

# Holo-Krome® Products

**Supplied by Engineering Services  
(Fasteners) Ltd**





# Working with Distribution



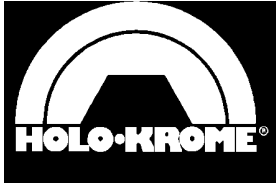
# Partners in Quality





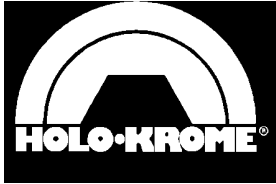
# Holo-Krome Products





## **Holo-Krome® Range**

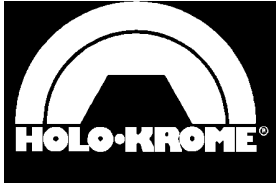
- **Metric and Inch on all ranges of:**
- **Socket Head Cap Screws (DIN 912) 12.9**
- **Countersunk (DIN 7991) 12.9**
- **Button Head (ISO 7380) 12.9**
- **Socket Set Screws (DIN 913-916) 45H**
- **Shoulder Screws (BS 4168 pt7) h8 body, 12.9**
- **Hexagonal Keys (Allen TM) (DIN 911)**
- **Special Products and coatings on request.**



# Holo-Krome Socket Head Cap Screws

- **2-Band Knurl.**
- **Thermo-Forged TM.**
- **12.9 Property Class.**
- **ISO 4762 (DIN 912).**
- **Marked "HK 129".**
- **For CRITICAL applications.**
- **M2 to M42 Diameter.**
- **Made in Dundee Scotland.**





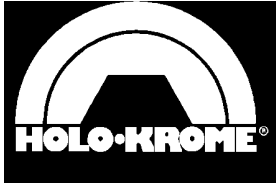
# Why Hexagon Socket Screws?

- **Used in the majority of Engineering Applications.**
- **A 'mature' product, since 1910.**
- **The strongest commercially available fastener.**
- **Trusted by Engineers and Designers.**
- **"Easy to make"?**



# Holo-Krome SHCS Features & Benefits

- **All Cap Screws are Thermo-Forged.**
- **Improves Grain Flow in head.**
- **Critical features measured by SPC methods.**
- **Gives full control of process & product.**
- **Full traceability of product.**
- **Using the Holo-Code or box label details.**
- **Socket chamfer.**
- **Ease of hex key or driver insertion.**
- **Dephosphated prior to Heat Treatment**
- **Removes embrittlement as per Ford Q101.**



## **“Easy to Make”?**

- **Common misconception is a ‘net shape’ requirement.**
- **Cold heading machine manufacturers supply ‘net shape’ tooling “off the shelf”.**
- **Heading machine Manufacturers DO NOT understand OEMs. REAL requirements.**
- **Heat treatment is CRITICAL to performance.**
- **“Easy to make”?**



# What is 12.9 Property Class?

**12.9 Grade means the tensile strength only!**

- **12.9 Property Class**, covers **ALL** critical aspects of the fastener! Such as:-
  - Minute Cracks, thread laps, fillet radius, thread run out, wall thickness, heat treatment and mechanical properties.
  - This is the standard Holo-Krome works to!

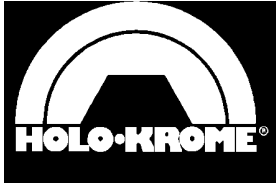


# Property Class

—V—

## 12.9 Grade.

- **12.9 Grade only refers to the tensile strength of a product. 1200N/mm at 90% yield.**
- **This can be adjusted by introducing elements such as boron to make inferior steels 'harder'.**
- **May not contain essential elements such as chrome or molybdenum.**
- **12.9 grade can allow small cracks or excessive de-carburisation.**
- **De-phosphate not essential.**



# Features 12.9 Property Class

## Feature:-

- Alloy Steel
- Smooth fillet radius
- Smooth bearing surface
- De Phosphated
- Precision Threads
- High lustre black finish.

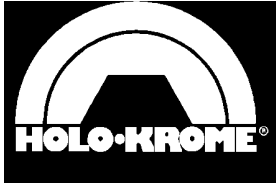
## Benefit:-

- ❖ High alloying elements.
- ❖ For head strength
- ❖ Gives consistent K value
- ❖ Removes embrittlement
- ❖ No dangerous laps
- ❖ Prevents rust.



