

Indented impressions on paper can be restored using Electrostatic Detection Devices such as an ESDA, IMEDD or Vacu-Box. Test strips can be used to determine if these instruments are fit for use and to ensure critical evidence in the form of indented writing impressions is not overlooked.

Gradient[®] test strips can:

- show when ambient test conditions are suitable,
- indicate if certain equipment components are faulty,
- measure the sensitivity of a particular test, and
- provide uniform standards for comparing different methods or testing protocols.

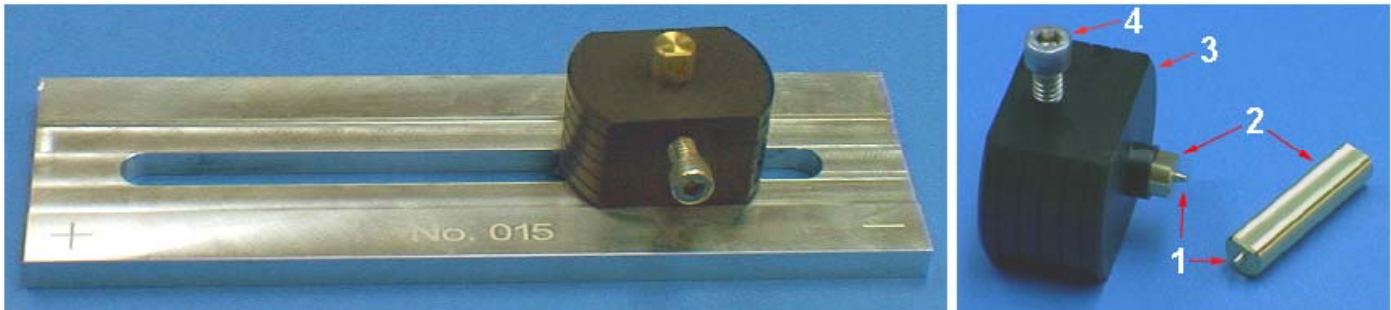


Figure 1: Principal components.

The parts of the **Gradient[®]** appear in Figure 1. The difference in thickness between opposite ends of the milled trough in the aluminium plate is $0.002" \pm 0.0005"$ over a distance of 6 inches. Ballpoint pen tips (#1), with ball diameters of 0.5 mm (0.197") and 0.8 mm (0.315") respectively, are mounted in the ends of two brass cylinders (#2). After inserting a cylinder into a Delrin[®] slider (#3), its position is adjusted so the pen tip is flush with the bottom of the plate when the slider is positioned at the high (+) end of the milled trough. The adjustment screw (#4) is then tightened making the **Gradient[®]** ready for use.



Figure 2: Production of paper test strips.

Two 3" x 8" strips are cut from paper similar in thickness to the questioned document. The strips are placed atop one another on a smooth surface. Since surface imperfections will be reflected in the test strip impressions, a granite surface plate with minimum overall accuracy of $\pm 0.0001"$ should be used as a supporting surface. Surface plates are not supplied but can usually be purchased from a local supplier.

With the **Gradient[®]** resting on the paper strips, the slider is moved back and forth along the trough while firmly applying constant downward pressure (see Figure 2). Two passes are usually sufficient to produce a suitable impression.

An impression ranging in depth from 0.000" to 0.002" is produced in the top strip while a shallower impression is generated in the lower strip because the pen tip exerts pressure through the top sheet of paper.

Either strip can be used for testing purposes. The lower test strip impression, generated by paper-to-paper contact, is usually used to determine if an instrument is fit for use or whether the ambient conditions are suitable. Since the depth of the impression in the top strip is closer to the design specifications of the milled aluminium plate, the top strip can be used to quantitatively assess the restored impression.

Figure 3 on the reverse side shows a test strip impression restored using an ESDA. The graph shows the relationship between impression depth as a function of the distance from the high (+) end of the trough. The long vertical arrow indicates the minimum depth (0.0002") at which impressions can be detected during this trial.

