FANUC
ROBOTICS

Worldwide leader in Factory Automation and Robotics

FANUC Japan Headquarters

FANUC Monthly Production Capacity

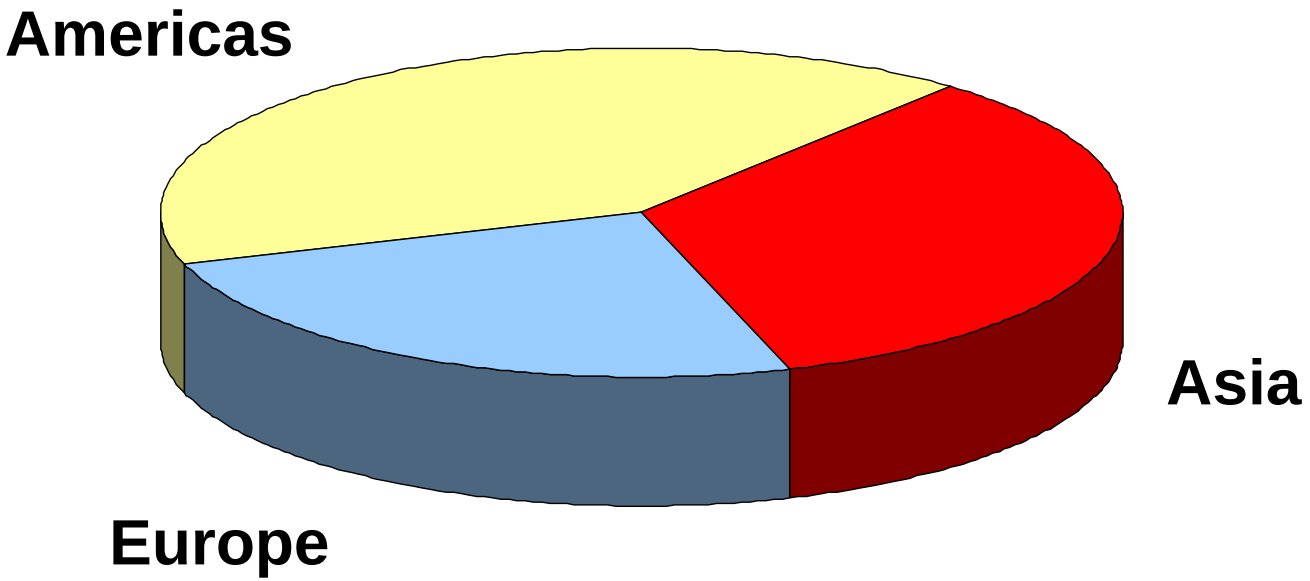
(Status November 2005)

➢ Robots	2500
➢ Robomachines	1600
➢ CNC	16000
➢ Servo Motors	65000
➢ Servo motor sensors	75000

FANUC Market Shares (2004)

- CNC worldwide: 63%
- Robot worldwide: 27%

Unit Volume by Region



Europe is the fasted growing region for FANUC Robotics

Total Market Size and Market Share

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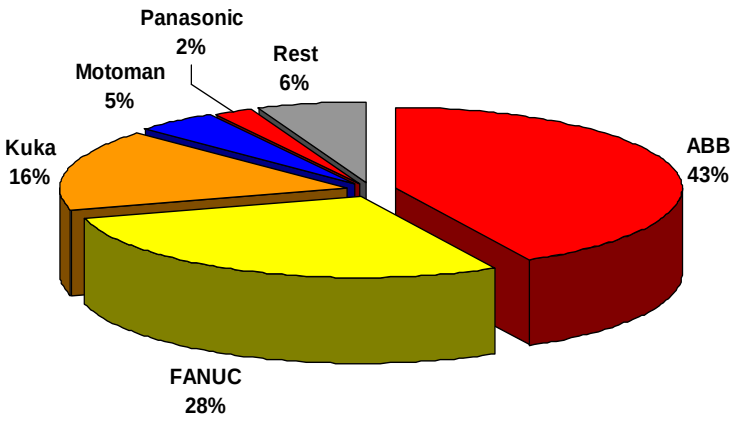
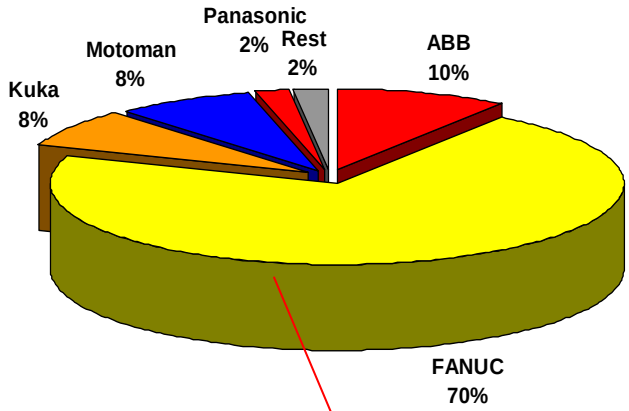
- **Total Market Size 2006**
  - Spain 2017 units
  - Portugal 259 units)
- **FRIB Share in Spain**