# **Holo-Krome -v- Unbrako** **Holo Code™ -v- E Code**

- **Holo Code™** was available 2 years before **E Code**.
- **Holo Code™** is an easily maintained system.
- **Holo Code™** is marked beside the HK grade stamp.
- **Holo Code™** does not affect the aesthetics of the head or damage the bearing surface.
  
- **E Code** marked on the top of the head is open to damage.
- **E Code** is confusing and difficult to understand.
- **E Code** has an uneven stamp depth and is difficult to read.
- **E Code** was an Unbrako reaction to **Holo Code**.

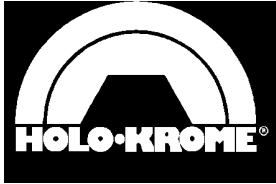


# Torque Comparison

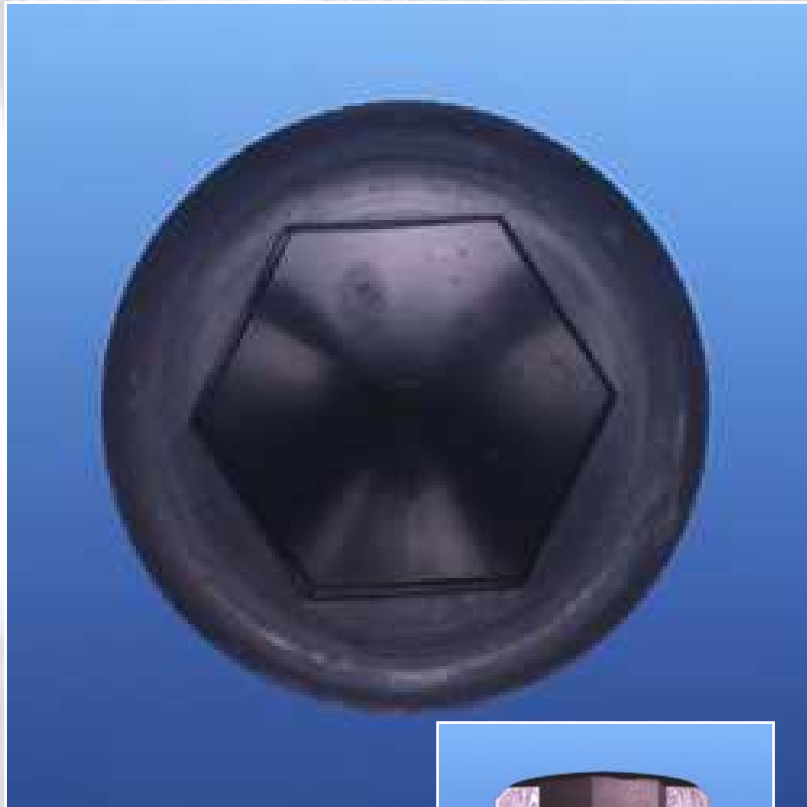
## Tightening Torque in Nm. 12.9 grade Socket Head Cap Screws

| Thread | Holo-Krome® | Unbrako   |
|--------|-------------|-----------|
| M3     | 2.43Nm      | 2.10Nm    |
| M4     | 5.66Nm      | 4.60Nm    |
| M5     | 11.40Nm     | 9.50Nm    |
| M6     | 19.34Nm     | 16.00Nm   |
| M8     | 46.34Nm     | 39.00Nm   |
| M10    | 88.28Nm     | 77.00Nm   |
| M12    | 161.78Nm    | 135.00Nm  |
| M14    | 257.40Nm    | 215.00Nm  |
| M16    | 397.20Nm    | 330.00Nm  |
| M18    | 551.63Nm    | 455.00Nm  |
| M20    | 772.28Nm    | 650.00Nm  |
| M24    | 1323.90Nm   | 1100.00Nm |
| M30    | 2684.50Nm   | 2250.00Nm |
| M36    | 4707.00Nm   | 3850.00Nm |

