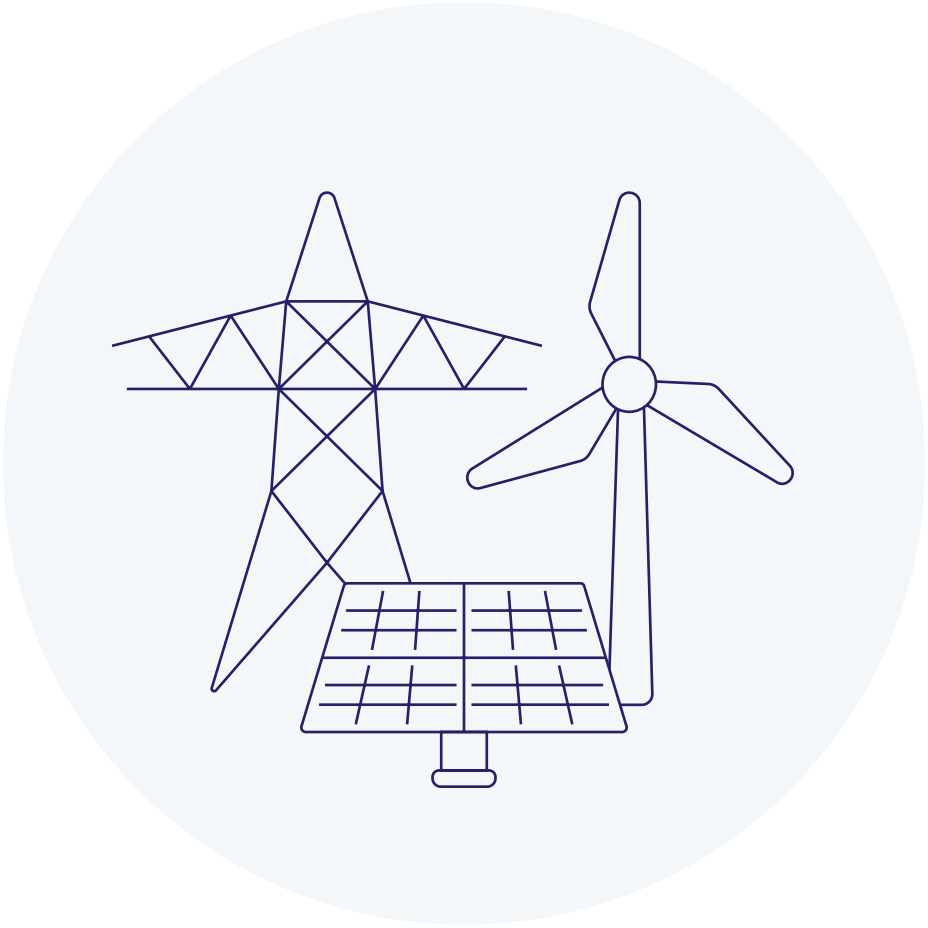
wevo

POWER ENGINEERING

ADVANCED SOLUTIONS BASED ON
POLYURETHANE, EPOXY AND SILICONE



WEVO – YOUR RELIABLE PARTNER FOR POWER ENGINEERING

Power engineering is facing major political as well as technical challenges and missions as a result of climate change. These include the increasing expansion of renewable energy sources, the transport of electricity over long distances, its storage, and the growing degree of digitalisation and privatisation of the power grids.

Wevo potting resins, thermal interface materials and adhesives protect and insulate electrical installations and components such as transformers, chokes, capacitors, current sensors and cable accessories. At the same time, solutions from Wevo ensure uniform heat dissipation from live parts, helping to improve efficiency and extend service life.

