



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"?**



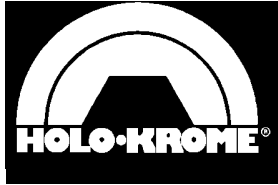
Holo-Krome SHCS Features & Benefits

- 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!

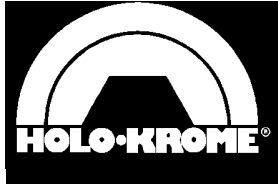


Property Class

—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.



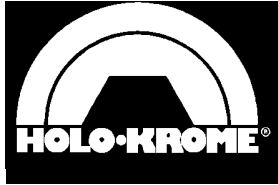
Features 12.9 Property Class

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

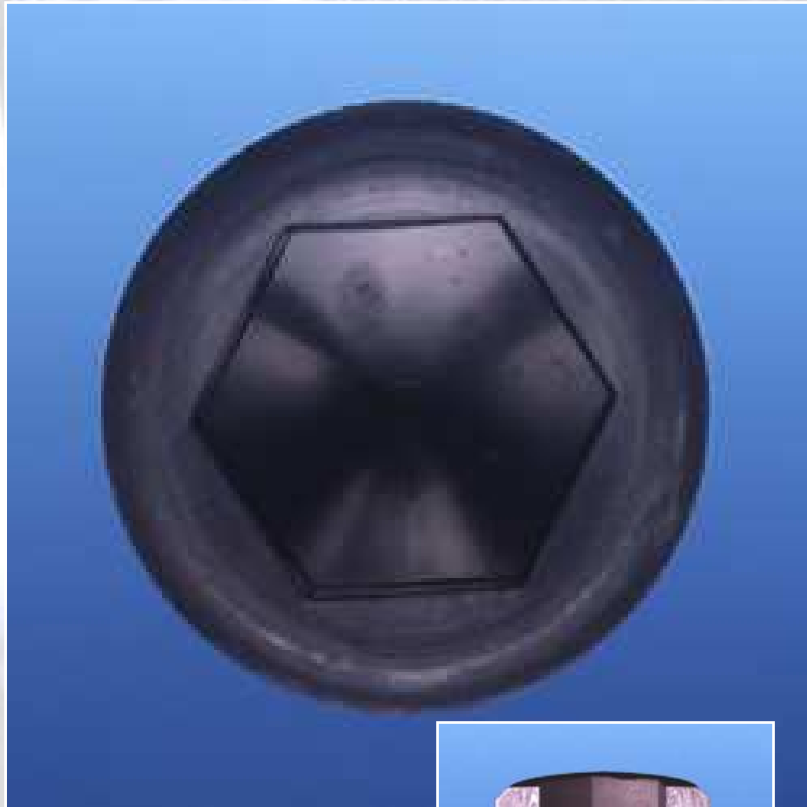
Tightening Torque in Nm. 12.9 grade Socket Head Cap Screws

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



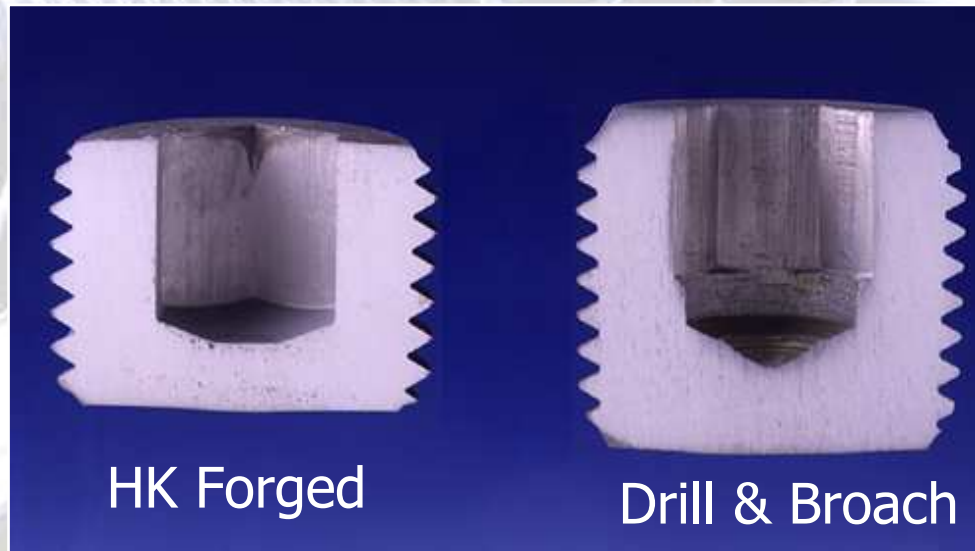


Socket Set Screws

- **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.



