

AZL Aachen GmbH in cooperation with

Aachener Zentrum für integrativen Leichtbau



Joint-Partner Project Potentials and Challenges of Thermoplastic Tapes for SME Injection Molders

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Aachen, 14 August 2018

Kickoff: October 2018

AZL Partner Network



IKV Partner Network

				DEUTSCHE Kautschul Gesellschaft e.V.
A.Schulman AEROCONCEPT Airex AG battenfeld-cinc	Bauscha Lomb HAN	SER () SECON DE	MAT Davis-Standard	DIK Dow
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Introduction **Innovations by Thermoplastic Tapes for Injection-Molded Parts**



[Picture sources: Wiha, Covestro, Neue Materialien Fürth, Sumitomo, TenCate]





Introduction Innovations by Thermoplastic Tapes for Injection-Molded Parts



[Picture sources: Covestro, Fraunhofer ICT, DExWin-Profile, MAI Multiskelett]





> 2300 Injection Molders in Germany alone



...however, only few of them utilize the strengths of thermoplastic tapes

[Sources: AMI, https://www.etmm-online.com]





Why Focus on SME Injection Molders? Unique Position in the Economy



Injection molders are **MULTIPLIERS**. When the group of SME injection molders understand the advantages of tapes (and the demands of OEMs) and have mastered the technology, **bottom-up market growth** is inevitable.

[Picture sources: Covestro, SGL, ENGEL, Siebenwurst, Dupont]





Objectives of the Study 1 Application Identification WITH the SMEs



SME: Small and Medium-Sized Enterprises





Objectives of the Study 2 Answering the Following Questions

Reaching out and understanding the SME injection molders base.



- Which barriers exist in SMEs and how to overcome them?
- How can the SME injection molder base be **empowered** for thermoplastic composite tapes? ...via teaching, networking, etc.
- How can we enable a wide bottom-up innovation growth?

Systematic identification of potentials for thermoplastic tapes in injection molding



- How to find new technically valid application potentials for thermoplastic composite tape inlays in injection molding parts
- Finding ways to "invert the Ashby material selection procedure"
- ...from material capabilities of compound + tapes – to applications





Project Plan 6-Months Work Program



Status at Typical Injection Molders:

- Know-how about thermoplastic composites? (Especially tapes / inlays)
- Barriers, chances & risks?
- Standard procedures in innovation projects; facility setups and material flows
- Expert interviews at injection molders / visitations
- Classification of SME injection molders (tool technology, dimensioning capabilities, company sizes, competences, value chain position Tier4 ... OEM)

Development of an Education Program:

- Material and processing technology
- Wo delivers what?

Identification of Application Potentials and Development of a Systematic Methodology:

- Pros and cons of hybrid thermoplastics compared to conventional plastics (in parts and manufacturing)
- Derivation of application clusters (Where does it makes sense?)
- Economical benchmarking (classification of parts)
- Material substitution approaches
 - Substitution of thermoplastics
 - Substitution of composites (thermoset-based)
 - Substitution of metal inlays

Deriving Recommendations for Action:

- Documentation of the systematic procedure to find business cases for hybrid thermoplastic parts
- Barriers and how to overcome them in SMEs for thermoplastic composites
 - Technical barriers
 - Organizational barriers
- Practical guiding principles
 - How to initiate projects
 - Easy-to-use design guidelines
 - Manufacturing guidelines
 - Planning guidelines
- Best practices in "fast & easy cost calculation"



Additionally: Workshops at injection molders with technology providers





Project Plan Kickoff Meeting

Fakuma

International trade fair for plastics processing



- The kickoff meeting will take place:
 - on October 18th, 2018
 - at Fakuma fair
 - In Friedrichshafen
- Detailed information on the meeting will prior to the meeting.
- This will be our first action in bridging the gap between thermoplastic composite and injection molding industry.





Team & Investment



Project Team:

- 1 scientist of IKV (injection molding, FRP design, processing)
- 1 scientist of AZL (process chains, cost modelling)
- 1 coordinator of AZL (organization, management, documentation)



Investment: Small companies (< 10 employees): 5.000,00 €</td> Medium-sized (< 50 employees): 7.500,00 €</td> Large (< 500 employees): 10.000,00 €</td> Very large (> 500 employees): 12.500,00 €

Targeted **number of participants**:

20 companies (at least 10 SME injection molders)





Your Benefits











SME injection molder

- Becoming capable of the technology
- Contact to new OEMs and suppliers (machines / materials)
- Learning a methodology to find technically valid application potentials
- Novel applications / business cases

Tape manufacturer / compounder

- Contact to potentially novel customers
- Understanding (& empowering) your customers, their barriers and pain points
- Novel applications / business cases

Machine and tool builder / Engineering provider

- Contact to potentially novel customers
- Understanding (& empowering) your customers, their barriers and pain point

OEMs/Tier1s

- Contact to suppliers (injection molders)
- Development of supplier chains and empowering them (Tiers1s, 2s, ...)
- Communication of requirements and demands (quality, cost, delivery time)
- Gaining important knowledge for the quality management & business cases
- → Win-win-win situation, where every participant gains from the work plan

[Picture sources: Covestro, Siebenwurst, M.TEC, KraussMaffei]





Contact





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Let us know your feedback, questions and proposals...





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