

Release Agents for Low VOC HR- Molded Foam

Kai-Oliver Feldmann, Alfred Vuin, Annegret Terheiden

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Types of Emissions

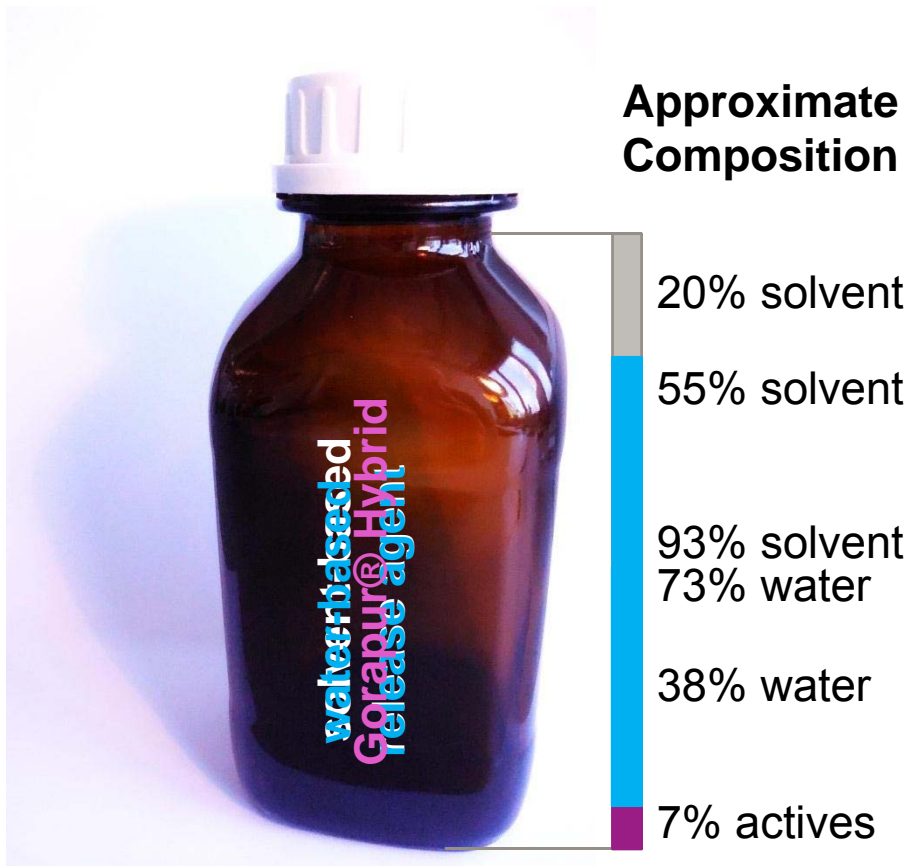


Foam Emission



Stack Emission

Influencing Stack Emissions



PROs and CONs when replacing solvent based release agents– Hybrid vs. Water



	water-based release agent	GORAPUR® Hybrid
reduction of stack emissions	very large	large

Influencing Foam Emissions – VDA 278



Mold Preparation

Set parameters:

Output: 71 g/min

Mold temperature: 65 °C

Variable parameters:

Drying time: 30, 45, 60 s

Amount applied: 12, 20 g/m²

Release agents

R-A3: Evonik GORAPUR® A3
solvent-based product (93% solvent)

R-Hybrid: Evonik GORAPUR® Hybrid
(55% solvent)

