



Technical Practices

Revised April 1, 2016

The following recommendations are for all Exhibitions requesting PSA Recognition, and other PSA Competitions.

The purpose of these practices is to provide recommendations and suggestions to insure uniform exhibition judging. This document provides benchmark recommendations for the proper illumination of prints and the proper projection of images for both judging and public exhibition in order that consistent viewing may be achieved from one PSA recognized exhibition to another worldwide. The individual exhibitor can easily duplicate these conditions to properly evaluate his exhibition entry.

JUDGING AND DISPLAYING PHOTOGRAPHIC PRINTS

1. Lighting:

- A. Proper color temperature can be provided by any of the following means, but the preferred methods are in the order given.
- B. The proper color temperature for judging and viewing prints should be between 5000 Kelvin and 5500 Kelvin. When there is a choice, the higher value within these limits is preferred.
- C. Incandescent (household tungsten type) bulbs burn at a color temperature below 3000 Kelvin and are, therefore, not suitable to be used alone.
- D. Lighting temperature and wattage are marked on most bulbs and tubes, however, it is advisable to use a color temperature meter to check Kelvin before a judging or exhibition as color temperature will change as bulbs age. (It is also advised to check the Kelvin mixed lighting situations such as tungsten and fluorescent. A three-filter color temperature meter should be used if possible.
- E. Color Rendering Index (CRI) rates a light source's ability to render colors in a natural and normal way, based on a scale from 1-100. Light sources of 90 or above should be used to judge prints. The best quality fluorescent tubes (such as the GE "Chroma 50") have a CRI rating of 90. These tubes are available in both 24" size (highly recommended for

use in the construction of Print Judging Light Boxes) and 48" size for area lighting.

2. Judging Print Box:

- A. The preferred light source for print judging boxes (and for other judging and print exhibition environments) is often referred to as "Full Spectrum" fluorescent lighting, which is balanced for app. 5500 Kelvin. (Uncorrected fluorescent illumination is **unacceptable** for PSA Recognized exhibitions.)
- B. Acceptable, are those light boxes having a mixture of incandescent bulbs and deluxe cool white fluorescent bulbs. 25% of the total wattage should be the specified fluorescent tubes e.g. 2 - 25-watt cool white fluorescent bulbs and 4 - 40 watt incandescent bulbs. Compact Fluorescent lamps and LED lamps can be substituted for the fluorescent tubes and incandescent lamps provided the proper color temperature, brightness and uniformity are achieved.
- C. Copies of "How to Construct a Print Judging Light Box" are available at www.psa-photo.org/psaexhibitionrecognition/print-judging-box.pdf

3. Light-stand and Easel Lighting Method:

- A. Photoflood lamps Type A (3400Kelvin) or Type B (3200 Kelvin) with reflectors may be used.
- B. A hand held incident light meter reading, or a reflected light meter or camera meter reading used with an 18 percent reflectance gray card should be used to balance the illumination, one light at a time. Then measure the overall illumination.
- C. Quartz Halogen studio type lighting can be used in a similar manner as that outlined in item B above.
- D. There are other methods for judging prints that are too numerous to list here, the important consideration for those using methods other than described here is to test the system in order that the integrity of these PSA standards for proper judging and exhibition conditions are maintained.
- E. When light-stands are used one light should be placed on each side of the print "easel", or other support, above the print and angled downward. The light stands should be angled at approximately 60 degrees from a central viewing position and if necessary they should be "**feathered**" inward to eliminate any unwanted reflections on the print.

