

# Guidelines to the Section 508 Technical Standards

The standards define the types of technology covered and set forth provisions that establish a minimum level of accessibility. The application section (1194.2) outlines the scope and coverage of the standards. The standards cover the full range of electronic Information Technology (EIT) in the Federal sector, including those used for communication, duplication, computing, storage, presentation, control, transport and production. This includes computers, software, networks, peripherals and other types of electronic office equipment. The standards define EIT, in part, as "any equipment or interconnected system or subsystem of equipment, that is used in the creation, conversion, or duplication of data or information."

## **1194.21 Software Application and Operating System Standards**

Most of the specifications for software pertain to usability for people with vision impairments. For example, one provision requires alternative keyboard navigation, which is essential for people with vision impairments who cannot rely on pointing devices, such as mice. Other provisions address animated displays, color and contrast settings, blink rate, and electronic forms, among others.

1194.21(a) *Keyboard input / text output*: At a minimum, every feature of an application must be available using the keyboard. (For example, you cannot have a print function that can only be accessed with a mouse.) The feature itself or the result of the feature must provide text feedback.

1194.21(b) *Accept accessibility features*: Systems or applications must not disrupt or disable documented accessibility features of software products or operating systems.

1194.21(c) *Expose input focus*: The point of action (e.g., cursor) is easy to find and is programmatically exposed to AT so that AT can track focus and focus changes.

1194.21(d) *Provide interface information*: All visually available (on screen) information in a product must be available to AT. Images, graphs, icons and forms must have descriptive information conveyed in a text format such as a text label, ALT tag or "tool tip".

1194.21(e) *Use images consistently*: An image's use must be consistent throughout a product. Alternative text (e.g., tool tip, ALT text) should also adhere to this standard.

1194.21(f) *Provide textual information*: Text information from a product must be available to AT. This is accomplished by interfacing with operating system functions for displaying text (e.g., APIs that accept text content and attributes).

1194.21(g) *Accept display attributes*: A product must be able to conform to the user's operating system display settings. A product cannot use its own color and contrast settings, unless it complies with 1194.21(j).

1194.21(h) *Provide non-animated mode*: If animation is used in a product, the user must be able to select at least one non-animated mode to display the animation's information (e.g., audio or text description).

1194.21(i) *Supplement color coding*: Color should never be the only means to identify functions, visual elements or information.

1194.21(j) *Providing color selections*: A variety of color selections and contrast levels should be provided when an application allows the user to change contrast or color settings. If the product does not feature adjustable color or contrast settings, then the standard does not apply. In either case, the product must conform to 1194.21(g) regarding system display settings.

1194.21(k) *Avoid fast flashing/blinking*: Design software products so that blinking on the screen is nonexistent, or very slow (e.g., one blink per second), or very fast (at least fifty-five blinks per second).

[1194.21\(l\)](#) *Providing electronic forms*: Electronic forms in products must be accessible to AT. This includes the fields in the form, all information required to complete the form, and any functions used to submit the form.

## **1194.22 Web-based Intranet and Internet Information and Application Standards**

The criteria for web-based technology and information are based on access guidelines developed by the W3C. Many of these provisions ensure access for people with vision impairments. Certain conventions, such as verbal tags or identification of graphics and format devices, like frames, are necessary so that these assistive devices can "read" them for the user in a sensible way. The standards do not prohibit the use of web site graphics or animation. Instead, the standards aim to ensure that such information is also available in an accessible format. Generally, this means use of text labels or descriptors for graphics and certain format elements.

1194.22(a) *Provide text equivalents*: For any non-text elements (e.g., logos, pictures, icons), provide an equivalent text description.

1194.22(b) *Synchronize multimedia alternatives*: The timing of audio descriptions, captions, or other alternatives must be synchronized in online multimedia presentations.

1194.22(c) *Supplement color coding*: Design web pages so that all information is color independent. The importance of information should be based on context (e.g., location or text content), markup (e.g., HTML heading levels), or other means accessible to AT and to users who have difficulty perceiving colors.

1194.22(d) *Readability without styles*: Web pages should be readable and accessible based on content rather than style formatting.

1194.22(e) *Server-side image maps*: For every linked region in a server-side image map there must be an equivalent text link.

