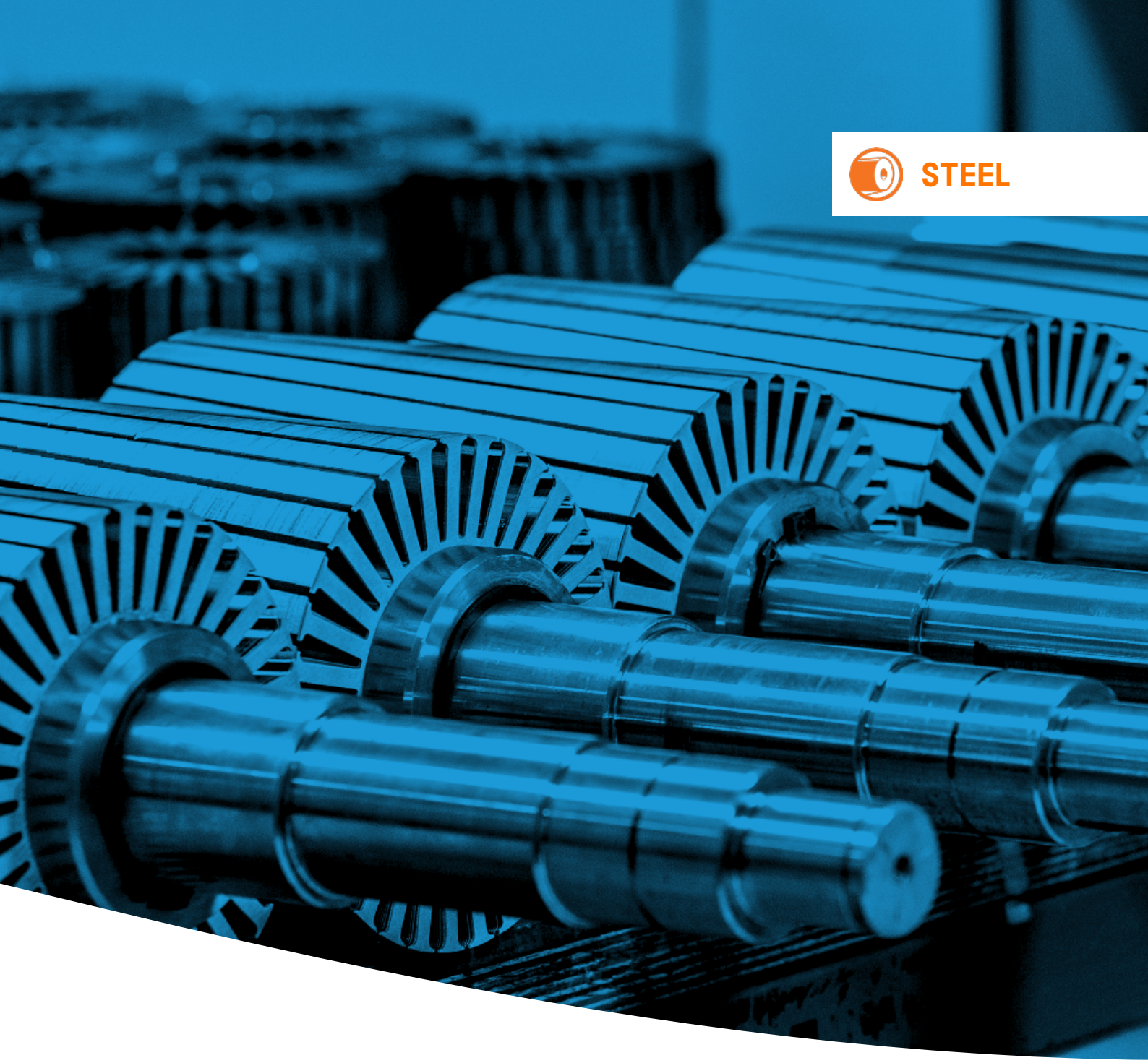


STEEL

Advancing Electrification. Together.

