ARKEMA
INNOVATIVE CHEMISTRY

TECHNICAL POLYMERS MED RANGE

Chemical resistance

CHEMICAL RESISTANCE OF ARKEMA'S MEDICAL-GRADE TECHNICAL POLYMERS

As healthcare technology continues to advance, the need for high performance medical grade polymers will increase. Arkema, having been a key player in the healthcare market, recognizes the importance of thoroughly understanding the chemical resistance profile of its Medical Grade Technical Polymers. In order to ensure optimal material selection for its customers, Arkema has conducted a chemical resistance study with the top chemical agents commonly used in hospitals and other healthcare settings along with its Medical Grade Technical Polymers.

TABLE 1- List of chemical agents

Main category	Chemical composition	CAS numbers	Commercial products (Hospital)
Bleach	Sodium hypochlorite 11-15% diluted at 0.2%	7681-52-9	10% bleach solution
			Clorox Bleach
			Dispatch
			Dispatch™ Hospital cleaner
			Disinfectant with bleach
			Sani-cloth™ Bleach Wipe
			Alcavis Bleach Wipe 1:10
H_2O_2	Hydrogen peroxide (30%) and peracetic acid (38-40%- diluted at 5%)	7722-84-1 and 79-21-0	Accel TB wipes
			Ecolabs oxycide
			Virox
IPA	2-propanol 100%	67-63-0	Isopropyl alcohol (or propan-2-ol or isopropanol)
			70% IPA solution
Phenol	CRESYL (10% hexylene glycol + 1% orthobenzylparachlorophenol + 0.1% O-phenylphenol)	59-50-7 and 90-43-7 and 120-32-1	Wex-cide 128
			Precise
			Sporicidin
			Precise™ Hospital Foam cleaner disinfectant
			Sporicidin™
			Vesphene IIse
QAC (Anti-infective agent)	Benzethonium chloride 98% diluted at 0.3%	121-54-0	Sanicloth HB wipe
			Sanicloth Super
			Sanicloth AF3
			Virex TB
Glycol Ether	2-butoxyethanol 99% diluted at 5%	111-76-2	Cavicide
Detergent	Chlorohexidine digluconate 30% diluted at 1%	18472-51-0	Aniospray 29
			Clinell detergent wipe
			Cidex (2.4% glutaraldehyde)
			Cidex OPA
DMSO	Dimethyl sulfoxide 99%	67-68-5	-

Table 2 demonstrates the qualitative performance of chemical resistance based on surface aspect (the appearance of cracks) and coloration. Environmental stress cracking resistance tests (ESCR) were performed using elliptical Bergen jig, which applies a range of strains to a single sample bar and injected plates immersed into the indicated chemical agent at room temperature (23°C) for 24 hours.

Table 3 demonstrates the solvent absorption of all the medical grades based on standard ASTM D543. Sample injected plates (1 mm thickness) were immersed in the designated solvent. The samples were maintained at room temperature (23°C) until the swelling reached a complete saturation of the material (approximately 1,300 hours). The weight absorption was measured regularly by removing the sample from the solvent, wiping it and weighing.

TABLE 2 - Chemical Resistance Performance

		Bleach	H_2O_2	IPA	Phenol	QAC	Ether	Detergent	DMSO
Pebax® MED	2533	++	++	++	+	++	++	++	++
	3533	++	++	++	+	++	++	++	++
	4033	+++	+++	+++	+	+++	+++	+++	+++
	4533	+++	+++	+++	+	+++	+++	+++	+++
	5533	+++	+++	+++	+	+++	+++	+++	+++
	6333	+++	+++	+++	+	+++	+++	+++	+++
	7033	+++	+++	+++	+	+++	+++	+++	+++
	7233	+++	+++	+++	+	+++	+++	+++	+++
	7433	+++	+++	+++	++	+++	+++	+++	+++
	MV1074	+++	+++	++	+	+++	+++	+++	+++
Rilsamid® MED	AESNO	+++	+++	+++	+++	+++	+++	+++	+++
	AMNO	+++	+++	+++	+++	+++	+++	+++	+++
Rilsan® MED	BESNO	+++	+++	+++	+	+++	+++	+++	+++
	BMNO	+++	+++	+++	+	+++	+++	+++	+++
	BESVO A	+++	+++	+++	+	+++	+++	+++	+++
Rilsan® Clear MED	G170	+++	+++	+	+	+++	+++	+++	+++
	G850 Rnew	+++	0	0	+	+++	+++	+++	+++
Kynar® MED	720	+++	+++	+++	+	+++	+++	+++	++

QUALITATIVE KEY FOR CHEMICAL RESISTANCE

+++	*Resistant. No or little change in weight or dimensions, no damage*
++	*Limited resistance. Changes in weight or dimensions after longer periods, possibly irreversible changes of properties. We recommend contacting us before use*
+	*Not resistant. May still sometimes be used under specific conditions (short exposure time, contact droplets)*
0	*Soluble or attacked after brief contact*

