PixelPaint Function Module

The standardized dressing package for PixelPaint

Carrie Zou, Global Product Manager (Paint), ABB Robotics
Content

- What's about the PixelPaint function module?
- A quick flash back of the technology;
- The scope of supply of PixelPaint function module;
- What work can be achieved with PixelPaint function module today;
- What is the workflow?
- FAQ
What’s new about the PixelPaint function module?
A quick flash back - Novelty/uniqueness of the product

Zero overspray eliminate the complexity of two-tone application, and high resolution for customization

<table>
<thead>
<tr>
<th>Significantly increase the productivity in paint shop</th>
<th>Massively reduce the CAPEX&amp;OPEX in paint shop</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="chart1.png" alt="Diagram showing before and after productivity increase" /></td>
<td><img src="chart2.png" alt="Cost analysis chart" /></td>
</tr>
</tbody>
</table>

Increase the productivity 20-100%, reduce the OPEX directly in MUSD/year in one paint shop

*Sources: customer's public presentation of two-tone cost analysis*
A quick flash back
Stages of the product genesis

- **Inkjet technology was chosen**
  - "non-overspray applicator" was initiated;
  - Inkjet had wide pattern and accuracy;

2017

2018

- **Redesigning for paint**
  - Paint has higher viscosity than ink;
  - Tests on automotive part;

2019

- **The prototype was borne**
  - No quality issue with regular paint which we are using today;
  - Preview in SURCAR, Cannes

2020

- **Product launch to market**
  - Optimization the synchronization between paint supply unit, print head and the robot movement;
  - 1st generation officially launched targeting automotive customer;

2021

- **Deploy to customer lab**
  - Cooperate with different regional customers to validate;
  - Provide the cell solution;

2022

- **Std. Function package launch**
  - Fully packed delivery from PDP to GSC which is ready to use;
  - Eliminate the DTO cost and shorten the LT;
  - For internal and selected customer lab use;
  - For waterborne ONLY;
A quick flash back - Sustained competitive advantage

High resolution painting provider

<table>
<thead>
<tr>
<th>Droplet jetting solution</th>
<th>Control droplet size</th>
<th>More than 1000 nozzles</th>
<th>Adjustable droplet density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>Small 20 um</td>
<td>Large 50 um</td>
<td>Robot moving</td>
</tr>
<tr>
<td>Drop x 1000</td>
<td>Middle</td>
<td>&gt; 1000 nozzles = 100 mm</td>
<td>interval</td>
</tr>
</tbody>
</table>

Flow:

- Small 20 um
- Middle
- Large 50 um

Paint Circulation:

- Thick
- Thin
The scope of supply of PixelPaint function module

System Overview
The scope of supply of PixelPaint function module

Process diaphragm

- PC (Robstudio + HMI)
- Paint head cleaner
- Paint Supply tank
- Paint return
- Paint supply
- Robot
- PixelPaint applicator
- Applicator
- Inside booth
- Outside booth
- Ethernet
- Paint process
- Control process

Remark:
- Target image

Main component for printing system, stores images
Internal Ethernet line
Controls the nozzles in the printhead
The scope of supply of PixelPaint function module

Main features

1 x IRB5500 floor mounted manipulator, same IRB5500 as is;
- For 1k, waterborne, mono color, solid paint;
- The current release is for internal and selected external customer for lab use, no cycle time restraints;
- The paint/process assessment is required according to the workflow;
- The lab validation may be required before deployment;
- Covers the horizontal surface.
- The slant and vertical surface needs to be verified case by case;
- Spray on dry film, wet on wet is not recommended;
- Differentiation in decorative painting;
What work can be achieved with PixelPaint function module?
Performance BEFORE
Demo >1 year ago
Performance BEFORE
Demo >1 year ago
Demos TODAY
Deployment scenarios

Inline & bypass solutions

1. Application base coat
   t1 (cap 1)
2. Application base coat
   t1 (cap 1)
3. Application base coat
   t1 (cap 1)
4. Application base coat
   t1 (cap 1)
5. Application base coat
   t1 (cap 1)
6. Application base coat
   t1 (cap 1)
7. Application base coat
   t1 (cap 1)
8. Application base coat
   t1 (cap 1)

All car bodies in one line

Intermediate dryer
cap 1+2

Application contrast color
cap 1

Application clear coat

Oven
t1 (cap 1)

Dedicated two-tone line

PixelPaint as bypass

1K top coat

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Slide 14
What is the workflow?
Workflow of PixelPaint

The journey of PixelPaint solution deployment to Automotive customer

Customer awareness
- Take the primary check list to talk with customer to have the primary information;
- Internal further evaluation;

Primary check phase
- Feedback to customer what is the next step;
- Validation test proposal;

Inquiry communication phase
- Lead the validation test in lab and aim for validation approval;

Validation phase
- Interface clearance/deployment plan;
- Full cost calculation;
- Time schedule confirm;

Project quotation phase
- Participation according to the plan;
- Ensure the paint maker’s participation;
- Tech. agreement acknowledgement;
- Trigger the order releasement process;

Order intake

ABB

Customer

Customer’ support
- Provide the relevant info. to ABB;
- May need input from paint maker too;

Customer expectation
- If their work piece/process can be done by PP;
- The primary feasibility feedback;
- The next step forward;

- Release the validation test order to ABB;
- Ensure the cooperation of paint maker;

- Participation according to the plan;
- Ensure the paint maker’s participation;
- Clear validation plan and target;
- Risk assessment done;

- Qualified film appearance;
- Application condition confirmation;
- Risk assessment of actual production;

- Clear price breakdown
- Clear after sales service plan;
- Smooth process of the contract signing;
Please reach out me if you need an editable version you can revise to your case.
Vision about non-over spray technology

The paint application development in Automotive

Manual air gun

Machines + air gun

Reciprocating Machines + air gun

Robots + air gun

Robots + HiV Atomizer

Robots + PixelPaint

T.E. 30-35%

T.E. 40-45%

T.E. 50-55%

T.E. 75-85%

T.E. 100%

Whole car body

Two tone Deco