



Pentamed®

Films for medical device packaging



klöckner pentaplast



innovation. delivered.

Our films deliver

The world's most innovative medical devices require innovative packaging. With Pentamed®, kp delivers.

We know that medical devices and instruments are sensitive and must be protected from both physical damage and environmental contamination. But health professionals need to open the packages quickly and easily. With Pentamed®, you get it all. These strong films produce trays and clamshells that ensure both product integrity and user convenience. And we're pioneering formulations to increase moisture protection, so that you can launch new products safely packing devices and pharmaceuticals together.

The medical industry is constantly changing. But your needs power our innovation: challenge us with a new product or idea, and we will develop the optimal film. At kp, we're not just innovating, we're innovating for you—and the opportunities are endless.



solutions.
delivered.

Innovative products that meet your needs

With Pentamed®, kp offers the most comprehensive line of films for medical device packaging in the industry. Choose from mono-polymer and multi-polymer rigid films in a range of formulations to suit your product. And if we don't have the film you need, our engineers will design a custom formulation.





Pentamed® films overview

	polymer	sterilization				barrier		forming			other characteristics						
		EtO	gamma	E-beam	steam	oxygen barrier	moisture barrier	thermoforming	die cutting	forming range °F (°C)	biocompatibility/ organoleptics (taste & odor)	chemical resistance	scratch resistance	heat sealing (Iyvek, paper)	gels & black points	burn streaks (yellow streaks)	can be colored or tinted
mono-polymer films	Pentamed® Vinyl	✓	—	—	—	++++	++++	++++	+++++	220-310 (104-154)	+++	+++	+++	+++++	+++	+++	+++++
	Pentamed® PETG	✓	✓	✓	—	+++	++	+++	+++++	220-310 (104-154)	+++++	++	++	+++++	++++	++++	+++++
	Pentamed® light PETG	✓	✓	✓	—	++	+	+++++	+++++	220-310 (104-154)	+++++	++	+++++	+++++	+++++	+++++	+++++
	Pentamed® GAG-PET (GPETG)	✓	✓	✓	—	++++	++	+++	+++++	220-310 (104-154)	+++++	++	+++	+++++	++++	++++	+++++
	Pentamed® APET	✓	✓	✓	—	++++	++	++	++	250-330 (121-165)	+++++	++	++	++	++++	++++	+++++
	Pentamed® A/MA/B	✓	✓	✓	—	+++++	++	+++++	+++++	240-330 (115-165)	++++	+++	++	+++++	++	++	++
	Pentamed® HIPS	✓	✓	✓	—	+	+	+++++	+++	270-300 (132-148)	+++	+	++	+++++	+++	++++	+++++
	Pentamed® PP	✓	✓	✓	✓	+	++++	++	+++	320-360 (160-182)	+++++	++	++	+++++	+++	++++	+++++
multi-polymer films	Pentamed® ACLAR® (PETG/ACLAR®)	✓	✓	✓	—	+++	+++++	+++	++++	237-327 (114-164)	+++++	+++++	++	+++++	++++	++++	+++++
	Pentamed® PET/PE	✓	✓	✓	—	++++	+++	++	++	250-330 (121-165)	+++++	++	++	+++++	++++	++++	++

+ Standard +++ High +++++ Ultra High



polymer films

Pentamed® mono-polymer & multi-polymer films

When a medical professional opens your device, it's got to be in perfect condition. That's why these incredibly strong, impact resistant films protect against all hazards—physical, mechanical, and environmental.



- PVC, PETG, GAG-PET (GPETG), APET, A/MA/B, HIPS, Polypropylene, PET/PE (peel and non-peel)
- Standard to ultra-high moisture and oxygen barrier properties
- Sealable to a full range of lidding materials
- Wide range of sterilization options (EtO, gamma, E-beam, and steam)
- Brilliantly clear
- No silicone branching
- Excellent deep-draw thermoforming characteristics
- Higher yields, more good parts per pound/kilogram, reduced costs
- Softer cutting formulations cause less knife wear and increased up-time
- High efficiency on standard form/fill/seal machinery



Pentamed® light

Engineered to offer superior aesthetics for package appeal while providing an opportunity for material reduction, Pentamed® light films reduce package weight and improve processability as compared to standard materials.

- 30% higher yield than competing PETG films
- Sealable to full range of lidstock
- Gamma, E-beam, and EtO sterilizable
- Proprietary embossed surface improves denesting and processability
- Printable
- Unique opaque finish

Pentamed® ACLAR®

If you package moisture-sensitive pharmaceuticals together with medical device components, choose Pentamed® ACLAR®. With this innovative film, you can expand your product line to include unique combinations, such as pre-filled syringes or inhalers, medical trays, and sensitive medical diagnostic equipment.

