



The Printer Working Group

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IPP Production Printing Extensions v2.0 (PPX)

Status: Prototype

Abstract: This specification defines attributes used for imposition, layout, and printing of covers, insert sheets, separator sheets, and different kinds of job sheets in high-volume "production" environments.

This specification was previously titled the "IPP Production Printing Attributes - Set 1".

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

This specification is available electronically at:

~~<https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippxxx20-20200130.docx>~~
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209 1. Introduction

210 High-volume "production" printing environments make use of covers, insert and separator
211 sheets, special media, and Input Page transformations in order to deliver finished print
212 products such as books, magazines, business cards, and so forth. Such environments also
213 often use dedicated human operators and job tracking processes. This specification defines
214 attributes used for printing in such high-volume "production" environments.

215 This specification obsoletes portions of the previous version of this specification
216 [PWG5100.3-2001] and was previously titled the "IPP Production Printing Attributes - Set
217 1". The title and conformance requirements of this version have been updated to better
218 reflect its focus. Finishing-specific attributes have been moved to the IPP Finishings 2.1
219 (FIN) specification [PWG5100.1]. The "media-col" Job Template and related attributes have
220 been moved to the IPP Job Extensions v2.0 (JOBEXT) specification [PWG5100.7]. A list of
221 changes can be found in section 12.

222 2. Terminology

223 2.1 Conformance Terminology

224 Capitalized terms, such as MUST, MUST NOT, RECOMMENDED, REQUIRED, SHOULD,
225 SHOULD NOT, MAY, and OPTIONAL, have special meaning relating to conformance as
226 defined in Key words for use in RFCs to Indicate Requirement Levels [BCP14]. The term
227 CONDITIONALLY REQUIRED is additionally defined for a conformance requirement that
228 applies when a specified condition is true.

229 The term DEPRECATED is used for previously defined and approved protocol elements that
230 SHOULD NOT be used or implemented. The term OBSOLETE is used for previously defined
231 and approved protocol elements that MUST NOT be used or implemented.

232 2.2 Printing Terminology

233 Normative definitions and semantics of printing terms are imported from the Internet Printing
234 Protocol/1.1 [STD92].

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

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

240 *Logical Device*: a print server, software service, or gateway that processes jobs and either
241 forwards or stores the processed job or uses one or more Physical Devices to render output.

242 *Output Device*: a single Logical or Physical Device

243 *Physical Device*: a hardware implementation of a endpoint device, e.g., a marking engine, a
244 fax modem, etc.

245 **2.3 Protocol Role Terminology**

246 The following protocol roles are defined to specify unambiguous conformance requirements:

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

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

252 **2.4 Other Terminology**

253 *Administrator*: An End User who is also authorized to manage all aspects of an Output
254 Device or Printer, including creating the printer instances and controlling the authorization
255 of other End Users and Operators [STD92].

256 *Cover Sheet*: A Media Sheet that the Printer adds to the beginning or end of a Set. Cover
257 Sheets may have zero, one, or two Input Pages imaged on them.

258 *Document Data*: The data that represent an "original document" supplied with a Job Creation
259 request. Typically Document Data is in the form of a Page Description Language (PDL).

260 *End User*: A person or software process that is authorized to perform basic printing functions,
261 including finding/locating a Printer, creating a local instance of a Printer, viewing Printer
262 status, viewing Printer capabilities, submitting a Print Job, viewing Print Job status, and
263 altering the attributes of a Print Job [STD92].

264 *Error Sheets*: One or more Media Sheets that the Printer adds to the end of a Job providing
265 information about the processing status of the Job including any errors that occurred.

266 *Imposition*: The process of laying out Impressions on the sides of one or more larger Media
267 Sheets. The Media Sheets can be folded and/or cut in order to produce a series of Finished
268 Pages.

