



## AMBIOS TECHNOLOGY THIN FILM STEP HEIGHT STANDARD

The Ambios Technology thin film step height standard is designed for the calibration of Ambios Technology stylus type surface profilers. The standard consists of a 10mm thick Quartz substrate (photomask blank) with lithographically defined Chrome features. The highest quality photomask blank was chosen as the substrate to assure an extremely flat and smooth working surface. Each standard is individually serialized. Complete calibration data is kept on file at Ambios Technology, Inc. for subsequent review if needed. Each standard has been fully characterized and the data from these tests accompany the standard along with the certification.

### THE CALIBRATION “DOG BONE”

The calibration area is defined as the central region of the “dog bone” at the center of the circle on the standard as is illustrated on the accompanying drawing. This feature is .2mm wide for the 10kÅ and smaller standards ([Figure 1](#)) or 1mm wide ([Figure 2](#)) for the larger standards. The thickness of the film in this area is determined by using a stylus profiler to measure the same location 10 times. The standard deviation of the 10 measurements must be 10 angstroms or less for standards that are less than 10kÅ in height and .1% of the height for 10kÅ or greater. The average of the 10 measurements is recorded as the “Measured Step Height”.

The accuracy of the measured thickness is based on the NIST certified calibration step height standard that is used as our primary standard – its accuracy is certified to be +/- .023 microns. Adding the secondary standard uncertainty, the six sigma accuracy of this standard is +/- .025 microns.

Note: This standard certification is for step height calibration only. The manufacturer for the Step Height Standards specifies the surface roughness to be less than 20Å. See [Table 1](#) for step height variance specifications.

Table 1. Step Height Variance Specifications

Step Height	Tolerance	Step Flatness Bandwidth Center Bar
200Å	± 25Å	60Å
500Å	± 40Å	80Å
1kÅ	+ 0	100Å
	- 160Å	
2kÅ	+ 0	100Å
	- 320Å	
5kÅ	+ 0	100Å
	- 800Å	
10kÅ	+ 0	100Å
	- 1.6kÅ	
50kÅ	+ 0	500Å
	- 7.5kÅ	
100kÅ	+ 0	1000Å
	- 15kÅ	



## CERTIFICATE OF COMPLIANCE

Ambios Technology, Inc. certifies that the Thin Film Step Height Standard, identified by serial number below, meets or exceeds the specification for this device as described in the accompanying technical information. Furthermore, the measurements made on this device were made with a stylus profiler, having sufficient repeatability and accuracy to insure said compliance. Prior to making ten repeated measurements on this device the stylus profiler was calibrated with a standard traceable to the National Institute of Standards and Technology.

Customer (Company) Name:	University of Dayton SN 558
Certified by:	Jeff Arthur
Certifier's title:	Manufacturing Engineer
Date:	September 26, 2005
Serial Number:	10445
Certified Step Height	9136 Å
Std. Dev. of 10 measurements:	9.7 Å



