



The Printer Working Group

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IPP Finishings 3.0

Status: Prototype

Abstract: This document defines new "finishings" and "finishings-col" Job Template attribute values to specify additional finishing intent, including the placement of finishings with respect to the corners and edges of portrait and landscape documents.

This document is a PWG Candidate Standard. For a definition of a "PWG Candidate Standard", see:

<https://ftp.pwg.org/pub/pwg/general/pwg-process30.pdf>

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68 About the Internet Printing Protocol Workgroup

69 The Internet Printing Protocol (IPP) workgroup has developed a modern, full-featured
70 network printing protocol, which is now the industry standard. IPP allows a print client to
71 query a printer for its supported capabilities, features, and parameters to allow the selection
72 of an appropriate printer for each print job. IPP also provides Job information prior to, during,
73 and at the end of Job processing.

74 For additional information regarding IPP visit:

75 <http://www.pwg.org/ipp/>

76 Implementers of this specification are encouraged to join the IPP mailing list in order to
77 participate in any discussions of the specification. Suggested additions, changes, or
78 clarification to this specification, should be sent to the IPP mailing list for consideration.
79

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1. Introduction

The Internet Printing Protocol/1.1: Model and Semantics [STD92] and Internet Printing Protocol (IPP): Production Printing Attributes - Set 1 [PWG5100.3] specifications define the basic attributes and values needed to support advanced finishing processes on printed output. This specification, which was originally titled 'IPP: "finishings" attribute values extension', defines additional values and member attributes needed to support the full breadth of finishing options available in modern Printers. It also revisits the original definitions of the "finishings" and "finishings-col" attributes to provide a holistic view of the various finishing processes that some Printers support.

The "finishings" Job Template attribute [STD92] allows Clients to specify simple intent - staple, fold, trim, etc. This specification extends the original values to include positional characteristics, e.g., staple top-left, as well as common variations, e.g., Z fold.

The "finishings-col" Job Template attribute [PWG5100.3-2001] allows Clients to specify detailed intent - staple at the following coordinates, fold at the following positions and directions, trim at the following positions and cut types, etc. This specification extends the original "finishing-template" member attribute to include standard names and adds member attributes for each type of finishing.

2. Terminology

2.1 Conformance Terminology

Capitalized terms, such as MUST, MUST NOT, RECOMMENDED, REQUIRED, SHOULD, SHOULD NOT, MAY, and OPTIONAL, have special meaning relating to conformance as defined in Key words for use in RFCs to Indicate Requirement Levels [RFC2119]. The term CONDITIONALLY REQUIRED is additionally defined for a conformance requirement that applies to a particular capability or feature.

2.2 Protocol Role Terminology

This document defines the following protocol roles in order to specify unambiguous conformance requirements:

Client: Initiator of outgoing IPP session requests and sender of outgoing IPP operation requests (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] User Agent).

Printer: Listener for incoming IPP session requests and receiver of incoming IPP operation requests (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] Server) that represents one or more Physical Devices or a Logical Device.

2.3 Printing Terminology

Normative definitions and semantics of printing terms are imported from the Printer MIB v2 [RFC3805], Printer Finishings MIB [RFC3806], and Internet Printing Protocol/1.1: Model and Semantics [STD92].

Document: An object created and managed by a Printer that contains the description, processing, and status information. A Document object can have attached data and is bound to a single Job.

Finishing Location: The distance ~~toward the center of the Sheet~~ from the 'left' edge of the Media Sheet toward the 'right' edge when the Finishing Reference Edge is either 'top' or 'bottom', or the distance from the 'bottom' edge of the Media Sheet toward the 'top' edge when the Finishing Reference Edge is either 'left' or 'right'.

Finishing Offset: The distance from the Finishing Reference Edge toward the center of the Media Sheet where finishing operations are performed. Some types of finishing operations, such as folding, only need an offset to be specified, while ~~others~~other types of finishing operations, such as punching or stitching, also need Finishing Location(s) to be specified.

Finishing Reference Edge: The Media Sheet edge ('top', 'left', 'right', 'bottom') used as a starting point to describe finishing operations.

Finishing Template: A named collection of finishing processes and values.

Impression: The Document content imposed upon one side of a Media Sheet by a marking engine, independent of the number of times that the sheet side passes any marker. An Impression contains one or more Input Pages that are imposed (scaled, translated, and/or rotated) during processing of the Document data. [STD92]

Input Page: A page according to the definition of "pages" in the language used to express the Document data. [STD92]

Job: An object created and managed by a Printer that contains description, processing, and status information. The Job also contains zero or more Document objects.

Media Sheet: A single instance of a medium, whether printing on one or both sides of the medium. Media Sheets also include sections of roll media. [STD92]

Set: A logical boundary between the delivered Media Sheets of a printed Job. For example, in the case of a ten-page single Document with collated pages and a request for 50 copies, each of the 50 printed copies of the Document constitutes a Set. If the pages were uncollated, then 50 copies of each of the individual pages within the Document would represent each Set. Finishing processes operate on Sets. [STD92]

311 **2.4 Acronyms and Organizations**

312 *CIP4*: The International Cooperation for the Integration of Processes in Prepress, Press, and
313 Postpress Organization, <http://www.cip4.org/>

314 *IANA*: Internet Assigned Numbers Authority, <http://www.iana.org/>

315 *IETF*: Internet Engineering Task Force, <http://www.ietf.org/>

316 *ISO*: International Organization for Standardization, <http://www.iso.org/>

317 *PWG*: IEEE ISTO Printer Working Group, <http://www.pwg.org/>

3. Requirements

3.1 Rationale for IPP Finishings

Based on the following existing specifications:

- "Internet Printing Protocol/1.1: Model and Semantics" [STD92] defined the "finishings" Job Template attribute and basic values.
- "Internet Printing Protocol (IPP): Production Printing Attributes - Set 1" [PWG5100.3-2001] defined the "finishings-col" Job Template attribute for stapling.
- IPP Finishings 2.0 [PWG5100.1-2014] defined additional Printer Description attributes that allow a Client to determine the type and extent of finishing options supported by the printer, allowing the User to select choices with higher fidelity and allowing the Client to accurately present a preview to the User of the selected finishing processes. It also defines Job Template attributes and values that allow the Client to express finishing intent clearly.

To allow Clients to use and clearly specify finishing intent, this IPP Finishings 3.0 specification SHOULD:

- Define Job Template attributes and values needed to clearly express finishing intent; and
- Define Printer Description attributes and values needed to allow a Client to determine the type and extent of finishing options supported by the Printer as well as preview the results of finishing processes for the User.

3.2 Use Cases

The following use cases are derived in part from the list of finishing processes defined in section 2.2 of [RFC3806].

3.2.1 Band

Jane needs to ship ten copies of a fifty-page report. Using software on her Client device, she specifies a finishing intent that will band wrap each copy and submits the print request.

3.2.2 Bind

Jane is self-publishing a book on lawn ornaments. Using software on her Client device, she specifies a finishing intent that will bind the long edge of each book and submits the print request.

348 **3.2.3 Booklet Maker**

349 Jane is producing an orientation guide for new students. Using software on her Client device,
350 she specifies a finishing intent that will impose the pages from her Document onto folded
351 sheets and submits the print request.

352 **3.2.4 Coat**

353 Jane needs to protect a digital photographic print from sunlight. Using software on her Client
354 device, she specifies a finishing intent that coats the media sheet with an archival UV
355 protectant and submits the print request.

356 **3.2.5 Cover**

357 Jane needs to print an investor report for an upcoming meeting with the preprinted company
358 report cover. Using software on her Client device, she specifies a finishing intent that will
359 add the report cover to each Set and submits the print request.

360 **3.2.6 Edge Stitch**

361 Jane wants to print a multi-page checklist. Using software on her Client device, she specifies
362 a finishing intent that will stitch the tops of the pages in the output and submits the print
363 request.

364 **3.2.7 Fold**

365 Jane has a set of attendee cards she wants to print. Using software on her Client device,
366 she specifies a finishing intent that will fold the cardstock in half after printing and submits
367 the print request.

368 **3.2.8 Laminate**

369 Jane is printing operating procedure checklists that will be used many times. Using software
370 on her Client device, she specifies a finishing intent that will laminate each checklist and
371 submits the print request.

372 **3.2.9 Punch**

373 Jane is printing invoices that will be placed in a 3-ring binder. Using software on her Client
374 device, she specifies a finishing intent that will punch three holes along the left side of each
375 sheet and submits the print request.

376 **3.2.10 Saddle Stitch**

377 Jane is printing a short informational booklet. Using software on her Client device, she
378 specifies a finishing intent that will place two staples along the midline of each Set and
379 submits the print request.

380 3.2.11 Staple

381 Jane is printing an accounts-receivable report. Using software on her Client device, she
382 specifies a finishing intent that will place a single staple at the top left corner of each Set and
383 submits the print request.

384 3.2.12 Trim

385 Jane is printing a large photograph on her roll-fed printer. Using software on her Client
386 device, she specifies a finishing intent that will cut the roll at the end of the printed
387 photograph and submits the print request.

388 3.2.13 Wrap

389 Jane is printing documentation for a software product. Using software on her Client device,
390 she specifies a finishing intent that will shrink-wrap each Set and submits the print request.

391 3.2.14 Multiple Finishing Options

392 Jane is printing an eight-page brochure booklet. Using software on her Client device, she
393 specifies finishing intent to first impose the pages from her Document onto sheets, then
394 staple the sheets along the midline, fold the sheets along the midline, and finally shrink-wrap
395 each booklet. She then submits the print request.

396 3.2.15 Finishing of Multiple Copies

397 Jane is printing a seven-page report to a Printer that only supports a raster format. Using
398 software on her Client device, she specifies a copy count of 10 and finishing intent to staple
399 each Set. She then submits the print request. Her Client device generates and submits 70
400 pages of raster data to the Printer.

401 3.2.16 Finishing Supplies

402 Jane is printing an accounts-receivable report. Using software on her Client device, she
403 specifies a finishing intent that will place a single staple at the top left corner of each Set.
404 She is notified that the number of staples in the Printer is low.

405 3.3 Exceptions**406 3.3.1 Unsupported Media**

407 After submitting the orientation guide for printing (section 3.2.3), the Printer returns an error
408 indicating that the requested media cannot be used with the booklet maker.

3.3.2 Unsupported Combinations of Finishing Options

After submitting an eight page brochure booklet for printing (section 3.2.14), the Printer returns an error indicating that the requested finishing intent cannot be combined as requested.

3.3.3 Finishing with Finisher Fidelity Restrictions

Jane is printing an eight-page brochure booklet. Using software on her Client device, she specifies finishing intent to impose the pages from her Document onto sheets, fold and staple the sheets along the midline, and shrink-wrap each produced copy of the booklet. The Client looks up finisher restrictions for the Printer's media and orientation and presents an accurate print preview. Jane submits the print request, and the output accurately matches the preview and her expectations.

3.4 Out of Scope

The following are out of scope for this specification:

1. Explicitly specifying the order of finishing processes, i.e., processing instructions instead of intent;
2. Support for folds not parallel to a Finishing Reference Edge;
3. Support for cuts not parallel to a Finishing Reference Edge; and
4. Support for cuts that do not extend the full width or length of the media

3.5 Design Requirements

The design requirements for this specification are:

1. Follow the naming conventions defined in the IPP/1.1 Model and Semantics [STD92], including keyword value (lowercase) and hyphenation requirements;
2. Optimize compatibility with existing IETF and PWG IPP operations when making design decisions in defining new operations and attributes;
3. Define values for the "finishings" Job Template attribute to support the full range of finishing options supported by modern Printers;
4. Define Printer Description and member attributes for the "finishings-col" Job Template attribute to support the full range of finishing options supported by modern Printers;
5. Update the definition of the "finishing-template" member attribute for all of the standard finishing options supported by modern Printers; and

6. Register all attributes and values with IANA and the PWG.

4. Overview of Finishing

The finishing processes supported by Printers are identified in the Printer Finishing MIB [RFC3806]. IPP finishing is any post-processing of the hardcopy output performed by any of the Subunits of the Printer. Common finishing processes include baling, binding, booklet making, coating, covering, folding, jogging, laminating, punching, stapling, stitching, trimming, and wrapping. As in [RFC3806], all IPP finishing processes are specified with respect to portrait media orientation. The "multiple-document-handling" Job Template attribute [STD92] defines how multiple copies and Documents are combined into sets for finishing.

A key concept with IPP finishing processes is that the "finishings" and "finishings-col" Job Template attributes define the Client's intent and not the processing order of finishing processes. That is, a Client can specify the intent that a Document be covered and bound or bound and covered and get the intended output – the Printer is responsible for determining the correct processing order for a sequence of finishing values.

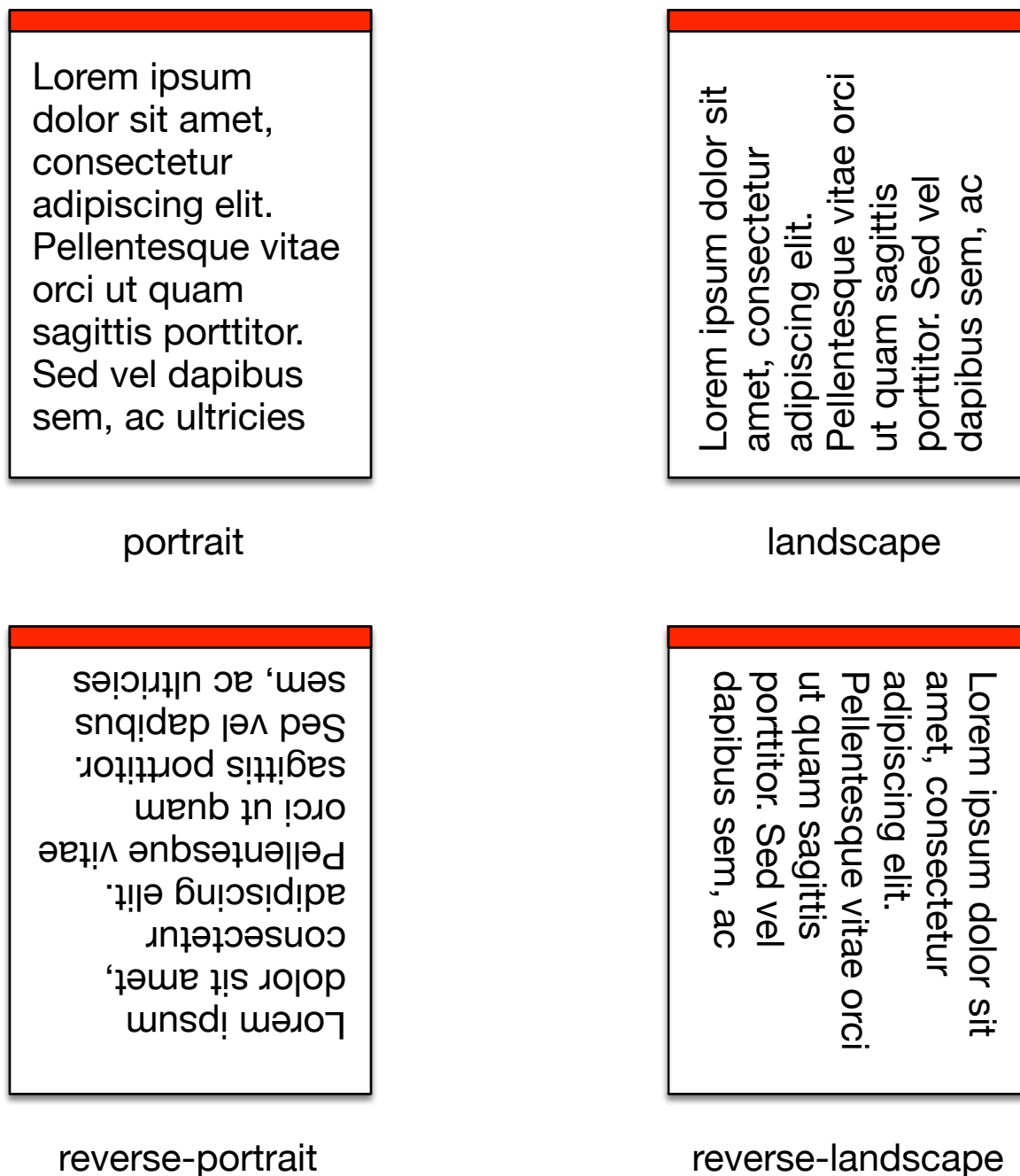
The original finishing support in IPP/1.1: Model and Semantics [STD92] only allows a Printer to list and a Client to specify simple finishing intent using the "finishings" attribute - staple, fold, punch, and so forth. The IPP Production Printing Extensions, Set 1 [PWG5100.3-2001] provided the first definition of the "finishings-col" Job Template attribute to provide explicit intent for the number and location of staples. This specification expands the "finishings-col" attribute so that it is possible to specify explicit intent for all finishing processes. In addition, the "finishings-col-database" and "finishings-col-ready" Printer Description attributes allow the Client to discover which "finishings-col" values are supported and to provide an accurate preview of those values.

4.1 Coordinate System

The positional values are specified with respect to the Document as if the Document was in portrait orientation. This coordinate system scheme agrees with the Finisher MIB [RFC3806], which in turn follows the ISO DPA [ISO10175] approach of using a coordinate system as if the document were portrait. The approach for coordinate system being relative to the intended reading direction depends on the device being able to understand the orientation embedded in the PDL, which is too problematic for many PDLs. The approach for the coordinate system of being relative to the media feed direction is too dependent on the way the device is configured, i.e., pulling short edge first vs. long edge first, and can vary between different output bins in the same device.

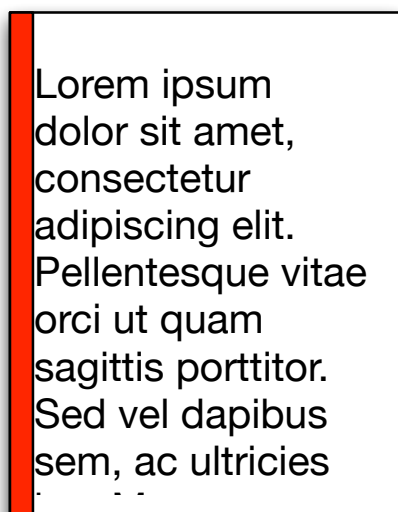
If the Document is in landscape or reverse-landscape orientation, the Client supplies the appropriate transformed value. For example, to position a staple in the upper left corner of a landscape Document when held for reading, the Client supplies the 'staple-bottom-left' value since landscape is defined as a counter-clockwise rotation from portrait. On the other hand, to position a staple in the upper left-hand corner of a reverse-landscape Document

478 when held for reading, the Client supplies the 'staple-top-right' value since reverse-
479 landscape is defined as a clockwise rotation from portrait. Figure 1 shows how content is
480 placed on sheets for each "orientation-requested" value [STD92] when feeding short edge
481 first. Figure 2 shows how content is placed on sheets for each "orientation-requested" value
482 when feeding long edge first.