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

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

- 275 *Insert Sheet*: A Media Sheet that the Printer inserts into an output document, on which no
276 Input Pages are imaged.
- 277 *ith*: Referring to a specific IPP '1setOf' value - the first value, the second value, and so forth.
- 278 *Job Creation Operation*: Any operation that causes the creation of a Job, e.g., Create-Job,
279 Print-Job, and Print-URI [STD92].
- 280 *Logical Device*: A print server, software service, or gateway that processes Jobs and either
281 forwards or stores the processed Job or uses one or more Physical Devices to render output
282 [STD92].
- 283 *Media Sheet*: A single instance of a medium, whether printing on one or both sides of the
284 medium. Media Sheets also include sections of roll media [STD92].
- 285 *Number Up*: The process of laying out multiple consecutive Input Pages to produce an
286 Impression.
- 287 *Operator*: An End User that also has special rights on the Output Device or Printer. The
288 Operator typically monitors the status of the Printer and manages and controls the Jobs at
289 the Output Device. The Operator is allowed to query and control the Printer, Jobs, and
290 Documents based on site policy [STD92].
- 291 *Output Device*: a single Logical or Physical Device [STD92].
- 292 *Physical Device*: A hardware implementation of an endpoint device, e.g., a marking engine,
293 a fax modem, etc. [STD92]
- 294 *Separator Sheet*: A Media Sheet that the Printer inserts between Sets in a Job, on which no
295 Input Pages are imaged.
- 296 *Set*: A logical boundary between the delivered Media Sheets of a printed Job. For example,
297 in the case of a ten-page single Document with collated pages and a request for 50 copies,
298 each of the 50 printed copies of the Document constitute a Set. If the pages were uncollated,
299 then 50 copies of each of the individual pages within the Document would represent each
300 Set. Finishing processes operate on Sets [STD92].
301

302 **2.5 Acronyms and Organizations**

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

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

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

306 *PDL*: Page Description Language

307 *PWG*: Printer Working Group, <http://www.pwg.org/>

308

309 **3. Requirements**

310 **3.1 Rationale**

311 Given the following existing specifications:

- 312 1. Internet Printing Protocol/1.1 [STD92]
- 313 2. IPP Finishings v2.1 (FIN) [PWG5100.1]

314 And given the desire for specifying printing intent in high-volume "production" printing
315 environments, the IPP Production Printing Extensions v1.1 (PPX) should:

- 316 1. Define attributes and values for specifying printed covers;
- 317 2. Define attributes and values for specifying how Input Pages are mapped to the
318 front side of a Media Sheet;
- 319 3. Define attributes and values for specifying how Input Pages are imposed on
320 Impressions;
- 321 4. Define attributes and values for specifying insert sheets;
- 322 5. Define attributes and values for specifying Job accounting, error handling,
323 operator, and summary information;
- 324 6. Define attributes and values for specifying the ordering and layout of Input
325 Pages; and
- 326 7. Define attributes and values for specifying how Input Pages are offset when
327 imposed on Impressions.

328 **3.2 Use Cases**

329 **3.2.1 Printing Bound Books with Printed Covers**

330 Jane wants to print a small run of 100 books from a document that contains pages for the
331 front and back covers. She opens the document in her client software and initiates a print
332 action, specifying the number of copies (100), desired output media, two-sided printing
333 intent, binding of output media pages, and the cover media with content from the input
334 document. The printer uses the first and last pages from the document for the covers of each
335 copy of the book that is printed.

336 **3.2.2 Printing Folded Booklets**

337 Bill wants to print a booklet from his word processing software, which does not know how to
338 layout pages for booklet printing. He initiates the print action from the software and specifies
339 that the printer should reorder and position the input pages so they appear in the correct
340 locations for a folded booklet.

341 **3.2.3 Separating Copies with Colored Paper**

342 David is printing multiple copies of a test and wants to separate each copy with a piece of
343 colored paper. He initiates the print action from his test software and specifies that each
344 copy should be separated by a yellow sheet.

345 **3.3 Exceptions**

346 The following subsection defines one exception, in addition to those defined in the Internet
347 Printing Protocol/1.1 [STD92].

Deleted: s

348 **3.3.1 Printing a Report on Error**

349 Bob manages a small printing shop and needs to know when a job fails to print correctly. He
350 uses his printer management software to always print an error summary on pink sheets.

351 **3.4 Out of Scope**

352 The following are considered out of scope for this specification:

- 353 1. Definition of new file formats; and
354 2. Definition of new protocol bindings.

