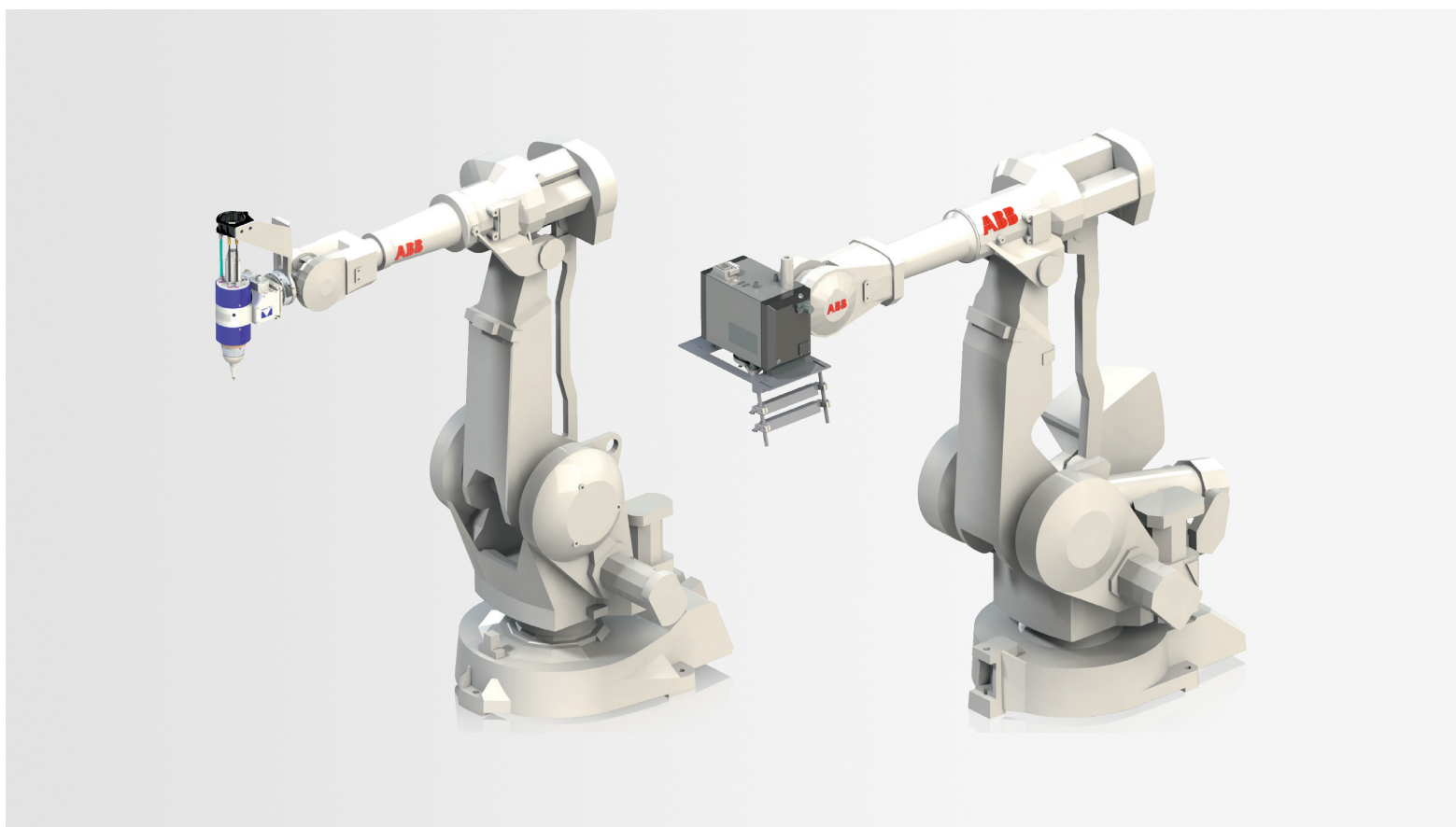


ROBOTICS

# FlexCutLaser & FlexWeldLaser cells

ABB integrated solution for high performance laser welding & cutting



- Standardized production solutions for laser welding applications.
- Flexible, configurable and compact, FlexCutLaser and FlexWeldLaser are delivered as production-ready solutions from ABB.

