

KUKA

KUKA Aerospace

NEW THRUST FOR THE PRODUCTION PROCESS



HIGH FLYER

or

SITTING DUCK

TRANSFORM COMPETITIVE PRESSURE INTO ADDED THRUST FOR YOUR COMPANY.

The pressure on the aerospace industry is becoming ever greater. Politicians demand solutions that are more environmentally friendly, there is increased pressure on costs, and the market demands greater flexibility. Technical innovations are constantly being introduced and production standards are being geared towards ever higher quality. This means that the manufacturer has to master all these challenges – while faced with strong competitors on the global market.

KUKA Aerospace is the worldwide network of KUKA Systems competence centers. The group specializes in the automation of processes in the aerospace sector and offers aircraft manufacturers a flexible range of products and services for the safe, fast and simple optimization of production processes. Here we show you how. We would be delighted to provide further explanation in person.



■ **PRECISION LANDING OR LONG ROLLOUT?**
THE FLEXIBLE RANGE OF PRODUCTS AND SERVICES FROM KUKA SYSTEMS ADAPTS ITSELF TO YOUR CORPORATE STRATEGY.

KUKA Systems specializes in the analysis, representation and optimization of complex production processes that are integrated and supported on site.

The first focus of our activity is the analysis, digital representation and engineering of manufacturing sequences. Our expertise offers a unique depth of experience and relevant data for every automation task. Our automated production solutions are world leaders in terms of safety and reliability.

The second focus of KUKA Systems is development of the optimal tools for every automation task. We first produce models of the processes to be optimized in order to be able to carry out tests for our customers without taking risks. In this way, we find the ideal tools for your production task.

Automation solutions from KUKA Systems can be flexibly scaled – from straightforward project engineering to the setting up of individual robotic cells as automated production islands, and even complete production lines filling entire shops.

The third focus of KUKA Systems is the installation and commissioning of turnkey systems or system components at any desired point on the globe. We have qualified personnel and competence centers located in the industrial regions of the world. This global network is also available after commissioning, with rapid response times for consultation or servicing, to improve every automated production system.

ENGINEERING

1

Make use of our engineering references in the development of highly efficient, automated production solutions.

PROCESSES

2

Optimize workflow layouts, material flows and automation components using the digital factory and our wealth of experience from numerous major projects.

TECHCENTER

3

Come and work with us at the KUKA Systems TechCenter covering an area of 2,500 m². There is plenty of space here for realistic mock-ups to provide reliable project data for applications without the need to take risks.

