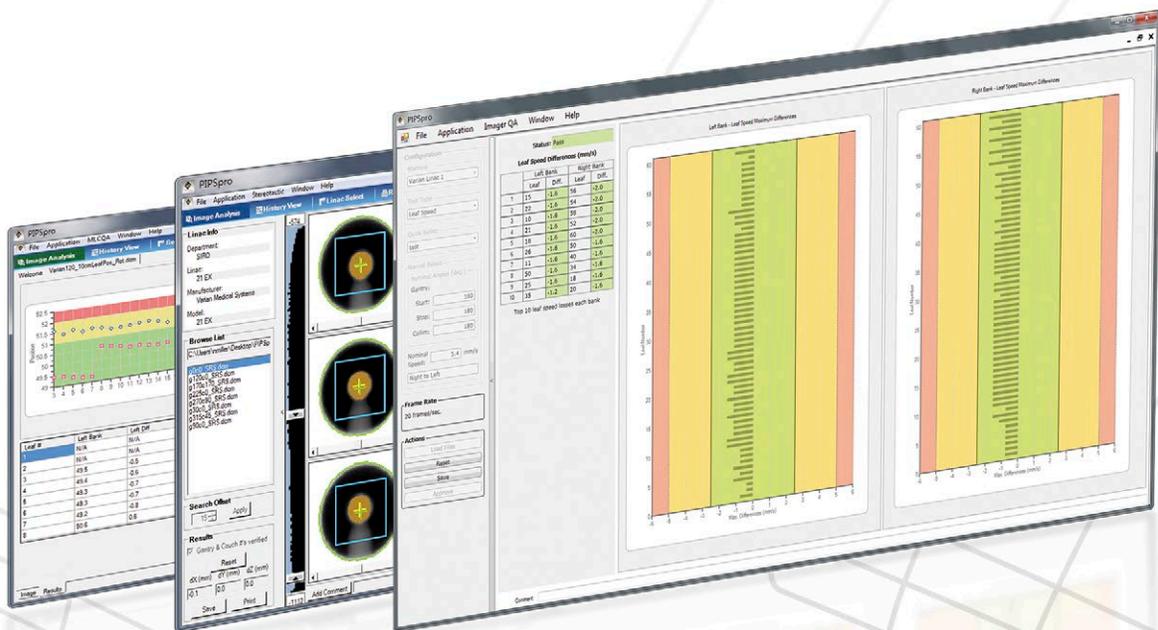




MONTHLY QA

AUTOMATED ANALYSIS OF QA TASKS



PIPSPRO™ SOFTWARE

OVER 30 PROCEDURES IN ONE EASY-TO-USE PLATFORM

TABLE II – MONTHLY MECHANICAL

- Light/radiation field coincidence
- Jaw position indicators
- Cross-hair centering

TABLE III – ANNUAL MECHANICAL

- Collimator rotation isocenter
- Gantry rotation isocenter
- Couch rotation isocenter
- Coincidence of radiation and mechanical isocenter

TABLE V – MULTILEAF COLLIMATION WEEKLY

- Qualitative test, aka “picket fence”

MONTHLY

- Setting vs radiation field for two patterns
- Travel speed
- Leaf position accuracy

ANNUAL

- MLC transmission
- Leaf position repeatability
- MLC spoke shot
- Coincidence of light field and x-ray field
- Segmental IMRT
- Moving window IMRT