4. Illumination Level:

- A. The illumination level provided by PSA international Exhibitions, and other Competitions, for judging photographic prints is higher than that used for general viewing. See item C. below. PSA level at the print plane for judging is an EV of 9.5 with an upper limit of EV 10 and a lower limit of EV 9.
- B. EV measurements can be made with a photographic light meter, or by using an in-camera light meter set

at an ISO value of **200**, match the f-stop value reading with the illumination value in the guide below. A reflected light meter reading can be made with an 18% reflectance gray card placed at the center of the print area. If using an incident light meter it should be placed at the center of the print area facing the judges. **Note: A print judge may request verification of illumination levels.**

C. PSA Exhibition Illumination Guide:

Light Value (EV) or Camera set at 1/60th Sec. @ F-stop:

11.0	@	f8
10.0	@	f 5.6
9.5	@	f 4.6
9.0	@	f 4

D. Uniformity of Illumination:

The illumination at the edges of the print should not be more, or less, than 0.5 EV (1/2 f-stop) from that of the center of the print.

5. Judging Angle and Distance:

- A. The center of the print viewing area should be at the judges' eye level.
- B. Minimum distance for positioning the judges should be 6 times the long dimension of the print. E.g. 8 X 10 inch print = 6 X 10 = 60 inches (5 feet), 16 X 20 inch print = 120 inches (10 feet). In exhibitions accepting both Class A large prints and Class B small prints and using the same panel of judges for both classes, it is recommended that the Class B small prints be judged first and the judges' seating adjusted for the judging of the Class A large prints.
- C. Judging distances for prints of mixed sizes. As the large print class of PSA International Exhibitions, and some other competitions, contain a mixture of print sizes it is recommended that the judge's position be approximately 6-7' from the print.
- D. Judging distances for small print classes should be according to the information given in (B) above.

6. Support Area behind Print:

The print should be placed against a panel that is a medium gray tone. The size of this panel should be such that it extends beyond the top and both sides of the print a distance equal to at least one quarter of the long dimension of the maximum size print to be judged. (E.g. 5 inches on each side of a 16 X 20 inch print. Dimensions of this backing area would = 30" X 30", or with Class B prints, 2.5 inches on each side of an 8 X 10 inch print - dimensions = 15" X 15")

7. Room Conditions for On-Site Judging:

- A. Room arrangements should be designed to produce a minimum of influence on the judging procedure. All distractions should be removed from the judge's field of view. Room lights should be either "off" or at a level that does not influence the judge(s) eye(s).

- B. Eliminate any distracting light or reflection directly behind the judging easel, or Print Light Box, monitors or TVs. Bright light coming through windows, or any other source, should be eliminated.
- C. All judging, including the final judging to select medal winners etc., should take place under identical conditions.
- D. Comfortable chairs should be provided for the judges. Rest and/or refreshment breaks should be arranged between the rounds, or more frequently if required.
- E. No audible comments or conversation from the audience, or workers, should be allowed.
- F. Public seating should start a minimum of two rows behind the judge's position.
- G. For Prints, soft white cotton darkroom gloves, or medical vinyl gloves, should be worn by print handlers at all times.
- H. Absolutely no food or beverage should be allowed in the judging room while prints are out of their protective boxes.

8. Lighting for Public Print Exhibition:

- A. The lighting for the print exhibition should duplicate, as close as possible, the conditions under which the prints were judged. The minimum light value should be acceptable to an informed person.
- B. Regular fluorescent room lighting (greenish in color) is not desirable. Supplementary tungsten lighting will help to correct this lighting, as it will bring out the natural color and tones of the prints.

JUDGING AND EXHIBITING ELECTRONIC STILL IMAGES:

- A. The minimum image pixel size recommended is 1024 pixels in the horizontal dimension and 768 pixels in the vertical dimension. Higher pixel sizes are allowed for higher quality images.
- B. Images must be judged as submitted in accordance with the pixel dimensions stated on the entry form. Images submitted smaller than the specified pixel dimensions should not be resized to the specified pixel dimensions. Handling of images submitted in excess of the specified pixel dimensions can be determined by the Exhibition
- C. Judging of electronic still images may be done by electronic projector; displayed on calibrated monitors or high definition TV.