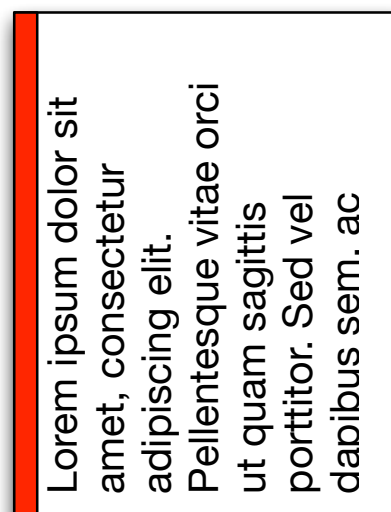


Leading Edge of Sheet

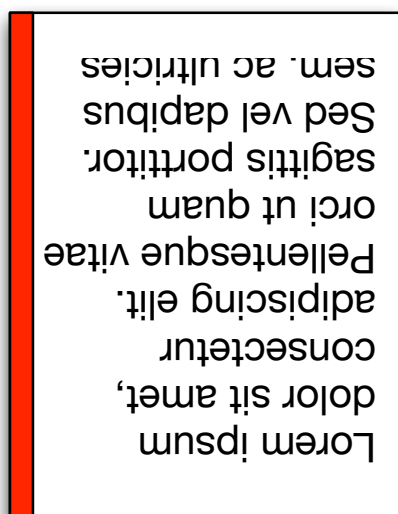
Figure 1 - Effect of "orientation-requested" on Output with Short Edge First Feed



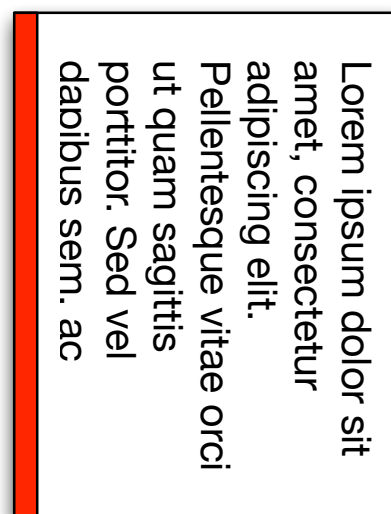
portrait



landscape



reverse-portrait



reverse-landscape

Leading Edge of Sheet

Figure 2 - Effect of "orientation-requested" on Output with Long Edge First Feed

487 **4.2 Finishing Processes**

488 The following subsections describe each of the finishing processes supported by this
489 specification.

490 **4.2.1 Bale (or Band) and Wrap**

491 Bale finishers bundle hardcopy output with string or straps. Wrap finishings completely
492 enclose the output, such as with a shrink-wrap material.

493 **4.2.2 Bind**

494 Bind finishers join hardcopy output along one edge. Binding can be performed by gluing the
495 edge, joining using plastic or wire loops, padded, or taped.

496 **4.2.3 Booklet Making**

497 Booklet making combines a half fold with signature imposition, placing and ordering input
498 pages so that the resulting output can be read as a booklet. Booklet making is often
499 combined with a saddle stitch to hold the hardcopy output together.

500 **4.2.4 Coat and Laminate**

501 Coating finishers apply a liquid or powdered material to the surface of the hardcopy output,
502 e.g., a clear UV light and weather resistant paint over a sign, while laminator finishers
503 combine a solid material with the hardcopy output using heat and/or adhesives.

504 **4.2.5 Cover**

505 Cover finishers place cover media over the hardcopy output, either as two separate sheets
506 or a single sheet that covers the binding edge.

507 **4.2.6 Fold**

508 A fold finisher places folds in hardcopy output at certain positions and directions. Figure 3
509 shows common fold styles that are supported by this specification.

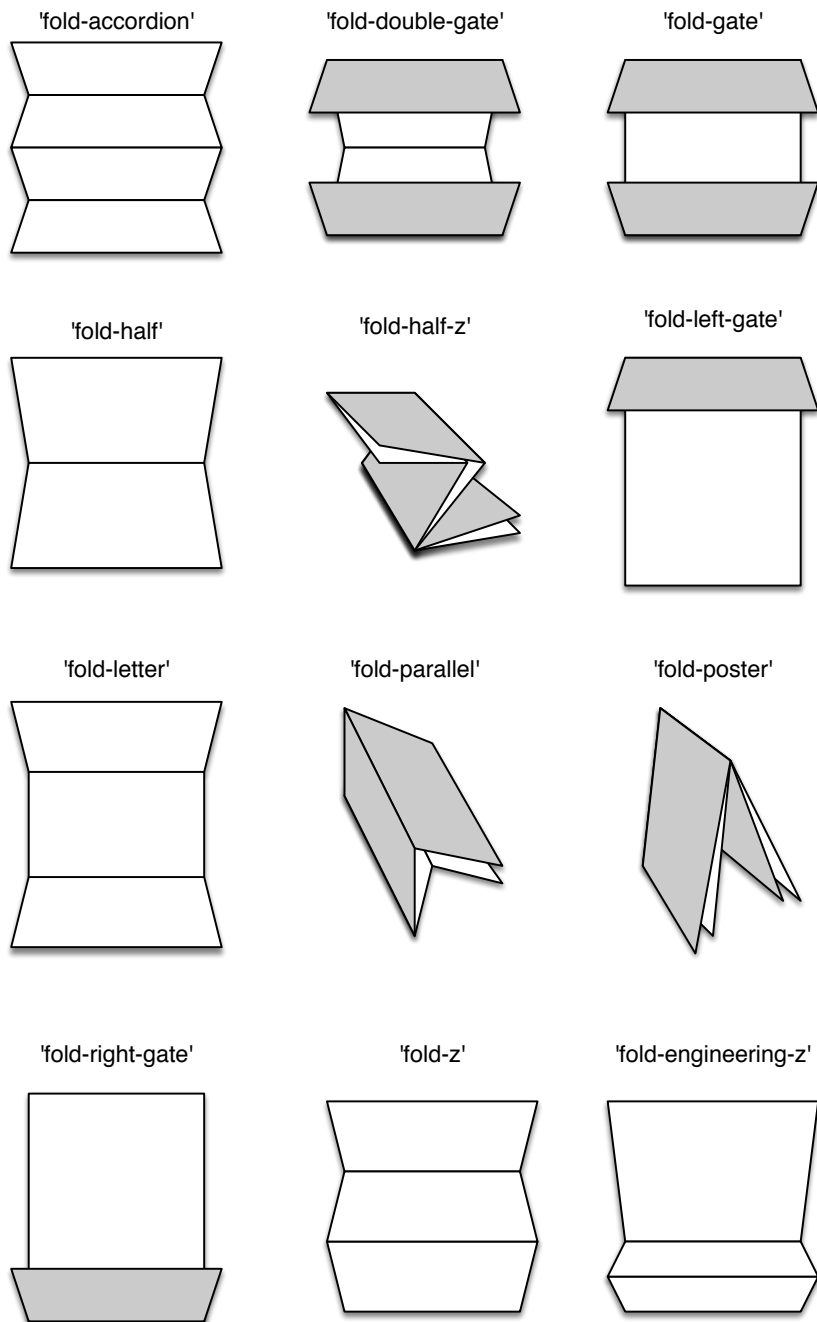


Figure 3 - Standard Folds

4.2.7 Punch

A punch finisher creates holes in the hardcopy Set by drilling or punching with a die. The number and location of holes varies and is not well standardized [PUNCH].

4.2.8 Stitch (Staple, Crimp, Edge Stitch, or Saddle Stitch)

Staple and stitch finishers bind Sets of hardcopy output using 'U' shaped pieces of metal wire ("staples"). Staples are placed in a corner, along an edge, or along the middle fold for saddle stitching. Crimps can be used instead of staples in some cases. IPP uses the keyword 'edge-stitch' when multiple staples are used along an edge and 'saddle-stitch' when multiple staples are placed along the middle fold.

4.2.9 Trim (Cut, Perforate, or Score)

Trim finishers cut, perforate, or score hardcopy output along a straight line parallel or perpendicular to the feed direction.

5. Job Template Attributes

Table 1 lists the Job Template attributes defined in this specification and their associated Printer conformance requirements.

Table 1 - New Job Template Attributes

Attribute	Printer Conformance
finishings	REQUIRED
finishings-col	REQUIRED
job-pages-per-set	CONDITIONALLY REQUIRED

5.1 finishings (1setOf type2 enum)

This REQUIRED Job Template attribute [STD92] lists the finishing processes that the Printer uses for each copy of each printed Document in the Job. A Printer that supports any of the finishing processes listed in section 4 MUST support this attribute.

The order of values supplied in the "finishings" attribute is not significant. A Printer MUST NOT require Clients to supply values in a particular order. If a Client supplies a value of 3 ('none') with any additional values, the Printer MUST ignore the 3 ('none') value and process the Job as though 'none' was never supplied.

If the Printer supports the "media-col-ready" and / or "media-col-database" Printer Description attributes [PWG5100.7], the Client can discover the media feed orientation and

539 direction by checking the values of the "media-source-feed-orientation" and "media-source-
540 feed-direction" member attributes in each collection.

541 Note: The effect of the "finishings" attribute on Jobs with multiple copies and Documents is
542 controlled by the "multiple-document-handling" Job Template attribute [STD92]. The
543 relationship of this attribute and the other attributes that control Document processing is
544 described in the Internet Printing Protocol/1.1 [STD92].

545 **5.1.1 STD 92 "finishings" Values**

546 The Internet Printing Protocol/1.1 [STD92] defines the following values for the "finishings"
547 attribute:

- 548 • **'none' (3):** Perform no finishing
- 549 • **'staple' (4):** Bind the Set(s) with one or more staples. The exact number,
550 placement, and orientation of the staples are implementation and/or site defined.
- 551 • **'punch' (5):** This value indicates that holes are required in the finished hardcopy
552 output. The exact number and placement of the holes are implementation and/or
553 site defined. The punch specification MAY be satisfied (in a site- and
554 implementation-specific manner) either by drilling/punching, or by substituting
555 pre-drilled media.
- 556 • **'cover' (6):** This value is specified when it is desired to select a non-printed (or
557 pre-printed) cover for each Set. This does not supplant the specification of a
558 printed cover (on cover stock medium) by the Document itself.
- 559 • **'bind' (7):** This value indicates that a binding is to be applied to the Set; the type
560 and placement of the binding are implementation and/or site defined.
- 561 • **'saddle-stitch' (8):** Bind the Set(s) with two or more staples (wire stitches) along
562 the middle fold. The exact number and placement of the staples and the middle
563 fold are implementation and/or site defined.
- 564 • **'edge-stitch' (9):** Bind the Set(s) with two or more staples (wire stitches) along
565 one edge. The exact number and placement of the staples are implementation
566 and/or site defined.
- 567 • **'staple-top-left' (20):** Bind the Set(s) with one or more staples in the top left
568 corner.
- 569 • **'staple-bottom-left' (21):** Bind the Set(s) with one or more staples in the bottom
570 left corner.
- 571 • **'staple-top-right' (22):** Bind the Set(s) with one or more staples in the top right
572 corner.

- 573 • **‘staple-bottom-right’ (23):** Bind the Set(s) with one or more staples in the
574 bottom right corner.
- 575 • **‘edge-stitch-left’ (24):** Bind the Set(s) with two or more staples (wire stitches)
576 along the left edge. The exact number and placement of the staples are
577 implementation and/or site defined.
- 578 • **‘edge-stitch-top’ (25):** Bind the Set(s) with two or more staples (wire stitches)
579 along the top edge. The exact number and placement of the staples are
580 implementation and/or site defined.
- 581 • **‘edge-stitch-right’ (26):** Bind the Set(s) with two or more staples (wire stitches)
582 along the right edge. The exact number and placement of the staples are
583 implementation and/or site defined.
- 584 • **‘edge-stitch-bottom’ (27):** Bind the Set(s) with two or more staples (wire
585 stitches) along the bottom edge. The exact number and placement of the staples
586 are implementation and/or site defined.
- 587 • **‘staple-dual-left’ (28):** Bind the Set(s) with two staples (wire stitches) along the
588 left edge assuming a portrait document (see section 5.1).
- 589 • **‘staple-dual-top’ (29):** Bind the Set(s) with two staples (wire stitches) along the
590 top edge assuming a portrait document (see section 5.1).
- 591 • **‘staple-dual-right’ (30):** Bind the Set(s) with two staples (wire stitches) along
592 the right edge assuming a portrait document (see section 5.1).
- 593 • **‘staple-dual-bottom’ (31):** Bind the Set(s) with two staples (wire stitches) along
594 the bottom edge assuming a portrait document (see section 5.1).

595 **5.1.2 PWG 5100.1-2001 “finishings” Values**

596 The IPP “finishings” attribute values extension [PWG5100.1-2001] defined the following
597 values for the “finishings” attribute:

- 598 • **‘fold’ (10):** Fold the hardcopy output. The exact number and orientations of the
599 folds is implementation and/or site defined.
- 600 • **‘trim’ (11):** Trim the hardcopy output on one or more edges. The exact number
601 of edges and the amount to be trimmed is implementation and/or site defined.
- 602 • **‘bale’ (12):** Bale the Set(s). The type of baling is implementation and/or site
603 defined.

- 604 • **'booklet-maker' (13):** Deliver the Set(s) to the signature booklet maker. This
605 value is a short cut for specifying a Job that is to be folded, trimmed and then
606 saddle-stitched.
- 607 • **'jog-offset' (14): (DEPRECATED)** Shift each Set from the previous one by a
608 small amount which is device dependent. This value has no effect on the "job-
609 sheet". This value SHOULD NOT have an effect if each Set of the Job consists
610 of one sheet. The "output-bin" Job Template attribute can be used instead,
611 specifying one of the 'stacker-NN' keywords (e.g. 'stacker-1').
- 612 • **'bind-left' (50):** Bind the Set(s) along the left edge; the type of the binding is
613 implementation and/or site defined.
- 614 • **'bind-top' (51):** Bind the Set(s) along the top edge; the type of the binding is
615 implementation and/or site defined.
- 616 • **'bind-right' (52):** Bind the Set(s) along the right edge; the type of binding is
617 implementation and/or site defined.
- 618 • **'bind-bottom' (53):** Bind the Set(s) along the bottom edge; the type of the
619 binding is implementation and/or site defined.

620 5.1.3 PWG 5100.1-2014 "finishings" Values

621 The IPP Finishings 2.0 specification [PWG5100.1-2014] defined the following values for the
622 "finishings" attribute:

- 623 • **'coat' (15):** Apply a protective liquid or powdered coating to each sheet in an
624 implementation and/or site defined manner.
- 625 • **'laminate' (16):** Apply a protective (solid) material to each sheet in an
626 implementation and/or site defined manner.
- 627 • **'staple-triple-left' (32):** Bind the Set(s) with three staples (wire stitches) along
628 the left edge assuming a portrait document (see section 5.1).
- 629 • **'staple-triple-top' (33):** Bind the Set(s) with three staples (wire stitches) along
630 the top edge assuming a portrait document (see section 5.1).
- 631 • **'staple-triple-right' (34):** Bind the Set(s) with three staples (wire stitches) along
632 the right edge assuming a portrait document (see section 5.1).
- 633 • **'staple-triple-bottom' (35):** Bind the Set(s) with three staples (wire stitches)
634 along the top edge assuming a portrait document (see section 5.1).
- 635 • **'punch-top-left' (70):** Punch a single hole in the top left of the hardcopy output.

- 636 • **'punch-bottom-left' (71):** Punch a single hole in the bottom left of the hardcopy
637 output.
- 638 • **'punch-top-right' (72):** Punch a single hole in the top right of the hardcopy
639 output.
- 640 • **'punch-bottom-right' (73):** Punch a single hole in the bottom right of the
641 hardcopy output.
- 642 • **'punch-dual-left' (74):** Punch two holes on the left side of the hardcopy output.
- 643 • **'punch-dual-top' (75):** Punch two holes at the top of the hardcopy output.
- 644 • **'punch-dual-right' (76):** Punch two holes on the right side of the hardcopy
645 output.
- 646 • **'punch-dual-bottom' (77):** Punch two holes at the bottom of the hardcopy
647 output.
- 648 • **'punch-triple-left' (78):** Punch three holes on the left side of the hardcopy
649 output.
- 650 • **'punch-triple-top' (79):** Punch three holes at the top of the hardcopy output.
- 651 • **'punch-triple-right' (80):** Punch three holes on the right side of the hardcopy
652 output.
- 653 • **'punch-triple-bottom' (81):** Punch three holes at the bottom of the hardcopy
654 output.
- 655 • **'punch-quad-left' (82):** Punch four holes on the left side of the hardcopy output.
- 656 • **'punch-quad-top' (83):** Punch four holes at the top of the hardcopy output.
- 657 • **'punch-quad-right' (84):** Punch four holes on the right side of the hardcopy
658 output.
- 659 • **'punch-quad-bottom' (85):** Punch four holes at the bottom of the hardcopy
660 output.
- 661 • **'fold-accordion' (90):** Accordion-fold the hardcopy output vertically into four
662 sections.
- 663 • **'fold-double-gate' (91):** Fold the top and bottom quarters of the hardcopy output
664 towards the midline, then fold in half vertically.

- 665 • **'fold-gate' (92):** Fold the top and bottom quarters of the hardcopy output
666 towards the midline.
- 667 • **'fold-half' (93):** Fold the hardcopy output in half vertically.
- 668 • **'fold-half-z' (94):** Fold the hardcopy output in half horizontally, then Z-fold the
669 paper vertically into three sections.
- 670 • **'fold-left-gate' (95):** Fold the top quarter of the hardcopy output towards the
671 midline.
- 672 • **'fold-letter' (96):** Fold the hardcopy output into three sections vertically;
673 sometimes also known as a C fold.
- 674 • **'fold-parallel' (97):** Fold the hardcopy output in half vertically two times, yielding
675 four sections.
- 676 • **'fold-poster' (98):** Fold the hardcopy output in half horizontally and vertically;
677 sometimes also called a cross fold.
- 678 • **'fold-right-gate' (99):** Fold the bottom quarter of the hardcopy output towards
679 the midline.
- 680 • **'fold-z' (100):** Fold the hardcopy output vertically into three sections, forming a
681 Z.

682 **5.1.4 PWG 5100.1-2017 “finishings” Values**

683 The IPP Finishings 2.1 specification [PWG5100.1-2017] defined the following values for the
684 “finishings” attribute:

- 685 • **'fold-engineering-z' (101):** Fold the hardcopy output vertically into three
686 sections, forming a Z but leaving room for binding, punching, or stapling along
687 the top edge
- 688 • **'punch-multiple-left' (86):** Drill or punch more than four holes along the
689 reference edge. For 1-4 holes, the individual explicit value ('punch-top-left',
690 'punch-dual-left', 'punch-triple-left' and 'punch-quad-left') SHOULD be used
691 instead. A Printer supplies the number and location of holes in the "punching"
692 member attribute in the collections listed by the "finishings-col-database" and
693 "finishings-col-ready" Printer Description attributes.
- 694 • **'punch-multiple-top' (87):** Drill or punch more than four holes along the
695 reference edge. For 1-4 holes, the individual explicit value ('punch-top-top',
696 'punch-dual-top', 'punch-triple-top' and 'punch-quad-top') SHOULD be used
697 instead. A Printer supplies the number and location of holes in the "punching"

member attribute in the collections listed by the "finishings-col-database" and "finishings-col-ready" Printer Description attributes.