355 **3.5 Design Requirements**

356 The design requirements for this specification are:

- 357 1. Define attributes and values for specifying printed covers;
358 2. Define attributes and values for specifying how Input Pages are mapped to the
359 front side of a Media Sheet;
360 3. Define attributes and values for specifying how Input Pages are imposed on
361 Impressions;
362 4. Define attributes and values for specifying Insert Sheets;
363 5. Define attributes and values for specifying Job accounting, error reporting,
364 operator, and summary information;
365 6. Define attributes and values for specifying the ordering and layout of Input
366 Pages;
367 7. Define attributes and values for specifying how Input Pages are offset when
368 imposed on Impressions; and
369 8. Define sections to register all attributes, values, and operations with IANA.
370

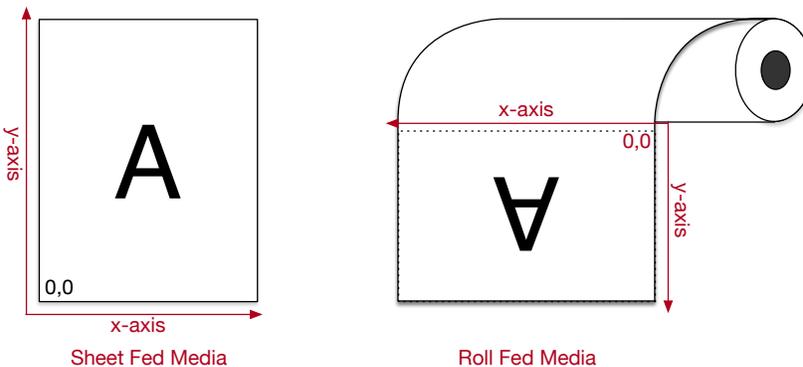
372 4. Model

373 This specification extends the Internet Printing Protocol/1.1 [STD92] model to include Job
374 Template attributes for production printing that specify:

- 375 1. Front and back covers;
- 376 2. Which Input Pages are placed on the front side of a Media Sheet;
- 377 3. How Input Pages are imposed on each Impression;
- 378 4. How Input Pages are ordered prior to imposition;
- 379 5. How Input Pages are offset during imposition;
- 380 6. Where and what Insert Sheets are placed in the output;
- 381 7. Job accounting information;
- 382 8. Job error reporting requirements; and
- 383 9. A message to the operator.

384 4.1 Imaging Coordinate System and Units

385 Figure 1 shows the coordinate system used by IPP when addressing locations on a Media
386 Sheet or within an Impression. Coordinates are provided without respect to the orientation
387 of the Input Page. For sheet fed media the X dimension is the short side and the Y dimension
388 is the long side ("portrait" orientation). For roll fed media the X dimension is in the cross-feed
389 direction and the Y dimension is in the feed direction, with the "top" of the page being the
390 leading edge of the roll.



391

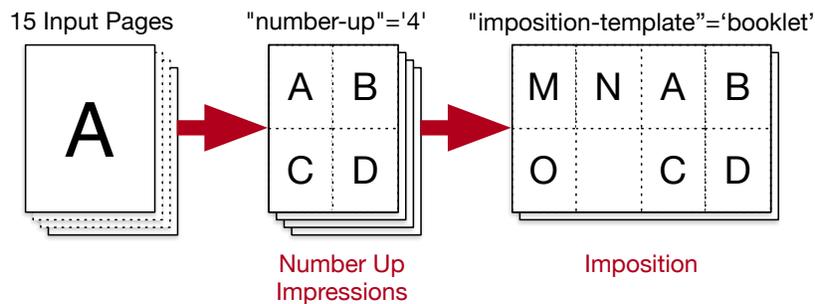
392

Figure 1 - IPP Media Sheet Coordinate System

393 Dimensions are always given in hundredths of millimeters (1/2540th of an inch) which are
394 sometimes called "PWG units".

395 4.2 Number Up, Imposition, and Shifting

396 The concepts of Number Up ("number-up" [STD92]) layout and Imposition are related but
397 separate steps. Figure 2 shows these steps visually for booklet imposition.



398

399

Figure 2 - Relationship Between Number Up and Imposition

400 Aside from the "imposition-template" Job Template attribute (section 5.1.3), this specification
401 defines additional Job Template attributes to offset and position the imposed Impressions
402 on the Media Sheet, typically to compensate for an application or scanning in some
403 consistent direction, or to shift the Impressions toward or away from a binding edge.