- **FRIB Share in Portugal**



- **Total Installed base Spain: 4500 units**
- **Total Installed base Portugal: 1000 units**

Incl. spot VW AutoEuropa

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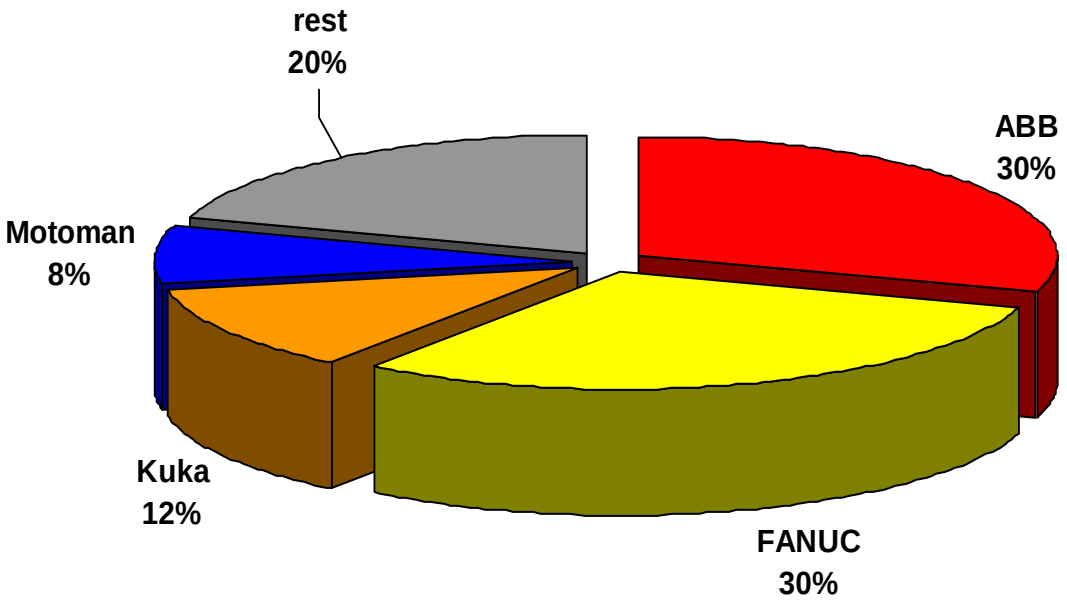
Base Business Market: FRIB and Competitor Share

Market Size (1600 units)



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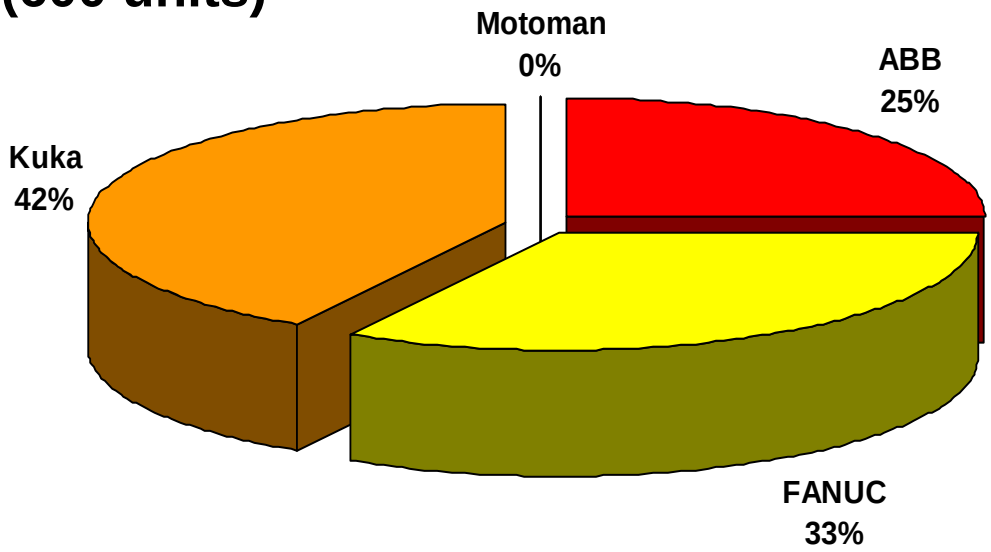
ABS Market: FRIB and Competitor Share

Market Size (600 units)



FANUC & Kuka dominate in ABS

What makes us successful?

