FlexLine
Superior Paint Process System
Higher efficiency, improved finish quality, lower cost and reduced emissions are all more easily achieved through ABB’s FlexLine™ paint process system.

The FlexLine™ system
The fully integrated paint process system FlexLine™ combines all the advantages of the cutting-edge ABB Technologies, from our powerful paint robots to our original paint application equipment and paint distribution. With every detail engineered and tuned for perfect results, the FlexLine™ system takes precision and reliability to a higher level. By choosing a fully integrated FlexLine™ solution from ABB, you will have one responsible partner with in-depth knowledge of the entire paint process.

High finish quality
ABB’s Paint Saving Technology ensures a uniform film build with a specified thickness over the entire object.

Increased paint and solvent savings
The shortest possible distance between the applicator and vital paint regulation equipment reduces paint and solvent waste significantly.

Unsurpassed flexibility
ABB’s Hollow Wrist Technology makes our paint robots among the most versatile and easy to program robots in the industry.

Fast installation
ABB’s pre-configured Function Packages are designed to have your system up and running very quickly.

Increased productivity
ABB’s Superior Control Technology allows program optimisation without interrupting production, and is surprisingly easy to learn and to operate.

Global service network
Another good reason for choosing ABB and a guarantee for maximum system up-time.
A life-long global partner

ABB is one of the leading suppliers of paint solutions worldwide. With a long history and a clear vision of the future we aim to be a life-long partner to our customers.

One of our car manufacturing customers states that "ABB was chosen due to a good relationship and extremely promising test results." This customer trusted our reliability and good quality as the best way of increasing their paint system availability.

We have built strong relationships with some of the world’s largest automotive manufacturers, and are represented on three continents. A fast installation process based on our standardised but flexible function packages, smooth system compatibility and proven reliability, has made them choose ABB as their longterm partner.

ABB is also the only company capable of providing a global network of local customer service resources, offering instant access to service technicians fully qualified in all core aspects of flexible automation. Thus we provide everything you need to optimise your precision paint process investment.

The ABB high finish quality is reflected on some of the world’s nicest cars.
FlexLine™ combines the cutting

Abb’s Paint Saving Technology: 
**Intelligent solutions**
The IRB 5400 process robot has been optimised for low material waste and fast process control. Vital paint regulation equipment is placed as close to the applicator as possible.

**Efficient paint process**
IPS, our Integrated Process System, features closed loop regulation and high speed control for paint and air flow adjustments. IPS ensures a uniform film build with a specified thickness over the entire object.

**High finish quality**
Our paint application equipment has been optimised for all parts of the painting process. Our range includes conventional highly efficient and precise guns and bells, and top-of-the-line G1 FlexBell with ABB Metabell™ technology. The Metabell™ function combines the high transfer efficiency of a bell with the versatility of a conventional air spray gun, giving the G1 FlexBell unsurpassed metallic finish quality and transfer efficiency.

**Optimised design**
Extensive lab measurements and real-life tests are used to optimize design and paint process efficiency. The robots are even tested and tuned in wind tunnels to minimise booth air flow disturbance caused by the high speed arm movements.

**High serviceability**
The process robot has been designed for optimum serviceability and reduced MTTR. Because of this the main process components are easily accessible and easy to replace.
edge ABB Technologies

ABB’s Hollow Wrist Technology:
**140° unsurpassed flexibility**
With 140° rotation capability in any direction, the Hollow Wrist allows full coating of even the most complex parts. The straight design of the wrist increases durability and reliability.

ABB’s Hose Routing Technology:
**Reduced hose wear**
By routing all hoses through the new riser of the IRB 5400-02 series, the system takes up less space in the paint booth. The Hose Routing Technology used for the IRB 5400 also improves safety and reduces hose wear.

ABB’s Superior Control Technology:
**User friendliness**
Our powerful software packages, CAP and FlexUI including the ShopFloor Editor, allow for easy programming without interrupting production. ABB’s RAPID Programming Language is easy to use with powerful paint commands and process control. Flexible communication interfaces make it easy to adapt to any environment.

ABB’s Global Controller Platform reduces training, service and engineering cost. Operation and service costs are kept to a minimum.
ABB’s exterior painting solutions

Built to fit your needs

The FlexLine™ system provides paint solutions which maximise your performance and minimize your costs.

The FlexLine™ system ensures consistent quality in application of prime coat, base coat and clear coat. As your partner in painting ABB can provide complete solutions to meet your precision painting needs with maximum flexibility.