# FlexCutLaser & FlexWeldLaser

## A new dimension in robotic laser-welding

Offering standardized production solutions for laser applications. ABB robots set the standard for robot path performance so it is no surprise that ABB is a leader in robotic laser processing applications. Flexible, configurable and compact, FlexCutLaser and FlexWeldLaser are delivered as production-ready solutions from ABB.

### Flexibility, accuracy

As the use of ultra-high strength steel, tubular steel and hydro formed parts becomes more mainstream, traditional laser machines may not be the best solution. Because laser machining centers are large, expensive and offer limited flexibility. The answer? FlexCutLaser – a flexible, configurable, and precise robotic laser solution to meet your needs.

Today's vehicles are largely steel structures. A Multi-material Vehicle (MMV) would utilize a range of materials from Advanced High Strength Steels (AHSS) and Ultra High Strength Steels (UHSS), to aluminum, magnesium and composites. While a true MMV structure offers the protection of UHSS with the weight savings of aluminum and magnesium, it would also pose numerous manufacturing challenges in terms of corrosion, joining, and design.

### Compact and configurable

Its self-contained modular design –which utilizes compact, pre-engineered cells in a variety of configurations –allows for easy cell transport,

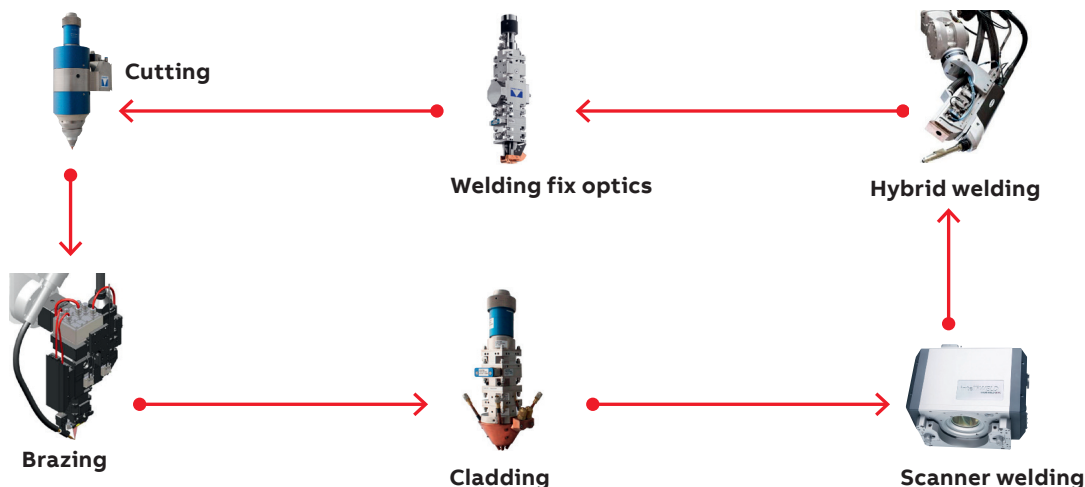
minimum set up time, and maximum flexibility in a limited amount of floor space.

### Offline programming & simulation

Integration using RobotStudio® also means fast, accurate off-line programming for laser processing applications. Using predefined templates for standard shapes such as circles, rectangles, hexagons, slots and even free-forms saves the programmer hours of complicated work. These shapes can be easily relocated by shifting just a single frame.

### Experience

And with almost 250,000 successful robot installations worldwide, you can trust ABB to deliver end to end performance –from planning and installation, to optimization and ongoing support. That's why we're already the choice of many of today's leading manufacturers. Learn about all the ways FlexCutLaser and FlexWeldLaser by ABB can help you reduce costs, increase output, improve quality, and give you advantages over your competition by contacting us today.

