

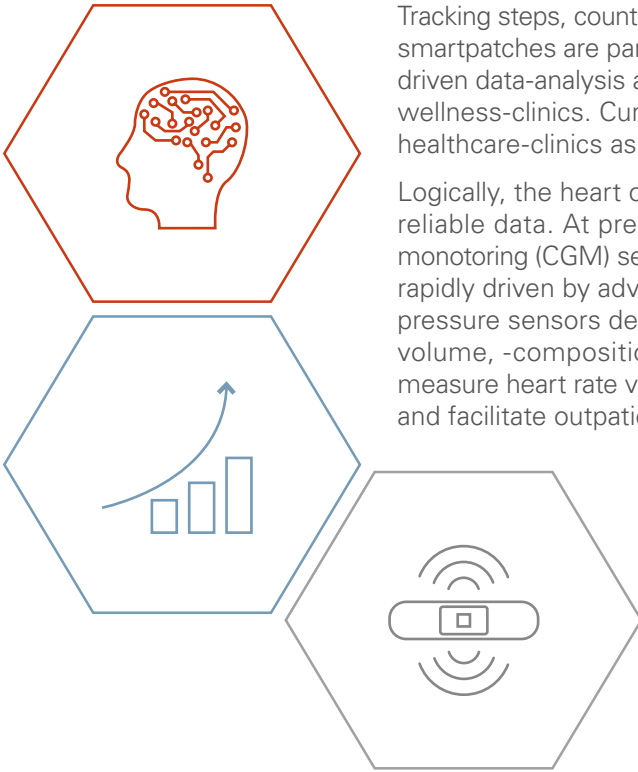


Liveo™ Silicone
Skin Adhesives

Dymax 2000-MW series
UV-curing adhesives

DuPont™ & Celanese™
plastic housing solutions

**Spotlight
Wearables**



Tracking steps, counting calories, monitoring sleep; wearables as smartwatches/ smartpatches are part of our everyday lives. Together with suitable APPs, AI-driven data-analysis and precise sensors, portable devices become personalized wellness-clinics. Currently we are in the middle of turning the wellness- into healthcare-clinics as wearable medical devices (wMD) are evolving in no time.

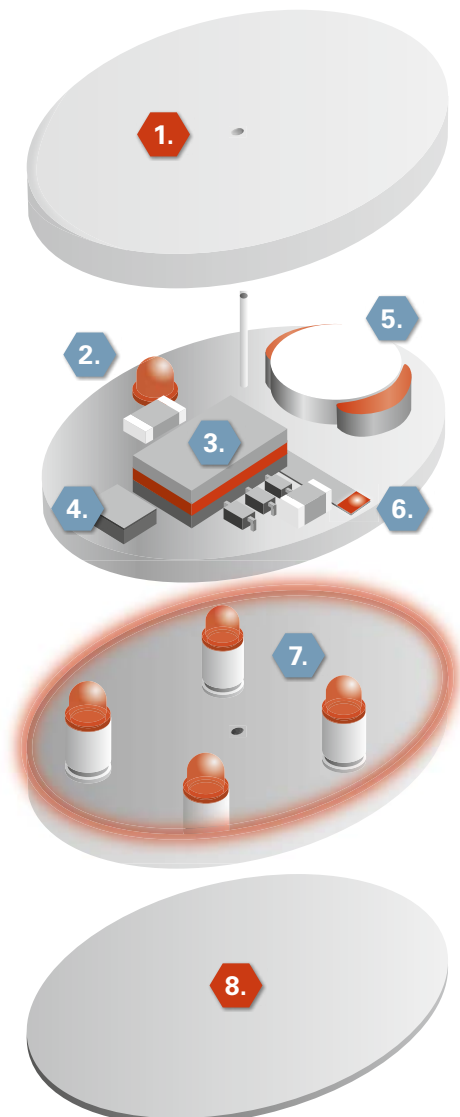
Logically, the heart of wMDs are the sensors that must deliver precise and reliable data. At present, the most recognized are continuous glucose monitoring (CGM) sensors for diabetes treatment. wMD innovation is progressing rapidly driven by advances in sensors, semiconductors and AI; stretch and pressure sensors detect muscle contractions, optical sensors monitor blood-volume, -composition and -pressure whereas other deduce ECG data to measure heart rate variability. Summing up, wMD are sophisticated, convenient and facilitate outpatient care of chronic health conditions.