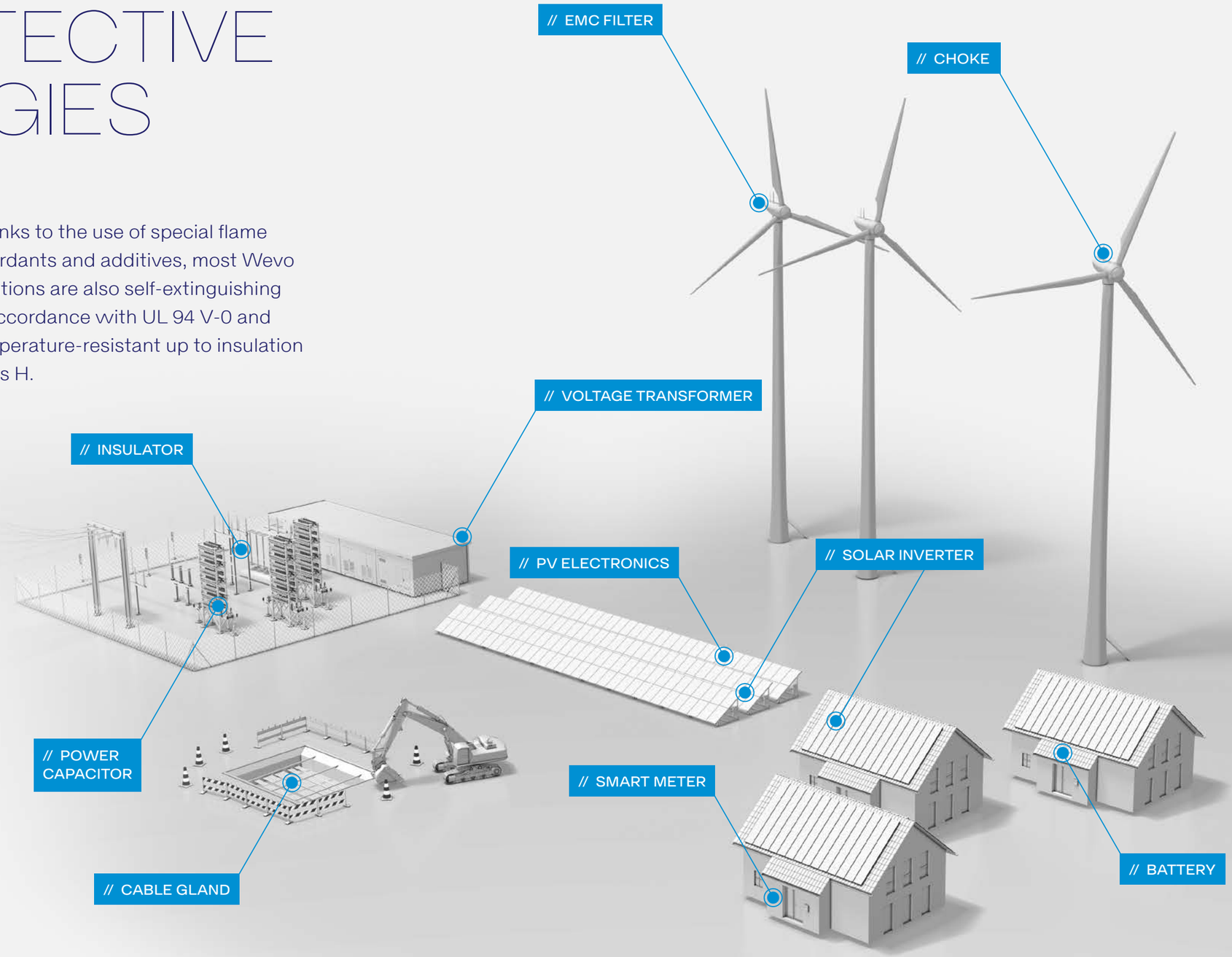
WEVO PROTECTIVE TECHNOLOGIES

A wide range of electrical and electronic components are used in modern power generation, storage and distribution plants and systems, including voltage transformers, insulators, and inductive and passive components.

The increasing digitalisation of the power grids and smart home applications as well as new technologies such as vehicle-to-grid mean current sensors and smart metering devices are essential. In addition, photovoltaic systems, for example, require special electronic components and storage technologies.

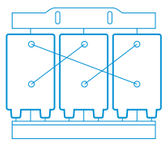
Polyurethane-, epoxy- and silicone-based potting resins from Wevo insulate these highly sensitive components and protect them against harmful environmental conditions, such as moisture and UV radiation, or even from harsh ambient conditions such as salty air or bad weather.

Thanks to the use of special flame retardants and additives, most Wevo solutions are also self-extinguishing in accordance with UL 94 V-0 and temperature-resistant up to insulation class H.



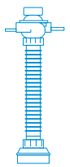
APPLICATIONS IN DETAIL

Regardless of their intended use, electrical systems and their components require appropriate protection against environmental influences to ensure safe operation and a long service life.



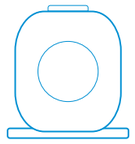
DRY-TYPE TRANSFORMATORS

Wevo's heat-curing and to some extent UL 94 V-0-compliant self-extinguishing, high-performance epoxy resins are used to cast transformers and seal winding heads that need to withstand elevated temperatures up to insulation class H.



