



Tentative Interim Amendment

# NFPA 1801

## Standard on Thermal Imagers for the Fire Service

2010 Edition

**Reference:** Various

**TIA 10-1**

(SC 11-3-16/TIA Log #1018)

Pursuant to Section 5 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 1801, *Standard on Thermal Imagers for the Fire Service*, 2010 edition. The TIA was processed by the Technical Committee on Electronic Safety Equipment and the Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment, and was issued by the Standards Council on March 1, 2011, with an effective date of March 21, 2011.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. *Insert a new 6.6.4.4.3 to read as follows:*

**6.6.4.4.3** The internal electronics overheat indicator shall be a flashing indicator consisting of a solid red thermometer-shaped image within a transparent equilateral triangle having a red border as shown in Figure 6.6.4.

2. *Revise 6.6.4.7.2 to read as follows:*

**6.6.4.7.2** The TI BASIC PLUS operational format indicator shall be an indicator consisting of a solid green “plus sign” (+) enclosed in a transparent square box with a green border as shown in Figure 6.6.4.

3. *Revise 7.1.4 to read as follows:*

**7.1.4** Thermal imagers shall be tested for effective temperature range as specified in Section 8.10, Image Color and Effective Temperature Range Test, and shall have all  $P_{IQ}$  values be greater than or equal to 0.80.

4. *Delete 8.1.4.2.1 and 8.1.4.2.2 in their entirety and renumber remaining paragraphs.*

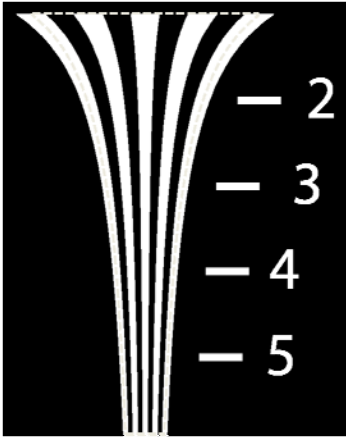
5. *Revise 8.1.6.7 to read as follows:*

**8.1.6.7** A minimum of 10 uncompressed color images at a minimum bit depth of 16 bits shall be captured from the visible spectrum camera at a rate of one image every 3 seconds,  $\pm 0.1$  second.

6. *Revise 8.1.6.11.1 to read as follows:*

**8.1.6.11.1** The pixels selected to calculate  $C_i$ ,  $CTF_i$ , and  $\mu$  shall be located along a baseline that is perpendicular to the centerline of the converging lines of the stencil pattern, as shown in Figure 8.1.6.11.1(a) and (b). Along these lines, all pixels between the maxima of the leftmost and rightmost lines of the stencil pattern shall be used.

Insert new Figure 8.1.6.11.1 (a), and renumber existing Figure 8.1.6.11.1 as Figure 8.1.6.11.1(b).



7. Revise 8.1.6.12 to read as follows:

**8.1.6.12**  $CTF_i$  shall be calculated at least at each indexed baseline as specified in Equation 8.1.6.12, where  $I_{max}$  and  $I_{min}$  are the averaged maximum and minimum pixel intensity values, respectively, for each of the hot and cold regions along the baseline.  $CTF_1$  shall be defined as the maximum CTF value calculated between indices 1 and 2, inclusive.

8. Revise text in 8.1.6.19 to read as follows, equation remains unchanged:

**8.1.6.19** The image quality probability ( $P_{IQ}$ ) shall be calculated for the spatial resolution procedure as specified in Equation 8.1.6.19, where  $C$  is the average of the  $CTF_1$ 's from both sets of lines calculated in 8.1.6.13,  $B$  is the average brightness calculated in 8.1.6.14,  $SR$  is the spatial resolution calculated in 8.1.6.18, and  $NU$  is the  $NU(30)$  value calculated in 8.1.5.16.

9. Revise 8.10.4.3.1 to read as follows:

**8.10.4.3.1** The surface labeled  $T_{hot}$  shall range in temperature from ambient  $50^\circ$  to  $550^\circ\text{C}$  ( $1022^\circ\text{F}$ ) and shall fill at least 50 percent of the FOV. The radiation source producing the  $T_{hot}$  surface shall be a blackbody and shall have an emissivity of  $0.95, \pm 0.03$ . The blackbody shall be calibrated at least every 6 months. The blackbody temperature accuracy shall be  $\pm 0.05^\circ\text{C}$  ( $\pm 1^\circ\text{F}$ ). The stability of the blackbody temperatures shall not exceed  $0.15^\circ\text{C}$ . The nonuniformity of the blackbody shall not exceed 0.02 using the method in 8.1.5.14 as applied to temperature measurements of the emitting surface of the blackbody.

10. Revise 8.10.5.8 to read as follows:

**8.10.5.8** The image capturing software and hardware shall permit 16-bit uncompressed color images to be downloaded from the visible spectrum camera to a computer or memory at a rate of one image every  $2^\circ\text{C} \pm 0.1^\circ\text{C}$  ( $3.6^\circ\text{F} \pm 0.2^\circ\text{F}$ ) as  $T_{hot}$  increases from ambient to  $550^\circ\text{C}$  ( $1022^\circ\text{F}$ ) at a rate not greater than  $15^\circ\text{C}$  ( $2^\circ\text{F}$ ) per minute.

11. Revise 8.10.6.7 to read as follows:

**8.10.6.7** The color yellow shall be defined as having a hue between 45 and 69 degrees, a luminosity between 0.5 and 0.9, and a color saturation greater than 0.2.

12. Revise 8.10.6.8 to read as follows:

**8.10.6.8** The color orange shall be defined as having a hue between 24 and 32 degrees, a luminosity between 0.5 and 0.9, and a color saturation greater than 0.1.

13. Revise 8.10.6.9 to read as follows:

**8.10.6.9** The color red shall be defined as having a hue between 344 and 15 degrees, a luminosity between 0.5 and 0.9, and a color saturation greater than 0.4.

14. Revise 8.10.6.10 to read as follows:

**8.10.6.10** The color dark red shall be defined as having a hue between 344 and 15 degrees, a luminosity between 0.5 and 0.7, and a color saturation between 0.1 and 0.4.

15. Delete 8.10.7.7 in its entirety

16. Revise 8.10.8 to read as follows:

**8.10.8 Report.**  $T_Y$ ,  $T_O$ ,  $T_R$ , and  $P_{IQ}$  shall be reported and recorded.

17. Revise 8.12.4.6 to read as follows (this information is found in 8.12.4.7):

**8.12.4.6** The emitting surface of the source targets shall be equal in size,  $\pm 10$  percent, as viewed on the thermal imager's display.

**Issue Date:** March 1, 2011

**Effective Date:** March 21, 2011

(Note: For further information on NFPA Codes and Standards, please see [www.nfpa.org/codelist](http://www.nfpa.org/codelist))

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