

COMPUTED RADIOGRAPHY IDEAL FOR FLASH X-RAY APPLICATIONS

L3 Harris is a world-leading manufacturer of flash X-ray systems that address a wide variety of industrial and research applications. Flash X-ray is used when it is necessary to examine fast-moving, visually-obscured objects, or to observe the effects of an event or impact that is too fast for the human eye.

L3 Harris Pulserad™ Flash X-ray Systems produce a single, extremely short and high-powered X-ray pulse that can be used to effectively stop the motion of a fast moving object and allow its internal structure to be imaged and analyzed. X-ray pulser voltages of 150kV, 300kV, 450kV and 1.0MV are available, with pulse widths from 20ns to 70ns, which offers the flexibility to address a wide variety of applications for both commercial and government entities.

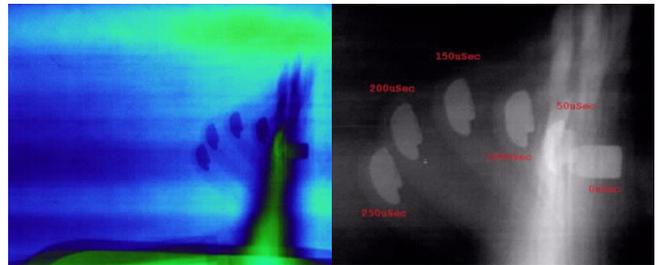


Past applications include inspection of helicopter blades while spinning, munitions in flight, impact events such as car crashes and bulletproof vests, and even evaluation of space shuttle tiles being struck by hypervelocity objects.

L3 Harris usually uses Computed Radiography (CR) to capture images because of its numerous advantages over film and DR. Specifically, the time to acquire an image is much shorter than it would be using film, and no darkroom or chemicals are required. This means that imaging can be done in the field and the results are available almost immediately. In addition, digital images are easily manipulated to enhance details and make accurate measurements of objects in the image. CR plates, unlike film, are also accepting of multiple x-ray exposures.

CR has advantages over DR in typical flash X-ray applications because the image capture medium often is at risk from shock or debris, may need to be shaped to fit a specific need, and always needs to have a very high sensitivity due to the short X-ray pulses. The Imaging Plates (IPs) used in CR are extremely inexpensive compared to a DDA, are more rugged, and are available in a wide variety of sizes, sensitivities and resolutions.

L3 Harris uses the DÜRR NDT ScanX Discover HC CR scanner to electronically capture X-ray images and then displays them digitally on a monitor for evaluation.



Imaging Example: The images above shows a sequence of six exposures, taken 50µsec apart, on a single CR plate, of a 30-06 bullet (moving right to left) striking a bullet proof (Kevlar) vest. The exposures were created using 150kV pulsers. Each x-ray pulse lasted 70nsec.

The ScanX HC is ideally suited for this application because of its ability to deliver high contrast images, and the flexibility given to the user to directly manipulate and control the internal functions of the scanner. For example, the Photo Multiplier Tube (PMT) inside the scanner can be explicitly controlled to provide the maximum amplification of the image captured on the imaging plate. Flash X-ray pulsers generally produces lower X-ray doses than standard NDT applications, which in turn means a relatively low exposure on the imaging plate. Having the ability to control the PMT to amplify this faint signal is key to capturing a usable image, as is the very low noise of the ScanX HC PMT.

Some flash X-ray applications involve very fast-moving objects and/or longer objects. To effectively image these, long imaging plates are often used to better image the objects in flight. The ScanX HC can scan imaging plates up to 14" (35cm) wide, and imaging plates up to 60" (150cm) long are routinely scanned by the ScanX HC. Under extreme circumstances, plates that are over 100" (250cm) have been successfully scanned.

In addition to the ScanX CR system, DÜRR NDT offers a variety of CR, DR and software products to the NDT industry. DÜRR NDT is proud to partner with L3 Harris and to provide solutions that address the unique requirements of flash X-ray applications.



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