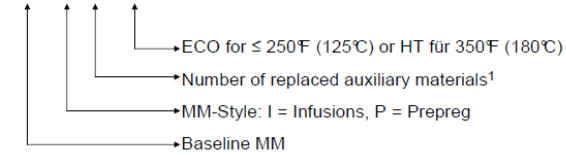


MULTI MEMBRANE TYPE`S

MM - X - x - XXX - Customer



To learn more, please contact us:

Varianten der MM

Typical bagging lay up's

Type: Vacuum Infusions	Type: Prepreg	Remark
Composites (Fabric, UD)	Composites (Fabric, UD)	
Peel Ply	Peel Ply	Option
Perforated Release Film	Perforated Release Film	
Greenflow		
Membrane	Membrane	
Membrane Carrier	Membrane Carrier	Not required with MM
Bleeder	Bleeder	
Bleeder (thick)	Bleeder (thick)	Option
Vacuum foil	Vacuum foil	

Effective Variations:

Type 1: MM1: Membrane + Carrier

Type 2: MM2: Perforated Foil + Greenflow + Membrane + Bleeder

Type 3: MM3: Perforated Foil + Membrane + Bleeder

Type 4: MM4: Membrane + Bleeder

Type x: MMx: Combination on customer specification

Baseline

Baseline Infusions

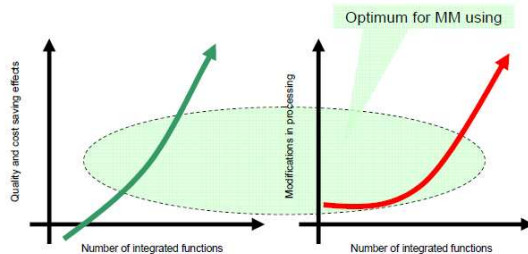
Baseline Prepreg

Baseline Combo

Baseline Individual

OTIMUM OF MM USING

Optimum of MM using



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EXAMPLES OF POTENTIALS IN COST SAVING FOR TYPICAL COMPOSITEPARTS PER YEAR

Total savings by using MM		
	With QA and Rework	Without QA and Rework
Per sqm	5,42 €	-1,60 €
per typical part	813,62 €	-239,39 €
per year	488.169,00 €	-143.631,00 €

ECO-INFUSIONS

Total savings by using MM		
	With QA and Rework	Without QA and Rework
Per sqm	12,75 €	1,71 €
per typical part	3.824,98 €	512,98 €
per year	764.995,20 €	102.595,20 €

HT PREPREG

MULTI MEMBRANE (MM)

AN ALTERNATE APPROACH TO REDUCE COSTS AND PRODUCE A HIGHER QUALITY IN THE FIELD OF COMPOSITES

The future for Infusions und Prepreg techniques

A service of:

HTF Hightech Fabrics

Wals / Austria

The Multi Membrane

Techniques for using

Used Techniques in the past	Application of MM-Type	Cost improvement potential
Prepreg ≤ 250 F (RT to 125°C)	MM-P-x-ECO	Yes
Prepreg ≤ 350 F (125°C to 180°C)	MM-P-x-HT	Yes
Infusions ≤ 250 F (RT to 125°C) with Membrane	MM-I-x-ECO	Partly if the membrane change of the fabric material is a real option
Infusions ≤ 250 F (RT to 125°C) without Membrane	MM-I-x-ECO	Yes
Infusions ≤ 350 F with Membrane (125°C to 180°C)	MM-I-x-HT	Yes because of the lower price compared to the market
Infusions ≤ 350 F without Membrane (125°C to 180°C)	MM-I-x-HT	Yes

Item	Effects	Cost improvements (CI)
Material price of MM in comparison with the old baseline bagging material price	Total materials price is equal or a little higher	neutral or negative
Handling and lay up time by using MM in comparison to the old baseline bagging system	Total reduce of the lay up and bagging time	Positive
Quality effects by using MM	Total reduce of QA and rework time	positive
Total effect	Cost savings in material, labor and QA	positive with short ROI (Return of Invest time)

By using a MULTI MEMBRANE (MM) some functions of auxiliary bagging materials will be integrated to the MM, The MM save cost in bagging and during the processing. The MM is a special to customer and process material only.