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Great Employees!

Great Customers!

Our partners appreciate that

- **We develop close partnerships with our customers**
- **We never compete with our partners**
- **We support our partners to develop new sales opportunities**

Our customers acknowledge FANUC's strength in:

- **Product quality**
- **Product range**
- **Reliability**

FANUC Worldwide

FR Europe Subsidiaries

FANUC Robotics **Belgium**
BOOM
Paul Ribus
+32 / 3 - 45.10-351

FANUC Robotics **Europe**
ECHTERNACH
Olaf Gehrels
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FANUC Robotics **(UK)**
COVENTRY
Chris Sumner
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FANUC Robotics **Deutschland**
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Olaf Gehrels
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FANUC Robotics **France**
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Christian Guibert
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FANUC Robotics **Czech Republic**
PRAG
Lionel Mercou
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FANUC Robotics **Italia**
ARESE (Milano)
Duilio Tissino
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FANUC Robotics **Ibérica**
BARCELONA
Bob Struijk
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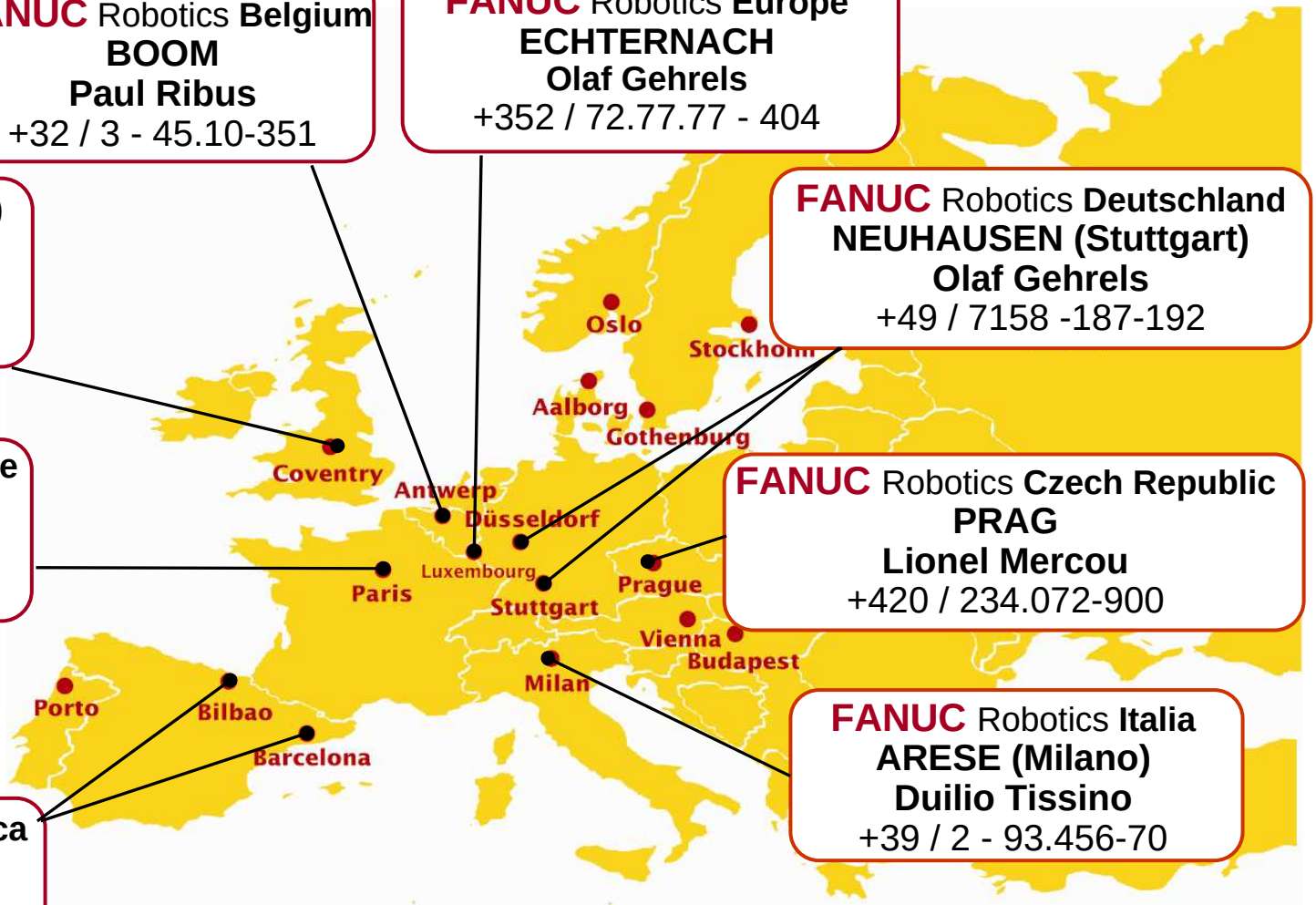