9. Judging Electronic Still Images using a Digital Projector:

A. Projectors:

If a projector is used in judging still electronic images, or in showing still electronic images at a public showing, it should have the following minimum specifications: **Resolution:** XGA (or higher) 1024 X 768 pixels or higher with the native

projector resolution matching or exceeding the maximum pixels specified for image submission

Brightness: 1000 lumens (minimum)

Contrast Ratio: 400:1 (minimum)

10. Projector Illumination Test:

- A. Test an image at the maximum pixels specified for submission and is filled with white. Turn off all room lights and eliminate any window or other light entering the room. The meter should measure only the projector light reflected from the screen.
- B. The test can be conducted by using a hand held reflected light meter, or by using an in-camera light meter.
- C. **Hand held reflected light meter test:** The overall brightness measurement of the projected image at the screen plane for judging should be an (EV) of 9.0 with an upper limit of 11.0 and a lower limit of 8.5.
- D. **In-camera meter projector illumination test:** Set the ISO value at 200 and match the f-stop value reading with the illumination value in (4 C). A camera with a spot meter can also be used.

11. Projection Screen:

A matte white screen, manufactured for the purpose of viewing projected images, should be used. It should be clean and free from all blemishes or damage and be a minimum size of 70 inches X 70 inches.

12. Screen test for even illumination:

Hold a hand held reflected light meter approximately 12" from the screen; use a hand held reflected light spot meter, or an in-camera spot meter, to measure the center and the four corners of the projected white light image on the screen. The illumination of each of the four corners should not vary from the illumination at the center by more than 0.5 EV (1/2 f-stop).

13. Keystoning:

- A. Keystoning may be corrected by using the automatic or manual adjustment on the electronic projector.
- B. If necessary, the projector height may be adjusted to eliminate keystoning.
- C. In the event the projector should be pointed upward (or downward in an auditorium with a sloping floor) the resulting angle between the lens axis and a line perpendicular to the screen should not exceed 10 degrees.

14. Focusing:

Focusing of electronic images may be accomplished by using the computer. This should be done before the judging starts. Adjust the distance from the projector to the screen so that the image fills the screen horizontally. Use the lens zoom adjustment if available. Adjust the focus for a sharp image. The electronic projector should hold focus throughout the judging session. Repeat the

above procedure after a long break or if the equipment has been turned off and on again.

15. Judging:

Judging Electronic Still Images Using Video Display Monitors and High Definition TVs.

The electronic equipment and video display (monitor) used for judging of electronic images should be calibrated. A monitor calibration color target is available on the EID web-site to check the monitor for correct color. The minimum size of the monitor screen should be 19 inches and have minimum pixel dimensions equal to the minimum pixel dimensions specified. It should display 24 bit color (8 bits per channel) or better. Judging of electronic still images on monitors or high definition TVs may be done on-site (with the judges assembled at one location) or off-site (with each judge at a different location).

16. On-Site Judging Using Monitors:

- A. If judging is done on-site, each judge should be supplied with a separate monitor to view the images. The image changing should be controlled at a central computer so each judge views and votes on the same image at the same time.
- B. Judges must only see their own monitor. The final total score shall be announced.
- C. If the judges are not viewing the same image at the same time, one or more scorers should be available to assist in recording the scores of each judge in such a way that the scores of one judge are not revealed to any other judge before the completion of the judging.
- D. All monitors must be calibrated and adjusted so the same image, including image color and image brightness, appears the same on each monitor when placed side by side.
- E. Use of High Definition Television (HDTV) is also considered judging using monitors. HDTVs must be set up so they do not change the pixel dimensions of the image being displayed. Automatic features such as Fit-to-Screen and Fill Screen must be turned off.

17. Off-Site (Remote) Judging:

- A. When done off-site, the judging will vary with the number of entrants, sections, and images, and can be done in one day or over a period of several days if necessary.
- B. The chairman should choose judges who have technical knowledge of computer equipment as well as the usual judging qualifications. The chairman should furnish these judges with the technical standards necessary for them to calibrate their equipment so there is uniform viewing of all images at each remote location.
- C. Remote judging may be done by either one of the following two methods.

