

PDF

The **Portable Document Format (PDF)** is a file format developed in the 1990s to present documents, including text formatting and images, in a manner independent of application software, hardware, and operating systems.<sup>[3][4]</sup> Based on the PostScript language, each PDF file encapsulates a complete description of a fixed-layout flat document, including the text, fonts, vector graphics, raster images and other information needed to display it. PDF was standardized as an open format, ISO 32000, in 2008, and does not require any royalties for its implementation.

Today, PDF files may contain a variety of content besides flat text and graphics including logical structuring elements, interactive elements such as annotations and form-fields, layers, rich media (including video content) and three dimensional objects using U3D or PRC, and various other data formats. The PDF specification also provides for encryption and digital signatures, file attachments and metadata to enable workflows requiring these features.

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Portable Document Format

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|---|--|
| <div><p>Adobe PDF icon</p></div> |  |
| Filename extension  | .pdf <sup>[1]</sup>  |
| Internet media type   | application/pdf, <sup>[2]</sup><br>application/x-pdf<br>application/x-bzpdf<br>application/x-gzpdf |
| Type code   | 'PDF' <sup>[2]</sup> (including a single space)  |
| Uniform Type Identifier (UTI)   | com.adobe.pdf  |
| Magic number  | %PDF   |
| Developed by  | ISO  |
| Initial release   | 15 June 1993   |
| Latest release  | 2.0  |
| Extended to   | PDF/A, PDF/E, PDF/UA, PDF/VT, PDF/X  |
| Standard  | ISO 32000-2  |
| Open format?  | Yes  |
| Website   | <div>www.iso.org</div> <div>/standard/63534.html (https://www.iso.org/standard/63534.html)</div>   |

## DataMatrix Code



**DataMatrix**, the public domain code from RVSI Acuity CiMatrix, is a 2D matrix symbology designed to pack a lot of information into a very small space.

The Data Matrix symbology employs Reed-Solomon, or convolutional, error correction with data redundancy to guarantee a fast and accurate read.

The symbol can store between one and 3116 numeric or 2335 alphanumeric characters. While Data Matrix is easily scalable between a 1-mil square to a 14-inch square, the actual limits are dependent on the fidelity of the marking device and the optics of the reader.

When printed on a 600 dpi (dots per inch) printer at an effective size of .300" square (about the size of your 'pinky' finger nail), the symbol can be reliably decoded with any 2D reader

The most popular applications for Data Matrix are the marking of small items such as integrated circuits and printed circuit boards.

The Data Matrix code is generally "read" by a CCD (charged coupled device) video camera (imager). Typical symbols between 1/8" square and 7" square can be read at distances ranging from contact to 36 inches away. Since the overall size of the Data Matrix symbol is infinitely scaleable, the Data Matrix symbols can be read at virtually any distance, given the right combination of Data Matrix size and reading equipment.

The list of organizations supporting and recommending Data Matrix symbology is extensive. For example:

- Data Matrix is supported by an ISO standard, [ISO/IEC16022—International Symbology Specification, Data Matrix](#), and is in the public domain, which means it can be used free of any licensing or royalties.
- The [Electronics Industry Association \(EIA\)](#) recommends Data Matrix for marking silicon wafers and components.
- The [Automotive Industry Action Group \(AIAG\)](#) recommends Data Matrix for small-part identification (B-4 -- Parts Identification and Tracking Application standard).
- The [Semiconductor Equipment Manufacturers' Institute \(SEMI\)](#) has chosen Data Matrix as the wafer marking [standard](#).
- The U.S. Department of Defense (DoD) has implemented a [policy](#) mandating the use of Data Matrix to uniquely identify a broad range of items acquired by the DoD. [MIL-STD-130L](#), Identification Marking of U.S. Military Property, provides guidance for the use of Data Matrix in support of the policy.
- The [Uniform Code Council \(UCC\)](#) is in the process of adopting Data Matrix as its 2D data carrier. The UCC is a member of EAN International, which promotes identification and business communication standards to all parts of the supply chain worldwide.

**Technical issues**

Accessibility  
Viruses and exploits

**Content****Software**

Editing  
Annotation  
Other

**See also****References****Further reading****External links**

## History and standardization

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Adobe Systems made the PDF specification available free of charge in 1993. In the early years PDF was popular mainly in desktop publishing workflows, and competed with a variety of formats such as DjVu, Envoy, Common Ground Digital Paper, Farallon Replica and even Adobe's own PostScript format.

PDF was a proprietary format controlled by Adobe until it was released as an open standard on July 1, 2008, and published by the International Organization for Standardization as ISO 32000-1:2008,<sup>[5][6]</sup> at which time control of the specification passed to an ISO Committee of volunteer industry experts. In 2008, Adobe published a Public Patent License to ISO 32000-1 granting royalty-free rights for all patents owned by Adobe that are necessary to make, use, sell, and distribute PDF compliant implementations.<sup>[7]</sup>

PDF 1.7, the sixth edition of the PDF specification that became ISO 32000-1, includes some proprietary technologies defined only by Adobe, such as Adobe XML Forms Architecture (XFA) and JavaScript extension for Acrobat, which are referenced by ISO 32000-1 as normative and indispensable for the full implementation of the ISO 32000-1 specification. These proprietary technologies are not standardized and their specification is published only on Adobe's website.<sup>[8][9][10][11][12]</sup> Many of them are also not supported by popular third-party implementations of PDF.

On July 28, 2017, ISO 32000-2 (PDF 2.0) was published by the ISO. ISO 32000-2 does not include any proprietary technologies as normative references.<sup>[13]</sup>

## Technical foundations

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The PDF combines three technologies:

- A subset of the PostScript page description programming language, for generating the layout and graphics.
- A font-embedding/replacement system to allow fonts to travel with the documents.
- A structured storage system to bundle these elements and any associated content into a single file, with data compression where appropriate.

### PostScript

PostScript is a page description language run in an interpreter to generate an image, a process requiring many resources. It can handle graphics and standard features of programming languages such as `if` and `loop` commands. PDF is largely based on PostScript but simplified to remove flow control features like these, while graphics commands such as `lineto` remain.