

Quick Changeover is used to reduce changeover and set up times, release additional production capacity and allow product ranges to be cycled through more often to reduce inventory holding and maintain short lead times for customers.

The Explanation

Quick Changeover and set up of machines is key to efficient manufacturing. Often, changing over machines is seen as a burden by Shift Leaders and Operators, but it is essential to successful manufacturing.

Avoiding changeovers and set-ups or taking too long to do them results in:

- Big batch production not aligned with customer buying patterns
- Additional inventory that has to be funded
- “Cherry picking” products from the production plan
- Longer lead times to customer
- An inability to respond to unexpected orders
- Wasted production capacity

SMED - A Single Minute Exchange of Die, a concept used to reduce change-over and set-up times.

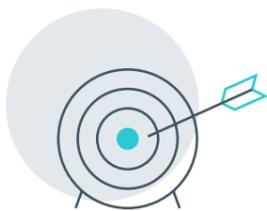
A SMED approach focuses on changeovers to compress them and will usually reduce the time taken by at least 50%. SMED defines the length of the changeover time as the “time from the last good part/product off the machine to the time for the first good part/product off the machine”.

The focus of SMED is to capture how changeovers are done now, and categorise the individual activities as:

- Internal where the machine has to be stopped
- External where the machine can still be running and are effectively prepared for the changeover

What investment is needed to start the analysis?

DIFFICULTY



Medium

It requires some reading around the subject and a structured approach

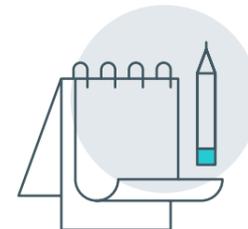
ACTIVITY



Team

Best results come from a team of engineers and assembly operators

EQUIPMENT

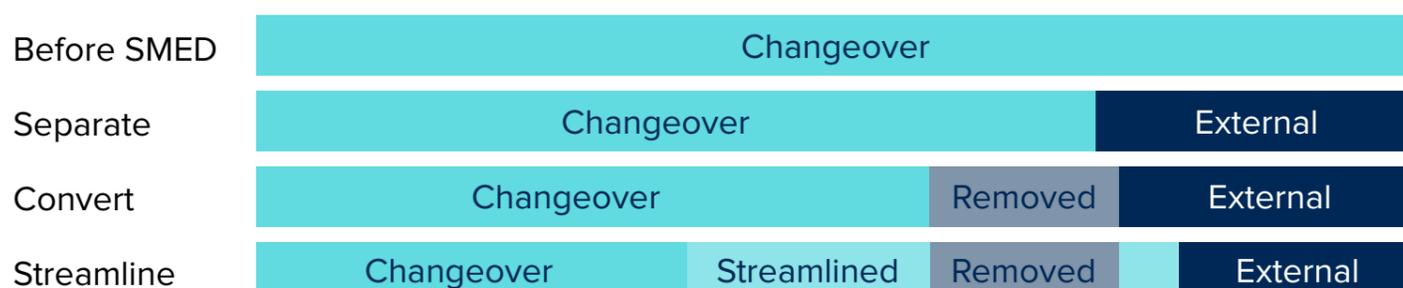


Tools

Potential investment in hand tools, jigs and fixtures

What action should I take?

The challenge is to compress the times for all activities and to convert Internal activities into External activities. This means that the machine is stopped for the shortest amount of time. In the diagram, the **blue** section is the Internal time. Using SMED, the Internal time is separated into Internal and External time. Some activities are then removed altogether.



How to make improvements?

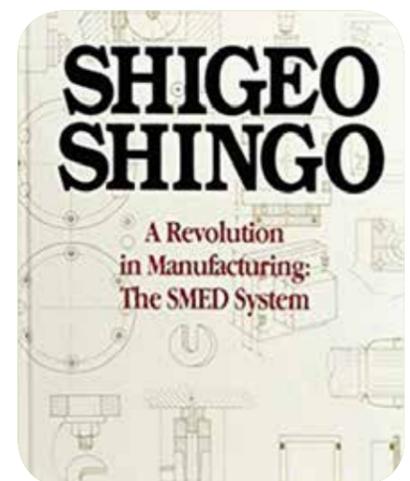
1. Gather together a group of engineers and production operators
2. Explain the concepts behind SMED systems
3. Observe and record a machine changeover
4. Identify the individual activities and how long each one takes
5. Categorise them as internal or external activities
6. Run the changeover again and record it; doing the external tasks in advance so the machine can be kept running as long as possible
7. Calculate the reduction in changeover time
8. Document the new process so that people can be trained how to do it.

Recommended reading



A Revolution in Manufacturing – a book by Shigeo Shingo.
The most complete and detailed instructions for transforming a manufacturing environment in ways that will speed up production and make small lot inventories feasible.

Shingo, S. (1985) *A Revolution in Manufacturing: The SMED System*. Cambridge.
[ISBN: 9780915299034]



Reducing Changeover Time with SMED

<https://www.youtube.com/watch?v=qoZpnnZbSak>

Glossary

Changeover and Set Up – the activities required to change production from one part/product to another

SMED – Single Minute Exchange of Die, a concept used to reduce change-over/set-up times created by Shigeo Shingo at the Toyota Motor Company.

For more advice, case studies and additional factsheets visit:
www.businessgrowthhub.com/manufacturing