FANUC Robotics Europe Website:
www.fanucrobotics.lu

FRIB Territory Overview

Automotive Installed Base : FRIB

More than 1600 units installed in Automotive

FANUC Robots worldwide
Financial Highlights

- **Unit Booking** 2004 — **15,900 Robots**
- **Sales Revenue** — **$1.44 Billion**
  Financial year 2005
- **Installed Base** (Jan. 2006) — **>150,000 Robots**

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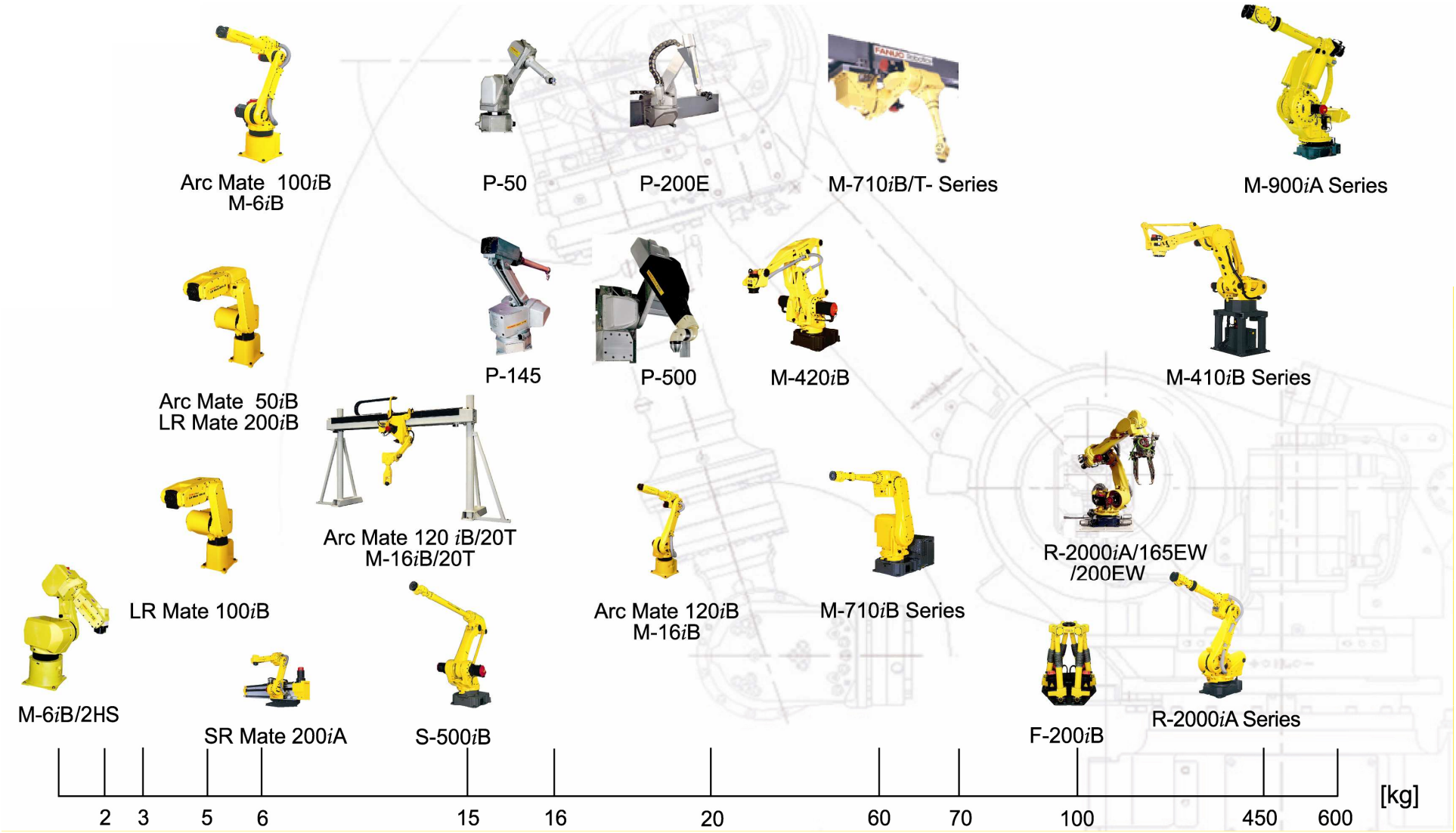

