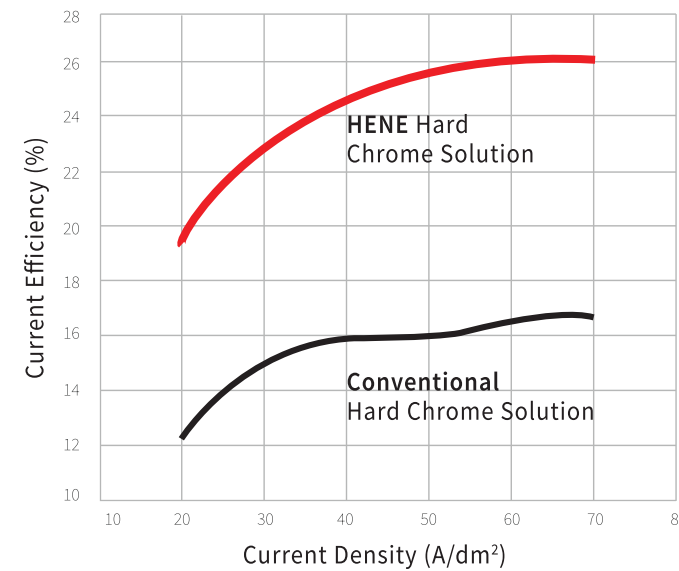


Comparison of Cathode Efficiency Conventional & HENE Hard Chrome



ACHIEVE UNMATCHED DURABILITY WITH HENE HARD CHROME PROCESSES



About Growel

India's trusted leader in metal finishing and surface treatment since 1957

We are pioneers in electroplating, paints, lubricants, surface treatment intermediates, and mission critical equipment. We partner with customers in diverse industries to provide comprehensive solutions backed by in-depth domain knowledge. Our R&D is recognised by the Indian Council of Science & Technology; our plants and processes are IMS certified.



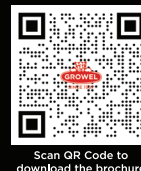
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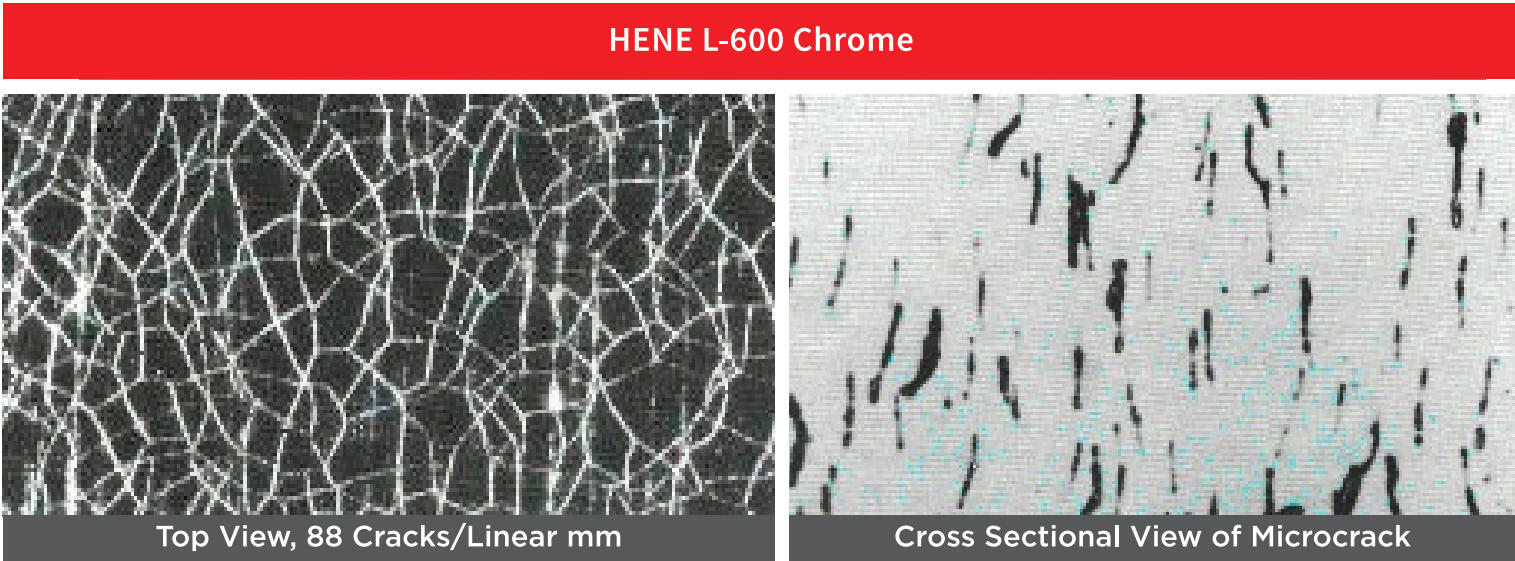
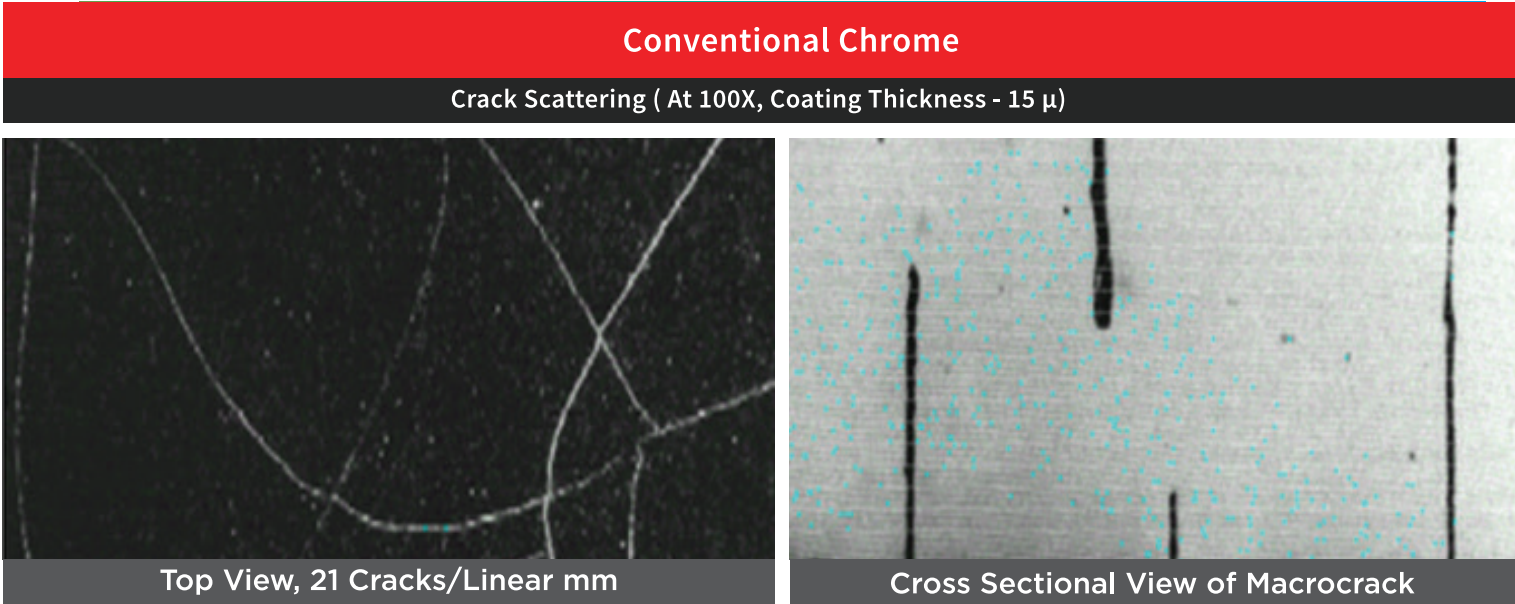
Growel excels in Hard Chromium plating with its High-Efficiency Non-Etching (HENE) process, which enables a remarkable 100% increase in deposit rate compared to conventional chrome plating methods.