- **'punch-multiple-right' (88):** Drill or punch more than four holes along the reference edge. For 1-4 holes, the individual explicit value ('punch-top-right', 'punch-dual-right', 'punch-triple-right' and 'punch-quad-right') SHOULD be used instead. A Printer supplies the number and location of holes in the "punching" member attribute in the collections listed by the "finishings-col-database" and "finishings-col-ready" Printer Description attributes.
- **'punch-multiple-bottom' (89):** Drill or punch more than four holes along the reference edge. For 1-4 holes, the individual explicit value ('punch-top-bottom', 'punch-dual-bottom', 'punch-triple-bottom' and 'punch-quad-bottom') SHOULD be used instead. A Printer supplies the number and location of holes in the "punching" member attribute in the collections listed by the "finishings-col-database" and "finishings-col-ready" Printer Description attributes.

5.1.5 PWG 5100.1-2020 “finishings” Values

This IPP Finishings 3.0 specification defines the following values, which were originally defined in [PWG5100.13-2012]:

- **'trim-after-pages' (60):** Trim output after each page.
- **'trim-after-documents' (61):** Trim output after each Document.
- **'trim-after-copies' (62):** Trim output after each Set.
- **'trim-after-job' (63):** Trim output after Job.

5.2 finishings-col (no-value | 1setOf collection)

This REQUIRED Job Template attribute specifies detailed finishing instructions that cannot be expressed by the "finishings" Job Template attribute (section 5.1). A Client creates the "finishings-col" for a Job by supplying all the "finishings-col" collections that correspond to the user's selections among the finishing operations listed by the Printer's "finishings-col-database" Printer Description attribute (section 6.9) and/or "finishings-col-ready" Printer Description attribute (section 6.11).

A Printer that supports any of the finishing processes listed in section 4 MUST support both this attribute and the "finishings" attribute. A Client supplies either the "finishings" or "finishings-col" attribute in a Job Creation request, but not both. A Printer MUST reject a Job Creation request supplying both the "finishings" and "finishings-col" attributes and return the 'client-error-conflicting-attributes' status code.

Table 2 lists the "finishings-col" member attributes. The order of member attributes supplied in the "finishings-col" attribute is not significant except for the ordering of "folding" member

733 attributes if present. A Printer MUST accept member attributes in any order. A Client supplies
 734 the 'no-value' out-of-band value to specify that no finishing processes are requested.

735 **Table 2 - "finishings-col" Member attributes**

Member attribute	Printer Conformance
finishing-template	REQUIRED
baling	CONDITIONALLY REQUIRED
binding	CONDITIONALLY REQUIRED
coating	CONDITIONALLY REQUIRED
covering	CONDITIONALLY REQUIRED
folding	CONDITIONALLY REQUIRED
laminating	CONDITIONALLY REQUIRED
punching	CONDITIONALLY REQUIRED
stitching	CONDITIONALLY REQUIRED
trimming	CONDITIONALLY REQUIRED

736 Supported values for each "xxx" member attribute and sub-member attribute are listed in a
 737 corresponding "xxx-supported" Printer Description attribute defined in section 6.

738 A Client supplies a complete set of member attributes to describe the desired finishing
 739 operation in cases where it does not supply the "finishing-template" member attribute
 740 (section 5.2.5). When a Client supplies a "finishing-template" member attribute, the Printer
 741 copies the other member attributes and their values from the matching collection in its
 742 "finishings-col-database" Printer Description attribute (section 6.9) to the Job. A Client
 743 supplies member attributes to override those from the matching collection. A Printer that
 744 receives a request that results in an incomplete "finishings-col" value MUST either reject the
 745 request and return the 'client-error-attributes-or-values-not-supported' status code or accept
 746 the request and return the 'successful-ok-ignored-or-substituted-attributes' status code
 747 [STD92].

748 The "xxx-reference-edge" member attributes all share a common set of keyword values
 749 defined in Table 3. These member attributes are all single valued, e.g., 'top-left' is not
 750 allowed.

751 **Table 3 - Reference Edge Keywords**

Keyword	Description
'bottom'	The edge at the bottom of the Media Sheet. This edge coincides with the x-axis of the coordinate system.
'top'	The edge at the top of the Media Sheet, parallel to the 'bottom' edge.
'left'	The edge on the left of the Media Sheet. This edge coincides with the y-axis of the coordinate system.

'right' The edge on the right side of the Media Sheet, parallel to the 'left' edge.

752 **5.2.1 baling (collection)**

753 This CONDITIONALLY REQUIRED member attribute specifies the type of baling to apply to
 754 a collection of Media Sheets. A Printer with a baling finisher MUST support this member
 755 attribute and all its member attributes.

756 **5.2.1.1 baling-type (type2 keyword | name(MAX))**

757 This REQUIRED member attribute specifies the baling to perform. This specification defines
 758 the following keywords:

- 759 • **'band'**: Media Sheets are baled with a paper or plastic band.
- 760 • **'shrink-wrap'**: Media Sheets are shrink-wrapped in plastic.
- 761 • **'wrap'**: Media Sheets are wrapped in paper.

762 **5.2.1.2 baling-when (type2 keyword)**

763 This REQUIRED member attribute specified when Media Sheets are baled. If a Client does
 764 not supply this member attribute and the template from the Printer's "finishings-col-
 765 database" doesn't include this member attribute, the Printer MUST use 'after-sets' as the
 766 default value.

767 This specification defines the following keywords:

- 768 • **'after-job'**: All Media Sheets produced by the Job are baled.
- 769 • **'after-sets'**: Each Set of Media Sheets are baled.

770 **5.2.2 binding (collection)**

771 This CONDITIONALLY REQUIRED member attribute specifies the location and type of
 772 binding to apply to the hardcopy output. A Printer with a binding finisher MUST support this
 773 member attribute and all its member attributes.

774 **5.2.2.1 binding-reference-edge (type1 keyword)**

775 This REQUIRED member attribute specifies the Finishing Reference Edge to be bound,
 776 using the keywords defined in Table 3.

777 **5.2.2.2 binding-type (type2 keyword | name(MAX))**

778 This REQUIRED member attribute specifies the type of binding to apply. This specification
 779 defines the following keyword values:

- 780 • **'adhesive'**: Media Sheets are bound using glue or adhesive.
- 781 • **'comb'**: Media Sheets are bound by placing small rectangular holes along the
782 binding edge and using a tube-shaped plastic binding strip with comb like fingers
783 that fit through the holes.
- 784 • **'flat'**: Media Sheets are bound so that they can lay flat when the hardcopy output
785 is opened. The specific method of producing such a binding is implementation
786 defined.
- 787 • **'padding'**: Media Sheets are bound by applying a non-penetrating adhesive to
788 the edge of the stack of sheets so that the sheets can be easily peeled off one at
789 a time.
- 790 • **'perfect'**: Media Sheets are bound by roughing the binding edge and applying
791 an adhesive.
- 792 • **'spiral'**: Media Sheets are bound by placing small round holes along the binding
793 edge and winding plastic or metal wire through the holes in a spiral pattern.
- 794 • **'tape'**: Media Sheets are bound by placing tape along the binding edge,
795 overlapping the top and bottom sheets of the stack.
- 796 • **'velo'**: Media Sheets are bound by placing small holes along the binding edge
797 and joining the sheets using plastic strips with pins that extend through those
798 holes.

799 **5.2.3 coating (collection)**

800 This CONDITIONALLY REQUIRED member attribute specifies the coating to apply to the
801 Media Sheets. A Printer with a coating finisher MUST support this member attribute and all
802 its member attributes.

803 **5.2.3.1 coating-sides (type1 keyword)**

804 This REQUIRED member attribute specifies the sides of the Media Sheets to be coated:
805 'front', 'back', or 'both'.

806 **5.2.3.2 coating-type (type2 keyword | name(MAX))**

807 This REQUIRED member attribute specifies the type of coating to apply. This specification
808 defines the following keywords:

- 809 • **'archival'**: Coat each Media Sheet to preserve the output for an extended period
810 of time, e.g., a UV protectant.

- 811 • **'archival-glossy'**: Coat each Media Sheet to produce a glossy surface that
812 preserves the output for an extended period of time, e.g., a UV protectant.
- 813 • **'archival-matte'**: Coat each Media Sheet to produce a matte surface that
814 preserves the output for an extended period of time, e.g., a UV protectant.
- 815 • **'archival-semi-gloss'**: Coat each Media Sheet to produce a semi-gloss surface
816 that preserves the output for an extended period of time, e.g., a UV protectant.
- 817 • **'glossy'**: Coat each Media Sheet to produce a glossy surface.
- 818 • **'high-gloss'**: Coat each Media Sheet to produce a high-gloss surface.
- 819 • **'matte'**: Coat each Media Sheet to produce a matte surface.
- 820 • **'semi-gloss'**: Coat each Media Sheet to produce a semi-gloss surface.
- 821 • **'silicone'**: Coat each Media Sheet to produce a water-resistant surface.
- 822 • **'translucent'**: Coat each Media Sheet to produce a translucent surface.

823 **5.2.4 covering (collection)**

824 This CONDITIONALLY REQUIRED member attribute specifies which cover to apply over
825 the hardcopy output. A Printer with a cover finisher MUST support this member attribute and
826 all its member attributes.

827 Note: Unlike the "cover-back" and "cover-front" Job Template attributes [PWG5100.3-2001],
828 finishing covers are applied over any binding, edge stitching, or staples and are not Media
829 Sheets.

830 **5.2.4.1 covering-name (type2 keyword | name(MAX))**

831 This REQUIRED member attribute specifies the cover to apply. The name typically
832 represents a pre-printed, pre-cut, or generic cover that is available to the Printer. This
833 specification defines the following keywords:

- 834 • **'plain'**: Apply a plain (blank) cover.
- 835 • **'pre-cut'**: Apply a pre-cut cover.
- 836 • **'pre-printed'**: Apply a pre-printed cover.

837 **5.2.5 finishing-template (type2 keyword | name(MAX))**

838 This REQUIRED member attribute specifies the unique name for the Finishing Template.
839 This specification defines keywords matching the names for all registered "finishings"
840 enums. This specification also defines keywords for each JDF @FoldCatalog [JDF1.5] value

841 of the form 'jdf-fN-N'. For example, the JDF @FoldCatalog value 'F8-6' (a triple fold
842 instruction similar to 'fold-parallel') would be specified using a "finishing-template" value of
843 'jdf-f8-6'.

844 A keyword can be extended by appending a qualifying label to the base registered keyword,
845 separated by an underscore, when a Printer supports multiple variants of a particular
846 finishing operation. For example, 'punch-quad-left_trio-binder', where 'punch-quad-left' is the
847 IANA registered type2 keyword, and 'trio-binder' is the qualifying label. This also enables
848 unique localized label strings for variants to be listed in the Printer's Message Catalog
849 [PWG5100.13].

850 A Client can also supply an implementation or site defined name. Vendor-unique finishing
851 processes SHOULD be identified using keywords with a suitable distinguishing prefix such
852 as 'smiNNN-' where NNN is an SMI Private Enterprise Number (PEN) [IANA-PEN]. For
853 example, if the company Example Corp. had obtained the SMI PEN 32473, then a vendor
854 attribute 'foo' would be 'smi32473-foo'. The Printer SHOULD provide localized strings for all
855 vendor unique "finishing-template" keyword values in its Message Catalog [PWG5100.13].

856 Note: Prior versions of this document recommended using a reversed domain name (e.g.,
857 'com.example-foo'). Domain names have proven problematic due to the length of some
858 domain names, parallel use of country-specific domain names (e.g., 'example.co.jp-foo'),
859 and changes in ownership of domain names.

860 **5.2.6 folding (1setOf collection)**

861 This CONDITIONALLY REQUIRED member attribute lists the location and direction of each
862 fold to be made to the Set, in order of execution. A Printer with a folding finisher MUST
863 support this member attribute and all its member attributes. A Printer MAY re-order "folding"
864 values so long as the result matches the specified intent.

865 This specification only defines folds parallel to its Finishing Reference Edge. Perpendicular
866 folds are achieved by choosing a perpendicular reference edge. Diagonal folds are
867 intentionally not supported.

868 A Client requests custom folding by supplying the "folding" member attribute with the
869 "folding-direction", "folding-location" and "folding-reference-edge" member attributes for
870 each collection. A Printer receiving an incomplete set of collections MUST either accept the
871 request, use implementation-defined defaults, and return 'successful-ok-ignored-or-
872 substituted-attributes' status code [STD92], or reject the request and return the 'client-error-
873 attributes-or-values-not-supported' status code [STD92].

874 The following example shows a "finishings-col-database" providing one collection describing
875 the 'fold-accordion' fold style from Figure 3 applied to A4 media sheets. If the folding finisher
876 or the fold style described has limits on the number of sheets that can be folded together,
877 that will be indicated in the collection by the "media-sheets-supported" member attribute
878 (section 6.9.2).

```

879     finishings-col-database=
880     {
881         finishing-template='fold-accordion'
882         media-size-name="iso_a4_210x297mm"
883         media-sheets-supported=1-8
884         folding=
885         {
886             folding-direction='inward'
887             folding-location=7425
888             folding-reference-edge='top'
889         },
890         {
891             folding-direction='inward'
892             folding-location=22275
893             folding-reference-edge='top'
894         },
895         {
896             folding-direction='outward'
897             folding-location=14850
898             folding-reference-edge='top'
899         }
900     }
901

```

902 5.2.6.1 folding-direction (type1 keyword)

903 This REQUIRED member attribute specifies whether the sheets are pushed outward
904 ('outward') or pulled inward ('inward') for the [current](#) fold.

905 5.2.6.2 folding-offset (integer(0:MAX))

906 This REQUIRED member attribute specifies the Finishing Offset where the [fold is made](#).
907 ~~The value is the distance from the Finishing Reference Edge, specified by the "folding-~~
908 ~~reference-edge" member attribute (section), toward the center of the medium~~[Printer folds](#)
909 [the Media Sheet](#), measured in hundredths of millimeters (1/2540th of an inch).

910 5.2.6.3 folding-reference-edge (type1 keyword)

911 This REQUIRED member attribute specifies the Finishing Reference Edge [relative to which](#)
912 ~~the Finishing Offset is measured~~ ('bottom', 'left', 'right', or 'top'). [used for the folding](#)
913 [operation](#).

914 5.2.7 laminating (collection)

915 This CONDITIONALLY REQUIRED member attribute specifies which material to apply to
916 the hardcopy output. A Printer with a laminating finisher MUST support this member attribute
917 and all its member attributes.

918 5.2.7.1 laminating-sides (type2 keyword)

919 This REQUIRED member attribute specifies which sides of the Media Sheets are laminated.
920 This specification defines the following keywords:

- 921 • **'front'**: The forward or primary side of a Media Sheet
- 922 • **'back'**: The rear or secondary side of a Media Sheet
- 923 • **'both'**: Both sides of a Media Sheet

924 5.2.7.2 laminating-type (type2 keyword | name(MAX))

925 This REQUIRED member attribute specifies the type of material used to laminate the Media
926 Sheets. This specification defines the following keywords:

- 927 • **'archival'**: Laminate each Media Sheet to preserve the output for an extended
928 period of time, e.g., a UV protectant.
- 929 • **'archival-glossy'**: Laminate each Media Sheet to produce a glossy surface that
930 preserves the output for an extended period of time, e.g., a UV protectant.
- 931 • **'archival-matte'**: Laminate each Media Sheet to produce a matte surface that
932 preserves the output for an extended period of time, e.g., a UV protectant.
- 933 • **'archival-semi-gloss'**: Laminate each Media Sheet to produce a semi-gloss
934 surface that preserves the output for an extended period of time, e.g., a UV
935 protectant.
- 936 • **'glossy'**: Laminate each Media Sheet to produce a glossy surface.
- 937 • **'high-gloss'**: Laminate each Media Sheet to produce a high-gloss surface.
- 938 • **'matte'**: Laminate each Media Sheet to produce a matte surface.
- 939 • **'semi-gloss'**: Laminate each Media Sheet to produce a semi-gloss surface.
- 940 • **'silicone'**: Laminate each Media Sheet to produce a water-resistant surface.
- 941 • **'translucent'**: Laminate each Media Sheet to produce a translucent surface.

942 5.2.8 punching (collection)

943 This CONDITIONALLY REQUIRED member attribute specifies the locations of holes to
944 make in the hardcopy output. A Printer with a hole punching/drilling finisher MUST support
945 this member attribute and all its member attributes.

946 The diameter of the hole made by the punch is indicated by the "punching-hole-diameter-
947 configured" Printer Description attribute (section 6.19).

948 A Client requests custom punching by supplying the "punching-locations", "punching-offset",
949 and "punching-reference-edge" member attributes. If a Printer receives an incomplete
950 collection, then it MUST either accept the request and return the 'successful-ok-ignored-or-
951 substituted-attributes' status code [STD92], or reject the request and return the 'client-error-
952 attributes-or-values-not-supported' status code [STD92].

953 **5.2.8.1 punching-locations (1setOf integer(0:MAX))**

954 This REQUIRED member attribute specifies the Finishing Locations of where the centers of
955 the Printer punches or drills holes to be punched or drilled on the Set, measured in
956 hundredths of millimeters (1/2540th of an inch), specified in ascending order) to the center
957 of each hole.

958 **5.2.8.2 punching-offset (integer(0:MAX))**

959 This REQUIRED member attribute specifies the Finishing Offset from where the center
960 of Printer punches or drills holes on the hole to the reference edge specified by the "punching-
961 reference-edge" member attribute (section), Set, measured in hundredths of millimeters
962 (1/2540th of an inch). from the Finishing Reference Edge to the center of each hole.

963 **5.2.8.3 punching-reference-edge (type1 keyword)**

964 This REQUIRED member attribute specifies the Finishing Reference Edge relative to which
965 the Finishing Offset is measured ('bottom', 'left', 'right', or 'top').) for the punching operation.

966 **5.2.9 stitching (collection)**

967 This CONDITIONALLY REQUIRED member attribute specifies the locations of stitches,
968 staples or crimps used to fasten Sets of Media Sheets. A Printer with a stapling / crimping /
969 stitching finisher MUST support this member attribute and all its member attributes.

970 A Client supplies the "stitching-locations", "stitching-offset, and "stitching-reference-edge"
971 member attributes to request custom stitching. A Printer receiving an incomplete collection
972 MUST either accept the request and return the 'successful-ok-ignored-or-substituted-
973 attributes' status code [STD92], or reject the request and return the 'client-error-attributes-
974 or-values-not-supported' status code [STD92].

975 **5.2.9.1 stitching-angle (integer(0:359))**

976 This REQUIRED member attribute specifies the staple or stitch's angle of counterclockwise
977 rotation around the center of the staple, measured in degrees. A value of 0 (zero degrees)
978 is parallel to the top edge of the Media Sheet in portrait orientation.

979 5.2.9.2 stitching-locations (1setOf integer(0:MAX))

980 This REQUIRED member attribute specifies the Finishing Locations for where the Printer
 981 places stitches on the Set, measured in hundredths of millimeters (1/2540th of an inch),
 982 specified in ascending order. If the value of the "stitching-reference-edge" member attribute
 983 (section) is either 'top' or 'bottom', then each value is the distance from the left edge toward
 984 to the center of the Media Sheet. If the value of the "stitching-reference-edge" is either 'left'
 985 or 'right', then each value is the distance from the bottom edge toward the center of the
 986 Media Sheet each stitch.

987 5.2.9.3 stitching-method (type2 keyword)

988 This REQUIRED member attribute specifies the type of stitching to use. This specification
 989 defines the following keywords:

- 990 • 'auto': Automatically choose a stitching type.
- 991 • 'crimp': Crimp the Set together.
- 992 • 'wire': Use wire staples.

