

The rising number of variants is a major challenge for the planning of efficient flow production line systems. In such flow production lines with a fixed cycle time it becomes more and more difficult to achieve an efficient production. The different assembly processes of the product variants cause varying processing times at the stations of the assembly line. In order to achieve an efficient production process waiting times as well as work overloads at the stations of the assembly line have to be minimized. By partitioning the assembly line system, structures can be developed, that allow lower overall production costs. In this work methods and algorithms are presented that support the planning of efficient line systems. Because of the different functional principle specific approaches are used for assembly lines with open station and closed station boarders. The planning result has a considerable impact on the production conditions for the life time of the production system. For that reason future adaptations have to be taken into account during the planning. Therefore a method is presented that supports the adaptation planning of multi-level assembly systems under uncertain market demands.