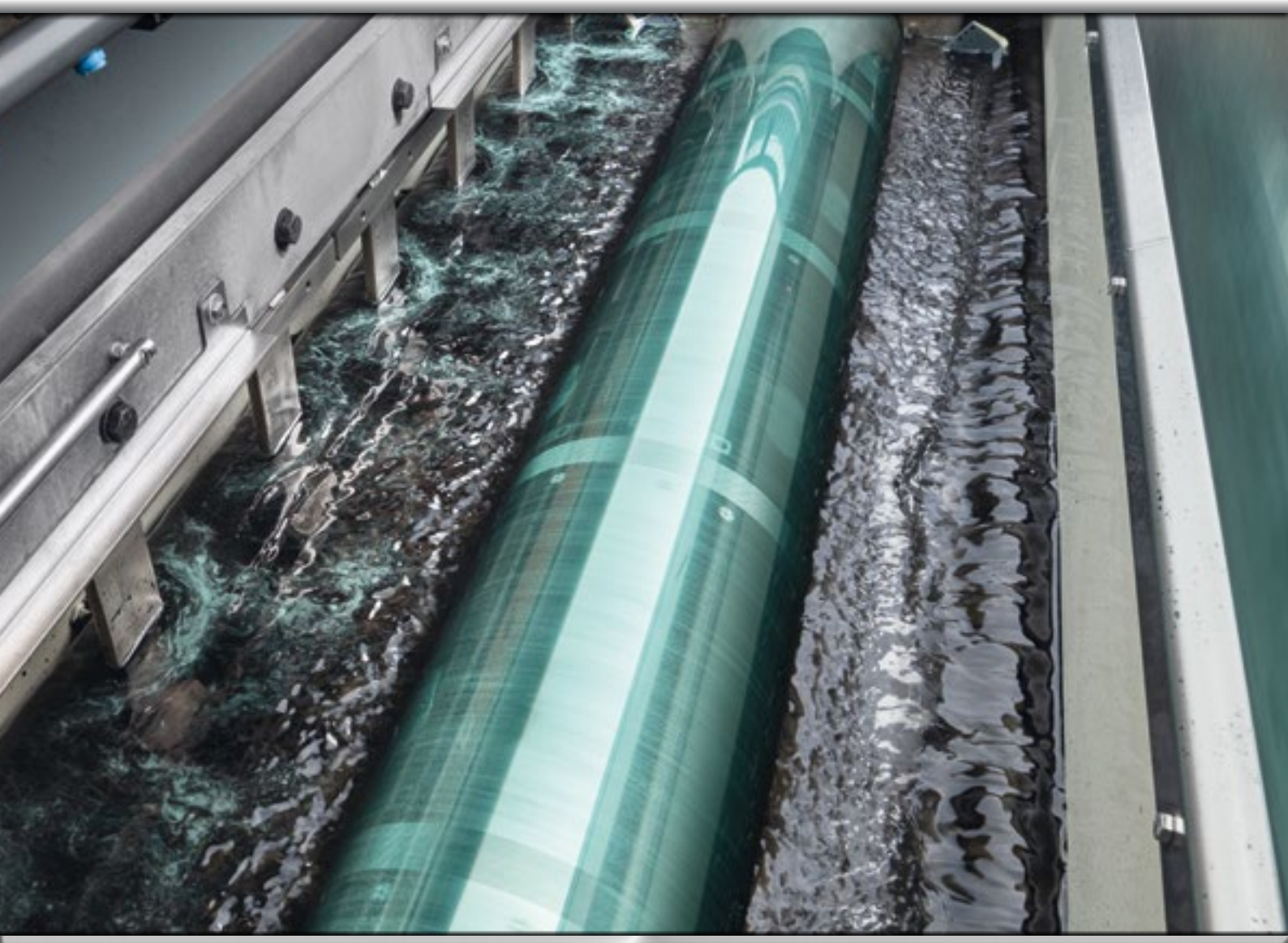
HelioChrome® NEO

THE WORLD'S FIRST HARD CHROME PLATING PROCESS FOR GRAVURE BASED ON CHROME(III)



BASED ON INNOVATION.

K.WALTER
PLATING AND PROCESSES

New. Safe. Economical.

NEO stands for "new" and with **HelioChrome® NEO** we have created a forward-looking solution, because it provides an eco-friendly and highly integrated all-in-one system for hard chrome plating gravure cylinders. The system comprises a specially designed plating tank, tailor-made process chemicals, groundbreaking control and analysis software that integrates all components, and an effective service concept with a digital laboratory connection for analysis purposes.