Insulating Coatings for Non-Grain Oriented Electrical Steel

Quaker Houghton™
Forward Together™

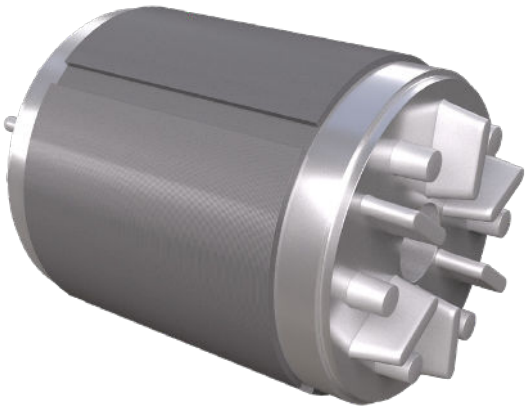
Quaker Houghton: Applied Expertise

Electrical steel coatings are integral to the performance of electric motors, generators and transformers, restricting eddy current losses by insulating each sheet of steel within the lamination stack.

Applying our expertise in silicon steel production, surface chemistry and downstream processing, Quaker Houghton offers a full range of non-grain oriented (NGO) electrical steel coatings including products to withstand annealing.

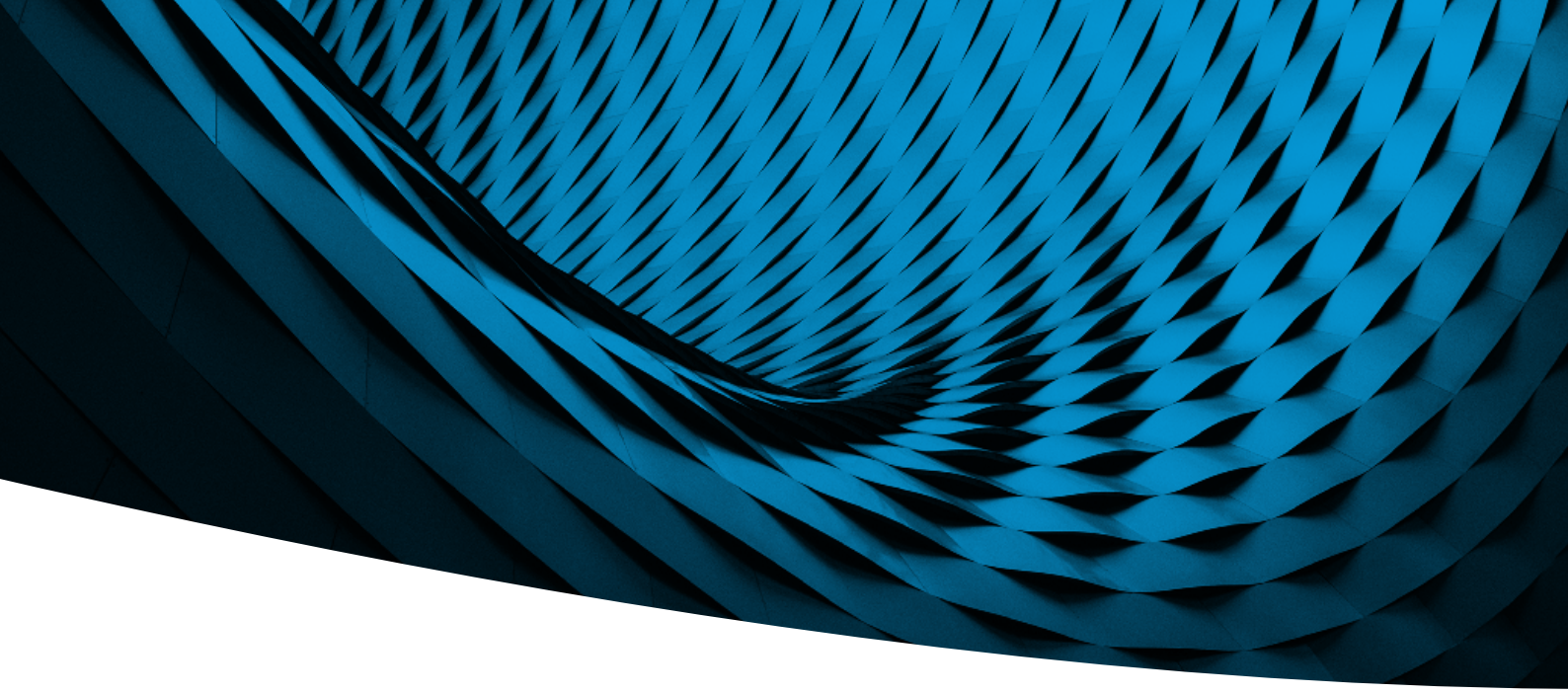
The benefits:

- Excellent substrate bonding and insulation properties
- Chrome-free technology supports the latest legislative requirements
- Water-dilutable formulations reduce solvent usage
- Good punchability for extended tool life
- Protection against corrosion



Our Portfolio

PRODUCT	APPLICATION
QH EVERTREAT™ 2030 C3 Organic Coating	Ideal for use in the magnetic cores of air and oil-cooled small and medium-sized electric motors, as well as transformers and distribution boards. Due to its excellent punchability, it is ideal for fast-running punching processes. The laminations may be fixed by means of rivets, clamps or interlocking.
QH EVERTREAT™ 2050 C5 Organic/ Inorganic Coating	Ideal for use in small and medium sized electrical motors with high demand on interlaminar insulation. QH EVERTREAT™ 2050 supports further annealing and welding processes.
QH EVERTREAT™ 2060 C6 Organic/ Inorganic Coating	Ideal for use in medium and large sized electrical motors, generators, high-power rotating machines and core packages of contactors, where high heat and pressure loads are expected as well as vibration damping.
QH EVERTREAT™ 7000 C3 Bonding Varnish	Ideal for small and large size magnetic cores with high demands on interlaminar insulation and bonding such as high efficiency electrical motors (e.g. electric and hybrid vehicles) and generators (e.g. wind turbines). Self-bonding technology eliminates the need to weld or rivet the magnetic core.



The Latest in Full-Face Bonding Varnish Technology

The demand for more efficient electric motors and generators is driving a trend to use thinner, more complex core plate design, in order to reduce core losses.

Bonding varnish, also known as backlack, provides both insulation and adhesion for these high efficiency core stacks, eliminating the need for traditional joining techniques such as interlocking, welding or clamping that are harder to achieve with thin-gauge steel and can impair magnetic performance.

Quaker Houghton has developed QH EVERTREAT™ 7000: a universal, one-component, self-bonding varnish for simplified, flexible production of high-performance bonded lamination stacks. This allows for both longer bonding times at lower temperatures for large stacks, as well as fast bonding where high productivity is required, without compromising on adhesion.

The benefits:

- Suitable for fast-running coil coating lines for improved productivity
- Broad peak metal temperature (PMT) range for initial cure to fit individual steel plant operations
- Flexible stack bonding time/temperature allows laminators to balance production speed and energy consumption
- Outstanding peel strength for extended motor life

QH EVERTREAT™ 7000

Allows for significantly reduced and flexible curing times of the stacks with no compromise on peel strength.

CURING CONDITIONS (STATE B)			BONDING CONDITIONS (STATE C)			DIN EN 1464
Dwell Time	PMT	Dry Film Thickness	Bonding Time	Bonding Pressure	Bonding Temperature	RSP Peel Resistance
seconds	°C	µm	minutes	MPa	°C	N/mm
20	235	3.5	60	3	140	6.55
20	235	3.5	60	3	140	6.48
20	235	3.5	45	3	150	9.27
20	235	3.5	45	3	150	7.67
20	235	3.5	30	3	160	7.82
20	235	3.5	30	3	160	8.14
20	235	3.5	15	3	180	9.14
20	235	3.5	15	3	180	10.29
20	235	3.5	10	3	200	10.24
20	235	3.5	10	3	200	9.42
20	235	3.5	2	3	230	10.24
20	235	3.5	2	3	230	10.32

Peel resistance results of QH EVERTREAT™ 7000 on 0.5mm M800-50A substrate* at varying temperature/time schedules from 2 minutes at 230°C to 60 minutes at 140°C.

CURING CONDITIONS (STATE B)			BONDING CONDITIONS (STATE C)			DIN EN 1464
Dwell Time	PMT	Dry Film Thickness	Bonding Time	Bonding Pressure	Bonding Temperature	RSP Peel Resistance
seconds	°C	µm	minutes	MPa	°C	N/mm
15	210	2.50	2	3	230	4.42
15	210	2.50	2	3	230	4.34
15	210	3.50	2	3	230	6.06
15	210	3.50	2	3	230	5.33
15	210	4.00	2	3	230	7.02
15	210	4.00	2	3	230	7.04

Peel resistance results of QH EVERTREAT™ 7000 on 0.25mm high performance automotive substrate* at varying dry film thickness and short bonding time of just 2 minutes.

*Optimal bonding parameters and RSP results are dependent on the steel grade.

Forward Together™

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