1194.22(f) *Client-side image maps*: When an image map is provided in a web application or page, it must be implemented as a client-side image map, unless its regions are so complex that it must be defined as a server-side image map.

1194.22(g) *Simple table headers*: Data tables must contain meaningful row and column headers that are properly associated with the data. (Decorative or layout tables should not contain headers.)

1194.22(h) *Complex table headers*: In complex data tables, data must be explicitly associated with the appropriate headers. That is, for any cell in a complex data table, the user should be able to identify meaningful headers that explain the significance of that cell's data. (Decorative or layout tables should not contain headers.)

1194.22(i) *Identify frames with titles*: Web pages that use frames must include title markup for frame identification and navigation.

1194.22(j) *Avoid fast flashing/blinking*: Design web pages so that flicker on the screen is nonexistent, or very slow (e.g., one flicker per second), or very fast (at least fifty-five flickers per second).

1194.22(k) *Providing text-only pages*: When a website cannot comply with the provisions of 1194.22 in any other way, a text-only equivalent of the site's content shall be provided to users. Whenever the content of the non-compliant page is changed, the text-only site must be updated as well.

1194.22(l) *Identify script information*: For all websites that use scripts to generate or display content, or to create interface elements, the information provided through that script must be accessible to AT.

1194.22(m) *Providing required plug-ins*: If a web page requires an application external to a user's browser (e.g., an applet or plug-in) to view content, the application must conform to 1194.21 Software Applications and Operating Systems standards. Also, the web page must provide a link to the application.

1194.22(n) *Providing electronic forms*: Electronic forms in products must be accessible to AT. This includes the fields in the form, all information required to complete the form, and any functions used to submit the form.

1194.22(o) *Skipping repetitive links*: For web pages or applications with navigation links that occur more than once, a means must be provided for users to skip such information.

1194.22(p) *Interactive system timeouts*: Alert the user whenever a time-critical action is required on their part. The user must be given enough time to extend the response time.

### **1194.23 Telecommunications Product Standards**

The criteria of this section are designed primarily to ensure access to people who are deaf or hard-of-hearing. This includes compatibility with hearing aids, cochlear implants, assistive listening devices, and TTYs. TTYs are devices that enable people with hearing or speech impairments to communicate over the telephone.

1194.23(a) *TTY function / compatibility*: Telecommunication products (e.g., telephones) or systems that provide voice communication must also have the capability to provide standard non-acoustic connection points for TTY. Microphones must be capable of being turned on and off to allow user to intermix speech with TTY use.

1194.23(b) *TTY signal protocols*: Voice telecommunication products must support commonly used protocols such as 45.5 baud Baudot and 300 baud ASCII.

1194.23(c) *Interactive system usability*: Automated telecommunication services (e.g. voice mailboxes) must support TTY interaction.

1194.23(d) *Interactive system timeouts*: The user should be alerted when any time-dependent function is about to timeout. The user must be given enough time to extend the response time.

1194.23(e) *Telecommunications functions*: Caller identification and similar functions of a telecommunication device must be accessible to TTY users and those who cannot see the device's display.

1194.23(f) *Mandatory volume control*: Telecommunications products that transmit voice communications must have the ability to amplify the volume and have an intermediary setting.

1194.23(g) *Automatic volume reset*: On telecommunication products that have adjustable volume, there must be an automatic volume reset function that sets the volume back to the default level. Assume that this standard refers to products that have a handset, headset, earphone, or other transducer near the ear. Assume that the default volume level is safe, clear, and audible for fully able users.

1194.23(h) *Magnetic wireless coupling*: When using a telecommunication product such as a telephone, there must be a means to effectively use magnetic wireless coupling devices such as hearing aids. Assume that effective magnetic wireless coupling to hearing aids with a telecoil and cochlear implants is applicable to this requirement.

1194.23(i) *Hearing technology interference*: Interference to hearing technologies (e.g., hearing aids, cochlear implants, assistive listening systems) should be reduced to the lowest possible level.

1194.23(j) *Transmission of information*: Any telecommunication product must have the ability to process information in a usable format. Products shall not remove information required for access. This requirement applies to the transmission of TTY signals over voice-based telecommunications systems, including VoIP. The requirement was written broadly to ensure that it would apply to evolving technologies.