The patented **HelioChrome® NEO** is the world's first hard chrome plating process for gravure based on chrome(III). It means our customers no longer need to face the uncertainty associated with chrome(VI) authorization being extended in stages – and that is the decisive criterion for investment security and peace of mind for the future in gravure. The revolutionary chrome(III) electrolyte completely replaces chrome(VI), which is harmful to both health and the environment. The mechanical properties and quality credentials of the metal surface produced are comparable to the conventional chrome(VI) equivalent.

HelioChrome® NEO offers

- the necessary hardness and abrasion resistance for the gravure printing process
- equivalent efficiency in terms of plating speed

HelioChrome® NEO avoids

- user exposure to carcinogenic, mutagenic substances
- costs related to compliance with EU regulations

Given that the chrome(VI) regulatory situation currently applies to the European Union only, **HelioChrome® NEO** is initially aimed exclusively at our European packaging printing customers. Looking to the future, we are nevertheless confident that this innovation will attract the interest and attention of gravure printers around the globe.

HelioChrome® NEO forms part of our threefold "HelioGreen Process" strategy

ChromeXtend	Interim solution: temporary authorization to continue using EU-regulated chrome(VI) electrolysis while transitioning to new technology
HelioChrome® NEO	Alternative technology immediately available: switchover of the hard chrome plating process to the non-toxic gravure of the future based on chrome(III)
HelioPearl®	Alternative technology in development: polymeric, laser-engravable monolayer with fewer process steps and remarkable abrasion resistance

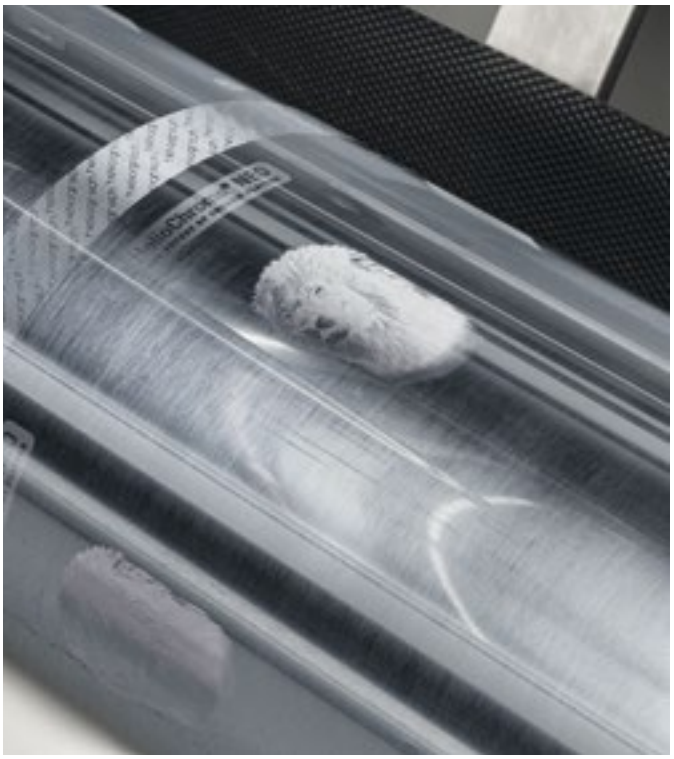
All in one. All good.

Impressive cost-efficiency and quality
Nothing can be taken for granted with new developments, so it is particularly good news that there are no fundamental changes to the overall cylinder chrome plating process.

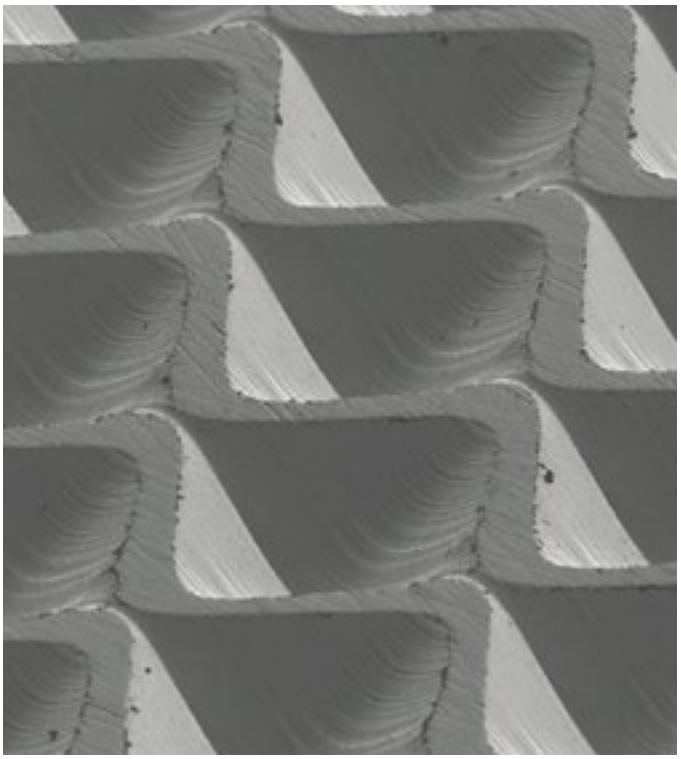
The **HelioChrome® NEO** tank can be integrated seamlessly into the existing workflow. Both the innovative process itself and the technical design of the all-in-one system deliver excellent cost-efficiency. The electrolyte temperature, which is 20 °C lower than in traditional chrome plating, reduces emissions and cuts energy requirements. Moreover, the process achieves a similarly fast speed to that of chrome(VI) plating. The tribological properties of the **HelioChrome® NEO** layer have been perfectly adapted to gravure-specific requirements. Many kinds of ink, substrate, doctor blade and printing speed combinations have been tested on a variety of presses.