Wide range of applications

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Arc welding

Cut, grind, debur, polish

Palletizing, packaging

Spot welding

Handling

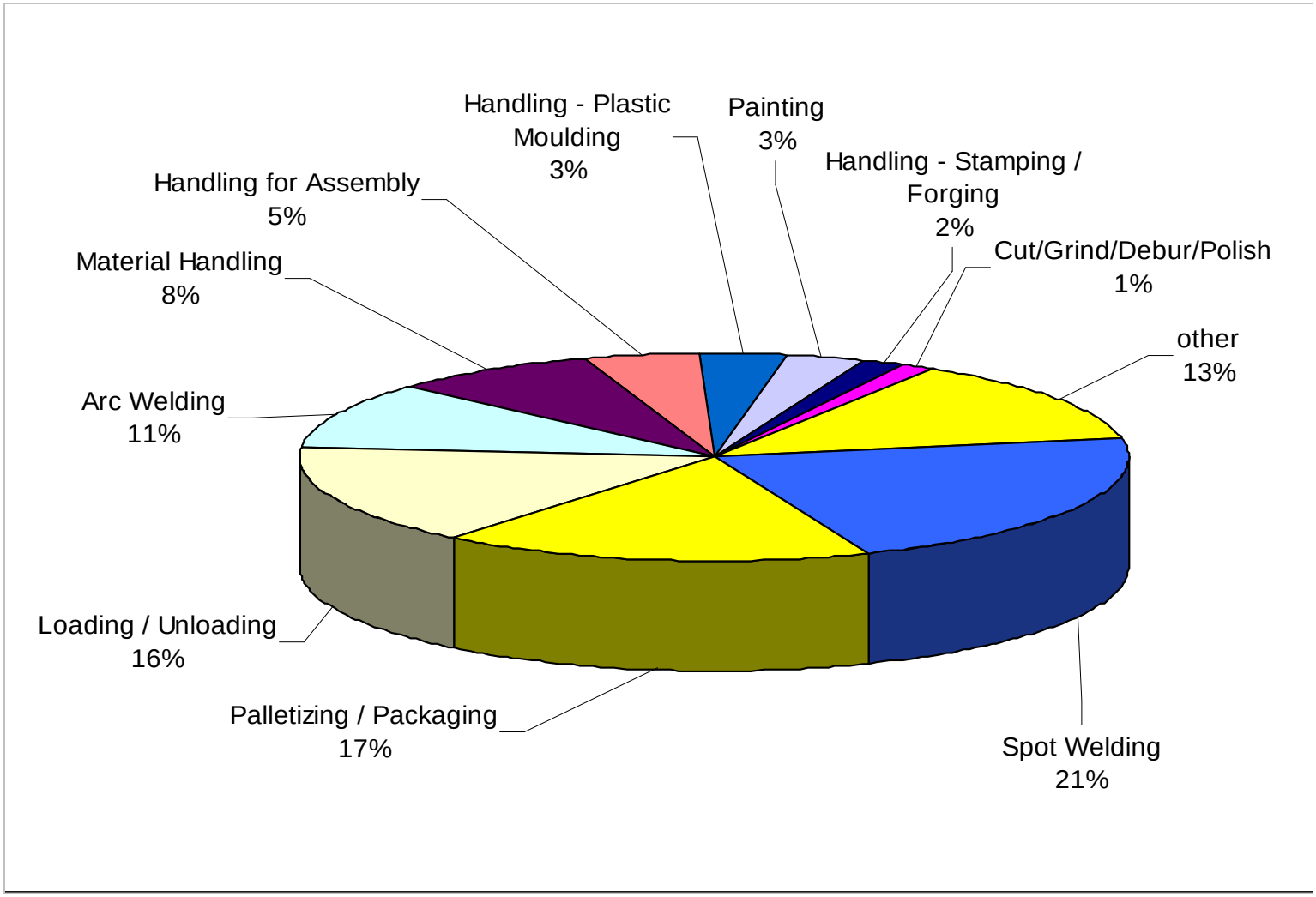
Loading

Handling, deburring

Loading

Painting

Unit Volume by Application (2005)



Good Cooperation

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Perpetual Motion

FANUC

- Automation from a single source
- Compatible components with identical interface
- Common Networking and Diagnostic Tools

Why Buy A Robot?

