flexis Reference Sequencing

flexis optimizes order planning in the component plant – with flexis Reference Sequencing on the way to inventory free supply chain

The order planning process in aggregate and component plants is subject to a growing trend towards reengineering. Traditional supply chains with large inventory buffers will soon be a thing of the past. The transition to pull control, just-in-sequence processes, and trailer yard concepts means that, for the aggregate plant, planning has to align itself with customer plants. Assembly restrictions within the plant, however, have to be taken into account as well.

flexis Reference Sequencing takes into account different granularities on the customer side as well as different transport times, cycle times in assembly and pre-assembly. The result is a production program which is optimized regarding human-resources allocation and assembly restrictions, and which, at the same time, enables inventory free delivery towards customers. A special challenge on the way to the inventory free supply chain lies in the consolidation of different demand granularities. Aggregate plants need to be tied to customer plants. Some customers of typical aggregate plants, however, send only daily or weekly orders. This is true for oversees customers, but also for CDK and spare part demands.

A clear picture of different supply concepts, taking into consideration planning restrictions, is essential. Planning reliability, which has been safeguarded so far by buffers, has to be created by a solution like flexis Reference Sequencing by balancing internal and external demands, which are necessary for smooth performance along the supply chain.

This makes an exact calculation of required dates for different orders indispensable. In doing so, different process and delivery dates as well as different working time models have to be taken into account.

Advantages of flexis Reference Sequencing

flexis Reference Sequencing generates a cumulative primary demand time line form the different demands and delivery times, which serves as a basis for internal planning in the plant. Internal specifications like planning restrictions can be modeled intuitively and feature specific.

Already at the time of the assembly start, different process chains are taken into account according to their production cycle and work schedule. flexis Reference Sequencing has a
scheduling functionality to guarantee an accurate demand calculation. Using backward scheduling, the latest possible start of assembly is calculated based on customer demand and also taking into account whether an order has a short or long cycle time.

Such accurate and forward-looking planning enables sequenced trailer loading, as well as decoupled supply for long transport times.

**flexis Reference Sequencing** offers the possibility to manually revise the optimized assembly sequence. The assembly processes in aggregate plants, like in vehicle assembly plants, are complete systems, which require flexible reactions. Changes and adjustments of restrictions can be done in **flexis Reference Sequencing** with minor effort.

The rules, which are used in creating the assembly sequence are also available for planning revisions. When revising the plan the total optimum is still in the foreground. The goal is to create an alternative without rule violations. In addition, it is essential to use the assembly lines optimally and at full capacity with regards to manpower and other resources. **flexis Reference Sequencing** creates a balanced plan based on the target assembly times per aggregate and assembly station or on the order attributes (e.g. 12 cylinders).

Despite a high complexity of specifications **flexis Reference Sequencing** guarantees a standardized workflow, high speed in solution finding, and planning stability.
### Advantages

**Productivity increase on the assembly line and in upstream and downstream regions**

Flexis Reference Sequencing creates an optimized, buildable, and reproducible production plan. All steps are transparent for the planner. Bottlenecks and troubleshooting measures in the assembly and in upstream and downstream regions are avoided. Smooth operation of the entire process leads to noticeable time and cost savings combined with higher productivity in production and logistics.

**Inbound and outbound cost savings**

Flexis Reference Sequencing creates an optimized plan, with regards to capital commitment and handling costs. This is done through the detailed display of plant order processes, taking into account inbound and outbound restrictions (e.g. sequence position requirements of customers).

This way JIS supply chains can be built in high variance areas without an inventory layer towards the customer. Trailer yard concepts are thereby sufficient and buffer stock is no longer necessary.

**Synergy thanks to efficient sequencing**

Flexis Reference Sequencing optimizes through structured and efficient processing of the planning process. By means of integrated restriction figures the planner can to a large extend forego manual rework. The algorithm efficiency during sequencing speeds up the process effectively.

This way planning divisions can be pooled and synergies can be tapped (made accessible, unlocked).

### Capabilities

- **Reduction of work in progress and relinquishing finished product stock**
  
The accurate interfacing with customer demand and the possibility to inventory free integration into the supplier network creates the necessary conditions for being able to relinquish decoupling stock in shipping. This reduces funding commitment in the plant, shortens cycle times, and reduces logistics and handling costs.

- **Productivity increase by improved balancing of work content**
  
  Equal distribution of work content through line balancing on the basis of assembly times per aggregate enables the reduction of man-power demand or an output increase. In reference installations increases of 2% to 5% were achieved over a period of 12 to 36 months.

- **Reduction of buffers and stock along the supply chain**
  
  The generation of consistent and balanced production programs with regards to capacity restrictions reduces the need for lasting flexibility and stock inbound as well. This applies to production process capacity in the aggregate plant itself as well as in the area of transport and supply chains. Steady demand avoids a surging of fluctuations across the supply chain, the so called bull-whip effect. This has lasting implications for parts costs.
The flexis AG Solutions

For the past ten years, flexis AG has been a supplier of solutions as well as a contact for the automotive industry and their suppliers. flexis develops and implements based on standard modules of customer-oriented solutions, which facilitates lean customer order processes as well as continuous and integrated sales and production planning. Based on the Toyota Production System, flexis supports the planning and controlling of synchronized production processes and their supply using the pull principle.

The solutions have been successfully in use for many years at international businesses such as Audi, Daimler and MAN. From Sales Planning to Sequencing in the short-term horizon, flexis offers an integrated solution spectrum for optimizing the customer order process.

The strengths of flexis AG are as follows:

- **We speak your language:** process know-how from project planning to implementation.
- **We orientate ourselves to your requirements:** from a modular concept of flexis solutions to a step-by-step rollout.
- **Our solutions are proven and tested through customer application:** we offer standardized “best of breed” solution modules.
- **The process defines the software:** from customizability of the workflows and optimization techniques to complete customer orientation when implementing the processes.
- **Low project costs and quick implementations:** lean processes from design to Go-Live.
- **Easy integration with existing system environments:** open interface to e.g. SAP/ERP.

With offices in Japan, Canada and USA, we support our customers worldwide during the successful implementation of innovative solutions for the order handling process.

**Germany**
flexis AG
Schockenriedstraße 46
D-70565 Stuttgart
Phone: +49 711 782380-0
Fax: +49 711 782380-78
e-mail: info@flexis.de

**Japan**
flexis K.K.
the SOHO 407
2-7-4 Aomi, Koto-Ku
135-0064 Tokyo - Japan
Phone: +81 3 4577 7640
Fax: +81 3 3529 3637
e-mail: info@flexis.jp

**Canada**
flexis Information Systems, Inc.
438 University Avenue, Suite 1802
Toronto, Ontario, M5G 2K8, Canada
Phone: +1 416 6426822
Fax: +1 416 2608496
e-mail: info@flexis.ca

**USA**
flexis North America, Inc.
110 Polaris Parkway, Suite 305
Westerville, OH 43082-7053, USA
Phone: +1 614 839 9989
Fax: +1 614 392 2555
e-mail: info@flexis.com