QUALITATIVE KEY FOR MATERIAL SWELLING

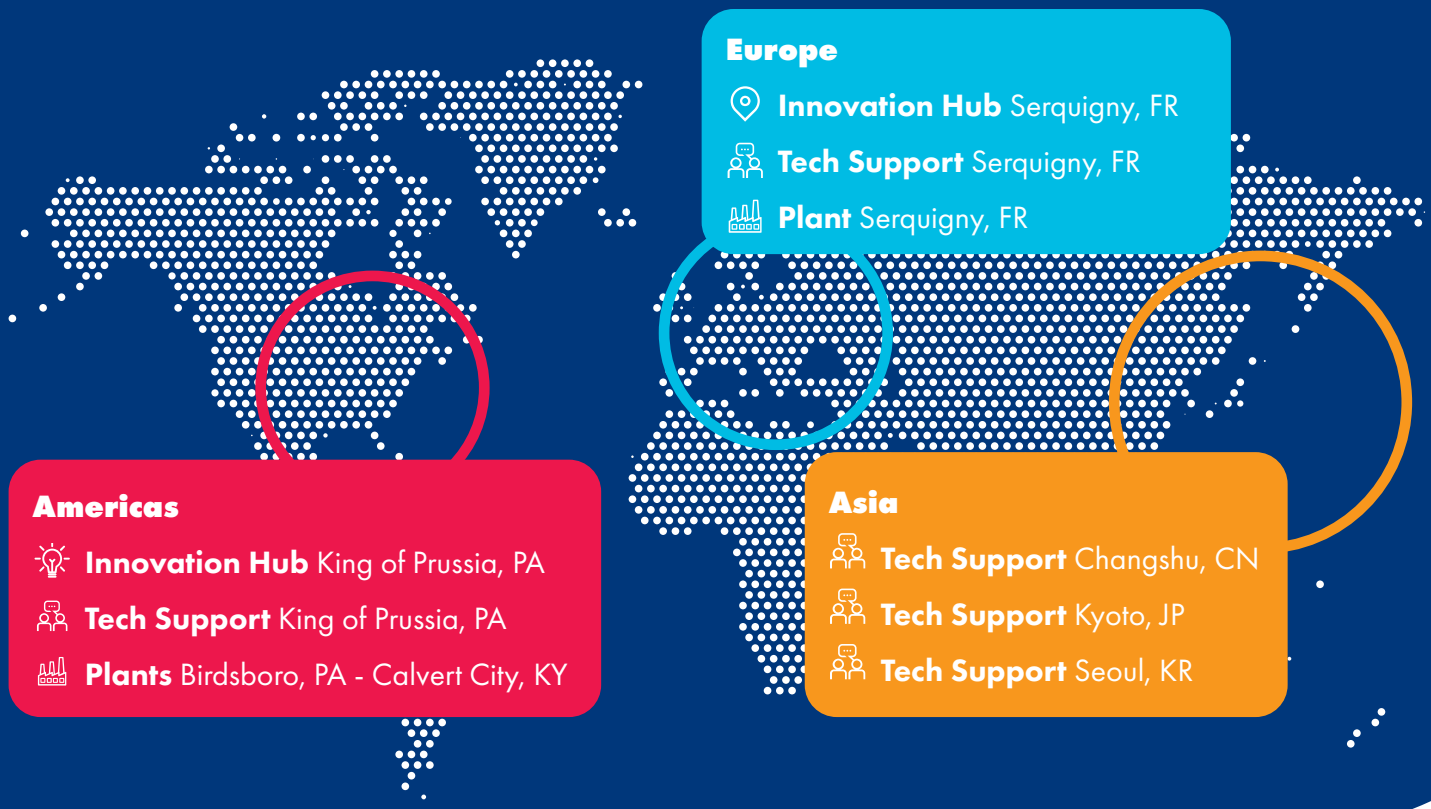
+++	*Resistant. No or little change in weight, no damage (-2%<Δm<5%)*
++	*Limited Resistance. Change in weight after longer periods (5%<Δm<15%)*
+	*Not Resistant (Δm>15%)*

Δm: Mean of relative weight change

TABLE 3 - Material Swelling Performance

		Bleach	H_2O_2	IPA	Phenol	QAC	Ether	Detergent	DMSO
Pebax® MED	2533	+++	+	+	+	++	+	++	+
	3533	+++	+++	+	+	+++	++	+++	++
	4033	+++	+++	+	+	+++	++	+++	++
	4533	+++	+++	+	+	+++	++	+++	++
	5533	+++	+++	+	+	+++	++	+++	++
	6333	+++	+++	++	+	+++	+++	+++	++
	7033	+++	+++	++	+	+++	+++	+++	+++
	7233	+++	+++	++	+	+++	+++	+++	+++
	7433	+++	+++	++	+	+++	+++	+++	+++
	MV1074	++	+	+	+	+	+	+	+
Rilsamid® MED	AESNO	+++	+++	+++	++	+++	+++	+++	+++
	AMNO	+++	+++	++	++	+++	+++	+++	+++
Rilsan® MED	BESNO	+++	+++	++	+	+++	+++	+++	+++
	BMNO	+++	+++	++	++	+++	+++	+++	+++
	BESVO A	+++	+++	+++	++	+++	+++	+++	+++
Rilsan® Clear MED	G170	+++	+++	+	+	+++	+++	+++	+
	G850 Rnew	+++	+++	+	+	+++	++	+++	++
Kynar® MED	720	+++	+++	+++	+++	+++	+++	+++	+

Global Manufacturing, Technical Support, and R&D



Arkema France - A French "société anonyme", registered in the Nanterre (France) Trade and Companies Register under the number 319 632 790 NA-Marcom -RZ- 05-2018 ADV# 2020-03

ARKEMA
INNOVATIVE CHEMISTRY

ExtremeMaterials.com

Contact Information
China: +86 21 61476888
Japan: +81 3 5251 9900
Korea: +82 2 37036700
Singapore: +65 64199199
Taiwan: +886 2 27476979
India: +91 22 66137500

Arkema Inc.
900 First Avenue
King of Prussia, PA 19406
USA
Tel.: (+1) 800-596-2750

Headquarters: Arkema France
420, rue d'Estienne d'Orves
92705 Colombes Cedex – France
Tel.: +33 (0)1 49 00 80 80
Fax: +33 (0)1 49 00 83 96
arkema.com