Automation Drivers

Higher asset utilization

- Robots improve productivity of expensive production lines by ensuring that
- manufacturing operations move at a
- constant pace with minimal machine
- time

Reduced labor costs

- Robots reduce direct manufacturing labor needs and improve labor deployment

Improved ergonomics and worker safety

- Robots minimize repetitive motion injuries and exposure to dangerous machinery

Higher quality and lower scrap

- Robots provide higher quality and yield because of more controllable, predictable and repeatable process consistencies

Robot Myths and Reality Checks

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Myth 1: Robots will eliminate my production labor costs

- **Reality:** ***robots are not panaceas; there will always be some jobs for which people are better than robots***

Myth 2: Robots are expensive to set up and maintain

- **Reality:** ***as with personal computers, prices have declined while ease of use and performance have improved***

Myth 3: Only high production runs can justify robot costs

- **Reality:** ***robots can perform different tasks for different parts***

Myth 4: Outside of university labs, only the big automakers use robots

- **Reality:** ***robots have been in factories since 1962 and are a mature technology***
- **Reality:** ***companies with < 500 employees now have the highest robot adoption rate***

Alternatives to Robotics

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Simple relative ranking; more stars is better

	People	Hard Automation	Robots (a.k.a. "Flexible Automation")
Flexibility	★★★	★	★★
Initial cost	★★★	★★	★★
Machine utilization	★	★★	★★★
Obsolescence	★★★	★	★★
Operating costs	★	★★★	★★★
Process consistency	★	★★	★★★
Redeployability	★★★	★	★★
Throughput	★	★★★	★★★
Time to production	★★★	★	★★
Uptime/reliability	★	★★	★★★
Value (total contribution to bottom line)	**You decide!**	★	★★★

Workcell Validation with Roboguide

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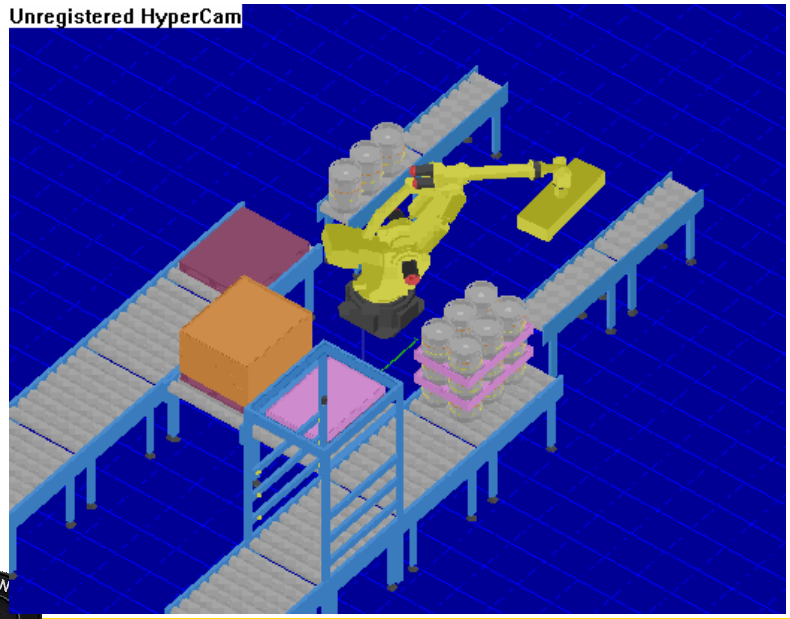
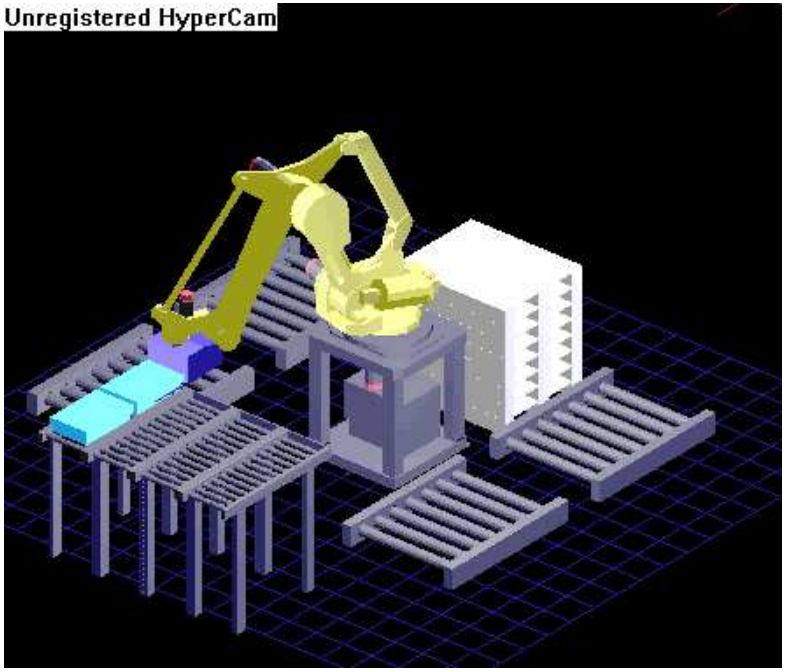
- Validate justification numbers for a workcell on a PC before ever turning a screw in the “real” world
- Import actual machine and part drawings for greater relevance
- Perform “what-if” analyses