993 5.2.9.4 stitching-offset (integer(0:MAX))

994 This REQUIRED member attribute specifies the Finishing Offset at which where the Printer
 995 places stitches on the Set, measured in hundredths of a millimeter millimeters (1/2540th of
 996 an inch). The Finishing Offset is relative to the) from the Finishing Reference Edge specified
 997 by the "stitching-reference-edge" member attribute (section) to the center of each stitch.

998 5.2.9.5 stitching-reference-edge (type1 keyword)

999 This REQUIRED member attribute specifies the Finishing Reference Edge relative to which
 1000 the Finishing Offset is measured ('bottom', 'left', 'right', or 'top'). for the stitching operation.

1001 5.2.10 trimming (1setOf collection)

1002 This CONDITIONALLY REQUIRED member attribute specifies where to cut, perforate, or
 1003 score the Media Sheets. A Printer with a trimming / cutting / perforation / scoring finisher
 1004 MUST support this member attribute and all its member attributes.

1005 A Client supplies the "trimming-offset", "trimming-reference-edge", and "trimming-type"
 1006 member attributes to request custom trimming. A Printer that receives an incomplete
 1007 collection MUST either accept the request and return the 'successful-ok-ignored-or-
 1008 substituted-attributes' status code [STD92], or reject the request and return the 'client-error-
 1009 attributes-or-values-not-supported' status code [STD92].

1010 **5.2.10.1 trimming-offset (1setOf integer(0:MAX))**

1011 This REQUIRED member attribute specifies the Finishing Offset where the Printer cuts,
 1012 perforates, or scores the Media Sheet, ~~(s), measured in hundredths of millimeters (1/2540th~~
 1013 ~~of an inch). The Finishing Offset is relative to) from~~ the Finishing Reference Edge ~~specified~~
 1014 ~~by the "trimming-reference-edge" member attribute (section).~~

1015 **5.2.10.2 trimming-reference-edge (type1 keyword)**

1016 This REQUIRED member attribute specifies the Finishing Reference Edge ~~relative to which~~
 1017 ~~the Finishing Offset is measured~~ ('bottom', 'left', 'right', or 'top'). for the trimming operation.

1018 **5.2.10.3 trimming-type (type2 keyword | name(MAX))**

1019 This REQUIRED member attribute specifies the type of trimming to use. This specification
 1020 defines the following keywords:

- 1021 • **'draw-line'**: Marks a cut line on the Media Sheet
- 1022 • **'full'**: Cuts the Media Sheet
- 1023 • **'partial'**: Partially cuts the Media Sheet
- 1024 • **'perforate'**: Pierces the Media Sheet
- 1025 • **'score'**: Scores the Media Sheet
- 1026 • **'tab'**: Cuts the Media Sheet, leaving a hanging tab.

1027 **5.2.10.4 trimming-when (type2 keyword)**

1028 This REQUIRED member attribute specifies when to perform the trimming operation. This
 1029 specification defines the following keywords:

- 1030 • **'after-documents'**: Trim after each Document.
- 1031 • **'after-job'**: Trim after the Job.
- 1032 • **'after-sets'**: Trim after each Set.
- 1033 • **'after-sheets'**: Trim after each Media Sheet.

1034 If a Client does not supply this member attribute, and the finishing template from the Printer's
 1035 "finishings-col-database" does not include this member attribute, the Printer MUST use
 1036 'after-sets' as the default value.

5.3 job-pages-per-set (integer(1:MAX))

This CONDITIONALLY REQUIRED Job Template attribute specifies the number of Input Pages that constitute a Set for finishing processes. A Printer MUST support this attribute when it does not support the "copies" Job Template attribute [STD92] for the specified Document format.

A Client supplies this attribute only when the Printer does not support the "copies" attribute for the selected Document format. If the Client supplies both this attribute and the "copies" attribute, the Printer MUST either accept the request and return the 'successful-ok-ignored-or-substituted-attributes' status code [STD92] to indicate which value it used, or reject the request and return the 'client-error-attributes-or-values-not-supported' status code [STD92].

A Client supplies a value for this attribute that is evenly divisible by the number of Input Pages, since it is being used to demarcate the length of a single Set (see the sections on the "multiple-document-handling" Job Template attribute [STD92] for more information on using this attribute with multiple Document Jobs). If the Printer receives a Document with a number of pages that is not evenly divisible by the value supplied for "job-pages-per-set", the Printer MUST accept the request, treat any remaining pages as a separate Set for finishing, return the 'successful-ok' status code [STD92], and include the 'job-completed-with-warnings' keyword in the "job-state-reasons" Job Status attribute [STD92] to report the issue.

For example, to produce two copies of a source containing seven Input Pages with each copy stapled, using a Printer that supports PWG Raster [PWG5102.4] but does not support "copies", a Client encodes that intent by rendering the source to produce a Document in PWG Raster format containing 14 pages, and submits that in a Create-Job / Send-Document operation sequence that includes the following IPP Job Template attributes:

- "job-pages-per-set" = 7
- "finishings" = '4' (staple)

Figure 4 shows a graphical representation of this example. Without "job-pages-per-set" to indicate the Set boundary and the Document lacked the blank pages, the Printer would create 14 impressions on 7 Media Sheets and staple them all together.

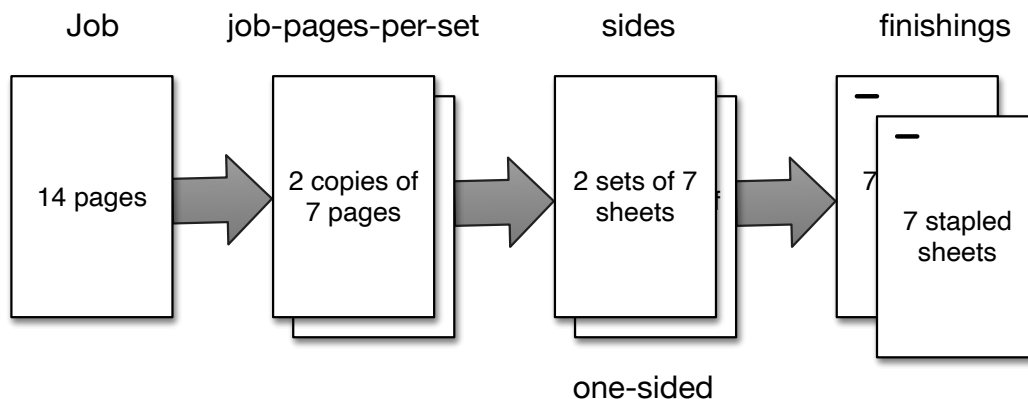


Figure 4 - Handling of "job-pages-per-set" with One-Sided Printing

To produce the same output but with two-sided printing enabled, the Client creates a Document in PWG Raster format containing 16 pages (seven pages from source, one blank page, seven pages from source, one blank page, to ensure two-sided printing works properly), and submits that in a Create-Job / Send-Document operation sequence that includes the following IPP Job Template attributes:

- "job-pages-per-set" = 8
- "sides" = 'two-sided-long-edge'
- "finishings" = '4' (staple)

Figure 5 shows a graphical representation of this example. If the Client does not insert blank pages and update the value of "job-pages-per-set" to include the blank pages to make the number of pages be an even number, the Printer's behavior is undefined.

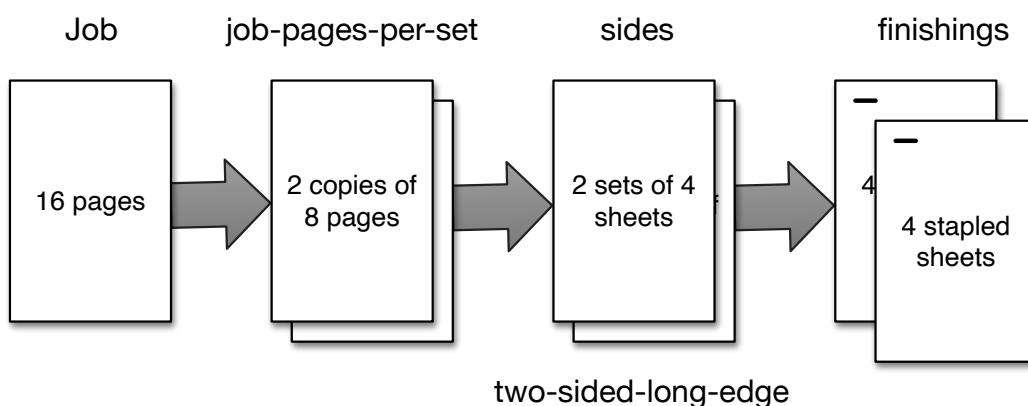


Figure 5 - Handling of "job-pages-per-set" with Two-Sided Printing

6.1. Printer Status Attributes

6. Printer Description Attributes

Table 4 lists the Printer StatusDescription attributes defined in this specification and their associated Printer conformance requirements.

Table 4—~~New Printer Status Attributes~~

<u>Attribute</u>	<u>Printer Conformance</u>
<u>printer finisher</u>	<u>REQUIRED</u>
<u>printer finisher description</u>	<u>REQUIRED</u>
<u>printer finisher supplies</u>	<u>CONDITIONALLY REQUIRED</u>
<u>printer finisher supplies description</u>	<u>CONDITIONALLY REQUIRED</u>

6.11.1 printer finisher (1setOf octetString(MAX))

This REQUIRED Printer Status attribute lists strings describing each of the Printer's installed (although perhaps not currently attached) finisher subunits. A Printer MUST list all installed finisher subunits. This attribute MUST have the same cardinality (supply the same number of strings) as the "printer finisher description" attribute (section). The i^{th} string in this attribute corresponds to the i^{th} string in the "printer finisher description" attribute. A Printer MUST support this attribute if it implements the IETF Finishing MIB [RFC3806] and the values MUST be mapped from the IETF Finishing MIB elements listed in:

Table —Keywords for "printer finisher"

<u>Key</u>	<u>IPP Data Type</u>	<u>Finishing MIB Element</u>	<u>Printer Conformance</u>
<u>type</u>	<u>String</u>	<u>finDeviceType</u>	<u>REQUIRED</u>
<u>unit</u>	<u>String</u>	<u>finDeviceCapacityUnit</u>	<u>REQUIRED</u>
<u>maxcapacity</u>	<u>Integer</u>	<u>finDeviceMaxCapacity</u>	<u>REQUIRED</u>
<u>index</u>	<u>Integer</u>	<u>finDeviceIndex</u>	<u>REQUIRED</u>
<u>presentonoff</u>	<u>String</u>	<u>finDevicePresentOnOff</u>	<u>REQUIRED</u>
<u>status</u>	<u>Integer</u>	<u>finDeviceStatus</u>	<u>REQUIRED</u>
<u>capacity</u>	<u>Integer</u>	<u>finDeviceCurrentCapacity</u>	<u>DEPRECATED</u>

Each string consists of an unordered sequence of key/value pairs, structured according to the ABNF [STD68] [FIN ABNF] defined in

Figure 6. A Printer MUST encode the strings listed by this attribute using only printable characters from the Net ASCII subset of the US ASCII character set [RFC5198].

Figure 6—ABNF for "printer finisher" Values

```

printer finisher = 1*finisher required *finisher optional
; set of finisher elements encoded into one value
finisher required = finisher req ","
finisher req = finisher type / finisher unit /

```

```

===== finisher max capacity / finisher index /
===== finisher presentonoff / finisher status
finisher optional = finisher opt ","
finisher opt = finisher capacity
=====
finisher type = "type" "-" 1*ALPHA
; enumerated value as an alpha string (e.g.,
; 'stitcher') of finDeviceType [RFC3806] mapped
; indirectly from the *label* in FinDeviceTypeTC
finisher unit = "unit" "-" 1*ALPHA
; enumerated value as an alpha string (e.g., 'other') of
; finDeviceCapacityUnit in [RFC3806] mapped indirectly from
; the *label* in PrtCapacityUnitTC [RFC3805]
finisher max capacity = "maxcapacity" "-" 1*[DIGIT / " "]
; integer value as a numeric string mapped directly from
; finDeviceMaxCapacity [RFC3806]
finisher capacity = "capacity" "-" 1*[DIGIT / " "]
; integer value as a numeric string mapped directly from
; finDeviceCurrentCapacity [RFC3806]
finisher index = "index" "-" 1*[DIGIT]
; integer value as a numeric string mapped directly from
; finDeviceIndex [RFC3806]
finisher presentonoff = "presentonoff" "-" "other" / "on" /
"off" / "notPresent"
; string value as an alpha string of
; finDevicePresentOnOff [RFC3806] mapped indirectly
; from the *label* in PresentOnOff [RFC3805]
finisher status = "status" "-" 1*[DIGIT]
; integer value as a numeric string mapped directly from
; finDeviceStatus [RFC3806]
finisher ext = finisher extname "-" finisher extvalue
finisher extname = 1*[ALPHA / DIGIT / " "]
finisher extvalue = 1*[ALPHA / DIGIT / " " / "." / ","]
; extension point for other MIB values not mapped

```

6.1.11.1.1 Example of printer finisher

Figure 7 describes an example "printer finisher" attribute listing two strings describing staple and punch finisher subunits, presented using PAPI textual encoding [PAPI] with line breaks added for readability.

Figure 7—PAPI Example of "printer finisher"

```

printer finisher[1] = "index=0;
                      type=stitcher;
                      unit=sheets;
                      maxcapacity=500;"

```

```
printer_finisher[2] = "index=3,  
type=puncher,  
unit=sheets,  
maxcapacity=100,"
```

~~6.21.1 printer_finisher_description (1setOf text(MAX))~~

~~This REQUIRED Printer Status attribute lists localized descriptions for each currently installed finisher subunit listed by the "printer_finisher" Printer Status attribute (section).~~

~~This attribute MUST have the same cardinality (supply the same number of values) as the "printer_finisher" attribute. The i^{th} value in the "printer_finisher_description" attribute corresponds to the i^{th} value in the "printer_finisher" attribute.~~

~~If a Printer implements the IETF Finishing MIB [RFC3806], then the Printer MUST support this attribute and MUST map each human-readable (localized) value from finDeviceDescription to one of the strings supplied by this attribute using the following process:~~

- ~~1. The value of finDeviceDescription is converted from the character set specified by prtGeneralCurrentLocalization and prtLocalizationCharacterSet to the character set specified by the "charset-configured" Printer Description attribute [STD92]; and~~
- ~~2.1. The new "printer_finisher_description" value is tagged with the natural language specified by prtGeneralCurrentLocalization, prtLocalizationLanguage, and prtLocalizationCountry unless the natural language matches the language to be used in the response as indicated by the "attributes-natural-language" operation attribute [STD92].~~

~~6.2.11.1.1 Example of printer_finisher_description~~

~~Figure 8 describes an example "printer_finisher_description" attribute listing two values corresponding to the values in Figure 7, each tagged with the natural language identifier for "de" (German), presented using PAPI textual encoding [PAPI] with line breaks added for readability.~~

~~Figure 8 PAPI Example of "printer_finisher_description"~~

```
printer_finisher_description[1] = "Heftter SN:DEISPIEL 12345"(de)  
printer_finisher_description[2] = "Lochstanze S/N:DEISPIEL 67890"(de)
```

~~6.31.1 printer_finisher_supplies (1setOf octetString(MAX))~~

~~This CONDITIONALLY REQUIRED Printer Status attribute lists a string for each supply used by the Printer's installed finishing subunits. A Printer MUST support this attribute if it implements the IETF Finishing MIB [RFC3806] finSupplyTable. A Printer that supports this attribute MUST support the "printer_finisher_supplies_description" attribute (section).~~

Each value consists of an unordered sequence of key/value pairs, structured according to the ABNF [STD68] [FIN-ABNF] defined in Figure 9. lists the keys defined in this specification and their derivation from the corresponding elements in the finSupplyTable defined in the IETF Finishing MIB.

Table — Keywords for "printer finisher supplies"

Key	IPP Data Type	Finishing MIB Element	Printer Conformance
deviceIndex	Integer	finSupplyDeviceIndex	REQUIRED (note 1)
class	String	finSupplyClass	REQUIRED
type	String	finSupplyType	REQUIRED
unit	String	finSupplyUnit	REQUIRED
max	Integer	finSupplyMaxCapacity	REQUIRED
level	Integer	finSupplyCurrentLevel	REQUIRED
color	String	finSupplyColorName	REQUIRED
index	Integer	finSupplyIndex	OPTIONAL (note 2)

Notes:

1. REQUIRED to associate the supply to the finisher subunit using that supply.
- 2.1. OPTIONAL because correlation with the original MIB order is not needed.

This attribute MUST have the same cardinality (supply the same number of values) as the "printer finisher supplies description" attribute. The i^{th} value in the "printer finisher supplies" attribute corresponds to the i^{th} value in the "printer finisher supplies description" attribute.

A Printer MUST encode the values of "printer finisher supplies" using printable characters from the Not ASCII subset of the US ASCII character set [RFC5198].

