



Sustainable foaming solutions
for

BUILDING & CONSTRUCTION INDUSTRY



Alve-One® foaming agent solutions, bringing more value for your footwear foamed applications



Matching the technical performances of the market reference with a cost-competitive solution



Enhancing sustainability performance for footwear products with a compliant and safe foaming agent



Simplifying logistics through a safe- to-use foaming agent, delivering foams containing no odor

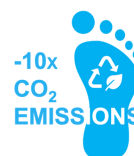


Improving competitiveness by optimizing formulations or manufacture processes (if desired)

Alve-One® characteristics

Chemical composition	Mineral based, endothermic decomposition	Granulometry range	Adapted to your process: From 5 µm to 50 µm
Physical form	Powder, Masterbatch *	Processing temperature range	Adapted to your process: From 140° to 210 °C
Resins	Elastomers, linear & crosslinked Polyolefins, rigid & flexible PVC, Rubber	Packaging	Supporting your needs

*Available on demand depending on your region



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LIGHTWEIGHT WITHOUT COMPROMISING ON SUSTAINABILITY

Alve-One® solutions are based exclusively on [safe raw materials combinations](#), 100% compliant with REACH regulations, and deliver efficient foaming performances.

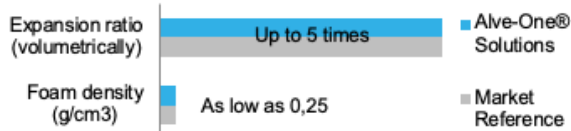


Fig 1. Performance comparison between ADCA & Alve-One® solutions in a PVC plastisol foam

✓ Alve-One® solutions found to be as efficient as the market reference for density reduction & expansion ratio.

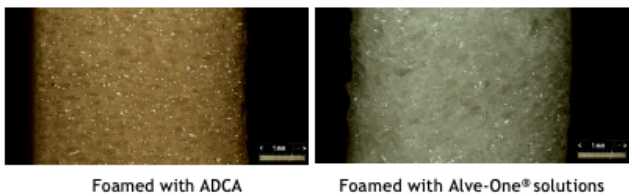


Fig 2. PVC plastisol foams' structures

✓ Similar cellular structures and a whiter color is obtained for the foam manufactured with Alve-One® without additional additives' use.

AN EASY-TO-USE FOAMING SOLUTION

Easily adopted, simplified plastisol formulation that maintain foaming performance

✓ PVC plastisol's formula can be optimized thanks to the continuous development support of Alve-One® team in collaboration with customers

Raw material	Name	Formulations (%) of PVC plastisol foamed with	
		ADCA	Alve-One®
PVC resin	PVC K-value 67	33,0	32,2
Plasticizer	DINP	26,2	25,7
Filler	CaCO ₃	39,5	39,9
Kicker / Activator	ZnO + Zn stearate	0,4	-
Blowing Agent	ADCA	0,9	-
	Alve-One®	-	2,5*
Objective	Expansion ratio	3,6	3,5
	Cellular structure	Homogeneous	Homogeneous

* Usage of Alve-One® can be optimized, resulting in a better foaming performance and cost-competitive solution compared to the market reference

Fig 3. Comparison of standard plastisol's formulations foamed with ADCA and Alve-One® foaming solutions





A READY-TO-USE AND SAFE FOAM

PVC plastisol foamed with Alve-One® do not emit any strong gas smell (ammonia) and contain negligible quantities of VOCs (volatile organic compounds). Faster time-to-market, lower logistic costs and higher acceptance from end-users are possible to achieve.

- ✓ Foams produced with Alve-One® solutions do not emit VOCs, a critical aspect:
 - in the production of artificial leather for the automotive industry, promoting a high VIAQ* standard
 - in the flooring** production.

*VIAQ: Vehicle Interior Air Quality – ISO 12219 and VDA standards
**ISO 16000

Foaming Agent	Weight Loss @ 100 °C	Weight Loss @ 150 °C	Weight Loss @ 200 °C
ADCA	0%	0,17%	0,82%
Alve-One®	0%	0,03%	0,04%

Fig 4. Analysis of amount of volatiles released by foams produced with ADCA and Alve-One® solutions, measured by the weight loss at 3 different temperatures.

PROGRESSING ON SUSTAINABILITY

The substitution of ADCA for Alve-One® solutions in the production of every type of PVC plastisol results on a significant improvement on environmental impact: a manufacturing footprint up to 97% lower.

