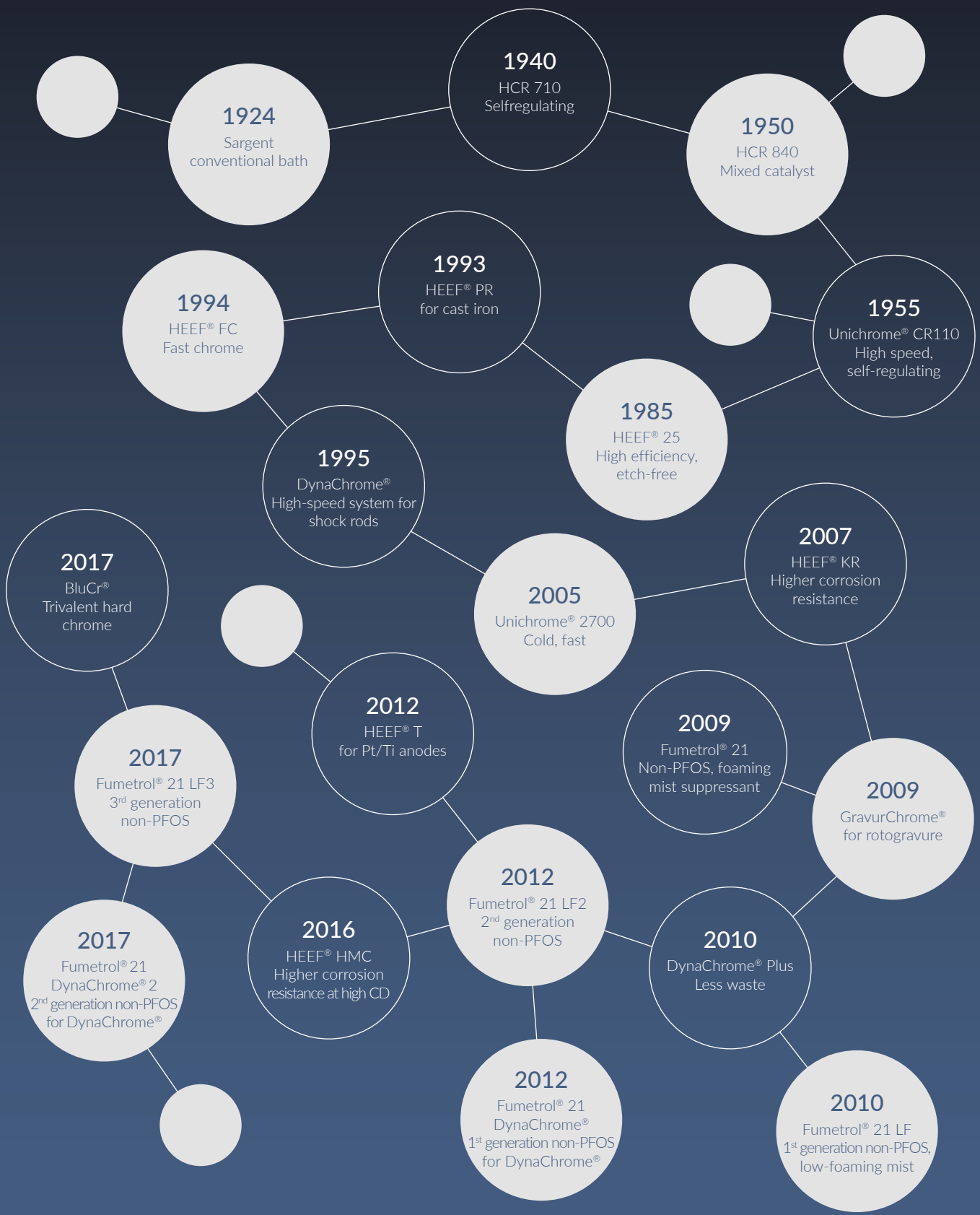
Functional chrome

Leading hard chrome technologies

mks | Atotech

The best of functional chrome



Decades of experience, enabling new technologies

MKS' Atotech has been a key player in functional chrome plating since the early days in the 1920s. We have developed many leading chrome processes, fume suppressants, pretreatment and post-treatments over the past 90 years including Unichrome®, HEEF®, DynaChrome® and Fumetrol®. With the introduction of BluCr®, the first trivalent hard chrome plating process available on the market, Atotech opens a new chapter in hard chrome history.

Shaping the future of hard chrome plating

Through a dedicated local and central workforce, extensive infrastructure and continual investments we are actively developing technologies and new processes. We have a large central team exclusively dedicated only to functional chrome that is used as a core center of competence. This team is responsible for research and development and provides support to the local regions and customers. At MKS, we develop technologies that continue to shape the future of the functional chrome industry.