**Holo-Krome® torque's are approximately 20% greater than competition.**



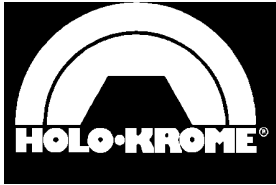
# Thermo-Forged Sockets



**Holo-Krome® socket screws are produced by Thermo-Forging®, A process invented by Holo-Krome®. The raw material is pre-warmed prior to forging, this increases the ductility and allows more controlled grain flow in the socket head feature.**

**Forged sockets are more precise and offer greater strength than machined socket screws.**





# Holo Code™



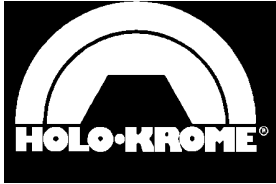
Letters in white for  
pictorial purposes only





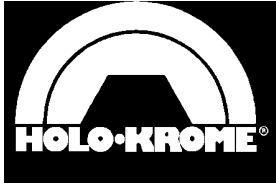
## Holo Code™

- **1st European to introduce lot marking on Cap Screws.**
- **All Holo-Krome metric Cap Screws (between M5 through M42) carry a Holo Code™ serial number.**
- **Serial number identifies process back to raw material supplier's heat number.**
- **Easily maintained and expandable system.**
- **Life cycle on the numbering system over 10 years.**



# Countersunk Socket Screws





## Countersunk Socket Screws

- **Manufactured in Metric and Inch sizes.**
- **12.9 Grade – NOT 10.9 Grade.**
- **Meets minimum load criteria.**
- **38-42 HRC. Hardness.**
- **ISO 10642 , DIN7991.**
- **Head NOT MARKED for aesthetic purposes.**
- **M3 through M20 Diameter.**



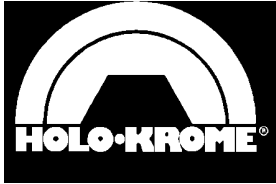
# Button Head Socket Screws





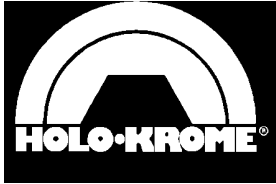
## Button Head Socket Screws

- Manufactured in Metric and Inch sizes.
- 12.9 Grade – NOT 10.9 Grade.
- Meets minimum load criteria.
- 38-42 HRC. Hardness.
- ISO 7380.
- M3 through M12 Diameter.
- Light duty applications.



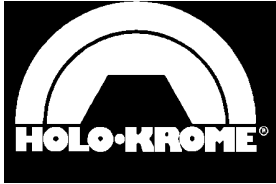
# Low Head Socket Screws





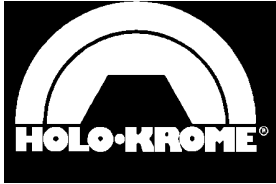
## Low Head Cap Screws

- **Manufactured in Metric only.**
- **Made to 10.9 Grade – from 12.9 Grade material.**
- **Meets minimum load criteria.**
- **36 HRC. Hardness.**
- **Holo-Krome Standard dimensions. Not DIN7984.**
- **M5 through M20 Diameter.**
- **Head Marked "HK 10.9" and Holo-Code.**



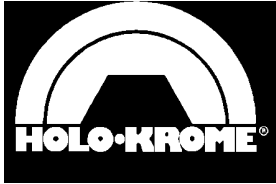
# Shoulder Screws





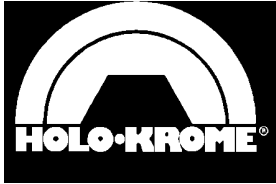
## Shoulder Screws

- **Manufactured in Metric and Inch sizes.**
- **Made to 12.9 Grade.**
- **Ideal for press tools as stripper bolts.**
- **Good shear strength through body portion.**
- **Note: Body tolerance is h8. Not f9.**
- **38 – 42 HRC. Hardness.**
- **Designate by body diam, thread, and body length.**
- **Example: 12mm (M10) x 50mm.**