404 The Printer MUST apply "number-up", "page-delivery", "presentation-direction-number-up",
405 image shifting, and "imposition-template" attributes listed in Table 1 in the following order:

- 406 1. Order the Input Pages according to the "page-delivery" attribute (section 5.1.10).
407 If "page-delivery" is unsupported or not applied, Input Pages are processed in the
408 order they occur within the Document Data.
- 409 2. Create an Impression by laying out the number of Input Pages specified by the
410 "number-up" attribute [STD92] in the direction specified by the "presentation-
411 direction-number-up" attribute (section 5.1.11). If "number-up" and "presentation-
412 direction-number-up" are unsupported or not applied, the Impression consists of
413 a single Input Page.
- 414 3. Shift the Impression as specified by the "x-image-xxx" and "y-image-xxx" image
415 shifting attributes. If the image shifting attributes are unsupported or not applied,
416 the Impression is not shifted.
- 417 4. Layout the Impressions onto the surfaces (i.e. sides) of a number of (larger) Media
418 Sheets according to the "force-front-side" (section 5.1.2), "imposition-template",
419 and "sides" [STD92] attributes.
420

421

Table 1 - Number Up, Imposition, and Offset Attributes

Template Attribute	Default Attribute	Supported Attribute
force-front-side (1setOf integer(1:MAX))	N/A	force-front-side-supported (rangeOfInteger(1:MAX))
imposition-template (type2 keyword name(MAX))	imposition-template-default (type2 keyword name(MAX))	imposition-template-supported (1setOf (type2 keyword name(MAX)))
page-delivery (type2 keyword)	page-delivery-default (type2 keyword)	page-delivery-supported (1setOf type2 keyword)
presentation-direction-number-up (type2 keyword)	presentation-direction-number-up-default (type2 keyword)	presentation-direction-number-up-supported (1setOf type2 keyword)
x-image-position (type2 keyword)	x-image-position-default (type2 keyword)	x-image-position-supported (1setOf type2 keyword)
x-image-shift (integer(MIN:MAX))	x-image-shift-default (integer(MIN:MAX))	x-image-shift-supported (rangeOfInteger(MIN:MAX))
x-side1-image-shift (integer(MIN:MAX))	x-side1-image-shift-default (integer(MIN:MAX))	x-side1-image-shift-supported (rangeOfInteger(MIN:MAX))
x-side2-image-shift (integer(MIN:MAX))	x-side2-image-shift-default (integer(MIN:MAX))	x-side2-image-shift-supported (rangeOfInteger(MIN:MAX))
y-image-position (type2 keyword)	y-image-position-default (type2 keyword)	y-image-position-supported (1setOf type2 keyword)
y-image-shift (integer(MIN:MAX))	y-image-shift-default (integer(MIN:MAX))	y-image-shift-supported (rangeOfInteger(MIN:MAX))
y-side1-image-shift (integer(MIN:MAX))	y-side1-image-shift-default (integer(MIN:MAX))	y-side1-image-shift-supported (rangeOfInteger(MIN:MAX))
y-side2-image-shift (integer(MIN:MAX))	y-side2-image-shift-default (integer(MIN:MAX))	y-side2-image-shift-supported (rangeOfInteger(MIN:MAX))

422 4.3 Cover, Insert, and Separator Sheets

423 The IPP Finishings 2.1 (FIN) [PWG5100.1] specification defines covers as one or two Media
424 Sheets that are placed over the hardcopy output. These covers are not printed on and draw
425 from a separate media supply. They can also be combined with the Cover Sheets, Insert
426 Sheets, and Separator Sheets defined in this specification.

427 Cover Sheets can be printed using Input Pages in the Job's Document Data and draw from
428 the standard media supply. Blank Insert Sheets can be added to separate forms or reports
429 within a Set. Blank Separator Sheets can be added between Sets to separate each Set
430 visually. Table 2 lists the Cover Sheet, Insert Sheet, and Separator Sheet attributes.

431 For example, a Job can request five copies of a Document with the first and last Input Page
432 of the Document Data printed as covers on blue cardstock Media Sheets, blank yellow Media
433 Sheets inserted between each section within the Document Data, and blank pink Media
434 Sheets separating each Set (copy) of the Document. When combined with IPP Finishings
435 2.1, the Covers and interior Media Sheets can be bound with the Separator Sheets left loose
436 between the bound Sets. Figure 3 shows how these Media Sheets are ordered within the
437 Job's output.