ROBOTIC APPLICATIONS

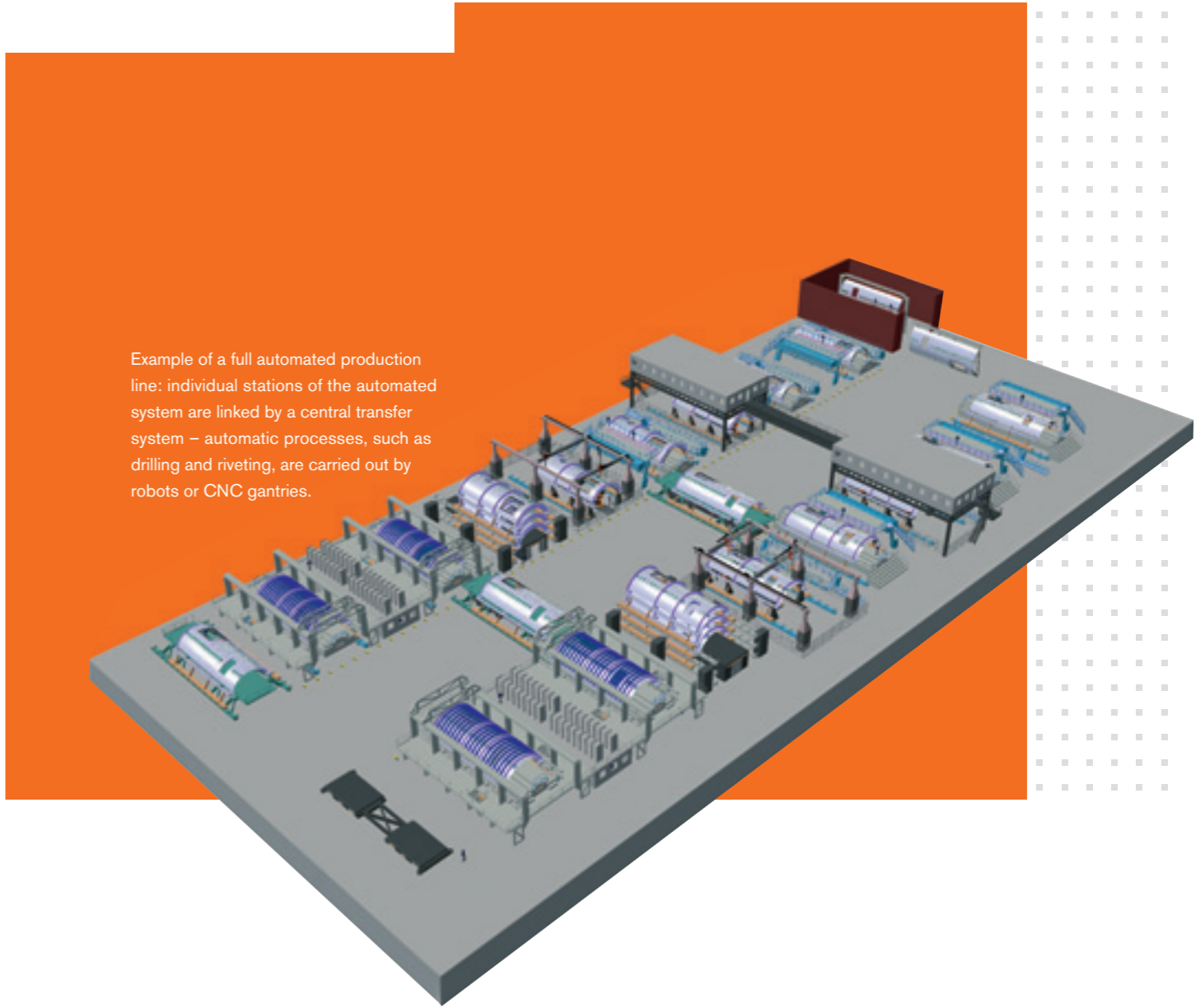
4

Make the most of our expertise in tools and robotic applications in order to manufacture even the most complicated workpieces with unrivaled quality and at unbeatable speed.

EXPERTS

5

Consult our local experts when production systems are put into operation and additional requirements arise.



Example of a full automated production line: individual stations of the automated system are linked by a central transfer system – automatic processes, such as drilling and riveting, are carried out by robots or CNC gantries.

■ **AUTOMATION INTELLIGENCE OR FURROWED BROW?**

WITH PRODUCTION CONDITIONS BECOMING EVER MORE COMPLEX, THE ASSOCIATED ENGINEERING TAKES ON EVER GREATER IMPORTANCE.

If a profitable automation solution is to be integrated into complex production processes, the engineering must be firmly rooted in industry-specific know-how. Right from the very first contact, you will experience how our experts understand your problems and are able to offer solutions. The requirements on high-quality production processes start long before the commencement of manufacturing. All relevant sources must be defined in advance and the data transformed into a workable model. This database must also be compatible within the supply chain and versatile enough to allow subsequent new developments and adaptations.

Good engineering can do much more, however: an intelligent automation solution can flexibly interface production strategies, make new, high-quality production technologies available in the shortest possible time, and cushion the impact of the lack of trained specialists. This is precisely what our team – with its automation expertise that is unmatched anywhere in the world – stands for.



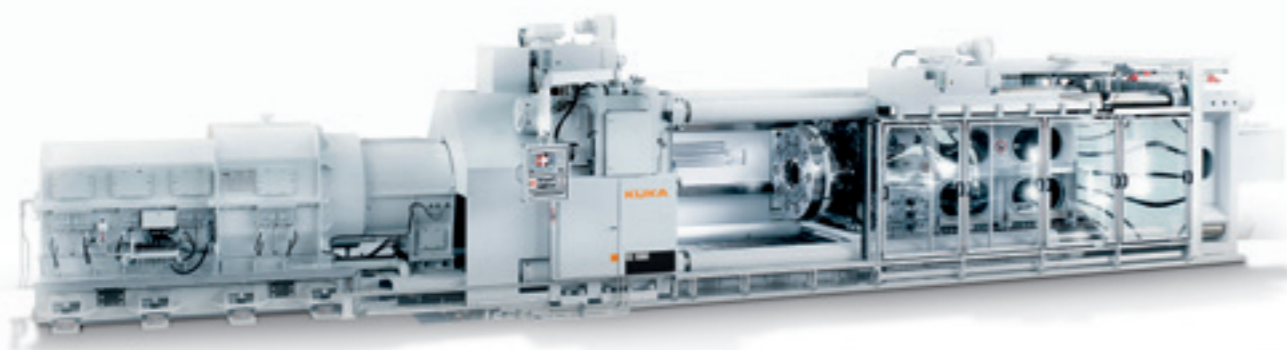
Behind the scenes at KUKA Systems: engineering is carried out with digital representation and testing. Shortly thereafter, automation improves the production process.

