

Metals Processing industry towards a 2050 Climate- Neutral Europe



The EU aims to be **climate-neutral by 2050** – an economy with net-zero greenhouse gas emissions. The transition to a climate-neutral society is both an urgent challenge and an opportunity to build a better future for all.



All parts of society and economic sectors in Europe will play a role in achieving climate-neutral, from the power sector to industry, transport, buildings, agriculture and forestry.



Certain key metals are considered critical materials based on their importance to clean energy, high supply risk and lack of substitutes. Many other metals are used to a greater or lesser extent in clean energy production and low-carbon technology. They can also be recycled and used as a source of a low-carbon future. Heat treatment is needed in the production of many metal parts, to modify or improve the mechanical properties, electrical performance, grain structure, corrosion resistance, etc., and plays an important part in the new technologies that help our environment.

It is also needed for gear boxes and nacelle for wind turbines, connectors and cables for smart grid energy storage or battery production for electric cars, electrical steel strip for motors and transformers, and much more.

As a leading industrial gas supplier and technology expert, Air Products invests heavily in heat treatment solutions to streamline this transition.

Your area	Material used	Metal part	Process	Gas	Our solutions
Electronics		Electronic boards & components silicon wafer	Soldering (SMT & wave), inerting	Ar, N ₂	<ul style="list-style-type: none"> • Atmosphere Control System for SMT and additional protection hoods for wave soldering.
EV (batteries)	Copper, aluminium	Foil	Rolling, annealing	LIN, N ₂ or N ₂ /H ₂	<ul style="list-style-type: none"> • Atmosphere Control System and Air Products Smart Technology to reduce atmosphere costs. • LIN Cooling enhancement in annealing to increase productivity.
EV (batteries)	Copper	Bus bars Connectors	Rolling, heat treatment, coating, cutting, machining	LIN, N ₂ or N ₂ /H ₂	<ul style="list-style-type: none"> • Atmosphere Control System and Air Products Smart Technology to reduce atmosphere costs. • LIN Cooling enhancement in annealing to increase productivity.
Smart electricity grid, wind turbines	Copper/aluminium (clad materials)	Connectors	Pressure weld rolling, followed by annealing for increased bonding strength	N ₂ , N ₂ /H ₂	<ul style="list-style-type: none"> • Atmosphere Control System and Air Products Smart Technology to reduce atmosphere costs and ensure bright surface finish and proper bonding.
EV (batteries) Car body	Steel (advanced high strength steel)	Sheet	Hot/cold rolling, annealing, machining	N ₂ , N ₂ /H ₂ , H ₂	<ul style="list-style-type: none"> • Atmosphere Control System and Air Products Smart Technology to reduce atmosphere costs and ensure desired surface finish to reduce reject rates. • Smart Nitrogen-Methanol Lance.
EV (batteries) Energy storage	Li-MnCo material	Cathode material	Calcination	O ₂	<ul style="list-style-type: none"> • Atmosphere Monitoring System and Air Products Smart Technology to reduce atmosphere costs and achieve desired material properties.
Power Infrastructure	Copper, aluminium	Wires/ cabling	Drawing, annealing	LIN, N ₂ or N ₂ /H ₂	<ul style="list-style-type: none"> • Atmosphere Control System and Air Products Smart Technology to reduce atmosphere costs. • LIN Cooling enhancement in annealing to increase productivity.
Transformers and electrical motors	Steel (electrical steel)	Transformer or electrical motor coil	Annealing (decarburisation)	N ₂ /H ₂ (modified)	<ul style="list-style-type: none"> • Controlled Atmosphere Humidification System and Air Products Smart Technology to reduce atmosphere costs and ensure desired material properties and surface finish to reduce reject rates.
Wind Turbines	Steel	Nacelle, rotor bearing, gearboxes	Carburising, hardening	N ₂ , N ₂ /H ₂	<ul style="list-style-type: none"> • Atmosphere Control System and Air Products Smart Technology. • Smart Nitrogen-Methanol Lance.

EV: electric vehicles
 LIN: liquid nitrogen
 SMT: surface-mount-technology

Sustainable advantages for the metals processing industry

Our solutions	Material used	Process	Benefits
Atmosphere Control System	Carbon steel, stainless steel, electrical steel, copper, aluminium, titanium, others	Sintering, brazing, hardening, annealing, additive manufacturing, soldering (SMT & wave), inerting	<ul style="list-style-type: none"> • Helps achieve a clean surface finish • Reduces product rejects due to oxidation • Can be set-up to avoid decarburisation or control desired decarburisation • Designed for Air Products extended Beltlife technology for sintering • Low-cost investment • Allows optimised gas flow control • Reduces sooting • Delivers long-term cost reductions • Easy to maintain with an Air Products calibration unit available to support Quality standards (i.e., CQI-9)
Atmosphere Humidification System	Carbon steel, electrical steel	Annealing	<ul style="list-style-type: none"> • Controlled humidification of decarburising • Non oxidising atmosphere or controlled surface oxidation • Low-cost investment • Product quality in tight tolerances
Air Products Smart Technology	Any	Atmosphere and process monitoring incl. i.e., dew point, oxygen, oxidising or reducing conditions, carbon potential or activity, hydrogen and other components, temperature, tank liquid level, maintenance and process advise	<ul style="list-style-type: none"> • Improves process and product reliability • Captures relevant atmosphere and process data • Analyses potential for savings and develop Process optimisation • Provides process documentation • Allows predictive maintenance of the furnace reducing unexpected shutdowns
Enhanced Cooling in annealing using liquid nitrogen	Copper, aluminium, steel	Annealing	<ul style="list-style-type: none"> • Improves mechanical properties • Faster cooling rates • Increases productivity
Smart Nitrogen-Methanol Lance	Steel	Carburising, hardening, annealing	<ul style="list-style-type: none"> • Reduces rejects and rework • Allows preventive maintenance • Supports a reliable, homogeneous atmosphere over time • Improves methanol cracking • Provides operational data • Industry 4.0 integration



Atmosphere Control System



Smart Nitrogen-Methanol Lance



Air Products Smart Technology



These offerings provide sustainable advantages.
The improvements made can reduce the carbon footprint
of the production chain.

Trust a worldwide leader

For more than 80 years, customers around the world have come to rely on Air Products' industrial gases, gas atmospheres, equipment, and technical support to help improve product quality, reduce operating costs, and increase productivity.

To learn more about how Air Products can help heat treatment manufacturers optimise heat treatment processes, while ensuring the transition to climate-neutral with net-zero greenhouse gas emissions, please visit airproducts.co.uk/metalsprocessing.



Air Products, leader in CO₂ capture, also researches and offers the supply of low-carbon gases. Please contact us for any additional information and to discuss your needs.

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