Figure 9 — ABNF for "printer finisher supplies" Values

```

finisher supply = 1*supply required *supply optional
; set of finisher supply elements encoded into one value
supply required = supply req "/"
supply req = supply class / supply type / supply description /
supply unit / supply max / supply current level /
supply color

supply optional = supply opt "/"
supply opt = supply index / supply device index / supply ext

supply class = "class" "-" 1*ALPHA
; enumerated value as an alpha string (e.g., 'supplyThatIsConsumed')
; of prtMarkerSuppliesClass in [RFC3805] mapped indirectly from
; the *label* in PrtMarkerSuppliesClassTC in [RFC3805]

supply type = "type" "-" 1*ALPHA
; enumerated value as an alpha string (e.g., 'staples') of
; prtMarkerSuppliesType in [RFC3805] mapped indirectly from
; the *label* in PrtMarkerSuppliesTypeTC in [RFC3805]

supply unit = "unit" "-" 1*ALPHA

```

```

supply max = "max" "=" 1*[DIGIT / ""]
// integer value as a numeric string mapped directly from
// finSupplyMaxCapacity in [RFC3806]

supply current_level = "level" "=" 1*[DIGIT / ""]
// integer value as a numeric string mapped directly from
// finSupplyCurrentLevel in [RFC3806]

supply color = "color" "=" 1*ALPHA
// enumerated value as an alpha string (e.g., 'silver') of
// finSupplyColorName in [RFC3806] mapped indirectly from the color
// names from PWC Media Standardized Names 2.0 [PWC5101.1]

supply index = "index" "=" 1*[DIGIT]
// integer value as a numeric string mapped directly from
// finSupplyIndex in [RFC3806]

supply device_index = "deviceIndex" "=" 1*ALPHA
// string value as an alpha string mapped directly from
// finSupplyDeviceIndex in [RFC3806]

supply ext = supply extname "=" supply extvalue
supply extname = 1*[ALPHA / DIGIT / ""]
supply extvalue = 1*[ALPHA / DIGIT / " " / "." / ","]
// extension point for other MIB values not mapped

```

~~6.3.11.1.1 Example of printer finisher supplies~~

~~Figure 10 shows an example "printer finisher supplies" listing one finisher supply, referencing the stitcher finisher device subunit listed in Figure 7, presented using a PAPI [PAPI] encoding (line breaks added for readability).~~

Figure 10- PAPI Example of "printer-finisher-supplies"

```
printer_finisher_supplies = {"class": supplyThatIsConsumed,  
                               type=staples,  
                               unit=items,  
                               max=500,  
                               level=100,  
                               color=silver,  
                               index=8.}"
```

6.41.1 printer-finisher-supplies-description (1setOf text(MAX))

~~This CONDITIONALLY REQUIRED Printer Status attribute lists localized descriptions of finisher supplies listed by the "printer finisher supplies" Printer Status attribute (section). A Printer MUST support this attribute if it supports the "printer finisher supplies" attribute. A Printer MUST support this attribute if the Printer implements the IETF Finishing MIB [RFC3806] finSupplyTable.~~

~~The values of this attribute are consistent with the finSupplyDescription element [RFC3806].~~

~~If the Printer implements the IETF Finishing MIB finSupplyTable, it MUST map each human-readable (localized) finSupplyDescription value to one of the strings supplied by this attribute using the following process:~~

- ~~1. The value of finSupplyDescription is converted from the character set specified by prtGeneralCurrentLocalization and prtLocalizationCharacterSet to the character set specified by the "charset-configured" Printer Description attribute [STD92]; and~~
- ~~2.1. The new "printer finisher supplies description" value is tagged with the natural language specified by prtGeneralCurrentLocalization, prtLocalizationLanguage, and prtLocalizationCountry unless the natural language matches the language to be used in the response as indicated by the "attributes-natural language" operation attribute [STD92].~~

~~This attribute MUST have the same cardinality (supply the same number of values) as the "printer finisher supplies" attribute. The ith value in the "printer finisher supplies description" attribute corresponds to the ith value in the "printer finisher supplies" attribute.~~

~~6.4.11.1.1 Example of printer finisher supplies description~~

~~Figure 11 shows an example of "printer finisher supplies description" listing a description for the supply listed in Figure 10, tagged with the "de" (German) natural language identifier, presented using a PAPI [PAPI] encoding.~~

~~Figure 11 PAPI Example of "printer finisher supplies description"~~

~~printer finisher supplies description = "Heftklammern"(de)~~

~~7.1. Printer Description Attributes~~

~~lists the Printer Description attributes defined in this specification and their associated Printer conformance requirements.~~

~~Table - New Printer Description Attributes~~

Attribute	Printer Conformance
baling-type-supported	CONDITIONALLY REQUIRED
baling-when-supported	CONDITIONALLY REQUIRED
binding-reference-edge-supported	CONDITIONALLY REQUIRED
binding-reference-edge-supported	CONDITIONALLY REQUIRED
coating-sides-supported	CONDITIONALLY REQUIRED
coating-type-supported	CONDITIONALLY REQUIRED
covering-name-supported	CONDITIONALLY REQUIRED
finishing-template-supported	REQUIRED
finishings-col-database	REQUIRED

finishings-col-default	REQUIRED
finishings-col-ready	REQUIRED
folding-direction-supported	CONDITIONALLY REQUIRED
folding-offset-supported	CONDITIONALLY REQUIRED
folding-reference-edge-supported	CONDITIONALLY REQUIRED
folding-direction-supported	CONDITIONALLY REQUIRED
folding-offset-supported	CONDITIONALLY REQUIRED
folding-reference-edge-supported	CONDITIONALLY REQUIRED
laminating-sides-supported	CONDITIONALLY REQUIRED
laminating-type-supported	CONDITIONALLY REQUIRED
job-pages-per-set-supported	CONDITIONALLY REQUIRED
punching-hole-diameter-configured	CONDITIONALLY REQUIRED
punching-locations-supported	CONDITIONALLY REQUIRED
punching-offset-supported	CONDITIONALLY REQUIRED
punching-reference-edge-supported	CONDITIONALLY REQUIRED
stitching-angle-supported	CONDITIONALLY REQUIRED
stitching-locations-supported	CONDITIONALLY REQUIRED
stitching-method-supported	CONDITIONALLY REQUIRED
stitching-offset-supported	CONDITIONALLY REQUIRED
stitching-reference-edge-supported	CONDITIONALLY REQUIRED
trimming-offset-supported	CONDITIONALLY REQUIRED
trimming-reference-edge-supported	CONDITIONALLY REQUIRED
trimming-type-supported	CONDITIONALLY REQUIRED
trimming-when-supported	CONDITIONALLY REQUIRED

1299 **7.16.1 baling-type-supported (1setOf (type2 keyword | name(MAX)))**

1300 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
 1301 of the "baling-type" member attribute (section 5.2.1.1). A Printer MUST support this attribute
 1302 if it supports the "baling-type" member attribute.

1303 **7.26.2 baling-when-supported (1setOf type2 keyword)**

1304 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
 1305 of the "baling-when" member attribute (section 5.2.1.2). A Printer MUST support this attribute
 1306 if it supports the "baling-when" member attribute.

1307 **7.36.3 binding-reference-edge-supported (1setOf type1 keyword)**

1308 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
 1309 of the "binding-reference-edge" member attribute (section 5.2.2.1). A Printer MUST support
 1310 this attribute if it supports the "baling-reference-edge" member attribute.

1311 **7.46.4 binding-type-supported (1setOf type2 keyword)**

1312 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1313 of the "binding-type" member attribute (section 5.2.2.2). A Printer MUST support this
1314 attribute if it supports the "binding-type" member attribute.

1315 **7.56.5 coating-sides-supported (1setOf type1 keyword)**

1316 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1317 of the "coating-sides" member attribute (section 5.2.3.1). A Printer MUST support this
1318 attribute if it supports the "coating-sides" member attribute.

1319 **7.66.6 coating-type-supported (1setOf (type2 keyword | name(MAX)))**

1320 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1321 of the "coating-type" member attribute (section 5.2.3.2). A Printer MUST support this
1322 attribute if it supports the "coating-type" member attribute.

1323 **7.76.7 covering-name-supported (1setOf (type2 keyword | name(MAX)))**

1324 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1325 of the "covering-name" member attribute (section 5.2.4.1). A Printer MUST support this
1326 attribute if it supports the "covering-name" member attribute.

1327 **7.86.8 finishing-template-supported (1setOf (name(MAX) | type2
1328 keyword))**

1329 This REQUIRED Printer Description attribute lists the supported values of the "finishing-
1330 template" member attribute (section 5.2.5). A Printer MUST list keyword value equivalents
1331 for all enum values listed by its "finishings-supported" Printer Description attribute [STD92]
1332 other than 'none'.

1333 **7.96.9 finishings-col-database (1setOf collection | no-value)**

1334 This REQUIRED Printer Description attribute lists the Printer's supported Finishing
1335 Templates. If the Printer's "finishings-supported" attribute only lists 'none', then the Printer
1336 MAY either support this attribute with the 'no-value' out-of-band value or omit this attribute.
1337 Each collection describes a single finishing process named by "finishing-template-
1338 supported". A Client can combine these using the "finishings-col" attribute. The Printer does
1339 not need to provide collections describing all possible combinations.

1340 This attribute includes all member attributes defined for the "finishings-col" Job Template
1341 attribute (section 5.2) and adds the member attributes listed in Table 5. If a Printer receives
1342 a Job Creation request supplying a "finishings-col" Job Template attribute containing any of

1343 the member attributes listed in Table 5, then the Printer MUST reject the request and return
1344 the 'client-error-bad-request' status code [STD92].

1345 **Table 5 - Additions to "finishings-col-database" and "finishings-col-ready"**

Member attribute	Printer Conformance
imposition-template	RECOMMENDED
media-sheets-supported	RECOMMENDED
media-size	RECOMMENDED
media-size-name	RECOMMENDED

1346 A Printer SHOULD list multiple collections supplying common "finishing-template" values but
1347 different "media-size" (section 6.9.3) or "media-size-name" (section 6.9.4) values to allow a
1348 Client to discover which finishing processes are supported for a given media size. A Printer
1349 MAY supply either the "media-size" or the "media-size-name" member attribute but MUST
1350 NOT supply both in a single collection.

1351 Because the number and size of values of this attribute can be very large, the Printer MUST
1352 NOT return this attribute in the response to a Get-Printer-Attributes operation [STD92]
1353 unless the Client explicitly requests it by including the 'finishings-col-database' value in the
1354 "requested-attributes" [STD92] operation attribute supplied in the Get-Printer-Attributes
1355 request.

1356 For example, a Printer that supports the 'booklet-maker', 'punch-triple-left' and 'staple-top-
1357 left' values for "finishings-template-supported" and "finishings-supported" might report the
1358 following for "finishings-col-database" [PAPI]:

```

1359     finishings-col-database=
1360     {
1361         finishing-template='booklet-maker'
1362         imposition-template='signature'
1363         media-size-name='na_tabloid_11x17in'
1364         media-sheets-supported=1-5
1365         folding=
1366         {
1367             folding-direction='inward'
1368             folding-offset=21590
1369             folding-reference-edge='top'
1370         }
1371         stitching=
1372         {
1373             stitching-locations=9313,18626
1374             stitching-offset=21590
1375             stitching-reference-edge='top'
1376         }
1377     },
1378     {
1379         finishing-template='booklet-maker'
1380         imposition-template='signature'
1381         media-sheets-supported=1-8
1382         media-size=
1383         {

```

```

1384         x-dimension=29700
1385         y-dimension=42000
1386     }
1387     folding=
1388     {
1389         folding-direction='inward'
1390         folding-offset=21000
1391         folding-reference-edge='top'
1392     }
1393     stitching=
1394     {
1395         stitching-locations=9900,19800
1396         stitching-offset=21000
1397         stitching-reference-edge='top'
1398     }
1399 },
1400 {
1401     finishing-template='punch-triple-left'
1402     media-sheets-supported=1-100
1403     media-size-name='na_letter_8.5x11in'
1404     punching=
1405     {
1406         punching-locations=5715,16510,27305
1407         punching-offset=1300
1408         punching-reference-edge='left'
1409     }
1410 },
1411 {
1412     finishing-template='staple-top-left'
1413     media-sheets-supported=1-150
1414     stitching=
1415     {
1416         stitching-locations=635
1417         stitching-offset=635
1418         stitching-reference-edge='left'
1419     }
1420 }

```

1421 **7.9.16.9.1 imposition-template (type2 keyword | name(MAX))**

1422 This RECOMMENDED member attribute specifies the default "imposition-template" Job
 1423 Template attribute [PWG5100.3-2001] used for the finishing process defined by the
 1424 collection. For example, when processing Input Pages and applying a 'booklet-maker'
 1425 finishing process, a Printer could automatically apply a 'signature' imposition template.

1426 **7.9.26.9.2 media-sheets-supported (rangeOfInteger(1:MAX))**

1427 This RECOMMENDED member attribute specifies the minimum and maximum number of
 1428 Media sheets supported for the finishing operation described by the collection. For example,
 1429 a Printer implementing the 'fold-half' Finishing Template that has a minimum of 1 sheet and
 1430 a maximum of 5 sheets indicates this limit with a value of '1-5'. A Printer MUST report a
 1431 value for this attribute that is within the range reported by the Printer's "job-media-sheets-
 1432 supported" Printer Description attribute [STD92].

1433 7.9.36.9.3 media-size (collection)

1434 This RECOMMENDED member attribute specifies the applicable media size for the finishing
1435 process described by the collection, represented by "x-dimension (integer(0:MAX))" and "y-
1436 dimension (integer(0:MAX))" member attributes semantically equivalent to those defined by
1437 the "media-size" member attribute of "media-col" [PWG5100.7].

1438 A Printer MUST report a value for this attribute listed by its "media-size-supported" Printer
1439 Description attribute [PWG5100.7]. A Printer MUST NOT include both this member attribute
1440 and the "media-size-name" member attribute (section 6.9.4) in the same collection.

1441 7.9.46.9.4 media-size-name (type2 keyword | name(MAX))

1442 This RECOMMENDED member attribute specifies the applicable media size for the finishing
1443 process described by the collection, represented as a keyword or name.

1444 A Printer MUST report a value for this attribute listed by its "media-supported" Printer
1445 Description attribute [STD92]. A Printer MUST NOT include both this member attribute and
1446 the "media-size" member attribute (section 6.9.3) in the same collection.

1447 7.106.10 finishings-col-default (1setOf collection | no-value)

1448 This REQUIRED Printer Description attribute contains the default value for the "finishings-
1449 col" Job Template attribute (section 5.2). This attribute MUST report the same finishing
1450 processes as the "finishings-default" Printer Description attribute [STD92]. If "finishings-
1451 default" has the value '3' (none), then the value of this attribute MUST be the 'no-value' out-
1452 of-band value [STD92]. A Printer SHOULD omit all media-specific member attributes from
1453 the collection values.

1454 7.116.11 finishings-col-ready (1setOf collection)

1455 This REQUIRED Printer Description attribute lists collections from the "finishings-col-
1456 database" Printer Description attribute (section 6.9) that are ready for use.

1457 6.12 finishings-col-supported (1setOf keyword)

1458 [This REQUIRED attribute lists the supported member attributes of the "finishings-col"](#)
1459 [Job/Document Template attribute \(section 5.2\).](#)

1460 7.126.13 folding-direction-supported (1setOf type1 keyword)

1461 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1462 of the "folding-direction" member attribute (section 5.2.6.1). A Printer MUST support this
1463 attribute if it supports the "folding-direction" member attribute.

1464 **7.136.14 folding-offset-supported (1setOf (integer(0:MAX) |**
1465 **rangeOfInteger(0:MAX)))**

1466 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1467 of the "folding-offset" member attribute (section 5.2.6.2). A Printer MUST support this
1468 attribute if it supports the "folding-offset" member attribute.

1469 **7.146.15 folding-reference-edge-supported (1setOf type1 keyword)**

1470 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1471 of the "folding-reference-edge" member attribute (section 5.2.6.3). A Printer MUST support
1472 this attribute if it supports the "folding-reference-edge" member attribute.

1473 **7.156.16 laminating-sides-supported (1setOf type1 keyword)**

1474 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1475 of the "laminating-sides" member attribute (section 5.2.7.1). A Printer MUST support this
1476 attribute if it supports the "laminating-sides" member attribute.

1477 **7.166.17 laminating-type-supported (1setOf (type2 keyword |**
1478 **name(MAX)))**

1479 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1480 of the "laminating-type" member attribute (section 5.2.7.2). A Printer MUST support this
1481 attribute if it supports the "laminating-type" member attribute.

1482 **7.176.18 job-pages-per-set-supported (boolean)**

1483 This CONDITIONALLY REQUIRED Printer Description attribute indicates whether the "job-
1484 pages-per-set" Job Template attribute (section 5.3) is supported. A Printer MUST support
1485 this attribute if it supports the "job-pages-per-set" Job Template attribute. A Printer MUST
1486 report a value of 'true' for each Document format listed by its "document-format-supported"
1487 Printer Description attribute [STD92] that does not support the "copies" attribute.

1488 **7.186.19 punching-hole-diameter-configured (integer(0:MAX))**

1489 This CONDITIONALLY REQUIRED Printer Description attribute supplies the diameter of the
1490 hole produced by the Printer's hole punch, measured in hundredths of millimeters (1/2540th
1491 of an inch). A Printer MUST support this attribute if it supports the "punching" member
1492 attribute (section 5.2.8).

1493 Note: Prior versions of this specification did not require the "punching-hole-diameter-
1494 configured" Printer Description attribute. If a Printer does not support this attribute, a Client

1495 SHOULD can the value is 790 (7.9mm or 5/16in.) for media sizes with dimensions measured
1496 in inches and 650 (6.5mm) for media sizes with dimensions measured in millimeters.

1497 **7.196.20 punching-locations-supported (1setOf (integer(0:MAX) |**
1498 **rangeOfInteger(0:MAX)))**

1499 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1500 of the "punching-locations" member attribute (section 5.2.8.1). A Printer MUST support this
1501 attribute if it supports the "punching-locations" member attribute.

1502 **7.206.21 punching-offset-supported (1setOf (integer(0:MAX) |**
1503 **rangeOfInteger(0:MAX)))**

1504 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1505 of the "punching-offset" member attribute (section 5.2.8.2). A Printer MUST support this
1506 attribute if it supports the "punching-offset" member attribute.

1507 **7.216.22 punching-reference-edge-supported (1setOf type1 keyword)**

1508 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1509 of the "punching-reference-edge" member attribute (section 5.2.8.3). A Printer MUST
1510 support this attribute if it supports the "punching-reference-edge" member attribute.

1511 **7.226.23 stitching-angle-supported (1setOf (integer(0:359) |**
1512 **rangeOfInteger(0:359)))**

1513 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1514 of the "stitching-angle" member attribute (section 5.2.9.1). A Printer MUST support this
1515 attribute if it supports the "stitching-angle" member attribute.

1516 **7.236.24 stitching-locations-supported (1setOf (integer(0:MAX) |**
1517 **rangeOfInteger(0:MAX)))**

1518 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1519 of the "stitching-locations" member attribute (section 5.2.9.2). A Printer MUST support this
1520 attribute if it supports the "stitching-locations" member attribute.

1521 **7.246.25 stitching-method-supported (1setOf type2 keyword)**

1522 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1523 of the "stitching-method" member attribute (section 0). A Printer MUST support this attribute
1524 if it supports the "stitching-method" member attribute.

1525 **7.256.26 stitching-offset-supported (1setOf (integer(0:MAX) |**
1526 **rangeOfInteger(0:MAX)))**

1527 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1528 of the "stitching-offset" member attribute (section 5.2.9.4). A Printer MUST support this
1529 attribute if it supports the "stitching-offset" member attribute.

1530 **7.266.27 stitching-reference-edge-supported (1setOf type1 keyword)**

1531 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1532 of the "stitching-reference-edge" member attribute (section 0). A Printer MUST support this
1533 attribute if it supports the "stitching-reference-edge" member attribute. A Printer MUST
1534 support the 'left' value.

1535 **7.276.28 trimming-offset-supported (1setOf (integer(0:MAX) |**
1536 **rangeOfInteger(0:MAX)))**

1537 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1538 of the "trimming-offset" member attribute (section 5.2.10.1). A Printer MUST support this
1539 attribute if it supports the "trimming-offset" member attribute.

1540 **7.286.29 trimming-reference-edge-supported (1setOf type1 keyword)**

1541 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1542 of the "trimming-reference-edge" member attribute (section 5.2.10.2). A Printer MUST
1543 support this attribute if it supports the "trimming-reference-edge" member attribute.

1544 **7.296.30 trimming-type-supported (1setOf type2 keyword)**

1545 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1546 of the "trimming-type" member attribute (section 0). A Printer MUST support this attribute if
1547 it supports the "trimming-type" member attribute.

1548 **7.306.31 trimming-when-supported (1setOf type2 keyword)**

1549 This CONDITIONALLY REQUIRED Printer Description attribute lists the supported values
1550 of the "trimming-when" member attribute (section 5.2.10.4). A Printer MUST support this
1551 attribute if it supports the "trimming-when" member attribute.

1552

7. Printer Status Attributes

Table 4 lists the Printer Status attributes defined in this specification and their associated Printer conformance requirements.