TABLE VI – IMAGING DAILY

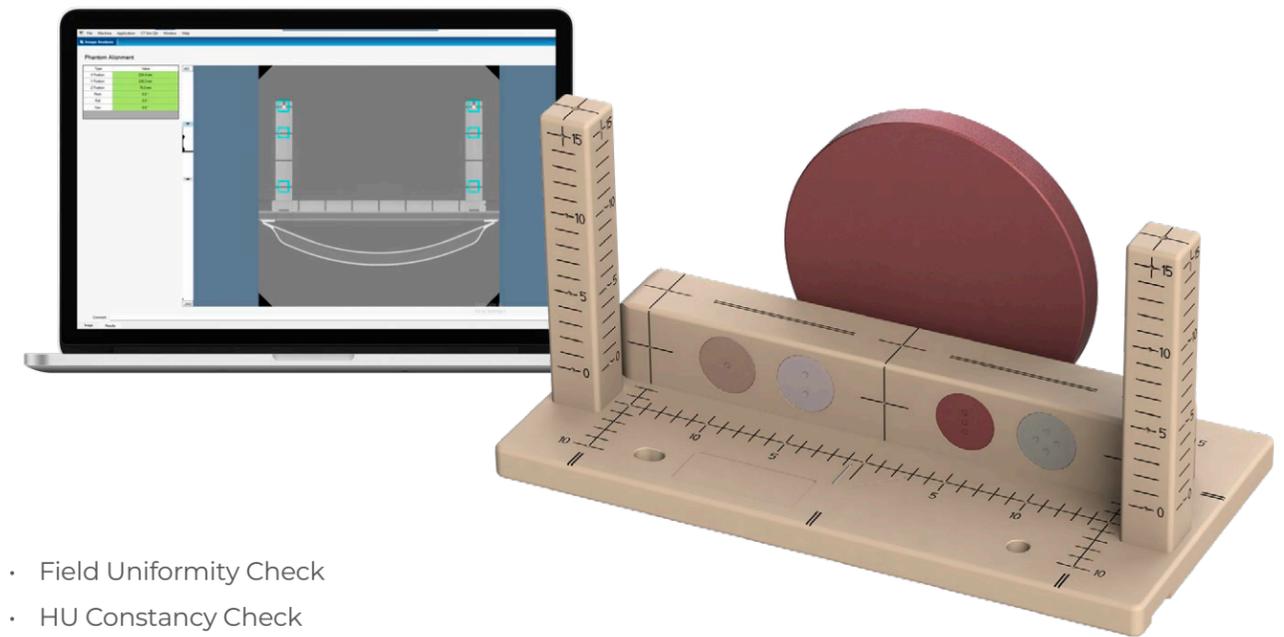
- **PLANAR KV AND MV (EPID) IMAGING**
 - Positioning/repositioning
 - Imaging and treatment coordinate coincidence
- **CONE-BEAM CT (KV AND MV)**
 - Imaging and treatment coordinate coincidence
 - Positioning/repositioning

MONTHLY

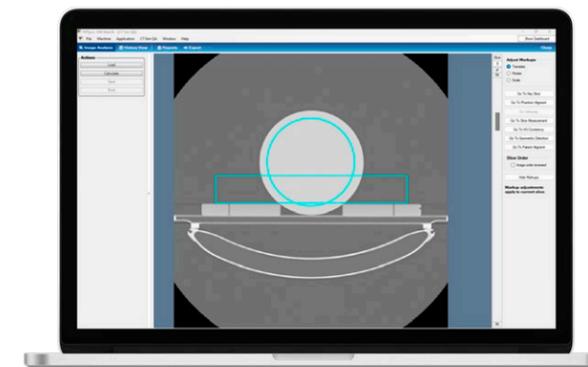
- **PLANAR MV IMAGING (EPID)**
 - Imaging and treatment coordinate coincidence
 - Scaling
 - Spatial resolution
 - Contrast
 - Uniformity and noise
- **PLANAR KV IMAGING**
 - Imaging and treatment coordinate coincidence
 - Scaling
 - Spatial resolution
 - Contrast
 - Uniformity and noise
- **CONE-BEAM CT (KV AND MV)**
 - Geometric distortion
 - Spatial resolution
 - Contrast
 - HU constancy
 - Uniformity and noise

DAILY CT SIMULATOR SPECIFIC CHECKS

PERFORM THESE CT SIMULATOR SPECIFIC CHECKS NOW WITHIN PIPSPRO SOFTWARE USING THE CT/SIM CHECK PHANTOM:



- Field Uniformity Check
- HU Constancy Check
- Geometric Constancy Check
- Image Orientation Verification

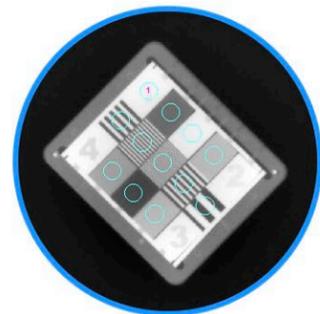
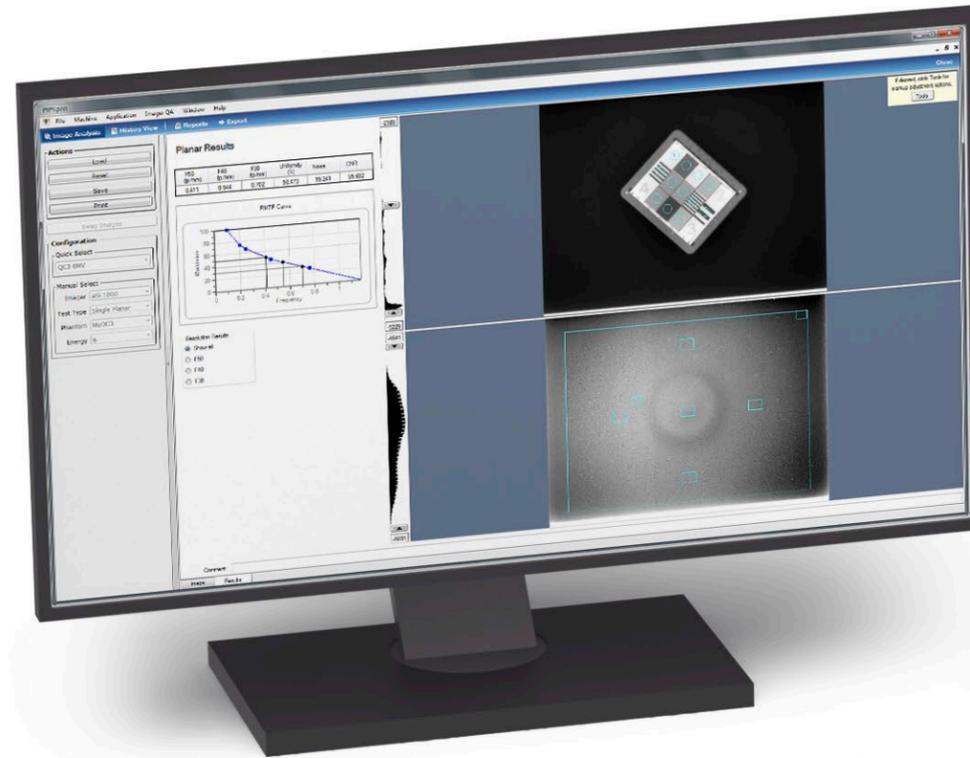


- Slice Thickness and Slice Position Verification
- Scanning Location Verification in X, Y, Z
- Rotation Verification in Pitch, Roll, Yaw
- Scaling