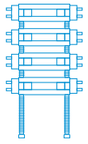
BUSHINGS/INSULATORS

Insulators are used in substations, for example. Bushing insulators insulate live conductors in power transformers and capacitors. Our silicone, polybutadiene and epoxy resins and polyurethane foams protect them against creepage and partial discharges.



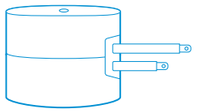
VOLTAGE TRANSFORMERS/ CURRENT SENSORS

Voltage transformers and current sensors are used to measure and transform voltages and currents in switchgear. Our temperature-resistant polyurethanes (insulation classes B and F) and epoxy resins (insulation classes F and H) protect the sensitive electronics against environmental influences.



FILM CAPACITORS

Film capacitors are used as DC link capacitors in power converters and as power capacitors in substations for intermediate storage and filtering purposes. Wevo potting compounds provide insulation and protect against among other things current leaks and electrical breakdown.

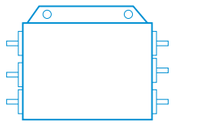


INDUCTIVE COMPONENTS

Transformers and chokes are used, for example, in frequency converters for wind-turbine and photovoltaic systems and for the smart grid. Our high-performance polyurethane, epoxy and silicone resins ensure they are properly protected.

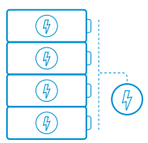
CABLE ACCESSORIES

Cable sets are used, for example, to connect offshore wind farms to the medium- and high-voltage grids. Potting compounds made of silicone, polyurethane and epoxy resin protect cable connections from water ingress and provide the necessary electrical insulation.



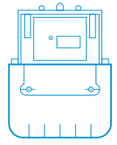
EMC FILTERS

EMC filters are used to suppress electromagnetic interference between the grid and the frequency converter, e. g. in photovoltaic and wind turbine systems. Our low viscosity polyurethane resins protect and help to reduce current peaks.



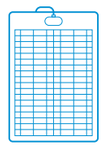
ENERGY STORAGE

Today, energy generated from renewable sources is stored by a range of different battery systems. Our flame-retardant potting compounds, adhesives, sealants and thermal interface materials are used in the assembly of lithium-ion and redox flow batteries.



SMART METERING

Digital electricity, water and gas meters are important modules for the smart home and smart grid. Our hydrophobic polyurethane, polybutadiene and silicone potting compounds protect electronics against moisture and tampering and ensure smooth measurement and signal transmission.



SOLAR/PV ELECTRONICS

Our silicone and polyurethane-based potting compounds are used in solar installations to electrically insulate the solar module junction boxes, MPPT optimizers and microinverters. They ensure safe operation of the installations and prevent water ingress.

WEVO SOLUTIONS IN DETAIL

The requirements of power engineering applications can differ greatly and call for special solutions.

Applications	DRY-TYPE TRANSFORMATORS	BUSHINGS/ INSULATORS	VOLTAGE TRANSFORMERS/ CURRENT SENSORS	FILM CAPACITORS	INDUCTIVE COMPONENTS
Requirements	• Low coefficient of thermal expansion, high E modulus • Insulation class F or higher • High glass transition temperature	• Good adhesion on plastics and metals • Good flowability • Good dielectric properties	• Adjusted glass transition temperature • Low shrinkage • Self-extinguishing in line with UL 94 V-0	• Low water absorption • Good impregnation • Good dielectric properties • Self-extinguishing in line with UL 94 V-0	• Good impregnation • Insulation class B or F • High thermal conductivity • Self-extinguishing in line with UL 94 V-0
Possible solutions	WEVOPOX/ WEVODUR • 2315 with 42 M • 36001 FL with 5001 • 8260 FL/60 with 1018/25	WEVOPUR/ WEVONAT • PD 52 with 385 • PD 64510 FL with 900 • 3025 with 9015 • 3025 T4 with 500 WEVOSIL • 26010 FL (A/B)	WEVOPUR/ WEVONAT • 9251 FL with 300 RE • 67210 FL with 507 • 60411 FL/30 with 300 RE • 7275 C with 300 WEVOPOX/ WEVODUR • 6503 with HC 3001 • 36001 FL with 5001	WEVOPUR/ WEVONAT • 512 FLE with 900 E • 67210 FL with 507 • 552 FL with 300 • 3025 with 9015 • 7030 EP 4 with 507 WEVOPOX/ WEVODUR • 8260 FL/60 with 1018/25	WEVOPUR/ WEVONAT • 403 FL/XX with 300 RE • 552 FL with 300 • 60416 FL with 300 RE WEVOPOX/ WEVODUR • 8260 FL with 1018/25 • 36001 FL with 5001

