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Integrated Deburring/Deflashing/Milling Process In The SMC Press Automation Process

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Images (from left to right, top to bottom): Composites World, Digital Trends, Green Car Congress, Magna
Schmidt & Heinzmann | Key Facts

1949
Founding

130
Employees

Privately owned company

Manufacturer of composite machinery

World wide delivery

Subsidiary
Cleveland, USA
- Services
- Costumer Support

Subsidiary
Phoenix, USA
- Sales & Services
- Costumer Support

Bruchsal, Germany
Headquarters

Subsidiary
Shanghai, China
- Sales & Services
- Costumer Support
Composite Equipment & Machinery

SMC Production
Automated Bonding
Automated Preforming
Fiber Processing
Press Automation
Cutting & Stacking
Automation & Robotics
Polyester Plate Production
Integrated Deburring/Deflashing/Milling Process
Deburring/Deflashing/Milling Cell
Highlight: Dust Extraction

- Dust Separation
- Local Extraction included in Fixation
- Tornado Systems
- Ionization of Air
Highlight: Component Fixation

Lifting and Tilting of the Components
- Reduces waste on surface
- Places components on conveyor after deburring
Concept Deflashing Outside

3D-Aggregate with surface copying function in 3 axis

Carbide cutter (10° angle) with surface copying function (bearing)

The final contact tool will be metal
Deflashing Outside - Video
Deflashing Outside - Results

- The deflashing result is smooth and regular with speed 80 mm/sec
- The visible milling surface is 1 mm wide
Deflashing Outside - Conclusion

Optimization of process reliability and result:

- special design milling cutter with 15° and at least 4 teeth
- Pre-machining step to remove large flash material to prevent chipping:
  - additional machining step with cutting tool (saw blade)
- Limitation of axis movement to 1 dimension to prevent stick-slippering of the contact tool
Deflashing Window - Concept

1D-Aggregate with surface copying function in z-axis

The final contact tool will be metal

milling tool with 5° cutting angle
Deflashing Window
Deflashing Window - Results

Results with pre-cutting step

- The visible milling surface is 1-2 mm wide
Deflashing Window - Results

Results without pre-cutting step

The flash is partially ripped out and leaves a rough surface
Deflashing Window - Conclusion

Optimization of process reliability and result:

- **Milling Tool:**
  - optimized design milling cutter with at least 4 teeth
  - reduce cutting edge height

- Pre-machining step to remove large flash material to prevent chipping and improve surface:
  - additional machining step with cutting tool (saw blade)

- **2 dimension Aggregate with additional radial contact tool**
  - contact surface will be clamping device instead of the door skin
Countersinking with the spindle

- Different depths of the countersinks due to shape deviations of the material.

*Complicated measuring or manual reworking is necessary!*
Compensation of the shape deviations through the use of a Floating Aggregate.

All countersinks will be perfect! No manual reworking!
Benefits through the use of Floating Aggregates

- No manual rework
- No measurement during processing
- Significantly shortened working hours
- High process reliability
- Highest quality standards with minimal reject rates
Full Animated Process
Process Cooperation

Thank You!