TG-142 MADE EASY

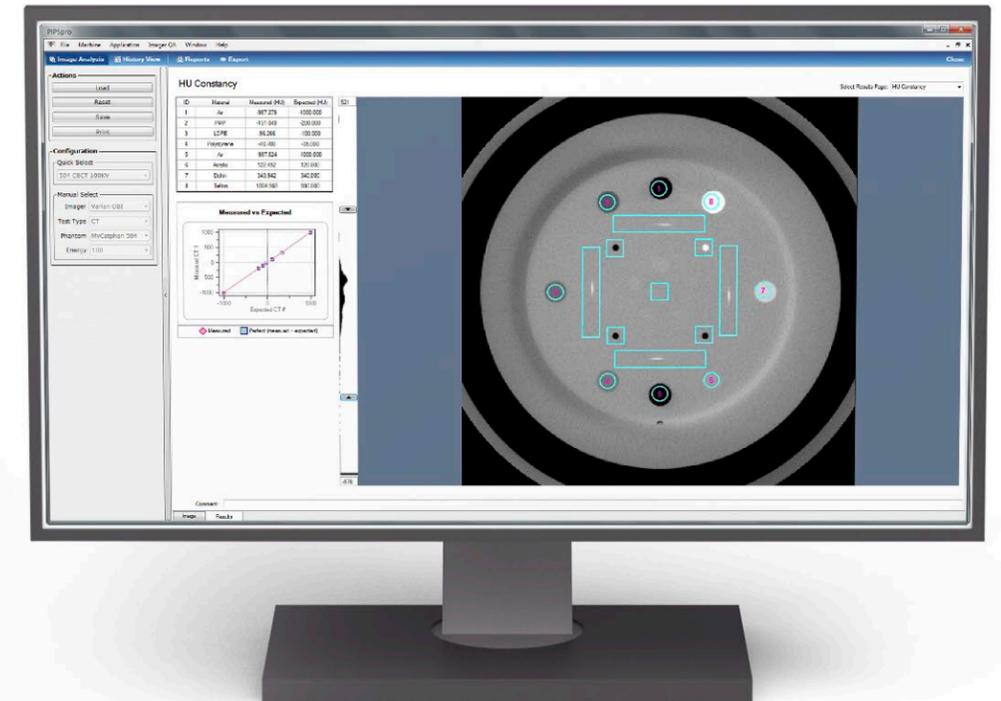
DESIGNED WITH A CONVENIENT AND OPTIMIZED WORKFLOW IN MIND

- Simple, clean and consistent user interface
- Easy-to-read reports, charts, and graphs
- PDF and comma separated variable (CSV) results export
- Multiple open modules for streamlined workflow
- Physicist-controlled editor for creating testing baselines
- Tracking and trending for test results
- Quick Selects™ for organizing tests and accessing test results
- Automatic image compositing for EPID MLC QA and StarShot images
- Centralized database for easy configuration and accessibility to results
- Complete Varian and Elekta IMRT and VMAT logfile analysis
- Workflow automation - single click deployment results
- Now includes Stereotactic collimator rotation



**AUTOMATIC
REGION
IDENTIFICATION**

By automatically identifying analysis regions, subjectivity is reduced and results consistency is improved.



PLANAR IMAGING QA

PIPspro kV planar imaging QA uses images obtained with Standard Imaging's QC-kV1 phantom or Leeds Test Objects' TOR CDR phantom. Testing is supported for kV imagers integrated with linear accelerators as well as images from ExacTrac, Cyberknife, and C-Arms. EPID MV planar imaging QA uses Standard Imaging's calibrated QC-3 phantom.

CT IMAGING QA

Using cone beam or diagnostic images obtained with any of the Catphan phantoms (503, 504, 600), PIPspro automatically finds analysis image slices and performs required TG-142 tests (geometric distortion, spatial resolution, contrast, HU constancy, uniformity and noise). Results are colored green ("Pass"), amber ("Alert"), or red ("Fail") for easy viewing of status (this scheme is used throughout PIPspro).

MACHINE QA

QUICK, EASY, PRECISE

RADIATION LIGHT FIELD ANALYSIS

PIPSpro uses a single image taken with custom phantoms (FC-2, Center Marker) to calculate:

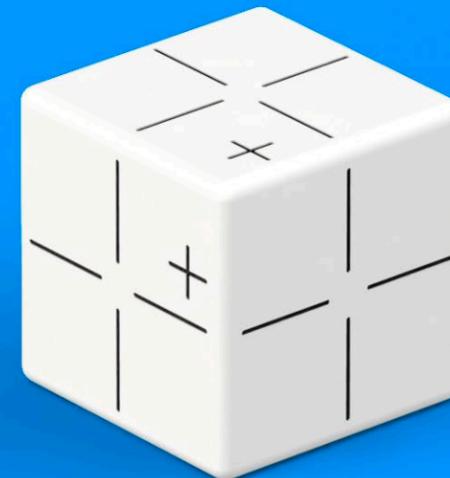
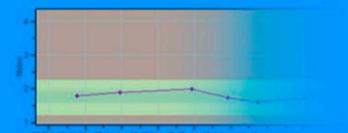
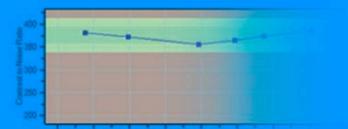
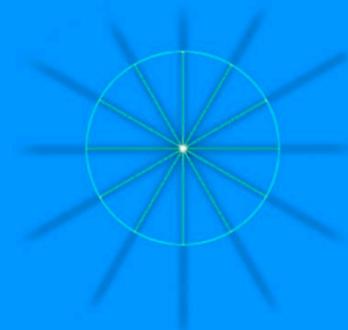
- Radiation and light field coincidence
- Radiation and crosshair displacement
- Light field and crosshair displacement
- Jaw position measurements
- Light field rotation

STARSHOT ANALYSIS

PIPSpro's StarShot module uses EPID MV or film images to measure rotational deviations in gantry, collimator, and couch mechanical isocenters. Results are expressed as the minimum diameter containing all spokes at the central point of intersection.

DAILY IGRT QA TRACKING

Use the Standard Imaging MIMI (Multi-Image Modality Isocentricity) phantom with image registration software to calculate known 3D (x, y, z) and 6D (add couch pitch, yaw and roll) offsets. PIPSpro allows you to record your daily offsets and track and trend your results.



WINSTON-LUTZ CUBE



STEREOTACTIC 3D

Use Standard Imaging's Winston-Lutz phantom to measure the difference between the radiation isocenter and the mechanical isocenter for a linear accelerator. A number of images are taken with your portal imager using fixed angles or angles of your choice.

- Automatically load and analyze any images, including DICOM images, for cones or MLC's.
- Automatically get 2D radiation/mechanical offsets for each image.
- Automatically get an optimal 3D offset to correct patient offset errors.
- 3D analysis with x, y, z results that help you improve patient positioning.

UPLOAD RESULTS TO QA PILOT

PIPSpro QA Portal to automatically upload test results to Standard Imaging's QA Pilot QA database software

COMPLETE MLC QA

COVER ALL TG-142 MLC QA TESTS WITH EPID IMAGES AND LOGFILES

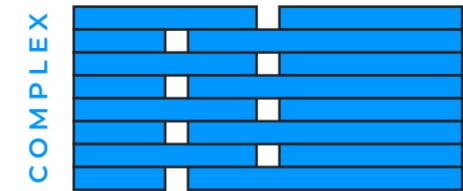
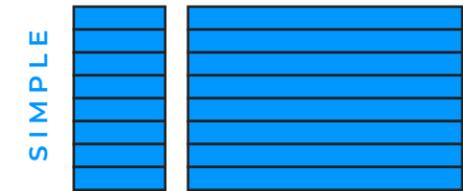
	Image-Based	Logfile-Based
Matched Segments, aka "Picket Fence"	✓	
Setting vs radiation field for two patterns (non-IMRT)	✓	
Travel speed - leaf speed loss (IMRT)*		✓
Leaf position accuracy (IMRT)		✓
Average of leaf and interleaf transmission, all energies	✓	
Leaf position repeatability*		✓
MLC spoke shot	✓	
Coincidence of light field and x-ray field, all energies	✓	
Segmental IMRT (step and shoot) test		✓
Moving window IMRT (four cardinal gantry angles)		✓

Adapted from TG-142, TABLE V, Multileaf collimation

*With logfile-based analysis, PIPSpro is the only commercial software solution able to measure quantitative leaf speed loss and leaf position repeatability.