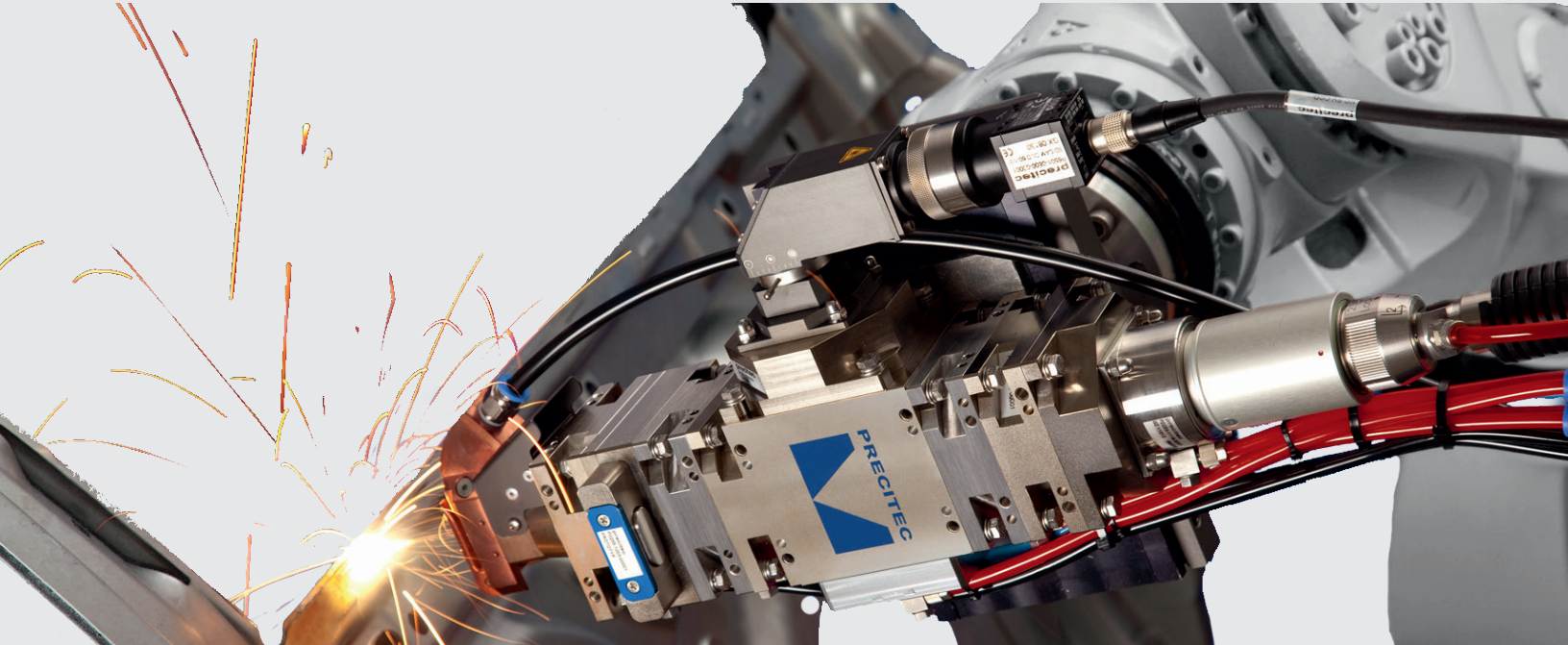


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**ENGINEERED SOLUTIONS**

ABB's research and development in welding and joining technologies has provided solutions for various production systems to generate continuous innovation in areas such as arc welding, laser welding, friction stir welding, & laser-arc hybrid welding





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## FlexWeldLaser - welding

Increasing international competition and the need to meet tightening environmental legislation mean that automotive suppliers are constantly seeking to reduce the weight of cars while also increasing comfort and safety for drivers and passengers. Lighter designs and new, lighter materials present joining issues. Other manufacturers are using a mixture of materials, providing further challenges. Robotics plays an important role throughout this game-changing environment by adding flexibility, accuracy, speed, and tools for easier programming.

Among all processes, the use of Remote Laser Welding has considerably increased in recent years and is forecast to continue. The Remote Laser Welding segment is expected to be the fastest-growing segment in the future because laser welding is a versatile system capable of welding a variety of materials. It ensures deep weld penetration (that helps to simplify part designs) and high speeds, while also low distortion due to low heat input for minor changes in microstructure.

ABB has recently made major advances towards the integration of a robot controller with the laser equipment. This new development has 3 directions:

### **Programming**

ABB has created specific RAPID library for fast and robust robot programming, welding instruction with embedded robot motion, On-the-fly and stationary welding modes, process parameterization through dedicated data types and user routines for customization and adaptability.

### **Robot-Laser interface**

An enhanced robot-laser interface to coordinate scan head mirrors and robot motion has been developed with exchange of status and laser commands and program selection.

