

Avoiding stains on leached, fiberoptic image guides

Overview

Fiberoptic image guides, when stored in dry, warm conditions and properly cared for, will give high-quality images during their life. Lessening exposure to humidity or fluid invasion during sterilization helps stop damaging visual defects.

Attempts to repair stained bundles have mixed results. Polishing bundle ends will not reach the stains. Some repair companies claim success by injecting chemicals behind the end-tip to neutralize stains. However, this can cause fiber breakage, and success is not assured.

In the end, proper-handling procedures offer the best solution.

Preventing stained bundles

1. Ask factory to install glass masks at time of order.
2. Bond a lens to the objective end of the image guide, if possible.
3. Store guides in warm, dry conditions when not in use.
4. Inspect and pressure-test endoscopes before soaking to assure that voids have not developed which allow fluids into the scope.

Background

Sometimes, image guides show visible defects often described as mosaic staining and measles-like dark spots when viewed through an eyepiece or magnifier.

Here's why-

Image guides are made of three types of optical glass:

core glass -high-transmission glass for light guide and image guide

second glass-cladding layer -high-grade glass for light guide and image guide

third glass-cladding layer -acid-soluble glass (ASG) for leached image guide only

An acid bath during bundle production eats the ASG away between image ends without damaging the important, second layer. This results in a flexible bundle with precise fiber arrangements.

However, guide ends still have ASG. These ends, when left unprotected, allow moisture to enter the ASG from the air or from regular cleaning methods. In tropical climates, this trapped moisture supports germ and mold growth, resulting in stained bundles. Therefore, prevention is the only sure answer to avoid these problems.