SUMNotes

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REPLICATING MEDIA *by Dr. E. MOGIRE*

Replicating media is used for non-destructive investigation of engineering components and materials. The media is a two-part system that solidifies upon contact and reproduces the details of the surface on which it is applied with very high precision. The media finds application in metallurgical/materiolographic inspections, failure and forensic investigations and metrology among others.

Figure 1.1 Two part silicone replication media and dispensing gun

Buehler replicating media has unique features, it is suited to different areas of applications where;

- High micron accuracy is a requirement such as in microstructural analysis of engineering components looking at damage assessments caused by creep deformation, micro- and macro-crack formation, fatigue failures in mating surfaces such as on gears and bolts

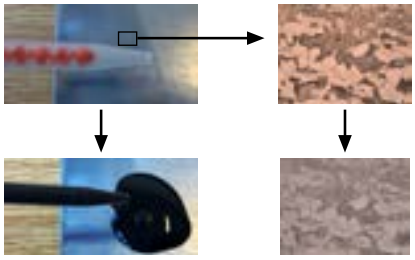

Figure 1.2 above illustrates how the media is applied on a polished and etched surface. (A) Shows the actual microstructure and (B) the extracted replica, fine submicron details are easily discernible

- Good dimensional stability of the replica is necessary allowing easy inspection and measurement of internal and external surfaces of complex objects, such as grooves, notches, fasteners and gear teeth.
- No shrinkage during polymerization guarantees no volume loss during application ensuring good dimensional stability

- Tribology and surface roughness assessment are carried out to determine the wear characteristics of mating surfaces as well as general visual inspection of tooling surfaces as shown below

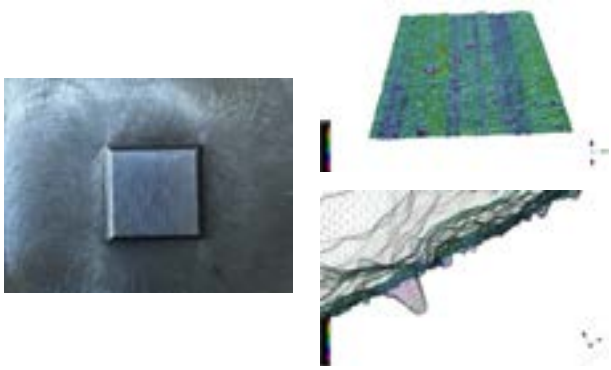

Figure 1.3 illustrates (a) stamping tool (b), the analysed replica surface and (c) inverse image of the depth profile of the observed surface features.

- Good resistance to chemical, mechanical and heat exposure to a maximum of 120°C with the ability to retain shape after exposure

- Details of tool marks, imprint evidence and tyre marks are required to be replicated for further macroscopical comparison with known tools used in criminal activities

BUEHLER

BUEHLER Worldwide Headquarters
North America-South America Offices
41 Waukegan Road
Lake Bluff, Illinois 60044-1699 USA
P: 800 BUEHLER (800-283-4537)
P: (847) 295-6500
www.buehler.com | info@buehler.com

European Headquarters
BUEHLER Germany
info.eu@buehler.com

BUEHLER France
info.fr@buehler.com

BUEHLER United Kingdom
info.uk@buehler.com

BUEHLER China
info.cn@buehler.com

BUEHLER Japan
info.japan@buehler.com

BUEHLER Asia-Pacific
info.asia@buehler.com