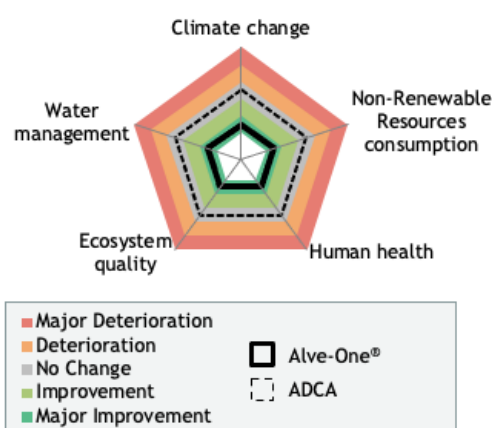


Fig 5. Life Cycle Analysis environmental impact comparison of both foaming agents taking into account Ecolnvent 3.4 data, publicly available data and Solvay's internal expertise

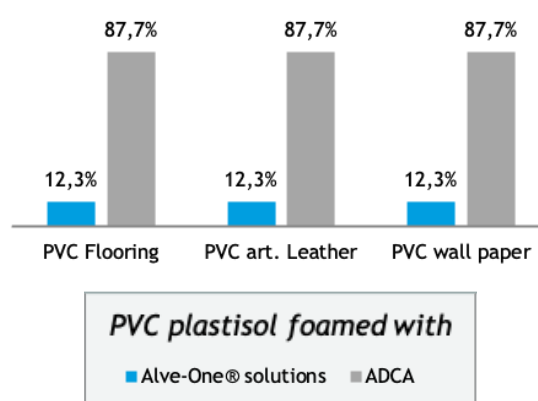


Fig 6. Normalized comparison of the Life Cycle Analysis of PVC plastisols foamed with ADCA and Alve-One® (following ISO 14040-44)

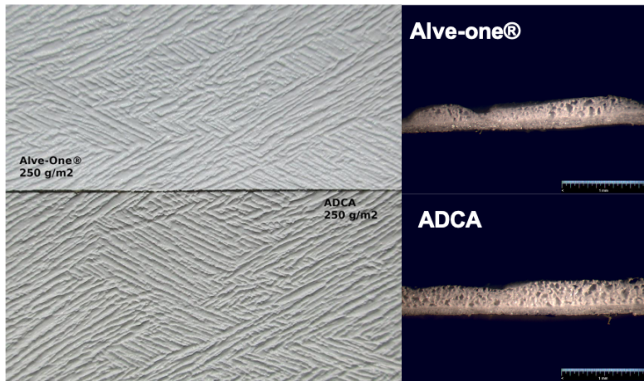




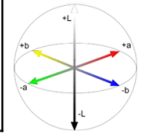
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WHITER, LESS THICKER AND VOC-FREE RESULTS

The use of Alve-One® in wallpaper allows for whiter and less thick results than those formulated with ADCA

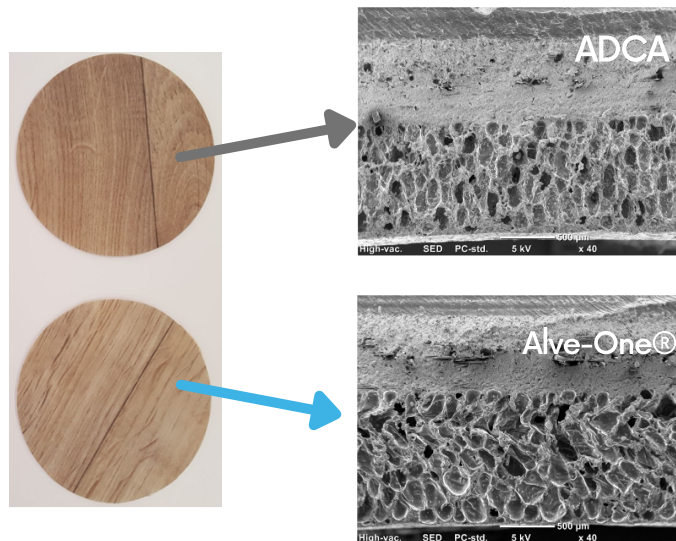


	ADCA	Alve-one®
Thickness (mm)	0.39	0.36
Density	0.65	0.66
Whitiness		
L*	96	96
a*	-0.3	0.3
b*	-0.7	-4.1



In PVC flooring solutions Alve-One® has a lower density without compromising the quality of the final product

Blowing agent	Thickness	Density
Alve-One®	2,81	0,93
ADCA	2,49	1,09





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