Table 6 - New Printer Status Attributes

Attribute	Printer Conformance
printer-finisher	REQUIRED
printer-finisher-description	REQUIRED
printer-finisher-supplies	CONDITIONALLY REQUIRED
printer-finisher-supplies-description	CONDITIONALLY REQUIRED

7.1 printer-finisher (1setOf octetString(MAX))

This REQUIRED Printer Status attribute lists strings describing each of the Printer's installed (although perhaps not currently attached) finisher subunits. A Printer MUST list all installed finisher subunits. This attribute MUST have the same cardinality (supply the same number of strings) as the "printer-finisher-description" attribute (section 7.2). The i^{th} string in this attribute corresponds to the i^{th} string in the "printer-finisher-description" attribute. A Printer MUST support this attribute if it implements the IETF Finishing MIB [RFC3806] and the values MUST be mapped from the IETF Finishing MIB elements listed in Table 7.

Table 7 - Keywords for "printer-finisher"

Key	IPP Data Type	Finishing MIB Element	Printer Conformance
type	String	finDeviceType	REQUIRED
unit	String	finDeviceCapacityUnit	REQUIRED
maxcapacity	Integer	finDeviceMaxCapacity	REQUIRED
index	Integer	finDeviceIndex	REQUIRED
presentonoff	String	finDevicePresentOnOff	REQUIRED
status	Integer	finDeviceStatus	REQUIRED
capacity	Integer	finDeviceCurrentCapacity	DEPRECATED

Each string consists of an unordered sequence of key/value pairs, structured according to the ABNF [STD68][FIN-ABNF] defined in

Figure 6. A Printer MUST encode the strings listed by this attribute using only printable characters from the Net-ASCII subset of the US-ASCII character set [RFC5198].

Figure 6 - ABNF for "printer-finisher" Values

```
printer-finisher = 1*finisher-required *finisher-optional
                  ; set of finisher elements encoded into one value
finisher-required = finisher-req ";"
finisher-req = finisher-type / finisher-unit /
               finisher-max-capacity / finisher-index /
               finisher-presentonoff / finisher-status
finisher-optional = finisher-opt ";"
```

```

1578 finisher-opt = finisher-capacity
1579
1580 finisher-type = "type" "=" 1*ALPHA
1581     ; enumerated value as an alpha string (e.g.,
1582     ; 'stitcher') of finDeviceType [RFC3806] mapped
1583     ; indirectly from the *label* in FinDeviceTypeTC
1584
1585 finisher-unit = "unit" "=" 1*ALPHA
1586     ; enumerated value as an alpha string (e.g., 'other') of
1587     ; finDeviceCapacityUnit in [RFC3806] mapped indirectly from
1588     ; the *label* in PrtCapacityUnitTC [RFC3805]
1589
1590 finisher-max-capacity = "maxcapacity" "=" 1*[DIGIT / "-"]
1591     ; integer value as a numeric string mapped directly from
1592     ; finDeviceMaxCapacity [RFC3806]
1593
1594 finisher-capacity = "capacity" "=" 1*[DIGIT / "-"]
1595     ; integer value as a numeric string mapped directly from
1596     ; finDeviceCurrentCapacity [RFC3806]
1597
1598 finisher-index = "index" "=" 1*DIGIT
1599     ; integer value as a numeric string mapped directly from
1600     ; finDeviceIndex [RFC3806]
1601
1602 finisher-presentonoff = "presentonoff" "=" "other"/ "on" /
1603     "off" / "notPresent"
1604     ; string value as an alpha string of
1605     ; finDevicePresentOnOff [RFC3806] mapped indirectly
1606     ; from the *label* in PresentOnOff [RFC3805]
1607
1608 finisher-status = "status" "=" 1*DIGIT
1609     ; integer value as a numeric string mapped directly from
1610     ; finDeviceStatus [RFC3806]
1611
1612 finisher-ext      = finisher-extname "=" finisher-extvalue
1613 finisher-extname  = 1*[ALPHA / DIGIT / "-"]
1614 finisher-extvalue = 1*[ALPHA / DIGIT / "-" / "." / ","]
1615     ; extension point for other MIB values not mapped

```

7.1.1 Example of printer-finisher

Figure 7 describes an example "printer-finisher" attribute listing two strings describing staple and punch finisher subunits, presented using PAPI textual encoding [PAPI] with line breaks added for readability.

Figure 7 - PAPI Example of "printer-finisher"

```

1621 printer-finisher[1] = "index=8;
1622                         type=stitcher;
1623                         unit=sheets;
1624                         maxcapacity=500;"
1625
1626 printer-finisher[2] = "index=3;
1627                         type=puncher;
1628                         unit=sheets;

```

maxcapacity=100;"

7.2 printer-finisher-description (1setOf text(MAX))

This REQUIRED Printer Status attribute lists localized descriptions for each currently installed finisher subunit listed by the "printer-finisher" Printer Status attribute (section 7.1).

This attribute MUST have the same cardinality (supply the same number of values) as the "printer-finisher" attribute. The ith value in the "printer-finisher-description" attribute corresponds to the ith value in the "printer-finisher" attribute.

If a Printer implements the IETF Finishing MIB [RFC3806], then the Printer MUST support this attribute and MUST map each human-readable (localized) value from finDeviceDescription to one of the strings supplied by this attribute using the following process:

1. The value of finDeviceDescription is converted from the character set specified by prtGeneralCurrentLocalization and prtLocalizationCharacterSet to the character set specified by the "charset-configured" Printer Description attribute [STD92]; and
2. The new "printer-finisher-description" value is tagged with the natural language specified by prtGeneralCurrentLocalization, prtLocalizationLanguage, and prtLocalizationCountry unless the natural language matches the language to be used in the response as indicated by the "attributes-natural-language" operation attribute [STD92].

7.2.1 Example of printer-finisher-description

Figure 8 describes an example "printer-finisher-description" attribute listing two values corresponding to the values in Figure 7, each tagged with the natural language identifier for "de" (German), presented using PAPI textual encoding [PAPI] with line breaks added for readability.

Figure 8 - PAPI Example of "printer-finisher-description"

printer-finisher-description[1] = "Hefter SN:BEISPIEL-12345"(de)
printer-finisher-description[2] = "Lochstanze S/N:BEISPIEL-67890"(de)

7.3 printer-finisher-supplies (1setOf octetString(MAX))

This CONDITIONALLY REQUIRED Printer Status attribute lists a string for each supply used by the Printer's installed finishing subunits. A Printer MUST support this attribute if it implements the IETF Finishing MIB [RFC3806] finSupplyTable. A Printer that supports this attribute MUST support the "printer-finisher-supplies-description" attribute (section 7.4).

Each value consists of an unordered sequence of key/value pairs, structured according to the ABNF [STD68] [FIN-ABNF] defined in Figure 9. Table 8 lists the keys defined in this

specification and their derivation from the corresponding elements in the `finSupplyTable` defined in the IETF Finishing MIB [RFC3806].

Table 8 - Keywords for "printer-finisher-supplies"

Key	IPP Data Type	Finishing MIB Element	Printer Conformance
<code>deviceIndex</code>	Integer	<code>finSupplyDeviceIndex</code>	REQUIRED (note 1)
<code>class</code>	String	<code>finSupplyClass</code>	REQUIRED
<code>type</code>	String	<code>finSupplyType</code>	REQUIRED
<code>unit</code>	String	<code>finSupplyUnit</code>	REQUIRED
<code>max</code>	Integer	<code>finSupplyMaxCapacity</code>	REQUIRED
<code>level</code>	Integer	<code>finSupplyCurrentLevel</code>	REQUIRED
<code>color</code>	String	<code>finSupplyColorName</code>	REQUIRED
<code>index</code>	Integer	<code>finSupplyIndex</code>	OPTIONAL (note 2)

Notes:

1. REQUIRED to associate the supply to the finisher subunit using that supply.

2. OPTIONAL because correlation with the original MIB order is not needed.

This attribute MUST have the same cardinality (supply the same number of values) as the "printer-finisher-supplies-description" attribute. The i^{th} value in the "printer-finisher-supplies" attribute corresponds to the i^{th} value in the "printer-finisher-supplies-description" attribute.

A Printer MUST encode the values of "printer-finisher-supplies" using printable characters from the Net-ASCII subset of the US-ASCII character set [RFC5198].

Figure 9 - ABNF for "printer-finisher-supplies" Values

```

finisher-supply = 1*supply-required *supply-optional
                  ; set of finisher supply elements encoded into one value
supply-required = supply-req "; "
supply-req      = supply-class / supply-type / supply-description /
                  supply-unit / supply-max / supply-current-level /
                  supply-color
supply-optional = supply-opt "; "
supply-opt      = supply-index / supply-device-index / supply-ext

supply-class    = "class" "=" 1*ALPHA
                  ; enumerated value as an alpha string (e.g., 'supplyThatIsConsumed')
                  ; of prtMarkerSuppliesClass in [RFC3805] mapped indirectly from
                  ; the *label* in PprtMarkerSuppliesClassTC in [RFC3805]

supply-type     = "type" "=" 1*ALPHA
                  ; enumerated value as an alpha string (e.g., 'staples') of
                  ; prtMarkerSuppliesType in [RFC3805] mapped indirectly from
                  ; the *label* in PprtMarkerSuppliesTypeTC in [RFC3805]

supply-unit     = "unit" "=" 1*ALPHA
                  ; enumerated value as an alpha string (e.g., 'items' or 'percent')
                  ; of finSupplyUnit in [RFC3806] mapped indirectly from the *label*

```

```

1699      ; in PrtMarkerSuppliesSupplyUnitTC in [RFC3805]
1700
1701      supply-max = "max" "=" 1*[DIGIT / "-"]
1702      ; integer value as a numeric string mapped directly from
1703      ; finSupplyMaxCapacity in [RFC3806]
1704
1705      supply-current-level = "level" "=" 1*[DIGIT / "-"]
1706      ; integer value as a numeric string mapped directly from
1707      ; finSupplyCurrentLevel in [RFC3806]
1708
1709      supply-color = "color" "=" 1*ALPHA
1710      ; enumerated value as an alpha string (e.g., 'silver') of
1711      ; finSupplyColorName in [RFC3806] mapped indirectly from the color
1712      ; names from PWG Media Standardized Names 2.0 [PWG5101.1]
1713
1714      supply-index = "index" "=" 1*DIGIT
1715      ; integer value as a numeric string mapped directly from
1716      ; finSupplyIndex in [RFC3806]
1717
1718      supply-device-index = "deviceIndex" "=" 1*ALPHA
1719      ; string value as an alpha string mapped directly from
1720      ; finSupplyDeviceIndex in [RFC3806]
1721
1722      supply-ext      = supply-extname "=" supply-extvalue
1723      supply-extname  = 1*[ALPHA / DIGIT / "-"]
1724      supply-extvalue = 1*[ALPHA / DIGIT / "-" / "." / ","]
1725      ; extension point for other MIB values not mapped

```

7.3.1 Example of printer-finisher-supplies

Figure 10 shows an example "printer-finisher-supplies" listing one finisher supply, referencing the stitcher finisher device subunit listed in Figure 7, presented using a PAPI [PAPI] encoding (line breaks added for readability).

Figure 10 - PAPI Example of "printer-finisher-supplies"

```

1731 printer-finisher-supplies = "class=supplyThatIsConsumed;
1732                             type=staples;
1733                             unit=items;
1734                             max=500;
1735                             level=100;
1736                             color=silver;
1737                             index=8;"

```

7.4 printer-finisher-supplies-description (1setOf text(MAX))

This CONDITIONALLY REQUIRED Printer Status attribute lists localized descriptions of finisher supplies listed by the "printer-finisher-supplies" Printer Status attribute (section 7.3). A Printer MUST support this attribute if it supports the "printer-finisher-supplies" attribute. A Printer MUST support this attribute if the Printer implements the IETF Finishing MIB [RFC3806] finSupplyTable.

The values of this attribute are consistent with the finSupplyDescription element [RFC3806].

If the Printer implements the IETF Finishing MIB finSupplyTable, it MUST map each human-readable (localized) finSupplyDescription value to one of the strings supplied by this attribute using the following process:

1. The value of finSupplyDescription is converted from the character set specified by prtGeneralCurrentLocalization and prtLocalizationCharacterSet to the character set specified by the "charset-configured" Printer Description attribute [STD92]; and
2. The new "printer-finisher-supplies-description" value is tagged with the natural language specified by prtGeneralCurrentLocalization, prtLocalizationLanguage, and prtLocalizationCountry unless the natural language matches the language to be used in the response as indicated by the "attributes-natural-language" operation attribute [STD92].

This attribute MUST have the same cardinality (supply the same number of values) as the "printer-finisher-supplies" attribute. The ith value in the "printer-finisher-supplies-description" attribute corresponds to the ith value in the "printer-finisher-supplies" attribute.

7.4.1 Example of printer-finisher-supplies-description

Figure 11 shows an example of "printer-finisher-supplies-description" listing a description for the supply listed in Figure 10, tagged with the "de" (German) natural language identifier, presented using a PAPI [PAPI] encoding.

Figure 11 - PAPI Example of "printer-finisher-supplies-description"

printer-finisher-supplies-description = "Heftklammern"(de)

8. Conformance Requirements

This section summarizes the Conformance Requirements detailed in the definitions in this document for Clients and Printers.

8.1 Conformance Requirements for Clients

For a Client to claim conformance to this specification, the Client MUST support:

- The REQUIRED IPP Job Template attributes defined in section 5;
- The REQUIRED IPP Printer Status attributes defined in section 0;
- The REQUIRED IPP Printer Description attributes defined in section 6;
- The internationalization considerations in section 9; and

- The security considerations in section 10.

8.2 Conformance Requirements for Printers

For a Printer to claim conformance to this specification, the Printer MUST support:

- The REQUIRED IPP Job Template attributes defined in section 5;
- The CONDITIONALLY REQUIRED IPP Printer Status attributes defined in section 0 for all the finishing features the Printer supports;
- The REQUIRED IPP Printer Description attributes defined in section 6;
- The CONDITIONALLY REQUIRED IPP Printer Description attributes defined section 6 for all the finishing features the Printer supports;
- The internationalization considerations in section 9; and
- The security considerations in section 10.

9. Internationalization Considerations

For interoperability and basic support for multiple languages, conforming implementations MUST support:

- The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8) [STD63] encoding of Unicode [UNICODE] [ISO10646]; and
- The Unicode Format for Network Interchange [RFC5198] which requires transmission of well-formed UTF-8 strings and recommends transmission of normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

Unicode NFC is defined as the result of performing Canonical Decomposition (into base characters and combining marks) followed by Canonical Composition (into canonical composed characters wherever Unicode has assigned them).

WARNING – Performing normalization on UTF-8 strings received from IPP Clients and subsequently storing the results (e.g., in IPP Job objects) could cause false negatives in IPP Client searches and failed access (e.g., to IPP Printers with percent-encoded UTF-8 URIs now 'hidden').

Implementations of this specification SHOULD conform to the following standards on processing of human-readable Unicode text strings, see:

- Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical

- 1804 • Unicode Line Breaking Algorithm [UAX14]– character classes and wrapping
- 1805 • Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]
- 1806 • Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences
- 1807 • Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization
- 1808 • Unicode Character Encoding Model [UTR17] – multi-layer character model
- 1809 • Unicode in XML and other Markup Languages [UTR20] – XML usage
- 1810 • Unicode Character Property Model [UTR23] – character properties
- 1811 • Unicode Conformance Model [UTR33] – Unicode conformance basis+
- 1812 • Unicode Collation Algorithm [UTS10] – sorting
- 1813 • Unicode Locale Data Markup Language [UTS35] – locale databases

1814 **10. Security Considerations**

1815 In addition to the security considerations described in the IPP/1.1: Model and Semantics
 1816 [STD92], implementations MAY support different access control to various finishing features,
 1817 depending on the identity of the User submitting the Job.

1818 Implementations of this specification SHOULD conform to the following standards on
 1819 processing of human-readable Unicode text strings, see:

- 1820 • Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks
- 1821 • Unicode Security FAQ [UNISECFAQ]– common Unicode security issues

1822 **11. IANA and PWG Considerations**

1823 **11.1 Attribute Registrations**

1824 The attributes defined in this document will be published by IANA according to the
 1825 procedures in IPP Model and Semantics [STD92] in the following location:

1826 <https://www.iana.org/assignments/ipp-registrations>

1827 The registry entries will contain the following information:

1828	Job Template attributes:	Reference
1829	-----	-----

1830	finishings-col (no-value 1setOf collection)	[PWG5100.1]
1831	baling (collection)	[PWG5100.1]
1832	baling-type (type2 keyword name(MAX))	[PWG5100.1]
1833	baling-when (type2 keyword)	[PWG5100.1]
1834	binding (collection)	[PWG5100.1]
1835	binding-reference-edge (type1 keyword)	[PWG5100.1]
1836	binding-type (type2 keyword name(MAX))	[PWG5100.1]
1837	coating (collection)	[PWG5100.1]
1838	coating-sides (type1 keyword)	[PWG5100.1]
1839	coating-type (type2 keyword name(MAX))	[PWG5100.1]
1840	covering (collection)	[PWG5100.1]
1841	covering-name (type2 keyword name(MAX))	[PWG5100.1]
1842	finishing-template (name(MAX) type2 keyword)	[PWG5100.1]
1843	folding (1setOf collection)	[PWG5100.1]
1844	folding-direction (type1 keyword)	[PWG5100.1]
1845	folding-offset (integer(0:MAX))	[PWG5100.1]
1846	folding-reference-edge (type1 keyword)	[PWG5100.1]
1847	imposition-template (type2 keyword name(MAX))	[PWG5100.1]
1848	laminating (collection)	[PWG5100.1]
1849	laminating-sides (type1 keyword)	[PWG5100.1]
1850	laminating-type (type2 keyword name(MAX))	[PWG5100.1]
1851	media-sheets-supported (rangeOfInteger(1:MAX))	[PWG5100.1]
1852	media-size (collection)	[PWG5100.1]
1853	media-size-name (type2 keyword)	[PWG5100.1]
1854	punching (collection)	[PWG5100.1]
1855	punching-locations (1setOf integer(0:MAX))	[PWG5100.1]
1856	punching-offset (integer(0:MAX))	[PWG5100.1]
1857	punching-reference-edge (type1 keyword)	[PWG5100.1]
1858	stitching (collection)	[PWG5100.3]
1859	stitching-angle (integer(0:359))	[PWG5100.1]
1860	stitching-method (type2 keyword)	[PWG5100.1]
1861	trimming (1setOf collection)	[PWG5100.1]
1862	trimming-offset (integer(0:MAX))	[PWG5100.1]
1863	trimming-reference-edge (type1 keyword)	[PWG5100.1]
1864	trimming-type (type2 keyword name(MAX))	[PWG5100.1]
1865	trimming-when (type2 keyword)	[PWG5100.1]
1866	job-pages-per-set (integer(1:MAX))	[PWG5100.1]
1867		
1868	Printer Description attributes:	Reference
1869	-----	-----
1870	baling-type-supported (1setOf (type2 keyword name(MAX)))	[PWG5100.1]
1871	baling-when-supported (1setOf type2 keyword)	[PWG5100.1]
1872	binding-reference-edge-supported (1setOf type1 keyword)	[PWG5100.1]
1873	binding-type-supported (1setOf type2 keyword)	[PWG5100.1]
1874	coating-sides-supported (1setOf type1 keyword)	[PWG5100.1]
1875	coating-type-supported (1setOf (type2 keyword name(MAX)))	[PWG5100.1]
1876	covering-name-supported (1setOf (type2 keyword name(MAX)))	[PWG5100.1]
1877	finishing-template-supported (1setOf (name(MAX) type2 keyword))	[PWG5100.1]
1878		
1879	finishings-col-database (1setOf collection)	[PWG5100.1]
1880	< member attributes are the same as finishings-col >	[PWG5100.1]
1881	folding-direction-supported (1setOf type1 keyword)	[PWG5100.1]
1882	folding-offset-supported (1setOf (integer(0:MAX) rangeOfInteger(0:MAX)))	[PWG5100.1]
1883		
1884	folding-reference-edge-supported (1setOf type1 keyword)	[PWG5100.1]
1885	laminating-sides-supported (1setOf type1 keyword)	[PWG5100.1]

```

1886 laminating-type-supported (1setOf (type2 keyword | name(MAX)))
1887                                     [PWG5100.1]
1888 job-pages-per-set-supported (boolean) [PWG5100.1]
1889 printer-finisher (1setOf octetString(MAX)) [PWG5100.1]
1890 printer-finisher-description (1setOf text(MAX)) [PWG5100.1]
1891 printer-finisher-supplies (1setOf octetString(MAX)) [PWG5100.1]
1892 printer-finisher-supplies-description (1setOf text(MAX)) [PWG5100.1]
1893 punching-hole-diameter-configured (integer(0:MAX)) [PWG5100.1]
1894 punching-locations-supported (1setOf (integer(0:MAX) | rangeOfInteger(0:MAX)))
1895                                     [PWG5100.1]
1896 punching-offset-supported (1setOf (integer(0:MAX) | rangeOfInteger(0:MAX)))
1897                                     [PWG5100.1]
1898 punching-reference-edge-supported (1setOf type1 keyword) [PWG5100.1]
1899 stitching-angle-supported (1setOf (integer(0:359) | rangeOfInteger(0:359)))
1900                                     [PWG5100.1]
1901 stitching-method-supported (1setOf (type2 keyword)) [PWG5100.1]
1902 trimming-offset-supported (1setOf (integer(0:MAX) | rangeOfInteger(0:MAX)))
1903                                     [PWG5100.1]
1904 trimming-reference-edge-supported (1setOf type1 keyword) [PWG5100.1]
1905 trimming-type-supported (1setOf type2 keyword) [PWG5100.1]
1906 trimming-when-supported (1setOf type2 keyword) [PWG5100.1]