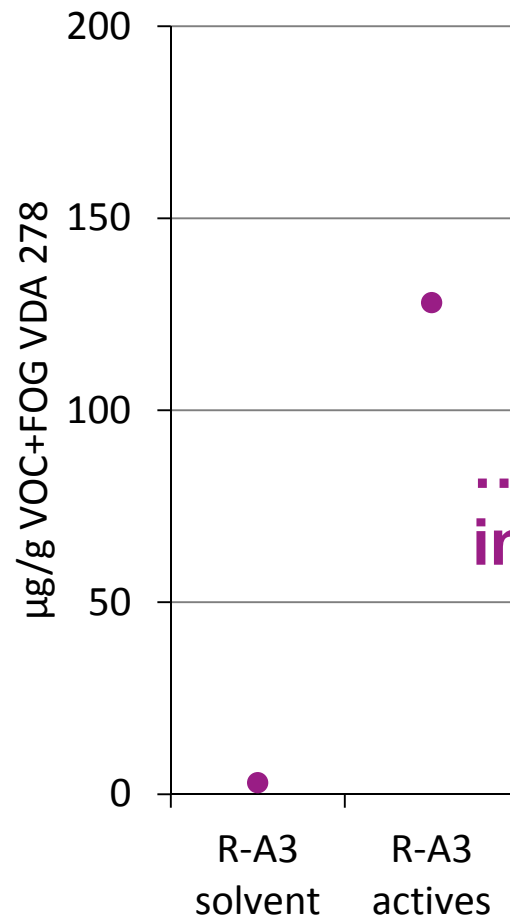
R-H₂O: Evonik GORAPUR® water-
based product (5% solvent)

Hand Mix Foam Formulation	pphp
Polyetherpolyol for HR foam (OH-Number = 31 mg KOH/g)	40.00
SAN-Copolymer Polyol for HR (43% SAN, OH-Number = 20 mg KOH/g)	60.00
Tegoamin® DEOA 85	1.00
TEGOAMIN® 33	0.41
TEGOAMIN® BDE	0.06
TEGOSTAB® B 8738 LF 2	0.70
Water	3.83
Toluene diisocyanate (T80)	40.39