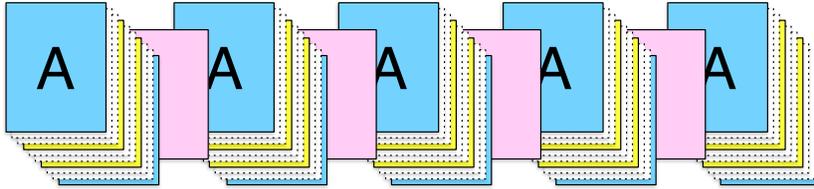


Figure 3 - Cover, Insert, and Separator Sheets

Table 2 - Cover, Insert, and Separator Sheet Attributes

Template Attribute	Default Attribute	Supported Attribute(s)
cover-back (collection)	cover-back-default (collection)	cover-back-supported (1setOf keyword) cover-type-supported (1setOf (type2 keyword name(MAX)))
cover-front (collection)	cover-front-default (collection)	cover-front-supported (1setOf keyword) cover-type-supported (1setOf (type2 keyword name(MAX)))
insert-sheet (1setOf collection)	insert-sheet-default (1setOf collection)	insert-sheet-supported (1setOf keyword) insert-count-supported (rangeOfInteger(0:MAX))
separator-sheets (collection)	separator-sheets-default (collection)	separator-sheets-supported (1setOf keyword) separator-sheets-type-supported (1setOf (type2 keyword name(MAX)))

438

439

440

441

442

443 **4.4 Error Sheets**

444 Error Sheets are an important part of large print Jobs which provide a detailed processing
 445 report that can be used to troubleshoot a Job. Table 3 lists the Error Sheet attributes.

446 **Table 3 - Error Sheet Attributes**

Job Template Attribute	Default Attribute	Supported Attribute(s)
job-error-sheet (collection)	job-error-sheet-default (collection)	job-error-sheet-supported (1setOf keyword) job-error-sheet-type-supported (1setOf (type2 keyword name(MAX))) job-error-sheet-when-supported (1setOf type2 keyword)
job-message-to-operator (text(MAX))	N/A	job-message-to-operator-supported (boolean)
job-sheet-message (text(MAX))	N/A	job-sheet-message-supported (boolean)

447

448

449 5. New Attributes

450 5.1 Job Template Attributes

451 5.1.1 cover-back (collection) and cover-front (collection)

452 These RECOMMENDED attributes specify how Cover Sheets are applied to the back and
 453 front of each Set. The Media Sheets in the rendered output that represent the Cover Sheets
 454 are treated like any other Media Sheet in the Set. For example, if the "finishings" Job
 455 Template attribute [STD92] has a value of 'staple,' then the staple would bind the Cover
 456 Sheets along with all of the other Media Sheets in the Set.

457 Table 4 lists the member attributes. If the Client omits both the "media" and the "media-col"
 458 member attributes, then the media currently being used by the Printer for the Job SHOULD
 459 also be used for the Cover Sheets. The Client MUST NOT supply both the "media" and the
 460 "media-col" member attributes. If the Client supplies such a malformed request, the Printer
 461 MUST either reject the request and return the 'client-error-bad-request' status code or
 462 choose either the "media" or the "media-col" member attribute and return the 'successful-
 463 ok-ignored-or-substituted-values' status code with the unused member attribute in the
 464 unsupported attributes group.

465 **Table 4 - "cover-front" and "cover-back" Member Attributes**

Member Attribute	Conformance
media (type2 keyword name(MAX))	REQUIRED
media-col (collection)	REQUIRED
cover-type (type2 keyword)	REQUIRED

466 5.1.1.1 media (type2 keyword | name(MAX))

467 This REQUIRED member attribute specifies the media to use for the cover. If specified, the
 468 "media-col" member attribute (section 5.1.1.2) MUST NOT be specified.

469 5.1.1.2 media-col (collection)

470 This REQUIRED member attribute specifies the media to use for the cover. If specified, the
 471 "media" member attribute (section 5.1.1.1) MUST NOT be specified.