1194.23(k)(1) *Tactilely discernible controls*: The controls and keys on a telecommunication product must be designed and manufactured so that a user may locate and identify them by means of touch alone, without activating them.

1194.23(k)(2) *Operability of controls*: Mechanically operated controls must be usable with one hand, without particular motions (twisting of the wrist, tight grasping, pinching) or considerable exertion (more than five pounds of force).

1194.23(k)(3) *Adjustable key repeat rate*: Telecommunications products with key repeat features must allow a two-second delay before repeating a key being held down. Products with key repeat features must also allow up to two seconds between each repetition of a key being held down.

1194.23(k)(4) *Discernible status of controls*: All locking or toggle controls or keys must be discernible visually, and through touch or sound.

## **1194.24 Video and Multimedia Product Standards**

Multimedia products involve more than one information medium and include, but are not limited to, video programs, narrated slide productions, and computer-generated presentations. Provisions address caption decoder circuitry (for any system with a screen larger than 13 inches) and secondary audio channels for television tuners, including tuner cards for use in computers. The standards also require captions and audio descriptions for certain training and informational multimedia productions developed or procured by Federal agencies. The standards also provide that users should be able to turn captions or audio descriptions on or off.

1194.24(a) *Caption decoder circuitry*: Any analog TV or DTV display or receiver must correctly receive and display closed captions that are transmitted by broadcast television, cable, videotape (e.g., VHS), or DVDs.

1194.24(b) *Secondary audio circuitry*: All TV tuners must have the ability to play secondary audio.

1194.24(c) *Open or closed captions*: A video or multimedia presentation must include captions if it satisfies these four conditions:

- It supports the agency's mission.

- It is for training or information purposes.

- It is a production (e.g., it is not simply raw video footage).

- It includes audio that is essential for understanding the presentation.

1194.24(d) *Audio descriptions*: A video or multimedia presentation must include audio descriptions if it satisfies these four conditions:

- It supports the agency's mission.

- It is for training or information purposes.

- It is a production (e.g., it is not simply raw video footage).

- It includes images that are essential for understanding the presentation.

1194.24(e) *User-selectability*: A user of a video or multimedia production should be able to select whether captions and/or audio descriptions are presented, unless they are a permanent part of the production (e.g., open captions).

## **1194.25 Self-Contained, Closed Product Standards**

This section covers products that generally have embedded software but are designed in such a way that a user cannot easily attach or install assistive devices. Examples include information kiosks, automated transaction machines, copiers, printers, calculators, fax machines, and similar types of products. The standards require that access features be built into the system so users do not have to attach assistive devices to it. Other specifications address mechanisms

for private listening (handset or a standard headphone jack), touch screens, auditory output and adjustable volume controls, and location of controls within accessible reach ranges.

1194.25(a) *Usability without assistive technology*: Self-contained products must be usable by people with disabilities. Products cannot require the attachment of AT for their use. Personal headsets for private listening do not fall under this standard; hence there is no conflict with 1194.25(e) below.

1194.25(b) *Interactive system timeouts*: Alert the user whenever a time-critical action is required on their part. The user must be given enough time to extend the response time.

1194.25(c) *Redundancy for touch controls*: An input method other than touch-responsive controls is required for devices using touchscreens or touch-operated (i.e., non-mechanic) controls. This provision does not prohibit the use of touchscreens and contact-sensitive controls, but requires a redundant set of controls that can be used by persons who have access problems with touch controls.

1194.25(d) *Redundancy for biometric controls*: If a system uses biometrics for identification (e.g., retinal scanning or fingerprint identification) or for system operation, the system must also provide a means of equivalent, alternative access independent of any particular biological feature (e.g., entering a password).

1194.25(e) *Providing auditory output*: If a product provides an audio output signal, it must meet specific requirements that allow for private listening.

1194.25(f) *Mandatory volume control & reset*: When a product has voice output and it will be used in a public area, it must have incremental volume control for the user to increase voice output above the ambient level. The product must be able to automatically reset the volume to its default level after every use.

1194.25(g) *Supplement color coding*: Color should never be the only means to identify functions, visual elements or information.

1194.25(h) *Providing color selections*: A variety of color selections and contrast levels should be provided when a product allows the user to change contrast or color settings. If the product does not feature adjustable color or contrast settings, then the standard does not apply.