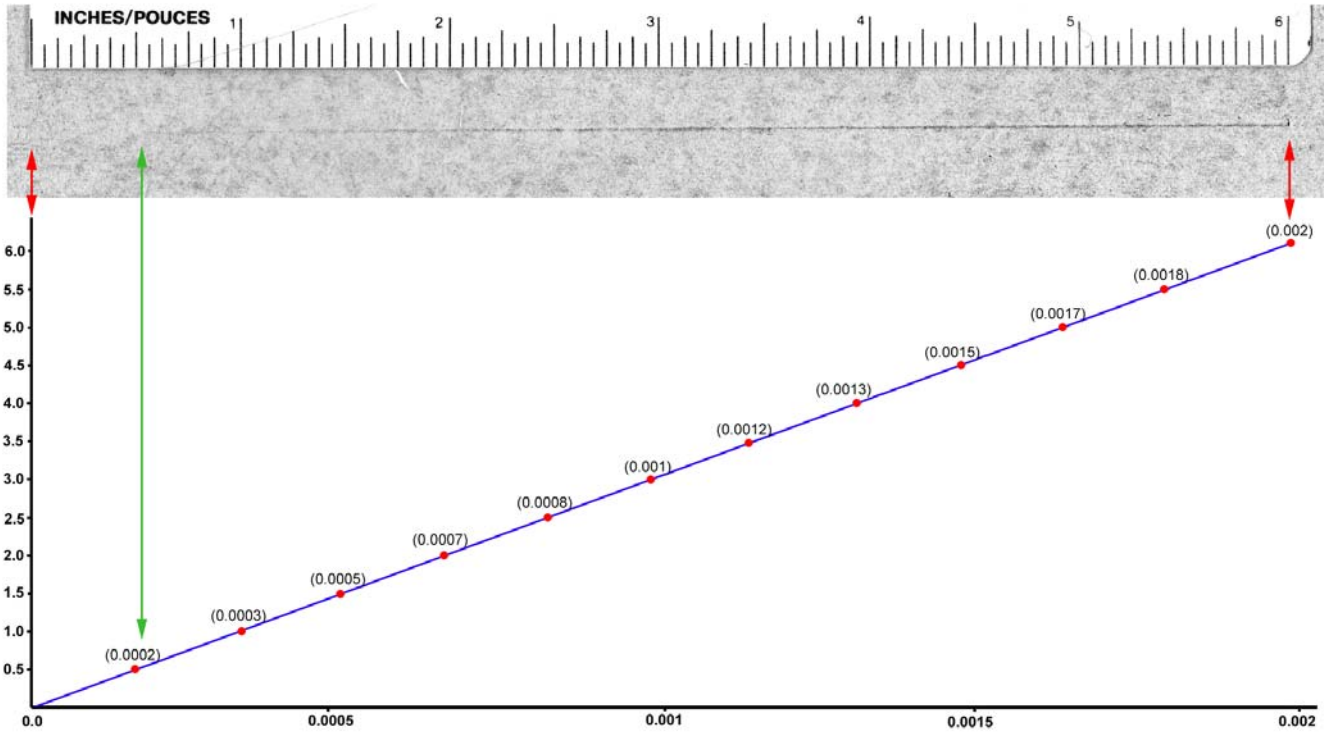


Figure 3: Impression depth as a function of distance from the + end of the aluminium plate.

Forensic document examiners working in accredited laboratories can use **Gradient**[®] test strips to monitor the condition of equipment used to restore indented impressions in paper. Examiners can also use this device to optimize the performance of such equipment and develop new or improve existing testing protocols. You can order a **Gradient**[®] by completing the following order form.

Gradient[®] Order Form				
All orders <u>must</u> be paid in advance by credit card or check in US dollars.				
Name:				
Address:				
City:		Province/State:		
Country:		Postal Code:		
Phone No:		Fax No:	Email:	
		Unit Cost (USD)	Number of Units	
Gradient [®] (includes aluminium plate, slider & two cylinders with tips)		\$295.00		
Less 15% discount for 3 or more units [Available to government agencies or institutions only.]				
Shipping <u>per unit</u> : USA/Canada = \$10.00; International = \$20.00				
Total (in US dollars)				
Payment Method (circle one)	Visa	Credit Card No.	CVV2 No.	
	MasterCard	Name on Card:		
	American Express	Signature:		
	Check			
Exp. Date:				

Mail or Fax Orders to: ASQDE
P.O. Box 18298
Long Beach, CA 90807
USA

Fax: 562-901-3378
email: asqjournal@aol.com