Influencing Foam Emissions – VDA 278



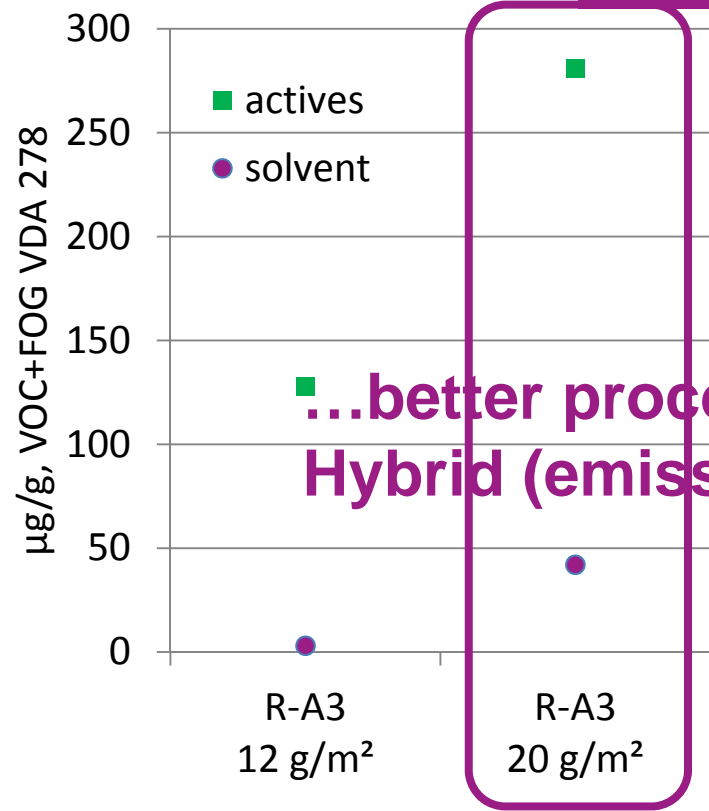
12 g/m², drying time 45 s



...solvent/water content of RA does not influence foam emissions in VDA 278

Influencing Foam Emissions – VDA 278

Spray amount as indicated, drying time 45 s



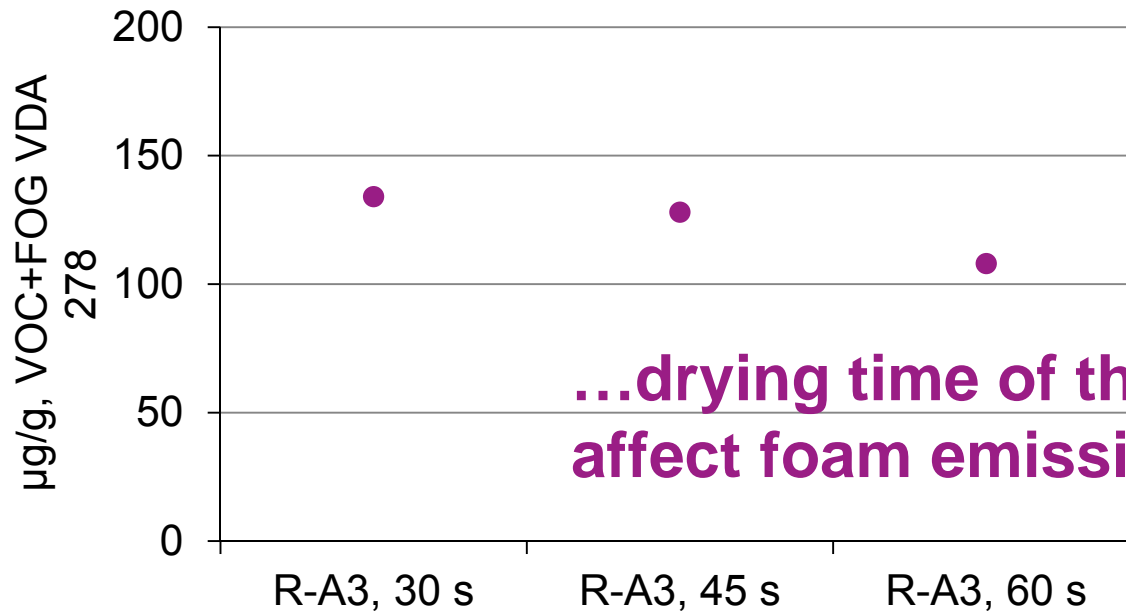
...better processing latitude with GORAPUR® Hybrid (emission in VDA 278 and surface quality)