Applications	EMC FILTERS	CABLE ACCESSORIES	ENERGY STORAGE	SMART METERING	SOLAR/ PV ELECTRONICS
Requirements	• Good flow properties, low mixed viscosity • Self-extinguishing in line with UL 94 V-0	• Low water absorption • Good dielectric properties • Good flowability	• Good heat dissipation • High chemical resistance • Good adhesion	• EMC compatibility • Good dielectric properties • Good flowability	• Moisture/heat resistance • Self-extinguishing in line with UL 94 V-0
Possible solutions	WEVOPUR/ WEVONAT • 512 FL with 900 • 552 FL/70 with 300 L	WEVOPUR/ WEVONAT • 512 FL with 900 • 3050 with 300 M • 873 FL with 300 M WEVOSIL • 20201 FL (A/B) • 22006 FL (A/B)	WEVOPUR/ WEVONAT • 512 FL with 900 • 60416 FL with 300 RE WEVOSIL • 22006 FL (A/B) • 22102 FL (A/B) • 22105 FL (A/B)	WEVOPUR/ WEVONAT • PD 4 with 385 • PD 445 with 385 • 552 FL with 300 • 512 FL with 900 WEVOSIL • 22006 FL (A/B)	WEVOPUR/ WEVONAT • 9251 FL with 300 RE • 512 FL with 900 WEVO^SIL • 22006 FL (A/B) • 22102 FL (A/B)

		PUR							POX					SIL			
Material		POLYURETHANE							EPOXY					SILICONE			
Resin / component A		WEVOPUR 3025	WEVOPUR 9251 FL	WEVOPUR 512 FL	WEVOPUR 552 FL	WEVOPUR 403 FL/33	WEVOPUR 60411 FL/30	WEVOPUR 60416 FL	WEVOPUR 67210 FL	WEVOPOX 2003 FL	WEVOPOX 36001 FL	WEVOPOX 8260 FL/60	WEVOPOX 2315	WEVOSIL 20201 A	WEVOSIL 22006 FL A	WEVOSIL 22102 FL A	WEVOSIL 22105 FL A
Resin / component B		WEVONAT 9015	WEVONAT 300 RE	WEVONAT 900	WEVONAT 300	WEVONAT 300 RE	WEVONAT 300 RE	WEVONAT 300 RE	WEVONAT 507	WEVODUR 5004	WEVODUR 5001	WEVODUR 1018/25	WEVODUR 42-1 M	WEVOSIL 20201 B	WEVOSIL 22006 FL B	WEVOSIL 22102 FL B	WEVOSIL 22105 FL B
Mixing ratio (parts by weight)		100:25	100:15	100:16	100:20	100:14	100:10	100:07	100:23	100:20	100:10	100:29	100:35	1:1	1:1	1:1	1:1
Mixed viscosity at 22 °C [mPa·s]	Rotational viscometer/ rheometer	600–800	1,300–1,800	600–900	1,000–1,300	2,000–2,500	3,000–6,000	5,000–12,000	500–1,500	2,700–3,200	3,500–6,500	3,000–5,000	3,000–3,500	300–700	2,000–2,800	1,700–3,300	3,000–5,000
Reactivity at 22 °C [min.]*	Rotational viscometer/ rheometer	30–40	10–50	15–60	5–50	10–45	25–35	40–60	35–45	120	180–240	30 (120 °C)	15–25	50–70	90–120	50–70	50–70
Shore hardness 00/A/D	DIN ISO 7619-1:2012-02	-- / 35–45 / --	-- / 30–40	-- / -- / 30–40	-- / -- / 60–70	-- / -- / 45–50	-- / -- / 60–70	-- / -- / 65–70	-- / -- / 80–90	-- / -- / 45–49	-- / -- / 85–90	-- / -- / 88–94	-- / -- / 85–90	gel	-- / 47–55 / --	50–70 / 10–20 / --	50–70 / 10–20 / --
Operating temperature [°C]		-50 up to +120	-40 up to +135	-40 up to +130	-40 up to +130	-50 up to +165	-50 up to +165	-50 up to +165	-40 up to +145	-40 up to +130	-40 up to +180	-40 up to +160	-30 up to +160	-60 up to +200	-60 up to +180	-60 up to +180	-60 up to +200
E modulus [N/mm²]	DIN EN ISO 527-2:2012-06	–	20	20.0	55	110	44	320	10,300	35	6,000	8,600	6,300	–	4	0.5	0.4
Thermal conductivity [W/m·K] (pressureless)	DIN EN ISO 22007-2:2015-12	0.20	0.6	0.80	0.6	0.8	1.04	1.70	1.0	0.7	1.1	0.9	–	0.2	0.5	1	1.5
Glass transition temperature [°C]	TMA ISO 11359-2:1999-10	-33	-20	-4	15	-6	-16	-12	75	2	51	90	74	< -100	< -100	-50	-45
Water absorption [%]	30 days, 22 °C	1.5	1.3	0.3	0.4	0.6	0.5	0.7	0.3	1.5	–	0.1	–	–	0.2	< 1.5	< 1.5
Flammability	UL 94	HB	V-0 6 mm**	V-0 4 mm**	V-0 1.5 mm**	V-0 1.5 mm**	V-0 1.5 mm**	V-0 1.5 mm**	V-0 1.5 mm**	V-0 6 mm**	V-0 2 mm**	V-0 6 mm**	HB	HB	V-0 4 mm**	V-0 1 mm	V-0 6 mm
Relative temperature Index UL file No. E108835 [°C]	UL 746 B	–	–	RTI Elec Str: 130 RTI Mech Str: 130	RTI Elec Str: 130 RTI Mech Str: 130	RTI Elec Str: 155	RTI Elec Str: 155	RTI Elec Str: 160	RTI Elec Str: 140	–	–	–	–	–	RTI Elec Str: 150 RTI Mech Str: 150	–	–
Dielectric strength [kV/mm]	DIN EN 60243-1:2014-01	20	> 20	38	29	30	> 20	> 20	28	–	25	33	–	23	33	> 25	> 20
Dielectric constant ε (at 50 Hz, 23 °C)	DIN EN IEC 62631-2-1:2018-12	5.1	7.8	6.1	5.6	5.7	7.0	7.8	4.2	7.8	4.3	3.8	4.3	–	3.8	4.5	6.1
Loss factor tan δ (at 50 Hz, 23 °C)	DIN EN IEC 62631-2-1:2018-12	0.200	0.090	0.120	0.117	0.040	0.090	0.100	0.010	0.180	0.006	0.014	0.009	–	0.065	0.041	0.014