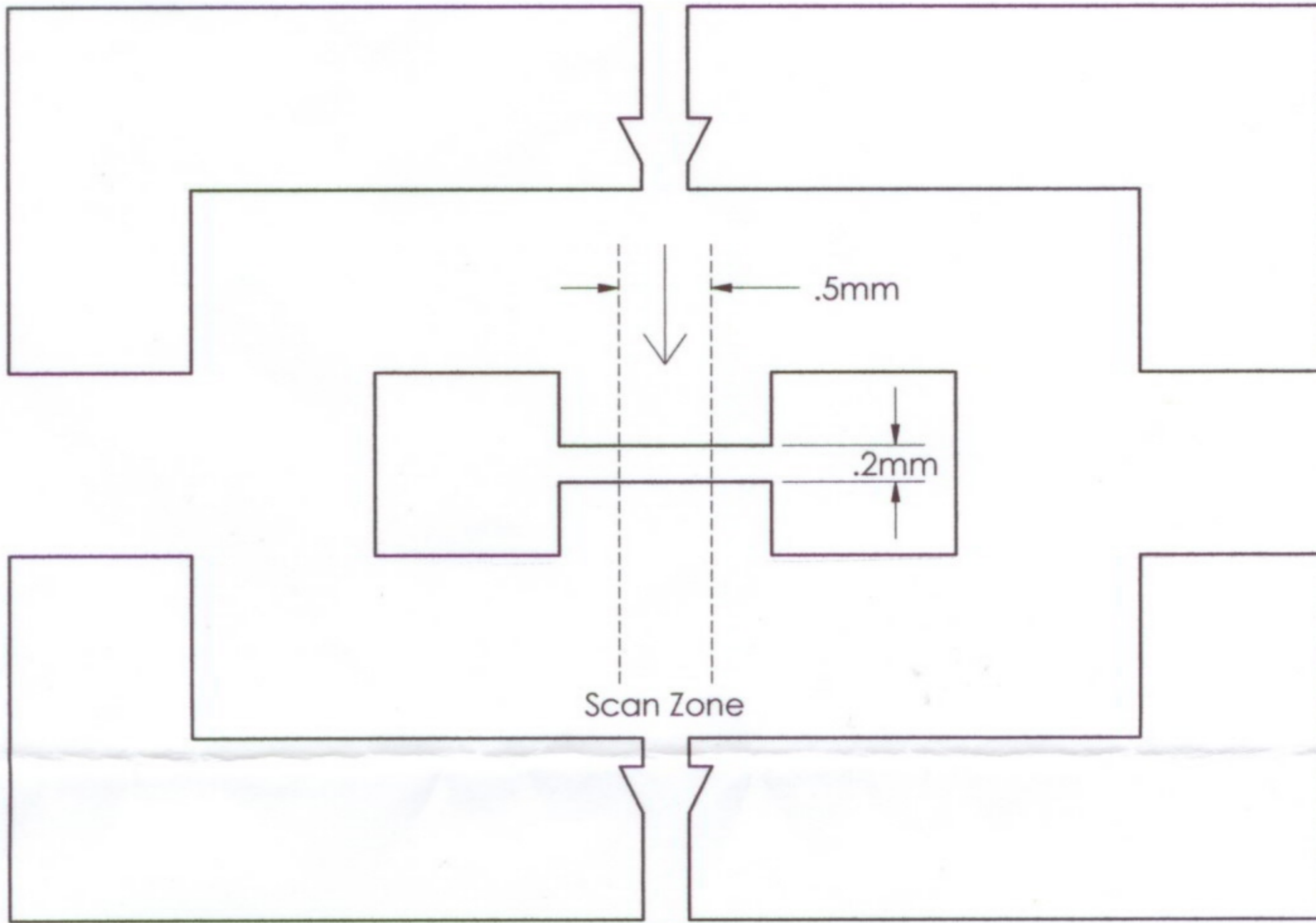


Figure 1. 200Å, 500Å, 1kÅ, 2kÅ, 5kÅ, 10kÅ

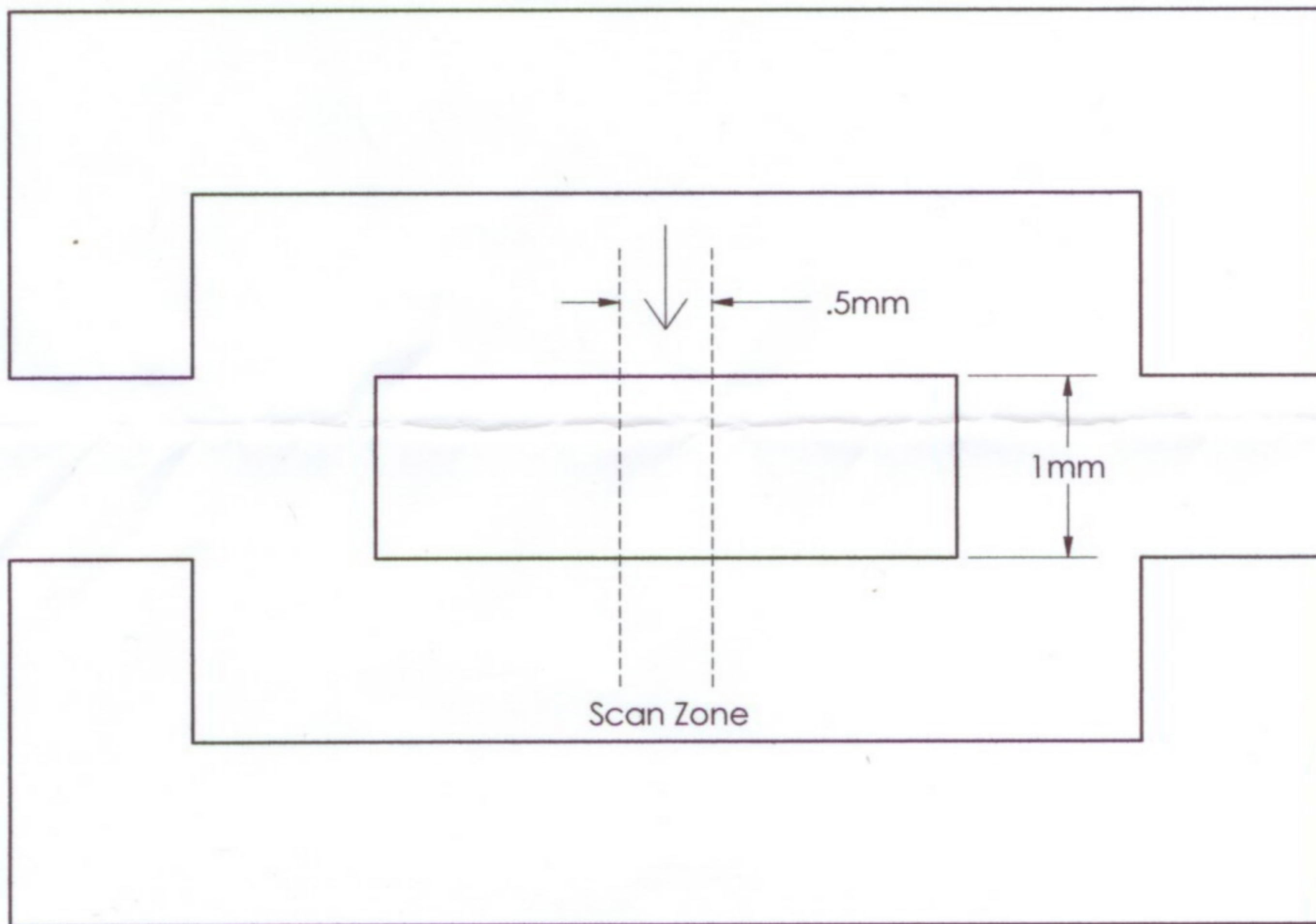


Figure 2. 50kÅ, 100kÅ