We are first

MKS proudly introduces an alternative to hexavalent hard chrome plating. With BluCr®, Atotech is the first company in the electroplating industry to offer an industrial trivalent chromium hard chrome plating process.

Changing an industry

Hard chrome coatings have been a popular and successful technology for about 90 years, providing superior wear resistance and corrosion protection. Despite the high level of acceptance and popularity, hard chrome coatings are subject to ever more stringent legal restrictions (e.g. REACH) meaning that alternative processes need to be found to replace the existing hexavalent chromium processes.

Cr(III) as an alternative

Hard chrome plating is one of the simplest and cheapest processes in electroplating that generates a deposit with excellent physical properties. Any viable alternative to Cr(VI)-based processes has to offer the same benefits in terms of robustness, plating speed and deposit characteristics. Due to the familiarity of the industry with chromium deposits the most sought after alternative is a chromium deposit that is produced from a non-carcinogenic trivalent chromium plating process. Although trivalent chromium plating processes have been used to some extent for decorative chrome plating, a suitable process for hard chrome applications has remained elusive. This is in no small part due to the technical challenges of finding a process that is stable, fast and allows the plating of thick chrome deposits with suitable physical characteristics.

Cr(III) breakthrough

BluCr® exhibits all the same benefits associated with MKS' Atotech hexavalent chromium processes:

- fast plating speed
- stable plating bath
- high hardness deposit
- high wear resistance
- low roughness
- low coefficient of friction
- superior chloride resistance

BluCr® REACH compliance

As the BluCr® process is hexavalent chromium and boric acid-free it is compliant with REACH regulations. Due to the special formulation of the BluCr® process the hazardous nature of hard chrome plating and the potential risks to the environment and personnel can be drastically reduced. As the BluCr® process utilizes either mixed metal oxide or graphite inert anodes for plating, the hard chrome plating industry can move away from the use of toxic lead alloy anodes. The BluCr® process represents a major leap forward allowing the hard chrome plating industry a more sustainable future.

BluCr® vs. hexavalent chrome

BluCr® deposits look and behave – in the main – like the familiar hexavalent chromium deposits. This makes the transition from one to the other relatively easy for the industry. BluCr® deposits have the extra benefit that they show a superior chloride resistance compared to hexavalent chromium deposits. This makes the BluCr® coating even more chemically resistant, making it more suitable for harsh environments.

BluCr® is Cr(VI)-free, boric acid-free and REACH compliant

50µm/h

BluCr® has the same plating speed as leading Cr(VI) processes

Industry benchmark – Our conventional hard chrome portfolio

HEEF® family

MKS' Atotech has been the market leader in hard chrome plating for decades with its HEEF® series of processes. HEEF® has been extremely successful in the market due to its high efficiency and excellent deposit properties.

HEEF® HMC: The latest addition to the HEEF® range, creating a hard chrome deposit with a finer and denser network of micro-cracks compared to the latest proprietary hard chrome processes, so enabling superior corrosion resistance.

Fumetrol®

Generation of mist is a by-product of hexavalent chrome plating. As chromic acid is classified a toxic substance, personnel in proximity to chrome plating baths need to be protected from this mist. With Fumetrol® LF MKS' Atotech was the first to release a low foaming, non-PFOS mist suppressant for the chrome plating market.

Fumetrol® 21 LF 3: The latest generation of non-PFOS, low foaming, permanent mist suppressant for hard chrome and decorative chrome plating processes. Its ease of operation and high stability makes it the ideal choice for reducing mist and complying with the latest PFOS directives.

Increased efficiency, reduced costs – our production system for hard chrome plating

DynaChrome® Plus contributes to minimal water and resource consumption

1,000

rods / hour high production capacity

DynaChrome® Plus

Besides our hard chrome plating chemistry, MKS' Atotech offers a production system for hard chrome plating of shock absorber rods that helps to reduce production costs significantly.

The DynaChrome® Plus system combines unique, patented plating equipment with specialized chemical processes and can be fully integrated into the production process increasing productivity and reducing manual handling. Through its frugal water utilization and efficient plating process consumption of water can be reduced by 40%, energy consumption by 20% and chemistry consumption by 30% compared to conventional systems.

In this system, chrome plating can be conducted immediately after pre-grinding, eliminating the need for storage. DynaChrome® Plus also plates to final specifications allowing the possibility to omit the post-grinding to size process. The use of platinized anodes eliminates the use of toxic lead in the process and provides more uniform plating distribution. The enclosed plating line and the extensive safety features of the system help to prevent exposure to and emissions of hazardous hexavalent chromium.

End markets and industries MKS serves

Automotive

Sanitary

Heavy machinery

Construction

Household appliances

Energy