```

1907 11.2 Type2 keyword Registrations

1908 The keyword attribute values defined in this document will be published by IANA according
 1909 to the procedures in the IPP Model and Semantics [STD92] in the following location:

1910 <http://www.iana.org/assignments/ipp-registrations>

1911 The registry entries will contain the following information:

1912 Attributes (attribute syntax)	Reference
1913 Keyword Attribute Value	
1914 -----	-----
1915 baling-type (type2 keyword name(MAX))	[PWG5100.1]
1916 band	[PWG5100.1]
1917 shrink-wrap	[PWG5100.1]
1918 wrap	[PWG5100.1]
1919 baling-type-supported (1setOf (type2 keyword name(MAX)))	[PWG5100.1]
1920 < all baling-type values >	
1921	
1922 baling-when (type2 keyword)	[PWG5100.1]
1923 after-sets	[PWG5100.1]
1924 after-job	[PWG5100.1]
1925 baling-when-supported (1setOf type2 keyword)	[PWG5100.1]
1926 < all baling-when values >	[PWG5100.1]
1927	
1928 binding-reference-edge (type1 keyword)	[PWG5100.1]
1929 bottom	[PWG5100.1]
1930 left	[PWG5100.1]
1931 right	[PWG5100.1]
1932 top	[PWG5100.1]
1933 binding-reference-edge-supported (1setOf type1 keyword)	[PWG5100.1]
1934 < all binding-reference-edge values >	[PWG5100.1]

1935		
1936	binding-type (type2 keyword name(MAX))	[PWG5100.1]
1937	adhesive	[PWG5100.1]
1938	comb	[PWG5100.1]
1939	flat	[PWG5100.1]
1940	padding	[PWG5100.1]
1941	perfect	[PWG5100.1]
1942	spiral	[PWG5100.1]
1943	tape	[PWG5100.1]
1944	velo	[PWG5100.1]
1945	binding-type-supported ((1setOf type2 keyword name(MAX)))	[PWG5100.1]
1946	< all binding-type values >	[PWG5100.1]
1947		
1948	coating-sides (type1 keyword)	[PWG5100.1]
1949	back	[PWG5100.1]
1950	both	[PWG5100.1]
1951	front	[PWG5100.1]
1952	coating-sides-supported (1setOf type1 keyword)	[PWG5100.1]
1953	< all coating-sides values >	[PWG5100.1]
1954		
1955	coating-type (type2 keyword name(MAX))	[PWG5100.1]
1956	archival	[PWG5100.1]
1957	archival-glossy	[PWG5100.1]
1958	archival-matte	[PWG5100.1]
1959	archival-semi-gloss	[PWG5100.1]
1960	glossy	[PWG5100.1]
1961	high-gloss	[PWG5100.1]
1962	matte	[PWG5100.1]
1963	semi-gloss	[PWG5100.1]
1964	silicone	[PWG5100.1]
1965	translucent	[PWG5100.1]
1966	coating-type-supported ((1setOf type2 keyword name(MAX)))	[PWG5100.1]
1967	< all coating-type values >	[PWG5100.1]
1968		
1969	covering-name (type2 keyword name(MAX))	[PWG5100.1]
1970	plain	[PWG5100.1]
1971	pre-cut	[PWG5100.1]
1972	pre-printed	[PWG5100.1]
1973	covering-name-supported (1setOf (type2 keyword name(MAX)))	[PWG5100.1]
1974	< all covering-name values >	[PWG5100.1]
1975		
1976	finishing-template (name(MAX) type2 keyword)	[PWG5100.1]
1977	bale	[PWG5100.1]
1978	bind	[PWG5100.1]
1979	bind-bottom	[PWG5100.1]
1980	bind-left	[PWG5100.1]
1981	bind-right	[PWG5100.1]
1982	bind-top	[PWG5100.1]
1983	booklet-maker	[PWG5100.1]
1984	coat	[PWG5100.1]
1985	cover	[PWG5100.1]
1986	edge-stitch	[PWG5100.1]
1987	edge-stitch-bottom	[PWG5100.1]
1988	edge-stitch-left	[PWG5100.1]
1989	edge-stitch-right	[PWG5100.1]
1990	edge-stitch-top	[PWG5100.1]

1991	fold	[PWG5100.1]
1992	fold-accordion	[PWG5100.1]
1993	fold-double-gate	[PWG5100.1]
1994	fold-engineering-z	[PWG5100.1]
1995	fold-gate	[PWG5100.1]
1996	fold-half	[PWG5100.1]
1997	fold-half-z	[PWG5100.1]
1998	fold-left-gate	[PWG5100.1]
1999	fold-letter	[PWG5100.1]
2000	fold-parallel	[PWG5100.1]
2001	fold-poster	[PWG5100.1]
2002	fold-right-gate	[PWG5100.1]
2003	fold-z	[PWG5100.1]
2004	jdf-f2-1	[PWG5100.1]
2005	jdf-f4-1	[PWG5100.1]
2006	jdf-f4-2	[PWG5100.1]
2007	jdf-f6-1	[PWG5100.1]
2008	jdf-f6-2	[PWG5100.1]
2009	jdf-f6-3	[PWG5100.1]
2010	jdf-f6-4	[PWG5100.1]
2011	jdf-f6-5	[PWG5100.1]
2012	jdf-f6-6	[PWG5100.1]
2013	jdf-f6-7	[PWG5100.1]
2014	jdf-f6-8	[PWG5100.1]
2015	jdf-f8-1	[PWG5100.1]
2016	jdf-f8-2	[PWG5100.1]
2017	jdf-f8-3	[PWG5100.1]
2018	jdf-f8-4	[PWG5100.1]
2019	jdf-f8-5	[PWG5100.1]
2020	jdf-f8-6	[PWG5100.1]
2021	jdf-f8-7	[PWG5100.1]
2022	jdf-f10-1	[PWG5100.1]
2023	jdf-f10-2	[PWG5100.1]
2024	jdf-f10-3	[PWG5100.1]
2025	jdf-f12-1	[PWG5100.1]
2026	jdf-f12-2	[PWG5100.1]
2027	jdf-f12-3	[PWG5100.1]
2028	jdf-f12-4	[PWG5100.1]
2029	jdf-f12-5	[PWG5100.1]
2030	jdf-f12-6	[PWG5100.1]
2031	jdf-f12-7	[PWG5100.1]
2032	jdf-f12-8	[PWG5100.1]
2033	jdf-f12-9	[PWG5100.1]
2034	jdf-f12-10	[PWG5100.1]
2035	jdf-f12-11	[PWG5100.1]
2036	jdf-f12-12	[PWG5100.1]
2037	jdf-f12-13	[PWG5100.1]
2038	jdf-f12-14	[PWG5100.1]
2039	jdf-f14-1	[PWG5100.1]
2040	jdf-f16-1	[PWG5100.1]
2041	jdf-f16-2	[PWG5100.1]
2042	jdf-f16-3	[PWG5100.1]
2043	jdf-f16-4	[PWG5100.1]
2044	jdf-f16-5	[PWG5100.1]
2045	jdf-f16-6	[PWG5100.1]
2046	jdf-f16-7	[PWG5100.1]

2047	jdf-f16-8	[PWG5100.1]
2048	jdf-f16-9	[PWG5100.1]
2049	jdf-f16-10	[PWG5100.1]
2050	jdf-f16-11	[PWG5100.1]
2051	jdf-f16-12	[PWG5100.1]
2052	jdf-f16-13	[PWG5100.1]
2053	jdf-f16-14	[PWG5100.1]
2054	jdf-f18-1	[PWG5100.1]
2055	jdf-f18-2	[PWG5100.1]
2056	jdf-f18-3	[PWG5100.1]
2057	jdf-f18-4	[PWG5100.1]
2058	jdf-f18-5	[PWG5100.1]
2059	jdf-f18-6	[PWG5100.1]
2060	jdf-f18-7	[PWG5100.1]
2061	jdf-f18-8	[PWG5100.1]
2062	jdf-f18-9	[PWG5100.1]
2063	jdf-f20-1	[PWG5100.1]
2064	jdf-f20-2	[PWG5100.1]
2065	jdf-f24-1	[PWG5100.1]
2066	jdf-f24-2	[PWG5100.1]
2067	jdf-f24-3	[PWG5100.1]
2068	jdf-f24-4	[PWG5100.1]
2069	jdf-f24-5	[PWG5100.1]
2070	jdf-f24-6	[PWG5100.1]
2071	jdf-f24-7	[PWG5100.1]
2072	jdf-f24-8	[PWG5100.1]
2073	jdf-f24-9	[PWG5100.1]
2074	jdf-f24-10	[PWG5100.1]
2075	jdf-f24-11	[PWG5100.1]
2076	jdf-f28-1	[PWG5100.1]
2077	jdf-f32-1	[PWG5100.1]
2078	jdf-f32-2	[PWG5100.1]
2079	jdf-f32-3	[PWG5100.1]
2080	jdf-f32-4	[PWG5100.1]
2081	jdf-f32-5	[PWG5100.1]
2082	jdf-f32-6	[PWG5100.1]
2083	jdf-f32-7	[PWG5100.1]
2084	jdf-f32-8	[PWG5100.1]
2085	jdf-f32-9	[PWG5100.1]
2086	jdf-f36-1	[PWG5100.1]
2087	jdf-f36-2	[PWG5100.1]
2088	jdf-f40-1	[PWG5100.1]
2089	jdf-f48-1	[PWG5100.1]
2090	jdf-f48-2	[PWG5100.1]
2091	jdf-f64-1	[PWG5100.1]
2092	jdf-f64-2	[PWG5100.1]
2093	jog-offset	[PWG5100.1]
2094	laminate	[PWG5100.1]
2095	punch	[PWG5100.1]
2096	punch-bottom-left	[PWG5100.1]
2097	punch-bottom-right	[PWG5100.1]
2098	punch-dual-bottom	[PWG5100.1]
2099	punch-dual-left	[PWG5100.1]
2100	punch-dual-right	[PWG5100.1]
2101	punch-dual-top	[PWG5100.1]
2102	punch-multiple-bottom	[PWG5100.1]

2103	punch-multiple-left	[PWG5100.1]
2104	punch-multiple-right	[PWG5100.1]
2105	punch-multiple-top	[PWG5100.1]
2106	punch-quad-bottom	[PWG5100.1]
2107	punch-quad-left	[PWG5100.1]
2108	punch-quad-right	[PWG5100.1]
2109	punch-quad-top	[PWG5100.1]
2110	punch-top-left	[PWG5100.1]
2111	punch-top-right	[PWG5100.1]
2112	punch-triple-bottom	[PWG5100.1]
2113	punch-triple-left	[PWG5100.1]
2114	punch-triple-right	[PWG5100.1]
2115	punch-triple-top	[PWG5100.1]
2116	saddle-stitch	[PWG5100.1]
2117	staple	[PWG5100.1]
2118	staple-bottom-left	[PWG5100.1]
2119	staple-bottom-right	[PWG5100.1]
2120	staple-dual-bottom	[PWG5100.1]
2121	staple-dual-left	[PWG5100.1]
2122	staple-dual-right	[PWG5100.1]
2123	staple-dual-top	[PWG5100.1]
2124	staple-top-left	[PWG5100.1]
2125	staple-top-right	[PWG5100.1]
2126	staple-triple-bottom	[PWG5100.1]
2127	staple-triple-left	[PWG5100.1]
2128	staple-triple-right	[PWG5100.1]
2129	staple-triple-top	[PWG5100.1]
2130	trim	[PWG5100.1]
2131	trim-after-copies	[PWG5100.1]
2132	trim-after-documents	[PWG5100.1]
2133	trim-after-job	[PWG5100.1]
2134	trim-after-pages	[PWG5100.1]
2135	finishing-template-supported (1setOf (type2 keyword name(MAX)))	
2136		[PWG5100.1]
2137	< any finishing-template value >	[PWG5100.1]
2138		
2139	folding-direction (type1 keyword)	[PWG5100.1]
2140	inward	[PWG5100.1]
2141	outward	[PWG5100.1]
2142	folding-direction-supported (1setOf type1 keyword)	[PWG5100.1]
2143	< all folding-direction values >	[PWG5100.1]
2144		
2145	folding-reference-edge (type1 keyword)	[PWG5100.1]
2146	bottom	[PWG5100.1]
2147	left	[PWG5100.1]
2148	right	[PWG5100.1]
2149	top	[PWG5100.1]
2150	folding-reference-edge-supported (1setOf type1 keyword)	[PWG5100.1]
2151	< all folding-reference-edge values >	[PWG5100.1]
2152		
2153	laminating-sides (type1 keyword)	[PWG5100.1]
2154	back	[PWG5100.1]
2155	both	[PWG5100.1]
2156	front	[PWG5100.1]
2157	laminating-sides-supported (1setOf type1 keyword)	[PWG5100.1]
2158	< all laminating-sides values >	[PWG5100.1]

2159		
2160	laminating-type (type2 keyword name(MAX))	[PWG5100.1]
2161	archival	[PWG5100.1]
2162	archival-glossy	[PWG5100.1]
2163	archival-matte	[PWG5100.1]
2164	archival-semi-gloss	[PWG5100.1]
2165	glossy	[PWG5100.1]
2166	high-gloss	[PWG5100.1]
2167	matte	[PWG5100.1]
2168	semi-gloss	[PWG5100.1]
2169	silicone	[PWG5100.1]
2170	translucent	[PWG5100.1]
2171	laminating-type-supported ((1setOf type2 keyword name(MAX)))	[PWG5100.1]
2172	< all laminating-type values >	[PWG5100.1]
2173		
2174	punching-reference-edge (type1 keyword)	[PWG5100.1]
2175	bottom	[PWG5100.1]
2176	left	[PWG5100.1]
2177	right	[PWG5100.1]
2178	top	[PWG5100.1]
2179	punching-reference-edge-supported (1setOf type1 keyword)	[PWG5100.1]
2180	< all punching-reference-edge values >	[PWG5100.1]
2181		
2182	stitching-method (type2 keyword)	[PWG5100.1]
2183	auto	[PWG5100.1]
2184	crimp	[PWG5100.1]
2185	wire	[PWG5100.1]
2186	stitching-method-supported (1setOf type2 keyword)	[PWG5100.1]
2187	< all stitching-method values >	[PWG5100.1]
2188		
2189	trimming-reference-edge (type1 keyword)	[PWG5100.1]
2190	bottom	[PWG5100.1]
2191	left	[PWG5100.1]
2192	right	[PWG5100.1]
2193	top	[PWG5100.1]
2194	trimming-reference-edge-supported (1setOf type1 keyword)	[PWG5100.1]
2195	< all trimming-reference-edge values >	[PWG5100.1]
2196		
2197	trimming-type (type2 keyword name(MAX))	[PWG5100.1]
2198	draw-line	[PWG5100.1]
2199	full	[PWG5100.1]
2200	partial	[PWG5100.1]
2201	perforate	[PWG5100.1]
2202	score	[PWG5100.1]
2203	tab	[PWG5100.1]
2204	trimming-type-supported (1setOf type2 keyword)	[PWG5100.1]
2205	< all trimming-type values >	[PWG5100.1]
2206		
2207	trimming-when (type2 keyword)	[PWG5100.1]
2208	after-documents	[PWG5100.1]
2209	after-job	[PWG5100.1]
2210	after-sheets	[PWG5100.1]
2211	after-sets	[PWG5100.1]
2212	trimming-when-supported (1setOf type2 keyword)	[PWG5100.1]
2213	< all trimming-when values >	[PWG5100.1]

2214 11.3 Type2 enum Attribute Value Registrations

2215 The enumerations defined in this document will be published by IANA according to the
2216 procedures in the IPP Model and Semantics [STD92] in the following location:

2217 <http://www.iana.org/assignments/ipp-registrations>

2218 The registry entries will contain the following information:

2219	Attributes (attribute syntax)		
2220	Enum Value	Enum Symbolic Name	Reference
2221	-----	-----	-----
2222	finishings (1setOf type2 enum)		[STD92]
2223	10	fold	[PWG5100.1]
2224	11	trim	[PWG5100.1]
2225	12	bale	[PWG5100.1]
2226	13	booklet-maker	[PWG5100.1]
2227	14	jog-offset	[PWG5100.1]
2228	15	coat	[PWG5100.1]
2229	16	laminate	[PWG5100.1]
2230	32	staple-triple-left	[PWG5100.1]
2231	33	staple-triple-top	[PWG5100.1]
2232	34	staple-triple-right	[PWG5100.1]
2233	35	staple-triple-bottom	[PWG5100.1]
2234	50	bind-left	[PWG5100.1]
2235	51	bind-top	[PWG5100.1]
2236	52	bind-right	[PWG5100.1]
2237	53	bind-bottom	[PWG5100.1]
2238	60	trim-after-pages	[PWG5100.1]
2239	61	trim-after-documents	[PWG5100.1]
2240	62	trim-after-copies	[PWG5100.1]
2241	63	trim-after-job	[PWG5100.1]
2242	70	punch-top-left	[PWG5100.1]
2243	71	punch-bottom-left	[PWG5100.1]
2244	72	punch-top-right	[PWG5100.1]
2245	73	punch-bottom-right	[PWG5100.1]
2246	74	punch-dual-left	[PWG5100.1]
2247	75	punch-dual-top	[PWG5100.1]
2248	76	punch-dual-right	[PWG5100.1]
2249	77	punch-dual-bottom	[PWG5100.1]
2250	78	punch-triple-left	[PWG5100.1]
2251	79	punch-triple-top	[PWG5100.1]
2252	80	punch-triple-right	[PWG5100.1]
2253	81	punch-triple-bottom	[PWG5100.1]
2254	82	punch-quad-left	[PWG5100.1]
2255	83	punch-quad-top	[PWG5100.1]
2256	84	punch-quad-right	[PWG5100.1]
2257	85	punch-quad-bottom	[PWG5100.1]
2258	86	punch-multiple-left	[PWG5100.1]
2259	87	punch-multiple-top	[PWG5100.1]
2260	88	punch-multiple-right	[PWG5100.1]
2261	89	punch-multiple-bottom	[PWG5100.1]
2262	90	fold-accordion	[PWG5100.1]
2263	91	fold-double-gate	[PWG5100.1]
2264	92	fold-gate	[PWG5100.1]