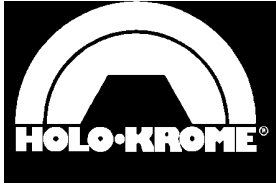
# Socket Set Screws



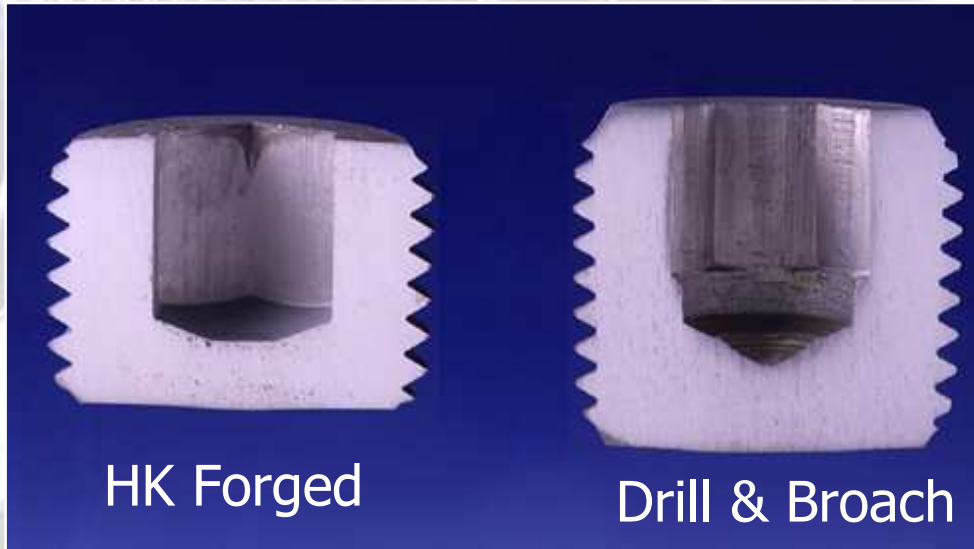


## Socket Set Screws

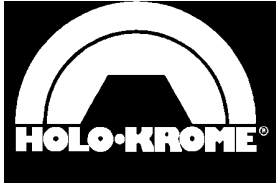
- **Manufactured in Metric and Inch sizes.**
- **Made to 45 HRC Minimum.**
- **All forged co-axially socket and point.**
- **Various point styles available.**
- **Plain cup is the most popular.**
- **Dog, flat, cone and knurled available.**
- **M2 through M20, standards. (M24 on request).**
- **Alloy steel 45H and stainless A50.**



# Forged Socket Set Screws



Some of our competitors (**including Unbrako**) still drill and broach sockets on socket set screws. Holo-Krome® were the first to develop forging socket set screws to give a smooth socket, and forged cup and flat point ends which are co-axial with the socket. Holo-Krome® developed unique secondary operation equipment to produce a variety of point profiles including oval, dog and cone points.



# Standard Documentation

Pick Note, Despatch Note  
and Invoice Generation

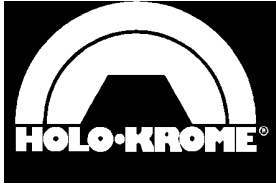


Certificate of  
Conformance



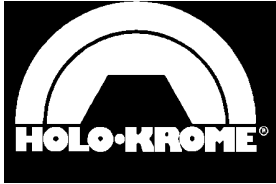
ISO9002  
Certificate





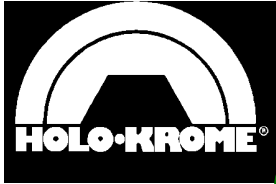
## What to **LOOK OUT** for:-

- **A fastener which has been repacked.**
- **This loses any traceability (if available).**
- **Hides the country of origin.**
- **Look under the head for signs of tool wear.**
- **Manufacturers trade mark and grade stamp.**
- **'Bare' surface finish on the fasteners.**



## What you **DON'T SEE** :-

- **Alloy elements.**
- **Thread laps.**
- **De-carburisation.**
- **Material inclusions.**
- **Embrittlement.**
- **Inherent cracks.**
- **Certificates of conformance!**
- **Product Liability!**



