

BLOWING AGENTS FOR A CHANGING WORLD

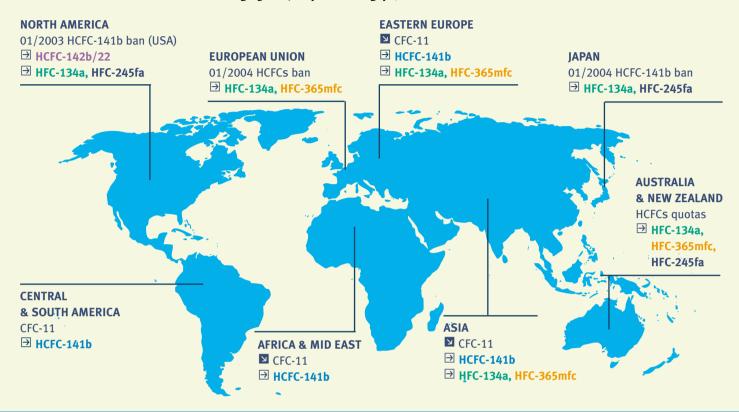






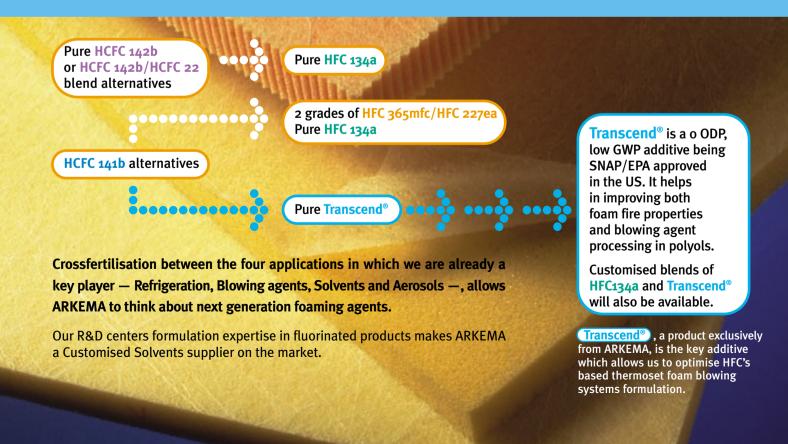
A world driven by different regulations resulting from the Montreal protocole

ARKEMA Fluorinated chemicals is today a major supplier of HCFC 142b, 22 and 141b, HFC 365mfc/227ea and 134a, and Transcend®.





From HCFC to third generation zero ODP blowing agent, Transcend® is a key formulation additive for the future





Physical properties of Forane® blowing agents

PHYSICAL PROPERTIES	HCFC- 141b	HCFC- 142b		HCFC- 22	HFC-365mfc / HFC-227ea 93/7 87/13		HFC- 134a	TRANS-1,2 DICHLORO ETHYLENE		
Formula	CH ₃ -CCl ₂ F	C ₂ H ₃ -CIF ₂		CH-CIF ₂		CF ₃ -CH	₂ -CF ₂ -CH ₃ HF-CF ₃	C ₂ H ₂ -F ₄	C ₂ H ₂ -Cl ₂	
Molecular weight (g/mol)	117	100.5		86.5		149.4	150.5	102	97	
Boiling point under 1.013 bar (°C) (starting)	32	-8.1		-39.9		30	23	-25.4	48	
Density of liquid at 25°C (kg/dm³)	1.236	1.02		1.05		1.256	1.263	1.04	1.26	
Vapour pressure at 25°C (bar)	0.81	3.33		10.39		0.85	1.08	6.66	0.45	
Saturated vapour density at the boiling point (kg/m³)	5.02	4.77		4.65		6.54	6.91	5.18	Not available	
Critical temperature (°C)	205.7	137.1		96.2		184.4	179.7	101.2	235	
Critical pressure (bar)	43.4	41.2		49.7		30.8	30.7	40.6	51.9	
Critical density, (kg/dm³)	0.46	0.44		0.52		0.47	0.47	0.51	0.43	
Latent heat of vaporisation at the boiling point (kJ/kg)	206.8	226		211.7		183.5	181.7	205.5	291	
Surface tension of the liquid at 25°C, mN/n	18.4	12.12		8.09		14.5	14.1	8.18	27.5	
Thermal conductivity (gas) at 25°C, mW/m. °C	9.8	11.94		13.06		10.7	11.2	14.16	10.6 (at 50°C)	
Flash point (iso1516/1523)	None	Not applicable		Not applicable		None	None	None	-12°C (ASTMD3828)	
Ozone Depletion Potential (ODP)	0.11	0.043		0.034		0	0	0	0	
Global Warming Potential (GWP)	630	2,400		1,700		1,030	1,150	1,300	< 11	

Quality and customer service

ARKEMA is committed to provide high quality products and services to its customers, particularly the SBU Derivatives of Fluorine, including the FORANE® and Transcend® products. Our production plants in Europe have the ISO 9002 accreditation as well as the ISO 14001.

CONTACTS

ARKEMA offers its customers all the necessary support:

Worldwide sales network
 with local agencies or sales offices
 and a central department
 ARKEMA - Fluorochemicals SBU
 4-8, cours Michelet
 92800 Puteaux - France
 Fax: 33-1-49 00 53 12

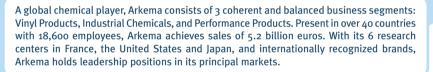


Technical service and R & D

This department based in the company's Pierre-Bénite Research Centre (CRRA, ISO 9001 accreditated) is dedicated to provide all the necessary support to ARKEMA's customers through specific technical brochures or direct contact.

ARKEMA CRRA - OFA Department

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