472 5.1.1.3 cover-type (type2 keyword)

473 This REQUIRED member attribute specifies whether a Cover Sheet is intended and which
 474 sides of the Cover Sheet are printed. The Input Pages used for printing on a Cover Sheet
 475 come from the Document Data.
 476

477 Standard keyword values for "cover-type" are:

478 'no-cover': No Cover Sheet is produced.

479 'print-none': Add a Cover Sheet but do not print on either side.

480 'print-front': Add a Cover Sheet that is printed on the front side (side one). For a
481 front cover ("cover-front") the first Input Page is printed on side one of the Cover
482 Sheet (this is the outside of the front cover) and the second Input Page is printed on
483 side one of the first Media Sheet of the output. For back cover ("cover-back") the
484 last Input Page is printed on side one of the Cover Sheet (this is the inside of the
485 back cover).

486 'print-back': Add a Cover Sheet that is printed on the back side (side two). For a
487 front cover ("cover-front") the first Input Page is printed on side two of the Cover
488 Sheet (this is the inside of the front cover) and the second Input Page is printed on
489 side one of the first Media Sheet of the output. For a back cover ("cover-back") the
490 last Input Page is printed on side two of the Cover Sheet (this is the outside of the
491 back cover).

492 'print-both': Add a Cover Sheet that is printed on both sides of the cover. The front
493 cover has the first and second Input Pages printed on the front and back sides of
494 the Cover Sheet, respectively. The back cover has the second to last and last Input
495 Pages printed on the front and back sides of the Cover Sheet, respectively.

496 When printing on the back side (side two) of a Cover Sheet, the value of the "sides" Job
497 Template attribute [STD92] SHOULD be used to determine which edge is the reference
498 edge, i.e., the long or short edge. When the "sides" attribute is 'one-sided', the reference
499 edge SHOULD be the long edge.

500 In cases where the Document Data does not contain enough Input Pages to satisfy the
501 "cover-type" request, the behavior is implementation dependent.

502 **5.1.2 force-front-side (1setOf integer(1:MAX))**

503 This RECOMMENDED attribute forces the identified Input Pages (numbered 1 to N) to be
504 imposed on the front side of a Media Sheet. This attribute is typically used to start a new
505 chapter or section of a document. For each identified Input Page, if that page would have
506 been imposed on the back side of a Media Sheet, that back side is left blank and the page
507 is imposed on the front side of the next Media Sheet.

508 If the "number-up" Job Template attribute [STD92] is also supplied and the specified page
509 would have been in the first position on the front side of a Media Sheet anyway, this attribute
510 has no effect. Otherwise, the Printer imposes the specified page in the first position of the
511 front side of the next Media Sheet and the intervening page positions are left blank.

512 5.1.3 imposition-template (type2 keyword | name(MAX))

513 This RECOMMENDED attribute specifies how Impressions are imposed on one or more
514 Media Sheets. Figure 4 shows the results of different kinds of imposition. Standard keyword
515 values are:

516 'none': No imposition template is applied.

517 'booklet': A template is applied so that Impressions are positioned, scaled, and
518 ordered for a saddle-stitched half-fold booklet.

519 'same-up_4_3_2x3.5in': Impressions are duplicated in four columns and three rows
520 using the standard business card size, producing 12 business card images. For
521 duplex printing, odd-numbered Impressions are duplicated for the front side and
522 even-numbered Impressions are duplicated for the back side of each Media Sheet.

523 'same-up_2_2_3.5x5in': Impressions are duplicated in two columns and two rows
524 using the standard US postcard size, producing four postcard images. For duplex
525 printing, odd-numbered Impressions are duplicated for the front side and even-
526 numbered Impressions are duplicated for the back side of each Media Sheet.

527 'same-up_2_2_105x148mm': Impressions are duplicated in two columns and two
528 rows using the standard ISO A6 postcard size, producing four postcard images. For
529 duplex printing, odd-numbered Impressions are duplicated for the front side and
530 even-numbered Impressions are duplicated for the back side of each Media Sheet.

531 'signature': An implementation-specific template is applied so that Impressions are
532 printed on both sides of a single Media Sheet that is folded, trimmed, bound and cut
533 to become a specific number of pages depending on the Impression size and the
534 size of the Media Sheet. This value is DEPRECATED.