BOOST THE QUALITY, SPEED AND ACCURACY OF OPERATIONS IN YOUR PRODUCTION SHOP - WITH THE UTMOST FLEXIBILITY AND NO RISK OF FATIGUE.

▪ **EXACT FIT OR MISFIT?**

The tools and solutions for automated production processes have meanwhile reached a level where they far exceed the accuracy, tirelessness and repeatability of human workers. Automation solutions also possess capabilities that until recently were deemed impossible in terms of flexibility and adaptability of processes.

You decide for yourself how intensively you want to profit from our know-how: from small optimization solutions to full thrust for your future – KUKA Systems can help you in many different ways. The examples presented here illustrate the possibilities of automated production. If you are looking for a different application, simply give us a call or visit us on the Internet at www.kuka-systems.com

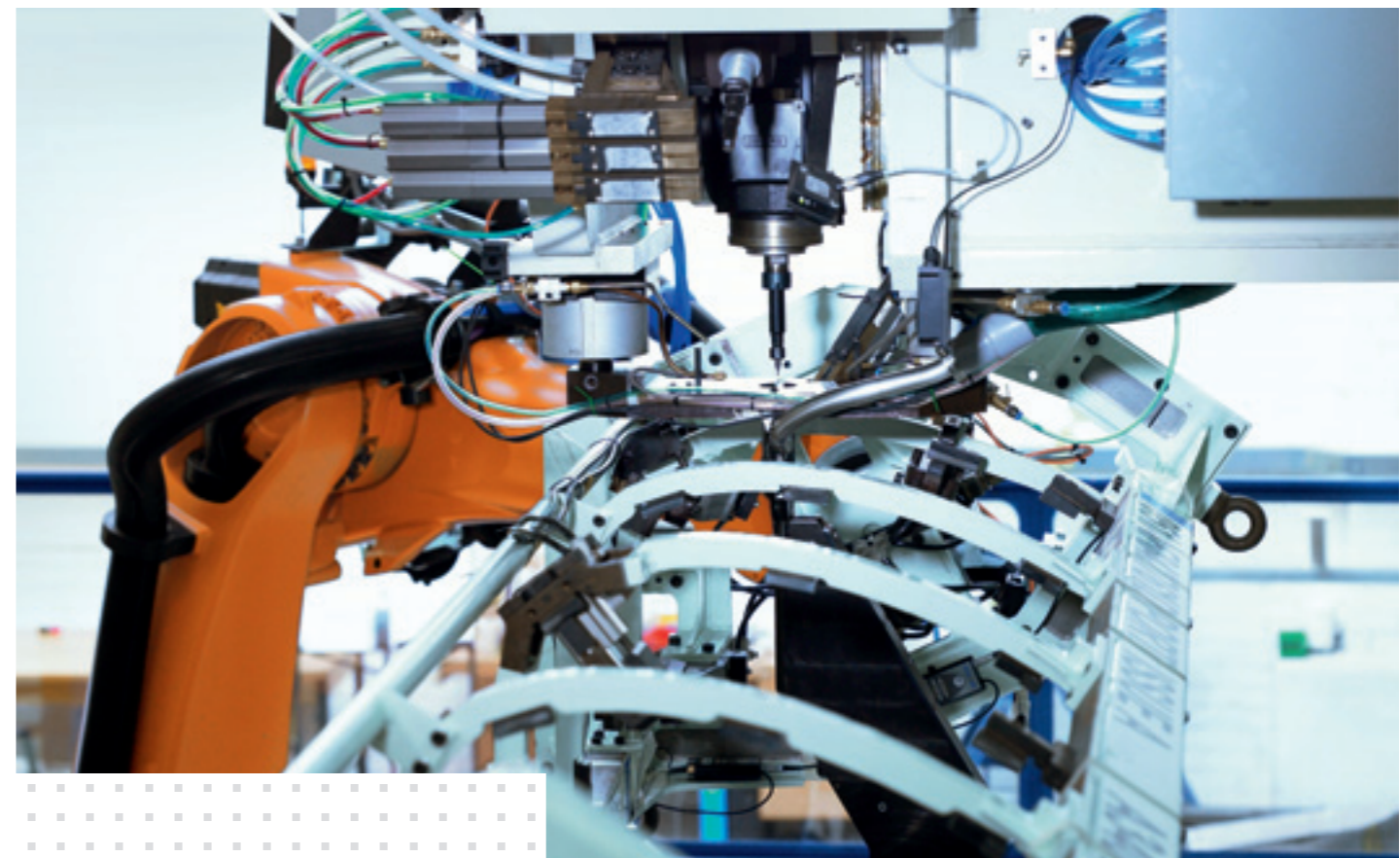


The friction welding champion: The RS 1000 from KUKA.