- Moderate to high moisture barrier protection
- Identical moisture barrier and superior thermoforming properties as kp pharmaceutical films
- Optimized for medical device packaging
- Sealable to standard polyester and ACLAR® compatible lidstocks
- Gamma, E-beam, and EtO sterilizable
- High gloss surface
- Clear and transparent colors



performance.
delivered.

Advanced technology, global sourcing

Since the first film rolled off a kp calender line in 1966, we have continually invested in state-of-the-art calendering, extrusion, laminating, and coating technology and equipment. When you buy kp film, you know it will perform on your machinery. Our plants execute your orders consistently, meeting precise specifications for color, surface, thickness, formulation, and function every time. The tolerances are very narrow, you can write tighter specifications to yield considerable cost savings. Raw materials are fully traceable.

To meet the needs of global medical companies, we use this advanced technology at manufacturing sites across the globe. Wherever you package medical devices, we can supply identical high-quality Pentamed® film from our sites in Asia, Europe, North America, and South America. kp global sourcing ensures security of supply. Re-qualifications for product transfers are no longer needed, so you get quicker access to new markets. And we are unique in backing every order with outstanding local technical and customer service.



kp plants are ISO 9000, 9001:2000, and 14001:2004 certified and we manufacture according to current GMP, HACCP, and BRC/loP standards. All Pentamed® films meet or surpass FDA, HPB & international regulatory standards:

- FDA Medical Device Master Files #240
- FDA Drug Master File #3764 and #7874
- Canadian Drug Master File #1989-033
- European Pharmacopoeia
- BgVV
- SFDA

Solutions for a changing world

kp's innovative portfolio of medical device films helps you to meet your social, economic, and environmental sustainability goals, while maintaining product integrity and production economies. We advise customers on the environmental aspects of our products and offer options such as light weighting and removal of excess packaging.





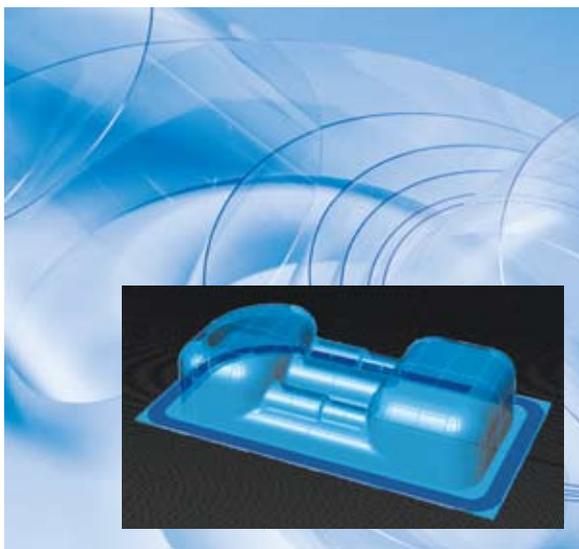
support.
delivered.

Our people stand behind our products

At kp, our people are there to help you make the most of Pentamed® film. Our sales force is the best trained in the industry, and they work closely with our engineers to meet your needs. Our customer service teams, stationed across the globe, ensure on-time delivery wherever you need it. We also offer the industry's most comprehensive technical support. Wherever you are, our technicians will visit you on-site for consulting, troubleshooting, and training.

kp tech support is also about improving performance to get your product to market faster. At kp Packaging Technology Centers, the first of their kind in the industry, we internally develop new films and solve your issues. We evaluate materials, tooling, and package design, and test your package under full production conditions.

Pentamed® BlisterPro™, kp's innovative and proprietary software program, has introduced finite element modeling for thermoforming packages to the medical device industry. This program helps you design more cost-effective packages that ensure product integrity by testing film formulations and tool geometry, calculating estimates of thermoformed cavities, and assessing process conditioning in a virtual environment. With kp support, you save time and expense on tooling and line trials.





results. delivered.

A world leader in film

At kp, we believe in meeting the needs of our customers comprehensively, with the highest quality films, the broadest range of formulations, and service and support from beginning to end. We offer the strength and stability of a global company, delivering results to you wherever you are.

Innovation. Solutions. Performance. Support. Results.
kp films deliver.

Film options

- Gloss, matte, matte/gloss, and embossed surfaces
- Clear, transparent colors, and opaque colors
- Custom formulations
- Custom film thicknesses
- Custom roll widths
- UV inhibitors

ACLAR® is a registered trademark of Honeywell International Inc.

Inset photo on page 4: Package courtesy of Arrow International, Inc.

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