2265	93	fold-half	[PWG5100.1]
2266	94	fold-half-z	[PWG5100.1]
2267	95	fold-left-gate	[PWG5100.1]
2268	96	fold-letter	[PWG5100.1]
2269	97	fold-parallel	[PWG5100.1]
2270	98	fold-poster	[PWG5100.1]
2271	99	fold-right-gate	[PWG5100.1]
2272	100	fold-z	[PWG5100.1]
2273	101	fold-engineering-z	[PWG5100.1]

2274 12. Overview of Changes

2275 12.1 Changes in IPP Finishings v3.0

2276 IPP Finishings v3.0 included the following changes over the preceding revision:

- 2277 • Changed conformance requirements on "finishings" and "finishings-col" and related
2278 attributes to be stricter, requiring a new major version.
- 2279 • Finishings v2.1 Errata resolutions
 - 2280 ○ [Issue #56](#) - Section 11.1 lacks mention of attributes and language clarifying
2281 shape / size / rotation of staples and punch
 - 2282 ○ [Issue #87](#) - Section 5.1: uses of "feed-orientation" and "orientation-requested"
2283 lack source reference citations
 - 2284 ○ [Issue #88](#) - Section 5.1.1 says 'RFC 2911 "finishings" Values'
- 2285 • Moved the definition of the 'trim-after-pages', 'trim-after-documents', 'trim-after-
2286 copies' and 'trim-after-job' enum value here since the originating document was being
2287 updated at the time the errata issues were being resolved.
- 2288 • Created a new Printer Status Attributes section to match similar editorial changes in
2289 EPX and NODRIVER.
- 2290 • Added tables to the start of sections to list the conformance requirements for the
2291 attribute definitions within the sections.
- 2292 • Rewrote the sections for "printer-finisher", "printer-finisher-description", "printer-
2293 finisher-supplies", and "printer-finisher-supplies-description" with Mike Sweet and
2294 Steven Young
- 2295 • Fixed passive voice and modernized the editorial style in the "xxx-supported"
2296 definitions in section 6.

2297 12.2 Changes in IPP Finishings v2.1

2298 IPP Finishings v2.1 included the following changes over the preceding revision:

- 2299 • Added finishing enums and templates for multiple hole punching and an engineering
2300 Z fold.
- 2301 • Defined an extension naming convention for the "finishing-template" member
2302 attribute.
- 2303 • Added the "media-sheets-supported" member attribute for the "finishings-col-
2304 database" and "finishings-col-ready" attributes.
- 2305 • Added the "stitching-method" member attribute for the "finishings-col", "finishings-col-
2306 database", and "finishings-col-ready" attributes.
- 2307 • Added the "printer-finisher-supplies" and "printer-finisher-supplies-description"
2308 attributes.
- 2309 • Added the "punching-hole-diameter-configured" and "stitching-angle" attributes,
2310 clarified that punched holes are round and of a particular size, and defined staples'
2311 axis of rotation to be around their midpoint, to more specifically define the coordinates
2312 of the space occupied by the punched holes and staples.

2313 12.3 Changes in IPP Finishings v2.0

2314 IPP Finishings v2.0 included the following changes over the preceding revision:

- 2315 • Moved definition of PWG 5100.3 "finishings-col" attribute to this document and added
2316 new member attributes for all finishings processes.
- 2317 • Added finishing enums and templates for coating, lamination, triple stapling, various
2318 kinds of punching, and common folds.
- 2319 • Added the "finishings-col-database" and "job-pages-per-set" attributes.
- 2320 • Added the "media-size" and "media-size-name" member attributes for the "finishings-
2321 col-database" and "finishings-col-ready" attributes.

2322 13. References

2323 13.1 Normative References

- 2324 [ISO10646] "Information technology -- Universal Coded Character Set (UCS)",
2325 ISO/IEC 10646:2011

- 2326 [JDF1.5] CIP4 Organization, "JDF Specification, Release 1.5", December 2013,
2327 <https://www.cip4.org/>
- 2328 [PWG5100.11] T. Hastings, D. Fullman, "IPP: Job and Printer Operations – Set 2", PWG
2329 5100.11-2010, October 2010, [https://ftp.pwg.org/pub/pwg/candidates/cs-
2330 ippjobprinterext10-20101030-5100.11.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext10-20101030-5100.11.pdf)
- 2331 [PWG5100.13] M. Sweet, I. McDonald, P. Zehler, "IPP: Job and Printer Extensions - Set
2332 3 (JPS3)", PWG 5100.13-2012, July 2012,
2333 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext3v10-
2334 20120727-5100.13.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext3v10-20120727-5100.13.pdf)
- 2335 [PWG5101.1] R. Bergman, T. Hastings, "Standard for Media Standardized Names",
2336 PWG 5101.1-2002, February 2002,
2337 [https://ftp.pwg.org/pub/pwg/candidates/cs-pwgmsn10-20020226-
2338 5101.1.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-pwgmsn10-20020226-5101.1.pdf)
- 2339 [PWG5102.4] M. Sweet, "PWG Raster Format", PWG 5102.4-2012, April 2012,
2340 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippraster10-20120420-
2341 5102.4.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippraster10-20120420-5102.4.pdf)
- 2342 [PWG5108.07] P. Zehler, "PWG Print Job Ticket and Associated Capabilities Version 1.0
2343 (PJT)", PWG 5108.07-2012, August 2012,
2344 [https://ftp.pwg.org/pub/pwg/candidates/cs-sm20-pjt10-20120801-
2345 5108.07.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-sm20-pjt10-20120801-5108.07.pdf)
- 2346 [RFC2119] S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels",
2347 RFC 2119/BCP 14, March 1997, <https://tools.ietf.org/html/rfc2119>
- 2348 [RFC3805] R. Bergman, H. Lewis, I. McDonald, "Printer MIB v2", RFC 3805, June
2349 2004, <https://tools.ietf.org/html/rfc3805>
- 2350 [RFC3806] R. Bergman, H. Lewis, I. McDonald, "Printer Finishing MIB", RFC 3806,
2351 June 2004, <https://tools.ietf.org/html/rfc3806>
- 2352 [RFC3808] I. McDonald, "IANA Charset MIB", RFC 3808, June 2004,
2353 <https://tools.ietf.org/html/rfc3808>
- 2354 [RFC5198] J. Klensin, M. Padlipsky, "Unicode Format for Network Interchange", RFC
2355 5198, March 2008, <https://tools.ietf.org/html/rfc5198>
- 2356 [RFC5646] A. Phillips, M. Davis, "Tags for Identifying Languages", September 2009,
2357 <https://tools.ietf.org/html/rfc5646>
- 2358 [RFC7230] R. Fielding, J. Reschke, "Hypertext Transfer Protocol (HTTP/1.1):
2359 Message Syntax and Routing", RFC 7230, June 2014,
2360 <https://tools.ietf.org/html/rfc7230>

- 2361 [STD63] F. Yergeau, "UTF-8, a transformation format of ISO 10646", RFC
2362 3629/STD 63, November 2003, <https://tools.ietf.org/html/std63>
- 2363 [STD68] D. Crocker, P Overell, "Augmented BNF for Syntax Specifications:
2364 ABNF", RFC 5234/STD 68, January 2008, <https://tools.ietf.org/html/std68>
- 2365 [STD92] M. Sweet, I. McDonald, "Internet Printing Protocol/1.1", STD 92, June
2366 2018, <https://tools.ietf.org/html/std92>
- 2367 [UAX9] Unicode Consortium, "Unicode Bidirectional Algorithm", UAX#9, June
2368 2014, <https://www.unicode.org/reports/tr9/tr9-31.html>
- 2369 [UAX14] Unicode Consortium, "Unicode Line Breaking Algorithm", UAX#14, June
2370 2014, <https://www.unicode.org/reports/tr14/tr14-33.html>
- 2371 [UAX15] M. Davis, M. Duerst, "Unicode Normalization Forms", Unicode Standard
2372 Annex 15, March 2008, <https://www.unicode.org/reports/tr15/>
- 2373 [UAX29] Unicode Consortium, "Unicode Text Segmentation", UAX#29, June 2014,
2374 <https://www.unicode.org/reports/tr29/tr29-25.html>
- 2375 [UAX31] Unicode Consortium, "Unicode Identifier and Pattern Syntax", UAX#31,
2376 June 2014, <https://www.unicode.org/reports/tr31/tr31-21.html>
- 2377 [UNICODE] Unicode Consortium, "Unicode Standard", Version 9.0.0, June 2016,
2378 <https://www.unicode.org/versions/Unicode9.0.0/>
- 2379 [UTS10] Unicode Consortium, "Unicode Collation Algorithm", UTS#10, June 2014,
2380 <https://www.unicode.org/reports/tr10/tr10-30.html>
- 2381 [UTS35] Unicode Consortium, "Unicode Locale Data Markup Language", UTS#35,
2382 September 2014, <https://www.unicode.org/reports/tr35/tr35-37/tr35.html>
- 2383 [UTS39] Unicode Consortium, "Unicode Security Mechanisms", UTS#39,
2384 September 2014, <https://www.unicode.org/reports/tr39/tr39-9.html>

2385 13.2 Informative References

- 2386 [FIN-ABNF] Collected ABNF for PWG 5100.1-YYYY,
2387 <http://ftp.pwg.org/pub/pwg/informational/pwg5100.1-abnf.txt>
- 2388 [IANA-IPP] Internet Assigned Numbers Authority (IANA) Internet Printing Protocol
2389 (IPP) Registrations, [http://www.iana.org/assignments/ipp-](http://www.iana.org/assignments/ipp-registrations/ipp-registrations.xml)
2390 [registrations/ipp-registrations.xml](http://www.iana.org/assignments/ipp-registrations/ipp-registrations.xml)
- 2391 [IANA-PEN] "IANA Registry of Private Enterprise Numbers",
2392 <http://www.iana.org/assignments/enterprise-numbers/>

- 2393 [ISO10175] "Document Printing Application (DPA)", ISO/IEC 10175, June 1996
- 2394 [PAPI] A. Hlava, N. Jacobs, M. Sweet, "Open Standard Print API (PAPI)", July
2395 2005, [http://prdownloads.sourceforge.net/openprinting/PAPI-](http://prdownloads.sourceforge.net/openprinting/PAPI-specification.pdf?download)
2396 [specification.pdf?download](http://prdownloads.sourceforge.net/openprinting/PAPI-specification.pdf?download)
- 2397 [PUNCH] "Hole punch", http://en.wikipedia.org/wiki/Hole_punch
- 2398 [PWG5100.1-2001] T. Hastings, D. Fullman, "IPP: 'finishings' attribute values extension",
2399 PWG 5100.1-2001, February 2001,
2400 [http://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings10-20010205-](http://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings10-20010205-5100.1.pdf)
2401 [5100.1.pdf](http://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings10-20010205-5100.1.pdf)
- 2402 [PWG5100.1-2014] M. Sweet, "IPP Finishings 2.0", PWG 5100.1-2014, December 2014,
2403 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings20-20141219-](https://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings20-20141219-5100.1.pdf)
2404 [5100.1.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings20-20141219-5100.1.pdf)
- 2405 [PWG5100.1-2017] S. Kennedy, M. Sweet, "IPP Finishings 2.1", PWG 5100.1-2017,
2406 February 2017, [https://ftp.pwg.org/pub/pwg/candidates/cs-](https://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings21-20170217-5100.1.pdf)
2407 [ippfinishings21-20170217-5100.1.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings21-20170217-5100.1.pdf)
- 2408 [PWG5100.3-2001] K. Ocke, T. Hastings, "Internet Printing Protocol (IPP): Production
2409 Printing Attributes – Set1", PWG 5100.3-2001, February 2001,
2410 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippprodprint10-20010212-](https://ftp.pwg.org/pub/pwg/candidates/cs-ippprodprint10-20010212-5100.3.pdf)
2411 [5100.3.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippprodprint10-20010212-5100.3.pdf)
- 2412 [PWG5100.7] M. Sweet, "IPP Job Extensions v2.0", August 2019,
2413 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobext20-20190816-](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobext20-20190816-5100.7.pdf)
2414 [5100.7.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobext20-20190816-5100.7.pdf)
- 2415 [PWG5100.13-2012] M. Sweet, I. McDonald, P. Zehler, "IPP: Job and Printer
2416 Extensions - Set 3 (JPS3)", PWG 5100.13-2012, July 2012,
2417 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext3v10-](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext3v10-20120727-5100.13.pdf)
2418 [20120727-5100.13.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext3v10-20120727-5100.13.pdf)
- 2419 [UNISECFAQ] Unicode Consortium "Unicode Security FAQ", November 2013,
2420 <http://www.unicode.org/faq/security.html>
- 2421 [UTR17] Unicode Consortium "Unicode Character Encoding Model", UTR#17,
2422 November 2008, <http://www.unicode.org/reports/tr17/tr17-7.html>
- 2423 [UTR20] Unicode Consortium "Unicode in XML and other Markup Languages",
2424 UTR#20, January 2013, <http://www.unicode.org/reports/tr20/tr20-9.html>
- 2425 [UTR23] Unicode Consortium "Unicode Character Property Model", UTR#23,
2426 November 2008, <http://www.unicode.org/reports/tr23/tr23-9.html>

2427 [UTR33] Unicode Consortium “Unicode Conformance Model”, UTR#33, November
2428 2008, <http://www.unicode.org/reports/tr33/tr33-5.html>

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2440 <https://www.pwg.org/ipp/>

2441 Implementers of this specification document are encouraged to join the IPP Mailing List to
2442 participate in any discussions of clarification issues and review of registration proposals for
2443 additional attributes and values.

2444 The authors would also like to thank the following individuals for their contributions to this
2445 standard:

2446 Don Fullman (original Author)
2447 Tom Hastings (original Author)
2448 Richard Blanchard (Apple)
2449 Ira McDonald (High North)
2450 Rick Yardumian (Canon)

2451 **15. Change History**

2452 **15.1 November 19, 2021**

2453 Several changes made after prototyping:

- 2454 • Added in the "finishings-col-supported", which is in the IANA registry but is strangely
2455 missing from Finishings 2.0 / 2.1 or earlier drafts of this document;
- 2456 • Moved the section for Printer Status attributes to be after the section for Printer
2457 Description attributes; and

- [Clarified the Finishing Offset and Finishing Reference Edge definitions, and simplified some attributes defining language to assume the reader is those definitions in context to eliminate superfluous language.](#)

~~15.1~~15.2 October 7, 2021

One minor change:

- In section 12.1 "Changes in IPP Finishings v3.0", moved the bullet stating that version contains changes in the requirements necessitating a new major version to be the first bullet in the list.

~~15.2~~15.3 October 6, 2021

One minor change:

- Added text to the first paragraph of section 5.3 "job-pages-per-set" to clearly state the conditions under which the Printer MUST implement this attribute, which was missing from the previous draft.

~~15.3~~15.4 September 2, 2021

Updated following IPP WG reviews on 2021-08-17, and 2021-09-02 with the following changes:

- Removed mention of "max-sheets" since it isn't needed;
- Fixed a few normative requirements;
- Fixed the definitions of the "laminating-sides" keywords; and
- Many small editorial changes to improve readability.

~~15.4~~15.5 April 12, 2021

Updated following IPP WG review on 2021-03-11 and 2021-04-08:

- Removed discussion of defaults from member attributes of the "finishings-col" Job Template attribute member attributes, but added description of the intended Printer behavior when only a "finishing-template" is supplied, and when other member attributes are supplied with or without a "finishing-template" member attribute
- Removed "A Client MUST" for all Job Template attributes (we don't make these statements in IPP).

- 2486 • Updated attribute descriptions to use the language conventions in the wd-template-
2487 20210315.docx draft

- 2488 • Removed the "Jog" and "Jog Offset" use case / feature, and deprecated the 'jog-
2489 offset' enum for "finishings"

2490 **~~15.5~~15.6 March 11, 2021**

2491 Updated following IPP WG review on 2021-02-25:

- 2492 • Updated description of "job-pages-per-set" after fixing its conformance requirement
- 2493 • Editorial changes following conformance requirements to a number of other attributes
- 2494 • Removed Client Conformance column from Table 2

2495 **~~15.6~~15.7 February 23, 2021**

2496 Updated following IPP WG review:

- 2497 • Rolled the version to 3.0 to update normative requirements
- 2498 • Rewrote some sections to update or in some cases remove normative requirements
2499 that were no longer necessary because there were no longer conditions for something
2500 being required in some cases.

2501 **~~15.7~~15.8 January 8, 2021**

2502 Resolved additional issues reported via email and IPP WG teleconference review:

- 2503 • Clarified "Note 1" for the table listing the keys for "printer-finisher" and "printer-
2504 finisher-supplies"
- 2505 • Created a new Printer Status Attributes section to match similar editorial changes in
2506 EPX and NODRIVER, and added tables to the start of sections to list the conformance
2507 requirements
- 2508 • Updated the conformance requirements
- 2509 • Rewrote the sections for "printer-finisher", "printer-finisher-description", "printer-
2510 finisher-supplies", and "printer-finisher-supplies-description" with Mike Sweet and
2511 Steven Young
- 2512 • Fixed passive voice and modernized the editorial style in the "xxx-supported"
2513 definitions in section 6.

- 2514 • Fixed section 5.1.4 to discuss FIN 2.1, and added an informative reference to FIN 2.1
- 2515 • Changed all references to RFC 8011 to instead reference STD92
- 2516 • Removed unused reference to RFC 20

2517 **~~15.8~~15.9 October 22, 2020**

- 2518 • Resolved errata reported to PWG website:
 - 2519 ○ [Issue #56](#) - Section 11.1 lacks mention of attributes and language clarifying
 - 2520 shape / size / rotation of staples and punch
 - 2521 ○ [Issue #87](#) - Section 5.1: uses of "feed-orientation" and "orientation-requested"
 - 2522 lack source reference citations
 - 2523 ○ [Issue #88](#) - Section 5.1.1 says 'RFC 2911 "finishings" Values'
- 2524 • Moved the definition of the 'trim-after-pages', 'trim-after-documents', 'trim-after-
- 2525 copies' and 'trim-after-job' enum value here since the originating document
- 2526 [PWG5100.13] is being updated at the time these v2.1.1 errata issues were being
- 2527 resolved.