Monitoring health 24/7, wMD are the major trend in the healthcare industry for the next 5-10 years and thus are expected to have exceptional growth potential: in 2022 globally, 320 million consumer health and wellness wearables will be shipped. By 2024, this figure will likely reach nearly 440 Million units ¹. wMDs only are suggested to have a CAGR of 19% (2021 to 2024).¹

¹ Jeff Loucks, Duncan Steward, Ariane Bucaille, Gillian Crossan, *Wearable technology in health care: getting better all the time, in Technology, Medica and Telecommunications Predictions 2022 for Deloitte Insights, 2022*

Wearable medical devices are built of several unique layers

1. DuPont™ Delrin® Moving Parts Solutions
Celanese™ Crastin® Housing Solutions
2. Dymax® Electronics Encapsulation
3. Dymax® Needle-to-Hub Bonding
4. Dymax® Edgebond
5. Dymax® Battery Reinforcement
6. Dymax® Wire and Flex Tacking
7. Dymax® Assembly Bonding
8. DuPont™ Liveo™ Silicone Skin-Adhesives



Dymax 2000-MW Series UV-curing Adhesives



Dymax 2000-series adhesives are uniquely designed for assembly of wearable medical devices. Formulated without skin-irritants, the series provides strong bonds and dependable performance against moisture and thermal shock.

Material ID	Unique material features	Recommended substrates
2022-MW	<ul style="list-style-type: none"> - 750 cP - D60 (ShoreA) - LED-optimized for 365 nm - low water absorption & minimized water ingress 	SS, Aluminum, Glass, SAN, PU, PI, PETG, PC, ABS
2101-MW-UR	<ul style="list-style-type: none"> - 5500 cP - D77 (ShoreA) - LED-optimized for 405 nm 	ABS, PC, PCTG, PETG, PVC, TPU
1901-M	- 3000 cP, A67 (ShoreA), for sealing, conformal coating or encapsulation of electronic circuit boards & components	CAP, PS, TPU, PCB (flexible & rigid)
2103-MW-UR*	<ul style="list-style-type: none"> - 5500 cP - D70 (ShoreA) - H317 monomer & CMR free 	PC, ABS, PVC, PEBA, SS

* ISO 10993-5/10 specifically designed to address skin sensitivity concerns
IBOA/TPO free
limited release, full commercialization expected Q1 2023, samples available upon request

DuPont™ Liveo™ Silicone Skin Adhesives



Material ID	Unique material features	Application areas
Liveo™ MG 7-9900	<ul style="list-style-type: none"> - soft-skin-adhesive - two-part (A&B) - 1,9 N/2,5cm (PC) - 5000 mPas (A&B) 	medium adhesion to the skin with gentle removal, OTC bandages, scar therapy gels, advanced wound care dressings
Liveo™ MG 7-9960*	<ul style="list-style-type: none"> - soft-skin-adhesive - two-part (A&B) - 2,8 N/2,5cm (PC) - 4400 mPas (A&B) 	medium to high adhesion to the skin, specifically designed for wearable medical device fixation
Liveo™ MG-2401	<ul style="list-style-type: none"> - pressure-sensitive-adhesive - one-part solvent-based (HMDS) - 17,2 N/2,5cm (PC) - 90 mPas 	high & durable adhesion to the skin, specifically designed medical devices such as stoma-patches, surgical dressings/pads, external prosthetic devices and patient monitoring

* USP Class V & VI compliant
ISO-10993 5/10 compliant
limited release, full commercialization expected Q1 2023, samples available upon request

DuPont™ Delrin® POM-Homo Celanese™ Crastin® PBT



Material	Unique material features	Application areas
Delrin® SC698 Delrin® SC698 Delrin® RASC698	POM-Homopolymer, self-lubricating, fatigue and impact resistance, dimensional stability. Delrin(r) RASC is produced with 100% renewable attributed content.	Gear wheels for insulin pumps, small parts in motion
Crastin® SC164	Unreinforced PBT, good chemical resistance, excellent colourability	Housing components for medical devices and wearables

- Biocompatibility, ISO 10993-5 and 10993-11
- USP VI
- Good Manufacturing Practice (GMP)
- Sterilisable

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