All application parameters refer to processing at room temperature. All mechanical, thermal and electrical properties are based on complete curing.
* The indicated range of pot life corresponds with current standard versions. Adjustment of pot life is possible.
** UL listing under file No. E108835
For a more detailed technical description of our systems please refer to the corresponding data sheets which are available for all products.

ADDED BENEFITS BY WEVO PRODUCTS

Our wide range of products offers a variety of benefits in addition to solving classic problems such as providing insulation and moisture protection for electrical installations.

Ask us about our materials compliant with the stringent fire and safety standard EN 45545-2 in hazardous levels HL2 and HL3 for requirements R22 and R23. A wide variety of products have self-extinguishing properties in line with UL 94 V-0.

Wevo materials are temperature-resistant up to +180 °C. The portfolio includes polyurethane resins of insulating classes B and F as well as epoxy and silicone resins of insulating classes F and H.

Some of our materials have increased thermal conductivities of up to 4 W/m·K and can be used as thermally conductive potting compounds or gap filler materials.

Wevo materials can be adjusted in terms of their reaction times, flow behaviour and to the individual needs of the production process. Thixotropic versions are available on request.

Wevo solutions exhibit outstanding electrical properties with CTI 600, high dielectric strength greater than 20 KV/mm as well as other outstanding dielectric properties.

In addition to standard materials produced to withstand temperatures of up to +180 °C, we offer materials suitable for even higher temperatures. Several resins have undergone accelerated aging tests and have been certified to UL 746 B, with listed RTI values up to 160 and CTI values of 600 (UL file No. E108835).

WE ARE MUCH MORE THAN A SUPPLIER

From development to volume production – we support our customers every step along the way.

WE PIONEER PROGRESS

We are a proven partner in project-driven innovation with a decades-long track record.

WE INITIATE INNOVATION

We develop new ideas for every area of electrical component potting, bonding and sealing.

wevo

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