HelioChrome® NEO operating and quality parameters at a glance

Parameter	Chrome(III) with HelioChrome® NEO	Conventional chrome(VI) process
Deposition speed	0.45 µm/min	0.45 µm/min
Electrolyte temperature	40 °C	60 °C
Vickers hardness	Approx.1200 HV	Approx.1200 HV



HelioChrome® NEO surface



HelioChrome® NEO coated cells

Optimum interaction of all system components

HelioChrome® NEO is an all-in-one system in which all components interact perfectly. Networked via state-of-the-art software, the complex system can be controlled very precisely. Customers benefit from our many years of expertise in everything from electroplating and the associated chemicals to the digital implementation of automated processes. The control and process software integrated in the **HelioChrome® NEO** plating tank automatically displays all relevant parameters.

Based on the electrolyte parameters determined in the laboratory, the software automatically recommends actions that are confirmed by the operator and implemented automatically by the tank. Process control is now fully digital and easier for the operator than with conventional processes. All our electroplating expertise has been integrated into the tank's control system.

One key aspect in this regard is our sample analysis service, which is available whenever required. Samples are labeled with a QR code and sent to the fully digital and highly automated K.Walter laboratory, where their chemical components are analyzed and validated. The results are automatically e-mailed to the plating tank's control system. This system calculates the necessary adjustments to the dosing/plating parameters and sends these suggestions together with a process control recommendation to the operator, who then simply needs to provide authorization.

The **HelioChrome® NEO** tank has various dosing systems and a precisely controlled chrome nugget dissolution cell. The dosing components (**HelioChrome® NEO Buffer**, **HelioChrome® NEO SA Solution**, **HelioChrome® NEO Wetting Agent** and **HelioChrome® NEO pH Correction**) are all safe to handle. The deposited chromium is replenished with metallic chrome nuggets.

The process also incorporates relevant quality measurements into the control software, which takes these into account if process adjustments are required. Virtually all manual process interventions by the operator are eliminated, thus delivering high standards of user-friendliness and operational safety that have not previously been achievable with traditional automated plating tanks.

User interface

HelioChrome® NEO nugget dissolution cell

K.Walter digitalized laboratory

Components and functions of the HelioChrome® NEO all-in-one system

Hardware	
Plating equipment	▪ Tank for hard chrome plating based on chrome(III) ▪ Dissolution cell for metallic chrome nuggets ▪ Four dosing systems for additives
Chrome polisher	Two paper polishing heads
Software	
Tank-integrated process software	▪ Developed specially for HelioChrome® NEO ▪ Automatically displays all relevant process parameters ▪ Overview of the current electrolyte condition ▪ Automatic prompts for operator action (service, sampling, etc.) ▪ Automatic recommendations based on analysis results, which are easy for the operator to implement
Connection options	▪ Process software connected to the K.Walter laboratory ▪ Analysis results e-mailed to the machine ▪ Synchronization with Cyon
K.Walter process chemicals	
Electrolyte components	▪ Based on chrome(III) ▪ Completely free of chrome(VI) ▪ Safe for workers and the environment ▪ Not restricted by any current ECHA regulation
Dosing components	HelioChrome® NEO Buffer, HelioChrome® NEO SA Solution, HelioChrome® NEO Wetting Agent, HelioChrome® NEO pH Correction
Service	
Laboratory service	Analyzing electrolyte samples at the K.Walter laboratory and, if the connection option is used (see under "Software"), e-mailing the analysis results directly to the machine
Measuring equipment service	Regular checking and calibration of process measuring equipment used, such as pH meter and MicroMet (thickness of chrome layer)
K.Walter laboratory	
Analysis	▪ Ultramodern digitalized laboratory equipment ▪ Specially trained experts ▪ Analyses carried out promptly

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