Materials List for:

A Method to Estimate Cadaveric Femur Cortical Strains During Fracture Testing Using Digital Image Correlation

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Materials

Name	Company	Catalog Number	Comments
Krylon plastic primer white	Krylon, Peoria, AZ, USA	N/A	Used as a base coat for a smooth white finish on bone surface
Water-based acrylic white and black paint	Plaid Enterprises (Ceramcoat), Norcross, GA, USA	N/A	Paint source for white and black colors
Mixing bowl	Not specific (generic)	N/A	Used to mix and prepare paint
Foam brush	Linzer Products, Wyandanch, NY, USA	N/A	Used to apply paint on bone surface
Toothbrush	Colgate-Palmolive, New York, NY, USA	Firm bristle	Used to apply appropriate size and distribution of speckling pattern
Hygenic Orthodontic Resin (PMMA)	Patterson Dental, St Paul, MN, USA	H02252	Controlled substance and can be purchased with proper approval
Kenmore Freezer	Sears Holdings, Hoffman Estates, IL, USA	N/A	Used to maintain a -20°C storage enviroment for bone specimens
Physiologic Saline (0.9% Sodium Chloride)	Baxter Healthcare, Deerfield, IL, USA	NDC 0338-0048-04	Used for keeping specimens hydrated
Scalpels and scrapers	Aspen Surgical (Bard-Parker), Caledonia, MI, USA	N/A	Used to remove soft tissue from bone specimens
Fume Hood	Hamilton Laboratory Solutions, Manitowoc, WI, USA	70532	Used for ventilation when preparing PMMA for potting of specimens
Lighting units	ARRI, Munich, Germany	N/A	Needed for illumination of target for image capture
High-speed video camera	Photron Inc., San Diego, CA, USA	Photron Fastcam APX-RS	Used to capture the high speed video recordings of the fracture events
Photron FASTCAM Imager and Viewer	Photron Inc., San Diego, CA, USA	Ver.3392(x64)	Used to record and view the high speed video recordings
Camera lens	Zeiss, Oberkochen, Germany	Zeiss Planar L4/50 ZF Lens	Needed for appropriate image resolution
ABAQUS CAE	Dassault Systemès, Waltham, MA, USA	Versions 6.13-4	Used for defining region of interest and creating finite element mesh
MATLAB	Mathworks, Natick, MA, USA	Version 2015b	Used for image processing and DIC analysis
TecPlot	TecPlot Inc., Bellevue, WA		Used for post processing of strain fields

Strain Calculator Software	Victor Barocas Research Group, University of Minnesota, Minneapolis, MN, USA	http://license.umn.edu/technologies/20130022_robust-image-correlation-based-strain-calculator-for-tissue-systems	Used to calculate strain field
mov_frames.m	Matlab script, Mayo Clinic, Rochester, MN,USA	N/A	Used to downsample uncompressed images from high speed video files
convert_imagesize.m	Matlab script, Mayo Clinic, Rochester, MN,USA	N/A	Used to register image pixel coordinates with mesh coordinates
rrImageTrackGui.m	Matlab script, Mayo Clinic, Rochester, MN,USA	N/A	Used to perform the image cross-correlation to obtain deformations and run Strain Calculator
analyzeFailurePrecursor.m	Matlab script, Mayo Clinic, Rochester, MN,USA	N/A	Used to track the peak strain components temporally
makeMovies.m	Matlab script, Mayo Clinic, Rochester, MN,USA	N/A	Used to create portable *.avi movies of the deformation components, strain components, principal strains, von Mises strain, and strain energy