IRB 5400-02, Process robot

- Integrated paint equipment and pump motors in horizontal arm
- Flexible hose routing solution all the way down through the foot unit
- Powerful mechanics & drive system, high acceleration and high speed
- Large work-envelope
- Available on rail systems

SidePainter™, TopPainter™ and IRB 5400-02 for exterior painting

The IRB 5400-02, the SidePainter™ and the TopPainter™ provide automotive manufacturers with cost-effective, flexible and reliable solutions for exterior painting. Combined they have the flexibility of robots, the capacity of SiTo and the transfer efficiency of the MetaBell technology. All three systems include integrated high voltage controller, integrated bell speed control, and full IPS with in-arm process control and integrated pump servo motors.

IRB 5640, TopPainter™

- 5 or 6 axis
- Standard or extended tracking
- Atomisers mounted on wrist
- Individual tilting of bells
- Servo controlled bell indexing

IRB 5610, SidePainter™

- 3 axis, Direct Transmissions
- Large space for Paint Handling Equipment
- Large work-envelope 2600mm x 700mm
IRB 5300, Door openers

Our door, hood and lid openers can be customised for the individual FlexLine™ system. The unique physical construction of these robots enables them to exactly follow the movement of the doors.

The IRB 5300-series robots are delivered with
- 3 or 4 axes
- Floor mounted, on clean-wall or on in-booth rail
- Conveyor tracking
- Full servo control, smooth and flexible motion

The cost saving IRB 5400-series

The time and paint savings of the IRB 5400-series will impress you. By integrating colour change valves, pumps, flow sensors and air- and paint regulators into the arm of the IRB 5400, we have made the IRB 5400 one of the most reliable, cost-effective paint process robots in its class.

The FlexPainter™ series consists of IRB 5400-02 FlexPainter™, IRB 5400-03 FlexPainter™ on clean-wall rail and IRB 5400-04 FlexPainter™ on in-booth rail.

IRB 5400-series characteristics

- Slim arm
- Flexible Hollow Wrist
- Large work-envelope
- Powerful mechanics & drive system
- High load capacity
- Full IPS system
- High acceleration and high speed
- Uniform performance
- Endless rotation axes 4 and 5
- Rail systems with minimum disturbance of booth air flow
- Easy programming
**IRB 5400 TECHNICAL DATA**

**SPECIFICATION IRB 5400**

**Handling capacity** 15 kg

**Number of axes** IRB 5400-02 - 6
IRB 5400-03 - 7
IRB 5400-04 - 7

**Axis movements**

- **Axis** Working range Max. speed
- 1. Rotation 300° / 170° with riser foot 137°/s
- 2. Vertical arm 180° 137°/s
- 3. Horizontal arm 150° 137°/s
- 4. Inner wrist Unlimited 440°/s
- 5. Wrist bend Unlimited 430°/s
- 6. Outer wrist 920° 600°/s

**Pose accuracy (Repeatability)** 0.15 mm

**Path accuracy** Ø 6 mm (+/- 3 mm)

**Rail system** Length 2m, 3m, 3.5m, 4m, 4.5m, ...

**Dimensions**

- **Horizontal arm** 150° 137°/s
- **Vertical arm** 160° 137°/s
- **Rotation** 300° / 170° with riser foot 137°/s

**Axis Working range Max. speed**

**Robot controller** IP 54

**Robot unit** IP 67

**Robot controller 5-52°C**

**Process robot excl. foot unit 240 kg**

**Depth 800 mm**

**Width 1200 mm**

**Height 1280 mm**

**Production (7 axis machine) < 1500 W**

**Production (6 axis machine) < 700 W**

**MACHINE INTERFACES**

- **Safety** EMY stop, Enable device, General mode stop, Auto mode stop, Test mode stop, Cabinet interlock

**USER INTERFACES**

- **Operator panel** In cabinet or external
- **Programming unit** Exi protected. Portable, joystick and keyboard
- **Remote I/O** Display 16 lines * 40 characters
- **Graphical programming** Graphic 240 * 320 pixels
- **Distributed intelligence** Configurable on screen menus

**PROCESSWARE**

- **IPS** Integrated Process System. Unique system for closed loop regulation and high speed control for paint and air flow adjustments. Based on open, flexible and adjustable architecture philosophy

**ENVIRONMENT**

- **Explosion protection**
  - North America Class 1, Division 1, Group C&D
  - Japan IIT4
  - Europe II B T4 (Zone 1)
- **EMC**
  - Electro Magnetic Compatibility certificate
- **Ambient temperature**
  - Robot unit 5-45°C
  - Robot controller 5-52°C
- **Relative humidity**
  - Max. 95% Non condensing
- **Degree of protection**
  - Protection standards IEC 529
  - Robot unit IP 67
  - Wrist IP 54
  - Robot controller IP 54

**TELEPHONE NUMBER**

- (+47) 51 48 90 00, Fax +47 51 48 37 25. www.abb.com

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