

### Masa 4.0 Solutions

# Masa API Webinar Handout

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# Masa API: Your interface between block production and ERP systems

Technical developments are steadily progressing, everything is becoming more networked, and a high degree of automation is entering into our life.

ERP systems are becoming increasingly important in the concrete block industry, which stems from a growing product portfoilio, commission-related production, warehouse management and logistics control, as well as order-related cost transparency. There are many other benefits that speak to the use of such a system in the block production industry.

Today, the integration of production data into an ERP system as well as data from the ERP system into the plant involves a huge amount of manual data entry. In order to eliminate this potential source of error and to automate the processes, Masa offers the possibility of generating a comprehensive data exchange between the database of the block making plant and the customer's ERP system of choice by means of a programming interface. This transfer of data is secured by an authentication principle. Once the Masa API has been implemented, you will be able to display comprehensive efficiency data of manufacturing processes as well as current inventory levels in the curing chamber plant, and precise tracking of material consumption in the ERP system in real time.

Masa API also allows you to significantly simplify master data and order management by automatically exchanging data from your ERP system with the plant control system. After creating a raw material, order, recipe or other data point, this information is automatically transferred to the manufacturing plant. A previously manual and error-prone data exchange is therefore no longer necessary.



### Enterprise resource planning and concrete block production

ERP referes to the planning of a companies resources. By means of an ERP system, operational resources are to be planned, controlled, and managed efficiently in a form that is tailored to a customers requirements and time-optimized. A permanent data exchange takes place between the production systems and the ERP system:

#### Order processing

In order processing, a distinction is made between sales orders and production orders. The sales order is created in the ERP system and can trigger several production orders or further processes. Each order is assigned an identification number.

#### **Production planning**

In production planning, the orders directly determine the material and personnel demands. They also influence the processing time in conjunction with production scheduling and the expected time for the final products coming off the line onto the storage patio.

#### Material and operating resources

The master data maintenance of material and operating resources is carried out in the ERP system. This is where the availability of raw materials and other consumables, such as packaging materials or transport pallets, is controlled and monitored.

#### Availability of personnel

The required qualifications and availability of personnel to fulfill an order is checked.

#### Inventory management

In the section of inventory management, the current stock level is taken into consideration. A prompt for additional resources are passed onto material planning as required.

#### Information- and communication technology

The document flow is coordinated via IT. In the case of several production sites, internal coordination also plays a major role, e.g. in order to make the best possible use of multiple site resources.

#### Accounting

The accounting is supplied with the corresponding data from the ERP system for precise cost accounting, controlling, and auditing, among other functions.

### ERP systems are also increasingly used in the concrete block making production. Some main benefits include:

#### Growing product diversity

Given the market constantly demanding new developments, product properties such as sealing, colour blending, and a growing range of moulds, all which lead to an increased administrative effort.

Simultaneously well known products must continue to be available. In addition, there are more and more corresponding product lines, e.g. for surface coverings and wall elements.

#### **Commission-related production**

Small quantities are often requested, which must be delivered as quickly as possible.

#### Warehouse management and logistics

Is the availability of my product in stock? The answer can be determined quickly and easily by an ERP system.

#### Order-related cost transparency

Also, order-related cost awareness should not be neglected. By means of cost monitoring per order, the processing time, the scheduling of employees, the availability or procurement of material and many other data inputs can be monitored in real time.



# Prerequisites for communication between your ERP system and block making plant

#### Data flow in the production plant

Data records created at various points in the production process are stored with the order ID and transported digitally as a data telegram throughout the entire process.

#### 1. Dosing and mixing plant

- Order ID
- Recipe data for raw materials, cement,...
- Main or face mix
- Time stamp

#### 2. Machine and wet side

- Order ID
- Recipe data
- Product information
- Mould data
- Time stamp (when produced)
- Information on quality control; Coating; Washing out

#### 3. Finger car and curing

- Curing time according to product parameters
- Storage place
- Time stamp of storage
- Time stamp of removal from storage

#### 4. Dry side, cubing and cube transport

- Order ID
- Processing information
- Packaging information
- Data for labels



# The Masa API: Basics and network structure

The data transfer shown on the previous page forms the basis for the transfer of data into an ERP system. The data transfer is realized by a so-called API (Application Programming Interface).

All production-related data from the plant environment can be made available and evaluated via readily programmed modules. The API is to be understood as a collection of pre-programmed functions that make specified data retrievable. These can be called upon by the customer's ERP system.

Masa programs the visualization systems and user interfaces with our own application developers. This enables the system to access and evaluate all data generated in the plant. Furthermore, the system is created to adapt to customer needs.

#### Network structure

The major priority is given to the availability and function of the entire plant. Even if the connection to the ERP system should be disrupted, no data will be lost and the plant is able to continue production. For this purpose, the Masa system uses its own subnet for the plant control system which gives the possibility to buffer data.

The diagram below shows an example of a network structure and describes how the plant is decoupled via a separate switch which provides the connection to the outside world. For further security, the access to the plant control is protected by a secure Remote Ethernet Device with firewall.



### The Masa API: Basic elements

#### The four basic elements of the API are

- secure data transfer
- master data synchronization
- order management
- and production data exchange.

#### Secure data transfer

To ensure the security of customer data, even beyond local network boundaries, Masa has integrated an authentication mechanism.

This is based on a token transfer method. The authentication server generates a new token with each request. In this configuration, data can only be exchanged in both directions after the communication channel has been verified.

#### Master data synchronization

Data of material components, mix recipes, and products are created as master data in the ERP system.

Master data is generated in the ERP system as the leading system and is assigned an ID there.

For example, a raw material newly created in the ERP system; followed by creating a listing in the database of the plant automatically via the API. The raw material also receives an ID there. These two IDs are assigned to each other by cross-references.

Only by this assignment the consumption can be recorded later in the ERP system. This process is then applied in a corresponding manner for the products, the mixtures and orders.



#### **Order management**

By connecting the ERP system via Masa API, the order is created in the ERP system and automatically transferred – the manual creation is therefore no longer necessary.

The order is the central point to record consumption values and to carry out a corresponding order costing in the ERP system. A data telegram runs with every production pallet that enables a reference to the order at every single position in the block making plant.

#### Exchange of production data

The exchange of production data is event driven. Such an event can be a new order, a dosed material, a new product or a shift change. Thus, corresponding evaluations for shift, product, or order reference can be generated in the ERP system.

In addition, it is possible to transfer the data in a time triggered manner in order to receive faster updates, which may be required by your ERP system.

The data structures have been developed in cooperation with the company OGS, an experienced manufacturer of ERP systems in the building materials industry.

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### The Masa API: Our experts

#### Our experts in the webinar



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The Masa API is an excellent way of linking your Masa Block Making Plant to your ERP system via a programming interface.

Would you like to use the Masa API as a toolbox for the data transfer of master data as well as consumption and production figures? Please contact us if you have any questions or require further information about the solutions presented in the webinar. Please contact us!

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