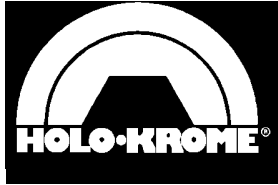
What you **DON'T SEE** :-

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



Quality Controlled Features

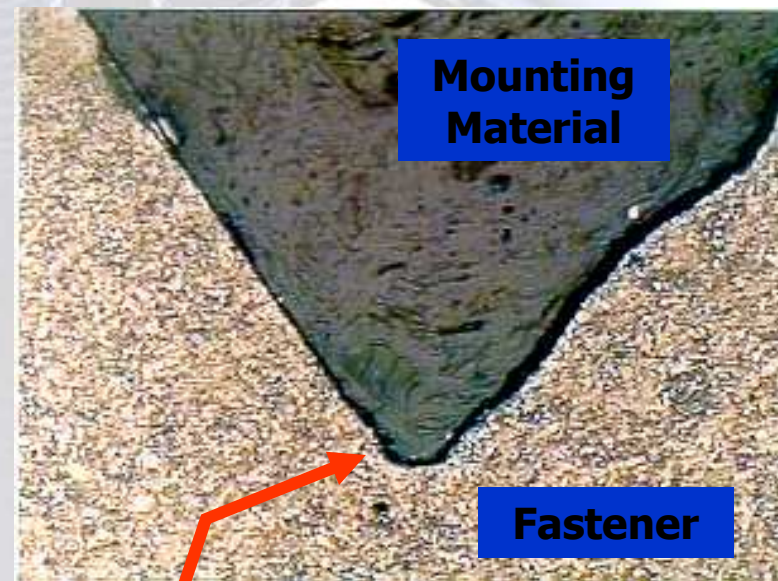
- Raw Material Control.
- Tooling.
- Gauging.
- Process Control.
- Thread Pitch
- Diameter Control.
- Tensile Strength.
- Wedge Tested
- Steel procurement.
- Carbide. For wear.
- Consistent dimns.
- Monitored by SPC.
- Monitored by SPC.
- Heat treatment monitored 24 hours
- Various angles



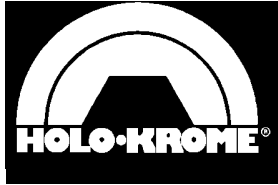
Thread Run-Out Comparisons



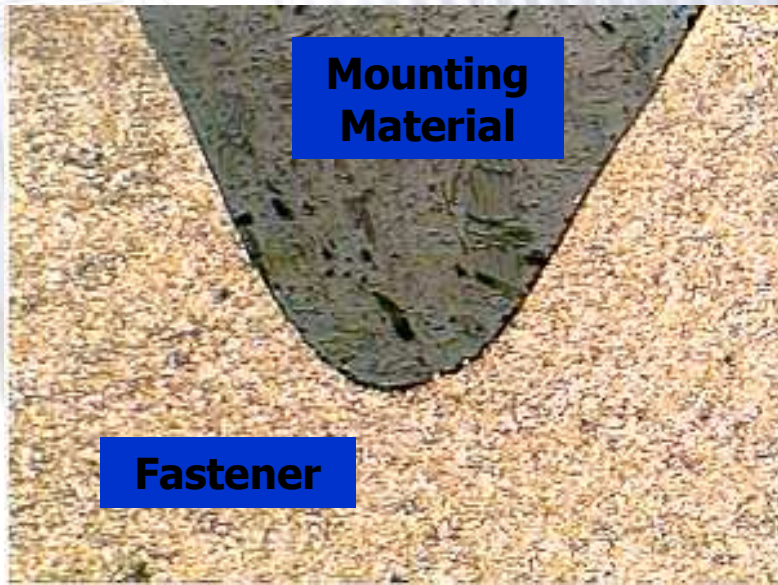
High Quality Thread Run-out



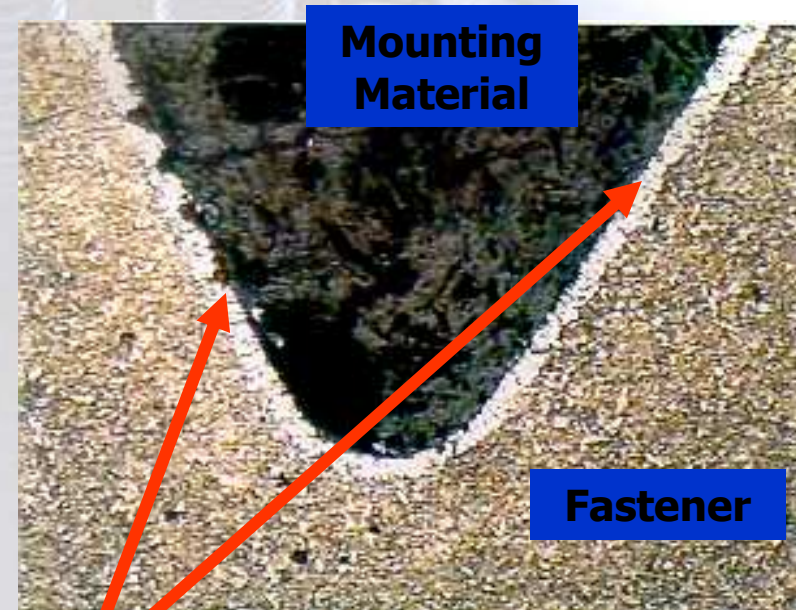
Very sharp hence very weak Run-out radius