TRUST THE LEADER IN SURFACE FINISHING

HENE Hard Chrome Processes

Achieving a bath efficiency ranging from 23% to 26%, Growel's HENE process ensures a hardness exceeding 1100 VPN. This high hardness, along with a micro-crack structure that aids in better oil retention, significantly elevates the abrasion and wear resistance of chrome-plated components. Our breakthrough lies in the developments of **HENE L 600** and **HENE 2009 Chrome Salt**, in large part due to the in-house manufacturing of our highly effective catalyst. These products are meticulously designed to offer the highest level of corrosion resistance, especially when applied over multilayer nickel coatings. Notably, this process effectively mitigates the issue of anode corrosion, a common concern with other similar processes.

Parameters	Unique Features
Bath Characteristics	23-26% current efficiency with excellent throwing and covering power
	Fast plating rate of 1 μ / min at 60 A/ dm² at 55°C
	Reduction in plating time
	Overall savings in electricity / plating cost
	Wide cathode current density operation (30-60 A / dm²)
Non-Etching	Non-Fluoride chemistry
	No attack to base metals
	Reduces the need for masking LCD areas
	Low build-up of metal
Deposit Characteristics	Brighter deposit
	Deposit hardness up to 1150 VPN
	Increased wear resistance
	Produces uniform micro-crack structure (60-100 cracks / linear mm)
	Imparts excellent corrosion protection
Environmental Consideration	Stable, non-volatile catalyst system
	Less misting and air-borne emissions
	Conventional waste treatment is applicable for process effluents



Parameters	HENE	HENE L - 600	HENE 2009 Chrome Salt
Additives	HENE Chrome Salt	*HENE L - 600 Make-up	***HENE 2009 Chrome Salt HENE Chrome 2009 Additive No. 1
	HENE Add. No. 1		
	HENE Add. No. 2	**HENE L - 600 Maintenance	
Deposit Appearance	Bright	Bright	Bright
Hardness (VPN)	Above 1000	Above 1100	Above 1100
Efficiency @ CD >30 ASD	23-26%	23-26%	23-26%
Micro-crack Scattering (Cracks / linear mm)	20-40	60-100	60-100
Corrosion Protection	Satisfactory	Better	Better

**HENE L - 600 Make-up is used for bath make-up.*

****Make-up and maintenance with compounded salt, **HENE 2009 chrome salt** - Provides users with economy and ease of operation.*

***HENE L 600 Maintenance is used for bath maintenance only.*