- i. The chairman is responsible for setting up a secure private website with a server capable of handling all the images. The judging process has two steps: The first is the on-line judging of all submitted images. The second is the selection of the medal winners and honorable mention images where the chairman can either set up a telephone conference call between the judges or a secure emailing conference so the voting can occur instantaneously.
 - ii. If a secure private website is not available the chairman writes an entry form and entry rules and posts them on a website. The entrant then fills in the form and sends it along with the images by Email (or the images can be put on a disk and mailed along with the entry form to the chairman. The Chairman prepares the images for judging using appropriate software which includes a collator that prepares the images in a list for judging, an image viewer, and a scoring report for entering the scores and providing a uniform scoring system. The images and software are placed on CD-ROMs and sent to the judges. The judges score the images with the image viewer, use the scoring report to record the scores, and then email the results in a text file to the Chairman. After receiving all the results, the Chairman should tabulate the scores. The chairman should then send the judges a list of the images that may be considered for medals and honorable mention and a list of those images that may be re-voted to obtain the necessary number of acceptances for the exhibition. Voting by the judges on these images can be done by secure emailing or by telephone conference.
- D. After the judging has been completed, the accepted images can be assembled into an html file for posting the results, as well as the exhibition catalog, on a website. If the accepted images are written to a CDROM to be distributed to the entrants, the maximum image size should be 550 pixels in the horizontal dimension and 450 pixels in the vertical dimension.

NOTE: For exhibitions with a large number of entries (over 100 entries) remote (off-site) judging is less suitable than on site judging.

18. Public Show Recommendations:

For public showings of exhibitions done with a digital projector.

A. Projection Screen:

A matte white screen is preferred and recommended (especially if the area of seating for the audience exceeds a viewing angle of 25 degrees as measured from the screen to the end seats of the audience rows).

19. Public Health and Safety:

Public health and safety should always be considered prior to the opening of the public exhibition. Check the following:

- A. Exit and aisle lighting
- B. Other electrical service/hook-ups (e.g. tape down loose electrical drop-cords that cross public aisles).
- C. Public access and egress, steps and stairways.
- D. Availability of handicap parking and the entrance to the exhibition area.
- E. Public Washrooms
- F. Have a public or cellular phone available in case of sickness, injury or other emergencies.
- G. Designate someone to turn the lights on and off when required.
- H. As public safety laws vary from country to country and from state to state, the above may or may not be regulated in your area.
- I. Fire Extinguishers should be available as a public safety precaution in all judging locations and public exhibition areas in accordance with local public safety regulations.

JUDGING AND EXHIBITING STEREO (THREE-DIMENSIONAL OR 3D) IMAGES

Stereo (3D) images are typically judged and then exhibited in three basic formats: film slides (transparencies), digital images, and prints. An exhibition may solicit any or all three of these formats. There are sub-formats of varying sizes and specifications within the three formats, as covered below. The particular exhibition will specify which sub-formats are acceptable.

20. Stereo Slides and:

Stereo transparencies may be in several formats: the left and right images may be separately mounted, may be mounted side-by-side in one frame, may be mounted in circular View-Master or Image3D reels, and can be 35mm, medium film format, or other sizes.

The most common slide format used in exhibitions is the 45mm by 105 mm "Realist" type mount, using various mounting materials and a variety of film "window size" openings. The most consistent and favorite mounting frames are those of the "RBT" type, with or without a single side glass cover.

- A. The second most common slide film formats are separate left and right mounts of the standard 35mm film (2 inch by 2 inch) size.
- B. Standards for labeling and color-coding stereo slides are fairly consistent with those for single "non-stereo or mono" slides. If separate mounts are used the left image has a red "dot" and the right image has a green "dot". The exhibition guidelines should note any particular requirements for labeling.
- C. Stereo transparencies are normally judged by projection. Occasionally stereo transparencies may be judged in hand viewers, particularly if there are only a few slides in that particular mount, or if their size does not easily allow projection. As an example,

at the discretion of the exhibition personnel, medium format transparencies may be viewed in a hand-held viewer. But in any case, all entries should be judged as equally as possible.