FRICION WELDING – OPTIMAL JOINING WITH ROTATION AND PRESSURE

No other welding technology joins rotationally symmetrical parts so gently and yet so perfectly and reliably. Furthermore, material combinations are also possible that can be joined with the utmost speed and accuracy and with the shortest of cycle times. The KUKA RS 1000 friction welding machine unites all these advantages and additionally offers variable forge pressure from 100 to 1000 tonnes. This performance means that it is ideally suited to the demanding requirements of aircraft engine production.



KUKA AUTOMATED PANELISATION SYSTEMS – DRILLING & FASTENING OF LARGE, COMPLEX AIRCRAFT PANELS

All manner of differently shaped panels are picked up and positioned by two cooperating robots. The entire automated drilling and riveting process is controlled and monitored with high precision by means of an “Adaptive Guidance System” – ensuring an uninterrupted check of all moving parts.



ROBOINSPECT – A FLEXIBLE ROBOTIC CELL FOR QUALITY INSPECTION

The equipment of a robot with a highly specialized end-effector, combined with an optical recognition unit and corresponding software, enables continuous quality inspection in aircraft production. The acquired data flow directly into the production process. The modular cell concept allows maximum flexibility of the workflow layout.



GLOBAL, LOCAL – OR BOTH?

WE ARE THERE WHERE YOU NEED US: WORLDWIDE.

KUKA Systems will launch your desired automation solution on a set date and in perfect quality – anywhere in the world. This applies equally to individual robotic cells in existing lines and to entire new production sites where the required infrastructure must first be created.

This performance is based in part on our longstanding global presence in every economically relevant region of the world. In all of these regions, KUKA Systems has competence centers in which our automation experts work.

These experts not only have a thorough understanding of their work and the objectives of the customer, but are also familiar with the mentalities of different countries.

Another factor for this capability is the fact that KUKA Systems has meanwhile been successfully supporting the automation of key industries for over 30 years. Over the decades, KUKA Systems has developed a first-class service and solution competency, offering extremely short response times anywhere in the world for the start, performance and completion of projects.

Our highly-qualified and lightning-fast service department is also set up on a global scale, with specialist personnel based locally to maximize efficiency. This service need not necessarily end with the commissioning of an automated production line. Particularly when it comes to keeping production flexible, KUKA Systems can also support ongoing operation. The scope of the support provided can be freely scaled by the customer.



RESPONSIBILITY RIGHT FROM THE GROUNDBREAKING CEREMONY – KUKA SYSTEMS AS GENERAL CONTRACTOR

KUKA Systems offers far more than the mere optimization of production processes: you can also order complete production centers from us – for installation anywhere in the world. We then act as general contractor and sole contact partner.

As we are able to build complete production facilities for you, this leaves you free to concentrate on your core competency. Our know-how in industrial building is complemented by our regional knowledge.



WHAT SERVICES DO WE OFFER WORLDWIDE? SEE FOR YOURSELF:

ENGINEERING	IMPLEMENTATION AND PROJECT MANAGEMENT	PROCESS TECHNOLOGY
<ul style="list-style-type: none"> Layout, shop structures, logistics and personnel concepts Drafting of clamping and assembly plans, methods and assembly sequences Process and production planning Simultaneous 3D CAD design and simulation, materials flow and system availability, ergonomic studies Investigation of reachability and accessibility Process simulation Development of tools for robot-based automation solutions 	<ul style="list-style-type: none"> Concrete/detailed planning and systems engineering Definition of system components and process parameters General contracting, turnkey or full-service project management Optimization of the project life span and product unit costs Monitoring of deadlines and progress 	<ul style="list-style-type: none"> Consulting/evaluation: component design Materials, process technology, systems engineering, robotic and system components Feasibility studies Methods planning Test set-up, studies, prototypes
		START-UP AND OPTIMIZATION
		<ul style="list-style-type: none"> Ensuring system availability and quality Process engineering support Optimization of process parameters

KUKA

KUKA Systems – International

BELGIUM
BRAZIL ✈
CHINA
CZECH REPUBLIC
FRANCE ✈
GERMANY ✈
INDIA
KOREA
MEXICO
NORWAY
RUSSIA
SLOVAKIA
SWEDEN
UK ✈
USA ✈

✈ Countries with KUKA Aerospace competence centers



**YOU WANT TO KNOW MORE ABOUT HOW TO FIRE YOUR PRODUCTION PROCESS
UP TO FULL THRUST? CONTACT US: **PHONE +49 821 797-1375** OR MAIL US AT:
AEROSPACE@KUKA.DE.**

KUKA Systems GmbH

Bluecherstrasse 144 | 86165 Augsburg | Germany | Phone +49 821 797-0 | Fax +49 821 797-1991 | info@kuka.de | www.kuka.com