Influencing Foam Emissions – VDA 278

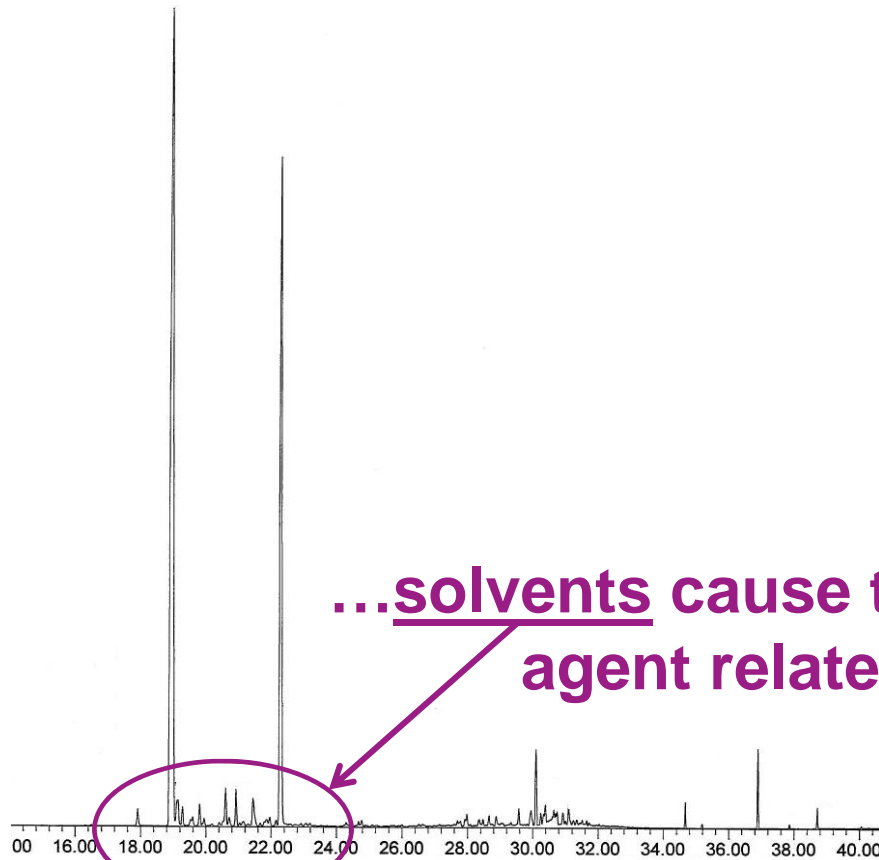


Spray amount 12 g/m², drying time as indicated



...drying time of the RA does hardly affect foam emissions in VDA 278

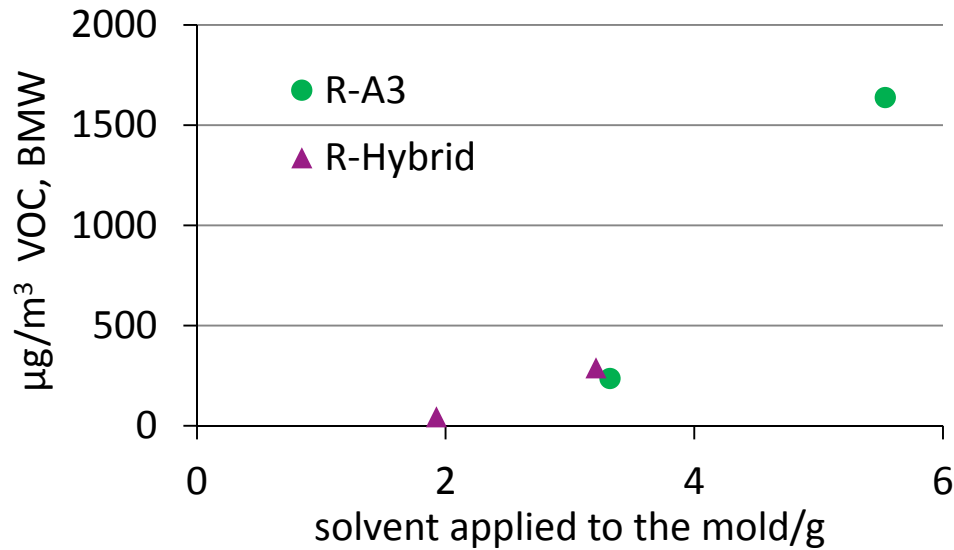
Influencing Foam Emissions – Modified BMW Summer Test



...solvents cause the major share of release agent related foam emissions in BMW

chromatogram of foam emissions

Influencing Foam Emissions – Modified BMW Summer Test



...total amount of solvent determines the emissions in BMW

Release agent	Use Level (g/m ²)	Solvent Related Emission (µg/m ³)
R-A3	12	237
R-A3	20	1638
R-Hybrid	12	46
R-Hybrid	20	290

Summary



- Active substances of release agents are detected in VDA 278, solvents in BMW.
- Neither drying time nor solvent content influence release agent related foam emissions in VDA 278.
- GORAPUR® Hybrids are an easy to implement replacement of solvent based release agents with lower stack emissions.
- GORAPUR® Hybrids provide wider processing latitude with respect to foam emissions and foam surface quality.
- GORAPUR® Hybrids serve to reduce release agent related emissions in BMW.

[Please, see accompanying paper for further details or give us a call.]



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