21. DIGITAL (ELECTRONIC) STEREO IMAGES

- A. It is an unfortunate fact that the various exhibitions use widely varying computers, monitors, projectors, and software to process the digital entries. Exhibition entry forms tend either to dictate or provide a range of allowable file formats, resolution sizes, aspect ratios, and image naming conventions. With all the evolving technologies and the desire to display the most effective imagery, it is not possible to standardize on one set of parameters. The entrant is advised to submit entries in the image and title formats that are most preferred by the exhibition guidelines, and that will require the least manipulation to fit the desired exhibition format. Electronic stereo images may be judged on a monitor or by projection. If the resulting exhibition or program will be presented by projection, then judging by projection is strongly preferred.
- B. For some judgments on monitors, the judges are not collocated and will be using different monitors and conditions that cannot exactly be duplicated for all three judges. The following guidelines are given for collocated and not collocated monitors used for judging. (If the judges are collocated, one monitor is acceptable unless the judges are required to simultaneously judge each image.)
- C. The electronic equipment and video display (monitor) used for judging of electronic stereo images should be calibrated. A monitor calibration color target can be used to check the monitor for correct color. A minimum size of the monitor screen should be 19 inches and have minimum pixel dimensions of 1024 X 768 pixels. The monitor should display 24-bit color (8 bits per channel) or better. Judging of electronic stereo images may be done on-site (with the judges assembled at one location) or off-site with the judges each at a different location.
- D. The judges may use free vision viewing or a stereoscopic viewer. Such viewers should be furnished. There are a number of handheld viewer options for use with a monitor, including some unity magnification viewers that can be used with large or small images on the monitor.

22. STEREO PRINTS

- A. Stereo prints of different formats may be solicited and accepted in different exhibitions. The most popular are stereo cards (Holmes-style views), similar to those commercially available for over 150 years. These cards are usually limited to 7 inches wide (to fit most handheld viewers) and a maximum height specified by the exhibition committee. Typical heights are 3 and a half inches up to 4 inches.

- B. Each judge should be provided with a stereoscope. Judges who wear glasses should be provided a stereoscope with no hood, or a hood wide enough to accommodate the glasses.
- C. Stereo prints should be judged with lighting that is comfortable for the judges. Lighting may be by any lamp that provides adequate and even illumination or by indirect natural (window) light as long as the images are evenly lighted and not washed out by excessive illumination. (Avoid direct sunlight which is too harsh.) Each judge should use the same type of light to view the prints.
- D. Another print format, anaglyphs, may be accepted by a particular exhibition. In this case the judges should be provided with red/cyan glasses for judging the anaglyphs. The lighting conditions should be as described above.
- E. If the exhibition accepts "over-under pairs" of stereo prints, the prints are typically specified to work with ViewMagic or comparable viewers in a lighting condition that eliminates glare.
- F. Another format of stereo image, phantograms, may be solicited by an exhibition, whose entry form should identify sizes and other requirements. The judges should be provided with appropriate anaglyphic red/cyan glasses or other viewers as necessary.
- G. Because of the nature of individually viewing a print, the judges do not simultaneously judge the same print.

23. 3D ANCILLARY EQUIPMENT

- A. **Projection screens** for stereo slides and stereo digital imagery usually require special screen surfaces. If the audience is wearing polarized glasses, then the screen must have a metallic (silver) finish to maintain a polarized reflection. A screen manufactured for the purpose of viewing projected stereo images should be used. Older silver screens usually have a vertical lenticular surface (to reflect more light to the center) while newer silver screens are usually not lenticular but have very fine patterns (to reduce "hot spots"). Non-lenticular screens are favored for digital images (to reduce the possibility of developing Moiré patterns). The screen should be clean and free of all blemishes and damage, and sizes larger than 70 inches are preferred. Other screens may be used for anaglyphic stereo images and other non-polarized stereo images.
- B. **Stereo viewing glasses** are required for the judges and all viewers of a projected 3D exhibition. The most common viewing glasses have linearly polarized lenses matching those on the projector(s). In some instances, the projection setup may use circularly polarized passive glasses (common in movie theaters and for some 3D televisions), active (shuttered) glasses, or colored anaglyphic glasses.