- Optimize equipment layout by providing extremely accurate cycle time, reach, duty cycle, and collision predictions
- Transfer programs to real robots

Other Considerations

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How Will Robots Affect Your…

- Productivity and throughput?
- Rework/scrap costs?
- The number of customer returns/rejects?
- Part quality/consistency?
- Employee ergonomics?
- Utilization of plant floor space per unit produced?
- Changeover times?
- Ramp-up time to volume production?
- Uptime of mold machines? Bottlenecks?
- Employee training?
- Employee turnover?
- Employees' acceptance of new technologies?
- Overall manufacturing strategy?

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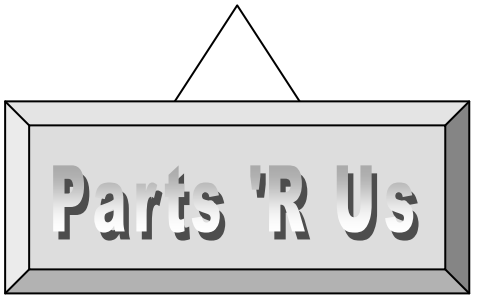
"Robots performing one task is great…so what *<u>else</u>* can you do for me?"



A key to justifying robot automation is using the robots' inherent flexibility to perform multiple ancillary operations for little or no incremental cost.

Broad Range of Applications

MATERIAL HANDLING	MATERIAL PROCESSING
» Assembly	» Deflashing/Trimming
» In-Process Part Transfer	» Deburring
» Machine Tending	» Dispensing
» Packaging	» Inspection/Measurement
» Packing	» Labeling/Reading
» Palletizing	» Painting
» Sorting/Kitting	» Powder Coating
	» Routering/Drilling
	» Scoring
	» Welding (Arc, Spot, Laser)

