

Takt Time

Vorne Lean Briefs provide easy-to-understand introductions to key lean manufacturing concepts.

QUICK DEFINITION

Takt Time is the pace of production (e.g. manufacturing one piece every 34 seconds) that aligns production with customer demand. In other words, it is how fast you need to manufacture product in order to fill your customer orders. Takt Time is calculated as:

$$\text{Takt Time} = \text{Planned Production Time} / \text{Customer Demand}$$

BENEFITS

Integrating the use of Takt Time into your manufacturing operations will:

- Help you to achieve a steady and continuous flow of production.
- Eliminate the waste of overproduction by producing to actual customer demand.
- Encourage the development of standardized work instructions, promoting quality and efficiency.
- Enable you to set real-time targets for production that show operators exactly where their work output should be at any given point of time.
- Make it easier to establish what-if scenarios for customer demand based on flexible manning.

UNDERSTANDING TAKT TIME

The term Takt Time comes from the German word *Taktzeit*, which loosely translates to “rhythmic time” or “keeping a beat”, similar to the ticking of a metronome or the movement of a conductor’s baton. Takt Time is a key concept in [lean manufacturing](#). It is the heartbeat of a lean organization – matching actual production to customer demand. It is not a goal to be surpassed, but rather a target for which to aim:

- Producing faster than Takt Time results in overproduction – the most fundamental form of waste.
- Producing slower than Takt Time results in bottlenecks – and customer orders that may not be filled on time.

There are two different yet related ways to use Takt Time. Both are valid and useful – they simply look at customer demand from different perspectives:

- Planning Perspective: Use Takt Time to set goals for [kaizen](#) activities that focus on making improvements to your production process to ensure that it can meet customer demand.
- Manufacturing Perspective: Use Takt Time to drive a real-time target for production.

The following is a simple example of a Takt Time calculation. To perform the calculation, two pieces of information are needed:

- What is your planned production time? Typically this is the shift length less planned downtime.
- What is the customer demand that needs to be met during the planned production time?

Item	Data and Calculations
Shift Length (A)	8 hours (480 minutes)
Breaks (B)	2 short x 15 minutes plus one meal x 30 minutes = 60 minutes
Planned Production Time (C)	A - B = 480 minutes - 60 minutes = 420 minutes
Customer Demand (D)	400 pieces
Takt Time	C / D = 420 minutes / 400 pieces = 1.05 minutes / piece

With this example, we know that if we produce one piece every 1.05 minutes (or 63 seconds), our production will be aligned with customer demand.

ADVANCED TOPICS

Comparing Takt Time, Cycle Time, and Ideal Cycle Time

A common point of confusion is the difference between Takt Time, Cycle Time and Ideal Cycle Time. They all represent the time to produce a piece – so how do they differ?

- Takt Time is how often a piece must be produced to meet customer demand. It is often used to pace a production line, and it is a calculated number.
- Cycle Time is the actual time to produce one piece. It is often used to gain an understanding of variations in production, and it is a measured number.
- Ideal Cycle Time is the theoretical fastest possible time to produce one piece. It is used in the calculation of [OEE](#), and it is usually derived from the “nameplate capacity” of a machine or through estimation by an industrial engineer.

Takt Time for the Plant Floor

A common use of Takt Time is to pace a production line. Takt Time can be used to drive a Target Counter, such that each time the Takt Time elapses, the Target Count increments. Typically, the Target Count is shown alongside the Actual Count (the number of good pieces that have been produced) and the Efficiency (the ratio of Actual Count to Target Count).

Visualizing a target can be as simple as a white board that is manually updated once per hour or as sophisticated as an electronic scoreboard that automatically updates in real time. [Visual feedback](#) can be a very powerful motivator for operators, especially when it is in straightforward and understandable terms such as Target/Actual/Efficiency.

Standardized Work

Standardized work refers to instructions that capture the best practices for manufacturing a given item in an efficient and highly repeatable manner. It is important to note that through [kaizen](#) these best practices are likely to continue to improve over time.

Standardized work helps to eliminate unwanted variability in the manufacturing process, which diminishes the opportunity for defects to be created. It also results in a much more consistent “per piece” manufacturing time (i.e. standardized work also helps eliminate variability in manufacturing time). Thus, in most cases standardized work instructions will have an associated Takt Time.

As touched on earlier, Takt Time can serve as a goal for kaizen activities that focus on making improvements to the production process. The results of these activities should ultimately be captured in standardized work instructions.

Flexible Manning

Customer demand rarely holds steady – it often fluctuates in unpredictable ways (especially over the short term). One way to cope with this is flexible manning (other ways include overtime and inventory buffers). With flexible manning, work processes and the associated standardized work instructions are designed to run with a variable numbers of operators.

- When customer demand is high, Takt Time is low, and more operators are utilized.
- When customer demand is low, Takt Time is high, and fewer operators are utilized. This frees up operators to work on other processes or on improvement initiatives.

COMMENTS OR QUESTIONS?

We welcome your comments and questions. Contact us at: lean@vorne.com.