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Press Release

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Modular elements for automation technology - the dynamism is in the system

Industrial kit systems for engineering applications are, today, a tried-and-tested base product in common use. The components that make up these kits may not (yet) count as DIN standard parts, but many of the components are treated by the users as if they were. However, there are considerable differences and, apart from numerous geometries, these are most evident in the value of the application to the user.

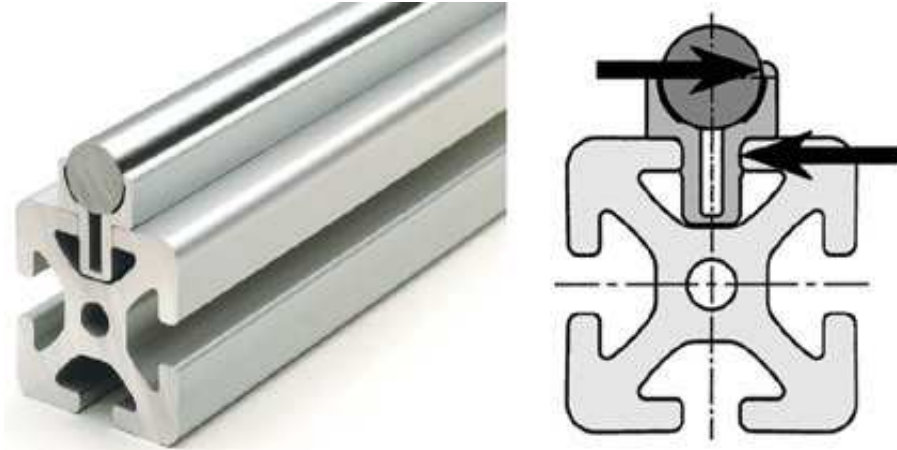
The first industrial applications of the aluminium profile kits were simple frame structures for machines and transfer systems. But the flexibility of the system soon convinced the market. The basic elements soon took on the nature of a protective housing simply by the addition of a few bolt-on parts and additional functionality was easily integrated. This added functionality has now developed into a fully-fledged range of products enabling complex machines and automated systems to be constructed "out of the box". As pioneers of the MB Building Kit System, item in particular has always concentrated on developing its Building Kit System in response to customers' requirements. The logical consequence is that this Building Kit System is now the all-round solution for production machinery designers. It fulfils all the requirements for economical automation.

The benefits of the item MB Building Kit System for constructing automation systems was recognised early on. For this purpose, special system components were developed: the Dynamic Elements product group includes everything necessary to build Linear Guides and mechanical Drives. All the components are designed to match a specific grid size which means they can be used together with a minimum amount of machining. This basic principle of the system's philosophy can be measured by customers in simple cash terms. As a result, time-consuming and costly preparation work, for example milling over the assembly areas of guides or machining the connections between shafts and multi-spline hubs on drives, are simply not required.

Always straightforward: the components for Linear Guides

The need for dynamic elements is evident very early on in engineering: wherever linear movements that exceed the simple occasional opening and closing of a sliding door are to be carried out in quick succession, with high precision and reliably, Linear Guides are the engineer's first choice. And if these Linear Guides can be integrated into the existing machine frame with remarkably little effort, it soon becomes clear that there almost no limit to the cost-saving applications of this system. It is, for example, possible to press-fit the Shaft Clamp Profiles into the

existing Grooves of the Profiles for use with Guide Shafts with no machining required at all. Here, they are permanently locked in place by the Shafts themselves – an item patent which is both simple and remarkably effective.



(Figure: Bild_1.tif)

Mounted on these Shafts are the Rollers which are made up into off-the-shelf Bearing Units based on Profiles and using the tried-and-tested Fastening Elements to form slides or carriages. A key advantage of this modular arrangement is that, independent of the size of the Support Profile, a Linear Guide can be attached and will fit. Seen another way, depending on the load on the Guides, it is possible to develop a Guide system that is designed to withstand those loads. Providing for larger "flying" sections or adding more Rollers are never an obstacle in a Modular Building Kit System.