PIPSpro MLC QA gives you actionable, quantitative results that allow you to track and trend all TG-142 requirements, delivering critical information that may indicate an impending MLC failure or indicate the need to recalibrate your machine for the best possible clinical outcomes. Step & Shoot and VMAT parameters are tested in any direction using MLC leaf pattern files (*.mlc, *.dva, *.efs).

In simple leaf speed tests, all leaves travel together

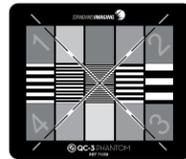


In complex leaf speed tests, every other leaf moves, maximizing inter-leaf friction

"PIPSpro is the first commercial machine QA software to determine leaf speed loss. Systems that report only maximum and mean leaf speed cannot be used to calculate leaf speed loss, as required by TG-142."

SHANNON HOLMES, PH.D.
 MEDICAL PHYSICIST
 STANDARD IMAGING

PHANTOMS



QC-3 PHANTOM

CALIBRATED PHANTOM
REF 71350

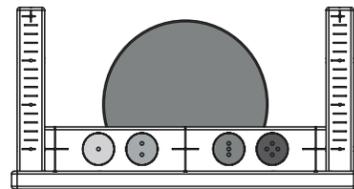
Used to test the image quality from electronic portal imaging devices (EPIDs).



QCKV-1 PHANTOM

CALIBRATED PHANTOM
REF 71451

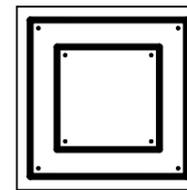
Ideal for kV imaging systems, including Varian, Elekta, BrainLAB and Cyberknife.



CT/SIM CHECK PHANTOM

REF 75030

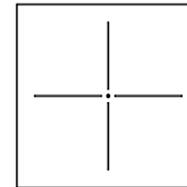
Designed with simplicity for implementing a broad range of CT/SIM performance analyses



FC-2 PHANTOM

REF 72187

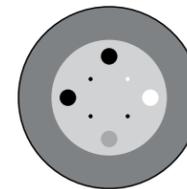
For performing the radiation field vs. light field test and jaw position testing



CENTER MARKER PHANTOM

REF 72247

For performing the radiation field vs. light field test and jaw position testing



CATPHAN

PURCHASED THROUGH
YOUR LINAC VENDOR

Compatible with model 503, 504, 600 and 604 phantoms



PIPSpro has streamlined our Monthly QA process. It has made the daunting tasks in TG142 manageable. We currently use it for an Elekta Synergy and image quality for our x-rays on our 3 IBA Proton treatment rooms.”

BEN ROBISON

Medical Physicist
Provision Radiation Therapy

PIPSPRO SOFTWARE/COMPUTER REQUIREMENTS

OPERATING SYSTEM — Windows® 10 Professional, 64 bit recommended

PROCESSOR — Dual Core, 1 GHz; Quad Core, 2 GHz Recommended

MEMORY — 32-bit OS: 2 GB, 4 GB Recommended 64-bit OS: 4 GB, 8 GB Recommended

RUNTIME ENVIRONMENT — .NET 4.5.2

HARD DRIVE — 32 GB or greater, 3 GB free space for software setup.
Sufficient space to store input image and/or MLC Log files.
5 GB free space if setting up a local copy of SQL Server Express; 25% free space recommended.

SCREEN RESOLUTION — 1600×900 (16:9) or higher, 16-bit HiColor or greater

OPTICAL DRIVE — Digital Versatile Disc(DVD)

VIRTUAL MACHINES — Must support WMI (Windows Management Instrumentation)

DATABASE MANAGEMENT — SQL Server 2014 minimum recommended

CONNECTIVITY — IPv4 LAN, 100 Mbit/s or greater

Windows® is a registered trademark of Microsoft Corporation.

MONTHLY QA

STANDARD IMAGING



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