# Quality Controlled Features

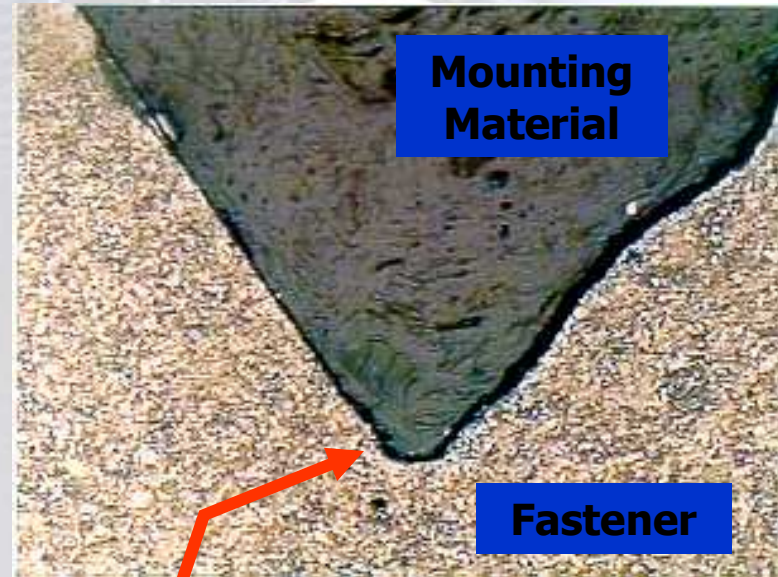
- **Raw Material Control.**
- **Tooling.**
- **Gauging.**
- **Process Control.**
- **Thread Pitch**
- **Diameter Control.**
- **Tensile Strength.**
- **Wedge Tested**
- **Steel procurement.**
- **Carbide. For wear.**
- **Consistent dimns.**
- **Monitored by SPC.**
- **Monitored by SPC.**
- **Heat treatment monitored 24 hours**
- **Various angles**



# Thread Run-Out Comparisons



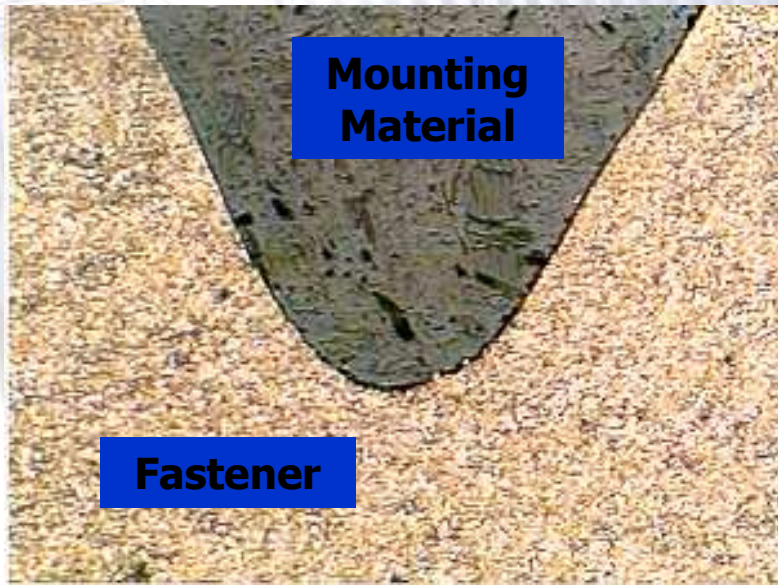
**High Quality Thread Run-out**



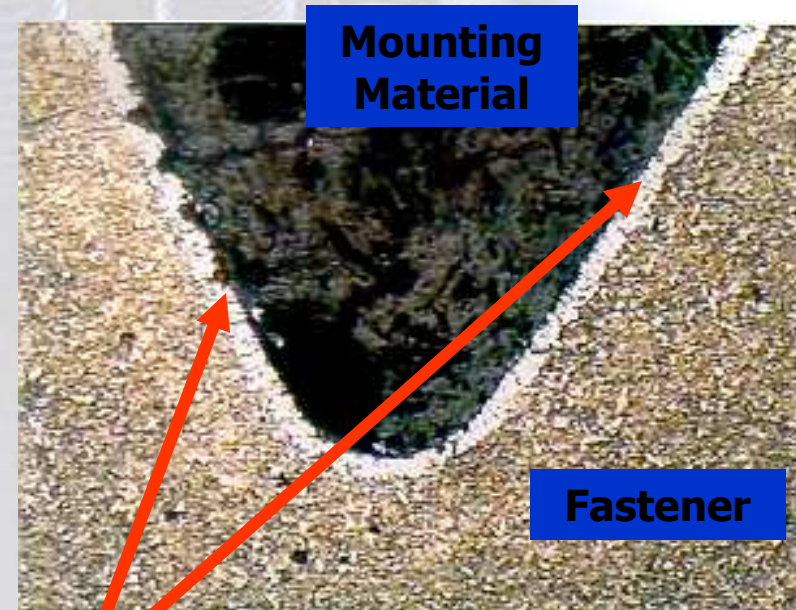
**Very sharp hence very weak Run-out radius**