(Figure: Bild_1.tif)

The Roller Guides may well have been the first Dynamic Elements in item's MB Building Kit System, but they did not stay alone for long. Today, customers can choose from five different types of Linear Guides. Depending on the exact application, there are special C-Rail Guides, Ball-Bearing Guide Bush sets and Linear Guide Systems with recirculating linear ball bearings. Each has its own specific advantages but all have in common their adherence to the modular philosophy which guarantees the customer the greatest possible degree of usefulness and, at the same time, flexibility. In this way, production systems can always maintain state-of-the-art status using item dynamic elements. Even short-notice modifications to a particular model can be easily accommodated thanks to the universal fitting systems. Conversion does not involve rebuilding the entire

system - the components can be reused. In all the components, the points of connection with the Profile Groove of the System provide optimum preconditions for attaching in all directions and this also facilitates setting and maintenance work. Numerous sophisticated "goodies" have been built into all item's Linear Guides. These range from play-free setting of the C Rail Guides and the remarkably compact fitting of Ball-Bearing Guide Bushes in the hollow spaces within the Profiles through to patented clamping systems for the Guide Rails and Linear Guide Systems and many others.



(Figure: Bild_III.tif)



(Figure: Bild_IV.tif)

Intelligent, customer-friendly solutions which prove that it is not only the adaptation of existing add-on components to match an existing system that has been so successful but the full integration of genuinely modular system components.

Moving things with Drive: mechanical Drive Elements

Linear Guides to suit the application in hand are a speciality of the item MB Building Kit System, while providing the corresponding drive components is another. As a result, the basic philosophy of the modular system has also been consistently implemented in terms of the Dynamic Elements. There are no less than three drive concepts available to ensure that the best possible method of generating linear motion on a Profile section is employed. Matched to the load classifications of the Guides are the Timing Belt, Chain and Spindle Drives. They differ in terms of their precision category and load-bearing capacity, but can all be combined with virtually any item Guide. This is made possible by predefined matching dimensions and slot-in connections between Shafts and Multi-Spline Hubs. Even in such complex elements, the underlying Building Kit System idea has been consistently applied.

The Drive Elements are all attached to the Profiles by means of the Profile Fastening Systems which have been designed to make machining virtually superfluous. The load-bearing capacity of these patented Fasteners, even under heavy dynamic forces, is no doubt one of the reasons for the success of the item MB Building Kit System. Conversion of the drive torque to a linear driving force is effected in accordance with the drive concept selected using Reverse Units or Ball Screws.



(Figure: Bild_V.tif)

(Figure: Bild_VI.tif)

Irrespective of whether the force is transmitted by Timing Belts, Chains or Spindles, the item Building Kit System offers the opportunity to attach virtually any motor to the Drive Elements. Prefabricated Coupling Housings connect the motor to the drive via a universal Adapter Plate, where direct connection between the Reverse Unit and the motor is also possible. Both the attachment of the motor and the transfer of torque have been solved in a simple, effective manner. The slot-in Splined Shafts mean that all the Drive Elements can be quickly and easily connected to each other. Two different shaft diameters are available to suit different applications. The adapter system employed for the play-free Couplings at the same time solves the matter of connecting to the motor take-off shaft. The Multi-Spline Hub at one end of the coupling merely has to be adapted to the shaft shape and the drive unit is complete.



(Figure: Bild_VII.tif)

item's engineers have also thought of the issue of controlling and distributing torque. The Bearing Blocks and Synchroniser Shafts simplify the construction of complex drive trains consisting of several components. Control components such as limit switches and cables can be easily inserted in ready-made holders and positioned with ease.

The field of application of the Building Kit System is not by any means exhausted in the context of machine rooms and protective housings. With the appropriate carefully thought-out Dynamic Elements, the System offers solutions for a completely different field of automation technology.

Fig. I. The patented Shaft Clamping System

Fig. II. High-load-bearing Guides can be made from the Building Kit System components

Fig. III: It could hardly be more compact - all the Guide Elements are contained within the hollow channels inside the Profiles

Fig. IV: Simple fitting of Guide Rails thanks to self-centring Clamping Profiles

Fig. V: Timing Belt Drives for torques up to 100 Nm

Fig. VI: The housing of the Ball Screw also supports the Linear Guide

Fig. VII: The Coupling Housings form the interface for attaching any motor to the Drive Elements

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