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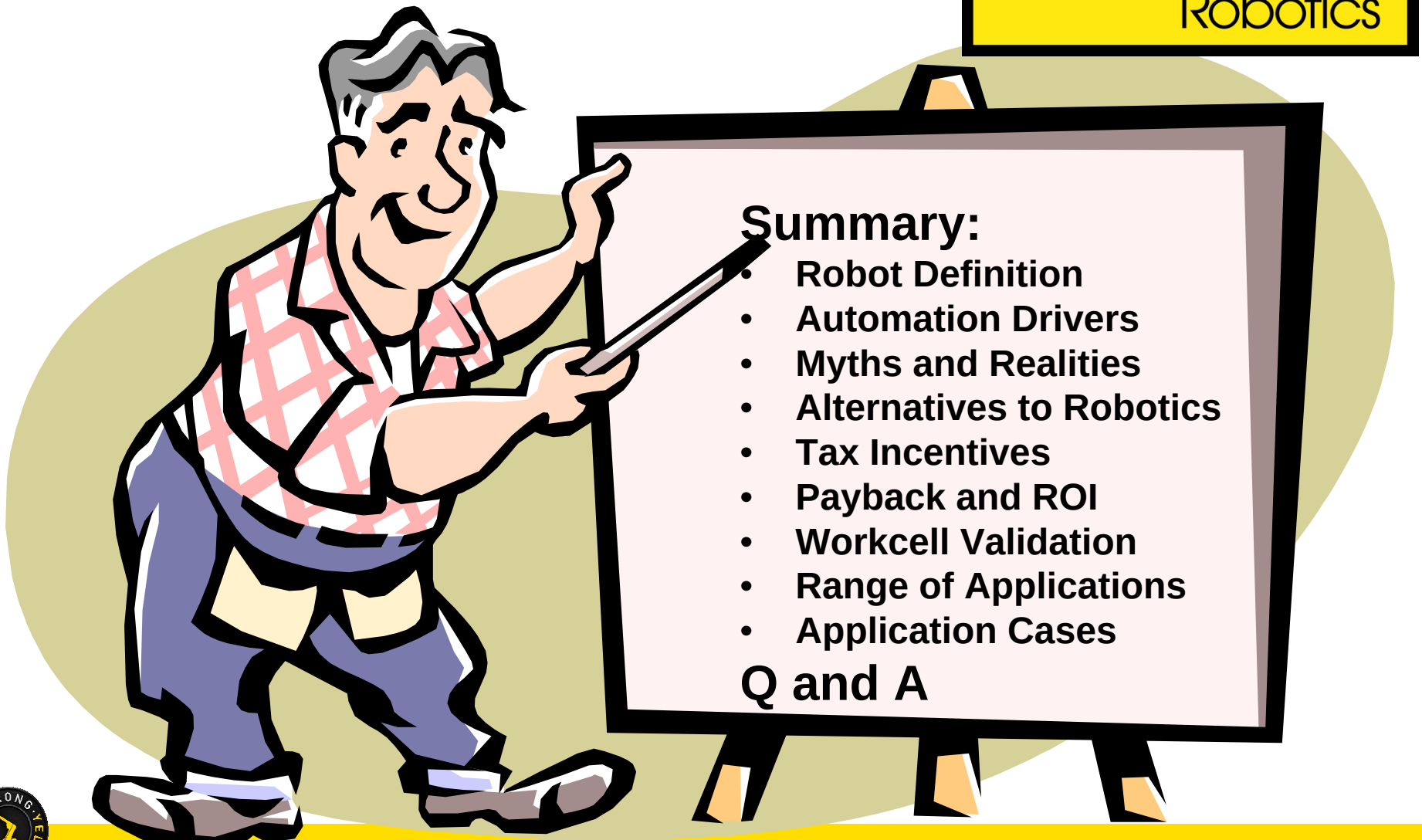
FANUC Robotics



Summary:

- Robot Definition
- Automation Drivers
- Myths and Realities
- Alternatives to Robotics
- Tax Incentives
- Payback and ROI
- Workcell Validation
- Range of Applications
- Application Cases

Q and A

What is palletizing?

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Typically “End-of-line” function

Usually involves positioning of product on a carrier (euro-pallet, chep-pallet, xx-pallet)

Robot can also handle pallet, tier sheet

Any kind of product

Carton box, crates, bags, barrels, loose product.

Product with/without plastic foil wrap

Robot positions product in pattern

Example 1

M-410i series robot

Safety fence

Gripper, overhead vacuum

Carton box

Pattern

Euro pallet 800x1200

End of line conveyor

Example 2

M-410i series robot

Bag gripper + pallet hook

Paper bag

pattern

Example 3: concrete blocks

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ing grippers

M-410 Paletizando barras de hierro

Robot types

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M-410i series, palletsing robot

M-420i series, palletising/packing robot

R-2000i series, general 6 axes robot

..M-16i series, general 6 axes robot

How to determine cell

What to take into account

How many infeeds, how many pallets

1st. Payload (inertia)

2nd. Cycle time of cell

Tier sheet y/n?

Bottom sheet y/n?

Pick pallet y/n? if yes, how many?

Type of gripper, how many products?

General lay-out

Robot vs. traditional palletiser

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++ robot is more flexible (pattern, product, lay out)

++ robot has less maintenance/problems

++ robot uses less floor space

-- robot has lower capacity

Why robot, advantages for customer

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Flexible production

Higher output/production possible

Change of product/packaging/etc

Regulations on lifting, chemical exposures

Reduction of work force

Constant quality of work / palletising

Machine load unload

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Robots for machine load and unload

Vision systems

Robot software options