1194.25(i) *Avoid fast flashing/blinking*: If a product includes one or more visual display screens, it should be designed so that flicker on the screens is nonexistent, or very slow (e.g., one flicker per second), or very fast (at least fifty-five flickers per second).

1194.25(j) When a product is intended to be a free-standing, permanent installation (e.g., an information kiosk), each operable control must be within reach.

(1) *Vertical reference plane*: Before verifying conformance to the reach ranges in standards (j)(2), (j)(3), and (j)(4) below, it is necessary to establish a reference plane for each control.

(2) *Height of proximal controls*: Each control that is proximal (within 10 inches of its reference plane) must be between 15 and 54 inches from the floor.

(3) *Height of recessed controls*: Each control that is recessed (farther than 10 inches from its reference plane, but within 24 inches) must be between 15 and 46 inches from the floor.

(4) *Maximum depth of controls*: Controls may not be recessed more than 24 inches.

## **1194.26 Desktop and Portable Computer Standards**

This section focuses on keyboards and other mechanically operated controls, touch screens, use of biometric forms of identification, and ports and connectors.

1194.26(a) *Accessibility of controls*: All controls and keys for the normal operation of a desktop or portable computer must be accessible. This includes the keyboard, keypad, power switch, reset button, unlocking controls for docking stations, and release buttons for expansion cards and drives.

1194.26(b) *Redundancy for touch controls*: An input method other than touch-responsive controls is required for devices using touchscreens or touch-operated (i.e., non-mechanic) controls. This provision does not prohibit the use of touchscreens and contact-sensitive controls, but requires a redundant set of controls that can be used by persons who have access problems with touch controls.

1194.26(c) *Redundancy for biometric controls*: If a system uses biometrics for identification (e.g., retinal scanning or fingerprint identification) or for system operation, the system must also provide a means of equivalent, alternative access independent of any particular biological feature (e.g., entering a password).

1194.26(d) *Providing hardware interfaces*: One or more of each kind of expansion slot, port, or connector on a computer must be designed according to an industry standard.

## **1194.31 Functional Performance Criteria**

Overview



The performance requirements of this section are intended for overall product evaluation and for technologies or components for which there is no specific requirement under the technical standards 1194.21-1194.26 in Subpart B. These requirements are designed to ensure that the individual accessibility components work together to create an accessible product. The requirements cover operation - including input and control functions, operation of mechanisms, and access to visual and audible information.

1194.31(a) "At least one mode of operation and information retrieval that does not require user vision shall be provided, or support for assistive technology used by people who are blind or visually impaired shall be provided."

1194.31(b) "At least one mode of operation and information retrieval that does not require visual acuity greater than 20/70 shall be provided in audio and enlarged print output working together or independently, or support for assistive technology used by people who are visually impaired shall be provided."

1194.31(c) "At least one mode of operation and information retrieval that does not require user hearing shall be provided, or support for assistive technology used by people who are deaf or hard of hearing shall be provided."

1194.31(d) "Where audio information is important for the use of a product, at least one mode of operation and information retrieval shall be provided in an enhanced auditory fashion, or support for assistive hearing devices shall be provided."

1194.31(e) "At least one mode of operation and information retrieval that does not require user speech shall be provided, or support for assistive technology used by people with disabilities shall be provided."

1194.31(f) "At least one mode of operation and information retrieval that does not require fine motor control or simultaneous actions and that is operable with limited reach and strength shall be provided."

## **1194.41 Information, Documentation, and Support**

### Overview

The standards address access to all information, documentation, and support provided to end users of EIT. This includes user guides, installation guides for end-user installable devices, and customer support and technical support communications. Such information must be available in alternate formats upon request at no additional charge. Alternate formats or methods of communication can include Braille, large print, electronic text, TTY access, and captions and

audio descriptions for video materials. However, the easiest solution for documentation is to have the vendor provide the information in an electronic format (e.g., CD). Documentation that is available on the vendor's website may be valuable, but it is not sufficient.

1194.41(a) "Product support documentation provided to end-users shall be made available in alternate formats upon request, at no additional charge."

1194.41(b) "End-users shall have access to a description of the accessibility and compatibility features of products in alternate formats or alternate methods upon request, at no additional charge."

1194.41(c) "Support services for products shall accommodate the communication needs of end-users with disabilities."