Heat Treatment Comparisons



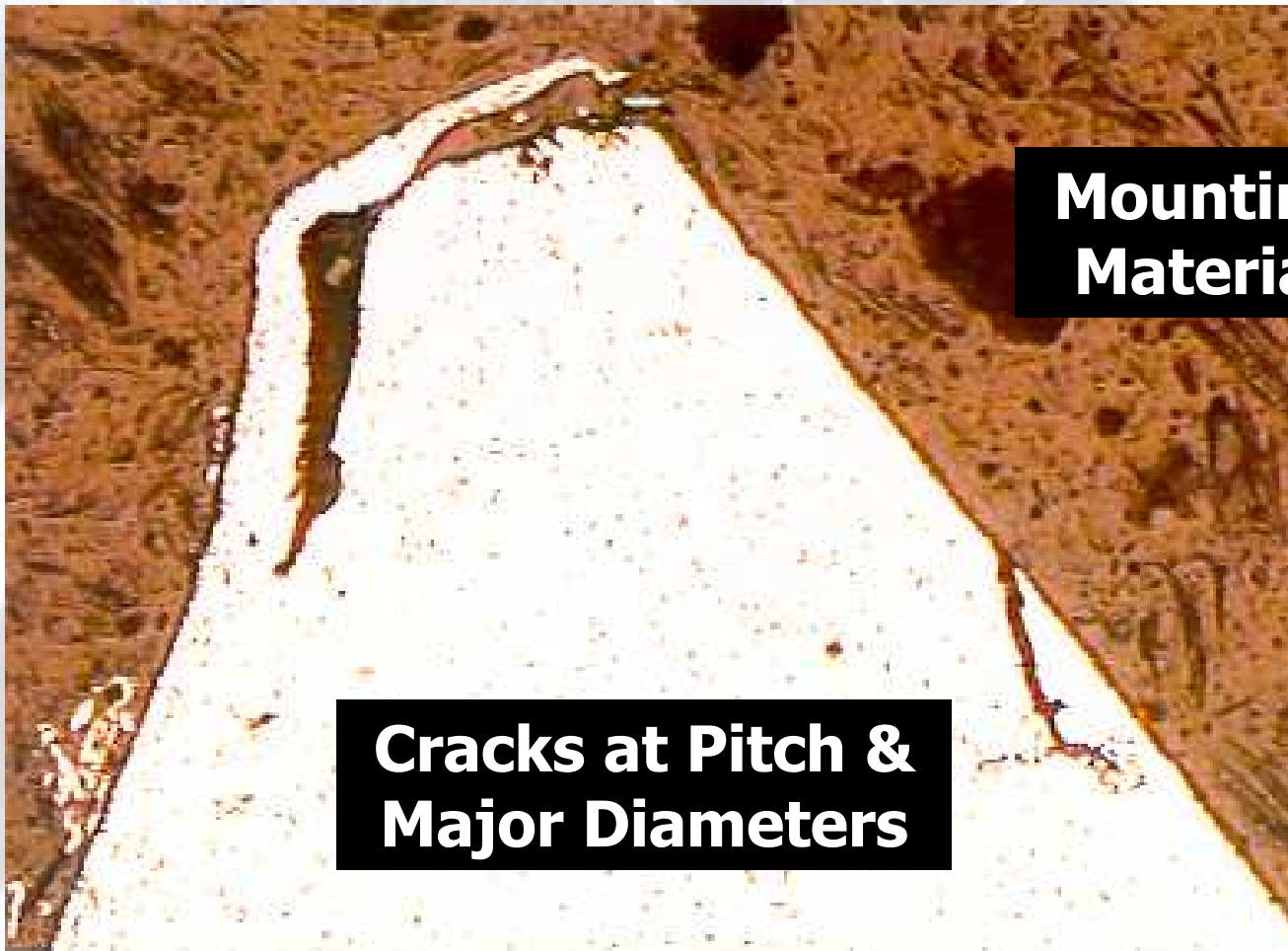
**High Quality
Heat Treatment**



**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°C to $+537^{\circ}\text{C}$.



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!**

****Y**our reputation hangs by a
thread.....**

Make sure it is one of ours !