### **Ease of use**

Many of the production staff working on the production floor lack proper understanding of robotic programming, which means that they struggle while operating welding robots. The number of unskilled/semi-skilled workers is higher in developing countries. This is why ABB has developed two new tools:

A dedicated User Interface on the robot Flexpendant for quick start-up and efficient operation, to monitor and analyze process signals, to monitor and control laser equipment, and to add teaching tools for easy and fast adjustments.

RobotStudio® package for Remote Laser Welding on-the-fly. This RobotStudio add-In allows importing scanner head programs into RobotStudio. The Laser Scanner Smart Component emulates the behavior of the real scanner head and its interaction with the robot controller. It reproduces the programs under the Remote Laser Welding add-In container in accordance with the robot input commands, and outputs program status feedback to the robot as it would do the real device; and thus assisting user tuning and optimizing the process. It also includes a signal analyzer that allows monitoring process signals (off-line and on-line) to assist users during the optimization phase.

# FlexCutLaser - cutting

## RobotStudio Cutting PowerPac

A sophisticated offline programming tool that allows operators to generate and modify programmed paths in an offline 3D simulation environment instead of on the factory floor.

## Pre-defined cutting instructions

RobotStudio Cutting PowerPac includes pre-defined cutting instructions for holes, slots, rectangles, hexagons and CAD shapes.

## Free form cutting

Free form cutting instructions, which are typically used for edge cutting, are also fully supported.

## Integration of process data

Laser parameter tables are available that facilitate process data re-use and creation of experience databases. The tables contain the most important parameters for laser cutting which can be used as best practice management.

## RobotWare Cutting

RobotWare Cutting is an advanced controller software that optimizes laser cutting using ABB robots. It includes sophisticated tools for robot tuning and calibration, integration of peripheral equipment and the programming of complex paths and shapes.

## Shape generation

It is easy to create complex shapes such as holes, slots, rectangles, hexagons and CAD shapes, by following dedicated programming instructions for each shape. In addition, free form cutting instructions

for linear and circular movements are supported, which are typically used for edge trimming.

## Intuitive user interfaces

Intuitive user interfaces make it easy to create advanced laser cutting programs, including instructions for specific shape cutting, advanced shape tuning and integration with peripheral equipment.

## Equipment integration

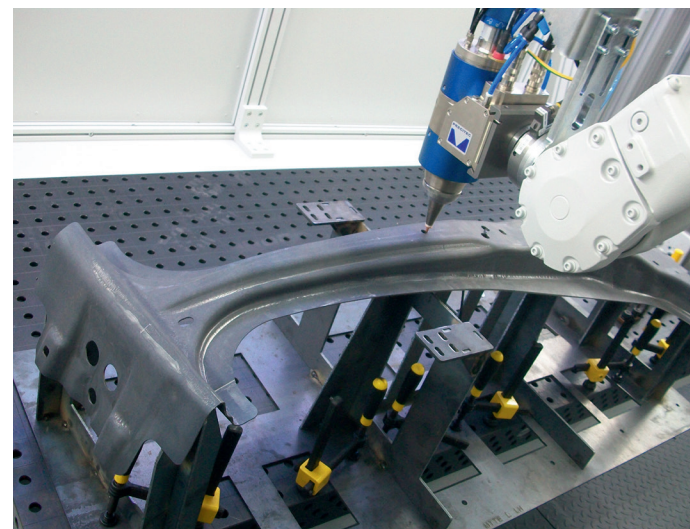
Most common brands and models of laser sources, laser cutting heads and other peripheral equipment are supported. Equipment specific functions such as turning on and off the laser can be controlled directly from the robot program. The interface between the robot and the peripheral equipment is standardized and can be adapted to different brands.

## Advanced shape tuning – Friction compensation

RobotWare Cutting automatically compensates for mechanical friction ensuring optimum performance for each shape. Advanced shape tuning optimizes the motion performance for a specific shape at a specific location, which helps in maximizing cutting performance.

## Iterative Learning Control

ABB cutting robots are learning by doing. Advanced iterative learning control algorithms improve the robot's cutting pattern. The path shape is recorded and compared with the desired shape, which generates an offset based on differences – allowing the robot to gradually improve cutting performance.





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