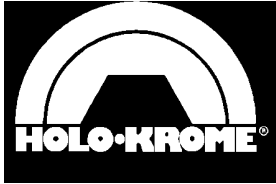
# Heat Treatment Comparisons



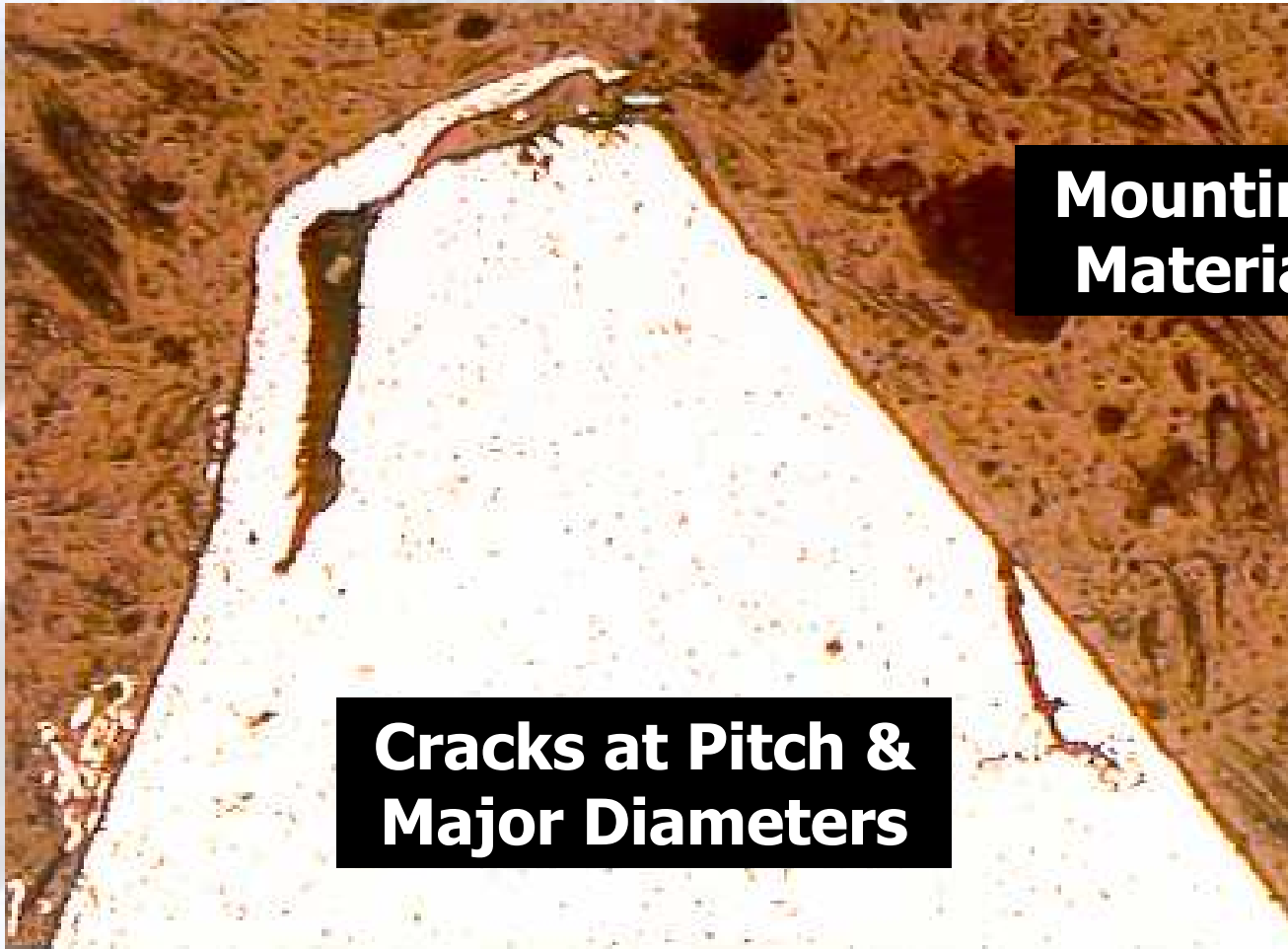
**High Quality  
Heat Treatment**



**Brand (A) De-carburisation  
problems**

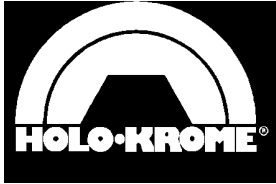


# Thread Faults Problem : Steel/Line Up



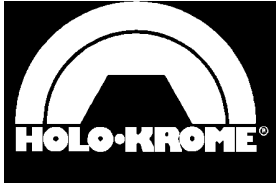
**Mounting  
Material**

**Cracks at Pitch &  
Major Diameters**



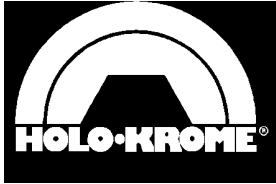
# Common Misunderstandings

- "I specify 12.9 grade it must be ok."
- "I have to reduce my spend on screws."
- "It is 15% cheaper to buy."
- "We get a free box if any break."
- 12.9 is a tensile spec only.
- What problems are created elsewhere?
- And 30% more expensive to install!
- What effect does this have on your product?



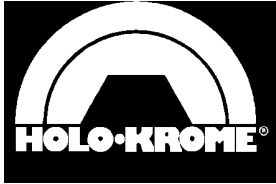
## Question to the Customer : Do you get the following ?

- De-Phosphated product?
- Free from de-carburisation?
- Lap free threads?
- Radius run out threads?
- Freedom from overworked tooling?
- Traceability?
- Product liability?



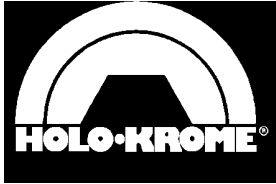
## **With Holo Krome you do you get the following !**

- **All of the previous page plus:-**
- **70 years experience of making socket screws.**
- **Integrity and inner strength. Product made with the best tools and gauges available.**
- **Statistical back up of manufacturing processes.**
- **Wedge tested above DIN or ISO standards.**
