

# Application Sheet

**HIGHLIGHTS :**

- > **Unique project for the Colonial Williamsburg Foundation**
- > **Touchless scanning of priceless American historical artifact**
- > **Easy portability of scanner ensured measurements could be made on site**
- > **Final alignment of scans done in Poly-Works**

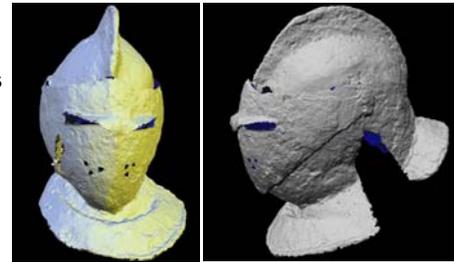
**“The Breuckmann scanner efficiently captured all the intricate detail of these two treasures of American archaeology”**  
 Emily Williams, Conservator of Archaeological Materials, The Colonial Williamsburg Foundation

**ACCUREX USES TOUCHLESS TECHNOLOGY TO SCAN TWO TREASURES OF AMERICAN ARCHAEOLOGY FOR COLONIAL WILLIAMSBURG FOUNDATION**

**Background**

Martin's Hundred was an early 17th century plantation located along the James River in the Virginia Colony, ten miles east of Jamestown. It consisted of 20,000 acres of land sold to investors at 100 acres per share. The administrative center of Martin's Hundred was Wolsten-

holme Towne, a fortified settlement of rough cabins. About 140 people were living at the Hundred when the most important event of its history took place. The land along the James River had been the domain of the Powhatans, and on March 22, 1622, they rose to kill as many English as they could surprise in their homes and fields. Martin's Hundred, the plantation hardest hit, lost more than 50, perhaps as many as 70 colonists. In addition about 15 women and 5 men were taken from Martin's Hundred and held as hostages.



**Model of a helmet**

The Indian Massacre of 1622 nearly accomplished its purpose. The English withdrew from their scattered settlements to the safety of Jamestown.

In the 1970s, Martin's Hundred was the subject of extensive archaeology excavations led by archaeologists Ivor Noël Hume and his wife Audrey Noël Hume and funded in part by the National Geographic Society.

Later Wolstenholme Towne was partially re-

stored. Among the items excavated at the site were two closed helmets. Closed helmets were a medieval holdover from the days when opposing knights rode at each other face to face. But against a hide-and-seek enemy such helmets' unquestioned protection from arrows was offset by their weight and restrictive vision.

The discovery of not one but two close helmets clearly shows that more than one Martin's Hundred colonist brought over the wrong equipment. The first complete closed helmets discovered in the New World, they have earned a place among the treasures



**Scanning a helmet**

of American archaeology.



**Drawing of the massacre**

**Scanning the helmets**

Accurex Measurement undertook to scan these helmets. The measurements were for

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ACCUREX USES TOUCHLESS TECHNOLOGY TO SCAN TWO TREASURES OF AMERICAN ARCHAEOLOGY  
CONTINUED



Site of Martin's One Hundred

archival purposes and for making replicas. The Breuckmann OptoTOP HE scanner provides very high quality scan data. The structured light technology allows the helmets to be measured without touching the surfaces, a very important factor when dealing with artifacts of such historical importance. The helmets were removed from the cases by the curator and placed



on the measuring table. The OptoTOP HE scanner takes approximately a second to collect the many data points that comprise each scan. After each scan the scanner was repositioned. As the scanner weighs only a few pounds this was a quick operation.

The helmets themselves have many diverse contours, so the contour matching technique which



Helmets positioned for scanning

makes use of this geometry was used align the scans. The Breuckmann OptoCAT software, which runs the scanner, has this capability built-in.

## Results

The final alignment of the scans for each of the helmets was carried out in PolyWorks software. The CAD models of the helmets were presented to the customer in STL format. The benefits that this project brought to the customer include the following. Accurate three

dimensional copies of these priceless artifacts are now available and should anything happen to the originals, authentic replicas can be constructed. In fact, one of the possible uses of the digital models is to make replicas for a "touch and feel" experience at the museum. It is also possible for museums to post digital copies of their scanned artifacts on the internet so that researchers can download them and study them, from anywhere on earth.



Curator moving a helmet prior to measurement

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