Ready to improve efficiency in your manufacturing business?

Find out more about our expertise in Quick Response Manufacturing and how we can help you optimise production with less Work in Progress.

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