- **Technical back up and published literature.**
- **PEACE OF MIND.**



# Materials

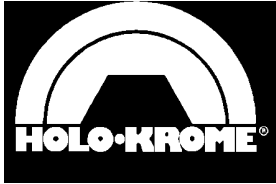
- Alloy Steel AISI 4037, 4042 and 4137 as standard.
- Stainless steel AISI 302 A2-70 18/8 composition.
- Exotic Stainless Steel, 17/4ph, 410 and A286.
- B7M for Oil Industry (Sour hydrogen).
- H11 for extreme temperature use  $-40\text{C}$  to  $+537\text{C}$ .



# Coatings

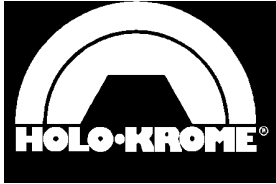
- **Electroplated Zinc with 23 Hour bake as standard.**
- **All plated products undergo a 24 hour block test.**
- **Mechanical plating: Dacromet, Zinc, Nickel etc.**
- **Electro-static paint.**
- **Black nickel.**
- **Others on request.**





# Approvals

- **ISO 9002 EN 29002 Certificate number FM00062.**
- **Civil Aviation Authority (CAA) A1/6197/61.**
- **British Aerospace BAC/GW/523.**
- **Ford Q101.**
- **New Specification for ISO 9000/2000 in progress.**
- **Meet USA FQA/HR3000 requirements.**
- **Various OEM approvals, JOY,BOC,Bell,BAe, etc.**



# Applications

- **Heavy Engineering.**
- **Machine Tools.**
- **Valves**
- **Hydraulics**
- **Plastic injection moulding tools.**
- **Tool and die jigs & fixtures**
- **Pumps internal and external applications.**
- **Military equipment.**
- **Robots and motion control.**



**We never forget YOU have  
a choice! .....**

**Your reputation hangs by a  
thread.....**

**Make sure it is one of ours !**