- C. Projectors for stereo slides** will depend upon the slide mount. Separate 2 by 2 stereo pairs are typically projected with two projectors such as Kodak Carousel projectors with matching lenses, lamps, and polarizers. The lamps typically have a rating of about 300 watts. The projectors should be externally positioned so the 3D images from each projector properly align on the screen. For the "Realist" type stereo mounts, special stereo projectors are used. The most popular are the RBT type automatic tray fed stereo projectors (with two lenses) and the Brackett manually operated series of dissolve projectors (with four lenses) or non-dissolve projectors (with two lenses). Occasionally much older manual stereo projectors are still used. These different projectors may use lamps rated at 250 watts or much more. View-Master reels and medium format film transparencies require other types of projectors. In all cases the illumination from one projector lens should not vary from the illumination of the other projector lens by more than 1/3 f-stop. The best way to guarantee this is to have identical projectors (if more than one projector is used), use identical lamp and lens models from identical manufacturers, and use either new or identically aged lamps.
- D. Digital projectors** are required for digital stereo projection, either for judging or presentation of the exhibition. Digital projectors may be used to judge stereo images submitted as either separate stereo pairs or combined left/right images. In most instances two digital projectors are selected that do not polarize the light internally. External polarizers are then added in front of the lenses. Many different resolutions, brightness, and contrast ratios are available in modern projectors. As for slide projectors, the two digital projectors should be identical in output performance. The projectors, used in judging and at a public showing, should have at least the following specifications: Resolution: XGA, 1024 X 768 pixels (minimum), Brightness: 1300 lumens (minimum), Contrast Ratio: 400:1 (minimum). NOTES: (1) most 3D exhibitions use two identical projectors that substantially exceed these minimum levels, and (2) most 3D exhibitions do not use a single "3D" or "3D Ready" digital projector because of the high cost of the active shuttered 3D glasses.
- E. Judging (scoring) techniques** of many types may be used. If the scoring device is such that an individual judge's score can be recognized before all judges have voted, the scoring device should be out of sight of the judges. The final total score may be announced. If the judges are not viewing the same image at the same time (typical for the judging of prints), one or more scorers should be available to assist in recording the scores of each judge in such a way that the scores of one judge are not revealed to any other judge before the completion of the judging. If the judging is done off-site, the judging may vary with the number of entrants, sections, and images, and can be done in one day or over a period of several days if necessary. For off-site judging on monitors the chairman should choose judges who have technical knowledge of computer equipment as well as the usual judging qualifications. The chairman should furnish these judges with the technical standards necessary for them to calibrate their equipment so there is uniform viewing of all images at each remote location. Procedures for distributing images to the judges (via CD or online) must be provided and methods of combining the scores (online, telephone, or otherwise) must be identified.
- F. Exhibition catalogs** may be distributed by postal mail or via the internet. Printed copies should be mailed to all entrants who are not using computers or who request printed copies. For all others, electronic exhibition catalogs have become very popular due to their speed of transmittal, no mailing and printing costs for the exhibition host, and the ease of sharing images of the high-scoring entries. The exhibition catalogs may be emailed as files to the entrants, or may be placed on a viewable website from which the catalog may be downloaded and printed. However, the exhibition host should be mindful of the rights of the entrant to his/her images. Only images of reduced resolution should be placed on websites or other electronic media, unless the entrant agrees to higher resolutions.

24. ADDITIONAL 3D INFORMATION

The **Exhibition Standards** should be reviewed for general entry specifications which apply in most instances to all divisions. Due to the nature of stereo images, some variations may apply, as noted above.

25. 3D JUDGING CONDITIONS

See Item #s 16; 17; 18 of JUDGING AND EXHIBITION ELECTRONIC STILL IMAGES.