535 ['tile': Impressions are automatically tiled to minimize media usage, typically for roll-](#)
536 [fed media. Printers can also merge Documents and Jobs using 'tile' to further](#)
537 [minimize media usage.](#)

538 Other keywords using the 'same-up' prefix can be specified using the 'same-
539 up_COLS_ROWS_WIDTHxHEIGHTunits' format. Figure 5 shows the ABNF [STD68] for
540 "imposition-template" keyword values.

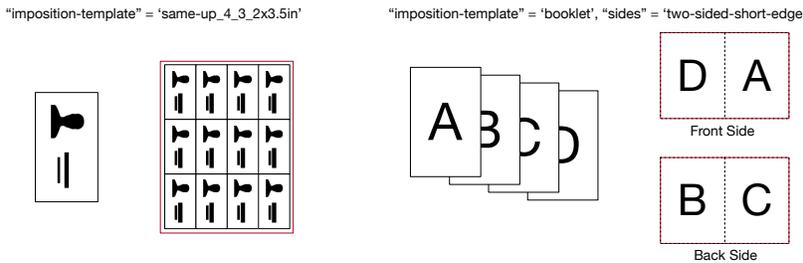


Figure 4 - "imposition-template" Examples

Figure 5 - ABNF for "imposition-template" Keyword Values

```

IMPOSITION-TEMPLATE = "booklet" / "none" / "signature" /
    IMPOSITION-SAME-UP / IMPOSITION-VENDOR

IMPOSITION-SAME-UP = "same-up_"
    INITIAL *DIGIT "-" ; same-up...
    INITIAL *DIGIT "-" ; Columns
    INITIAL *DIGIT "-" ; Rows
    INITIAL *DIGIT [ "-" 1*DIGIT ] "x" ; Width
    INITIAL *DIGIT [ "." 1*DIGIT ] ; Height
    ( "in" / "mm" ) ; Units

IMPOSITION-VENDOR = "smi" 1*DIGIT "-" 1*KEYWORDCHAR ; smiNNN-foo

INITIAL = %x31-39 ; 1-9
KEYWORDCHAR = %x61-7A / DIGIT / "." / "-" / "_" ; a-z, 0-9, etc.
    
```

5.1.4 insert-sheet (1setOf collection)

This REQUIRED attribute specifies where Insert Sheets are included in the sequence of Media Sheets that are produced for Set in the Job. The order of the values of the "insert-sheet" attribute is significant - in the case where more than one value refers to the same "insert-after-page-number" member attribute value, the values of "insert-sheet" are applied in the order specified.

This attribute is affected by the "multiple-document-handling" attribute. For values of 'single-document' and 'single-document-new-sheet', the sheet is inserted in the composite (single) document created by the concatenation of all the Input Pages in all of the Documents. In the case of 'separate-documents-collated-copies' and 'separate-documents-uncollated-copies', the inserted sheets are applied to each Document separately. Table 5 lists the member attributes.

Table 5 - "insert-sheet" Member Attributes

Member Attribute	Conformance
insert-after-page-number (integer(1:MAX))	REQUIRED
insert-count (integer(0:MAX))	REQUIRED

Member Attribute	Conformance
media (type2 keyword name(MAX))	REQUIRED
media-col (collection)	REQUIRED

571 5.1.4.1 insert-after-page-number (integer(0:MAX))

572 This REQUIRED member attribute specifies the Input Page number, starting at 1, after which
573 the Insert Sheets are to be placed. The inserted sheets do not affect the numbering of Input
574 Pages. For example, to insert a single sheet after both pages 2 and 3 of a given document,
575 the value of "input-after-page-number" would be '2' and '3' respectively, not '2' and '4' as it
576 would be if the inserted sheet affected the Input Page count.

577 If the value is '0' then the sheet is inserted before the first page. If the value is MAX
578 ('2147483647'), then the sheet is inserted after the last page.

579 If the value is not a valid Input Page number, e.g., if the page number is beyond the last
580 page and is not MAX, or if the "page-ranges" Job Template attribute [STD92] does not
581 include the specified page number, then the Printer SHOULD ignore the request.. There is
582 no way to validate this member attribute with the Validate-Job operation since the validation
583 cannot occur until the pages of the Documents have arrived at the Printer.

584 Since this member attribute refers to a specific Input Page, it is possible to specify a page
585 that would not be the last page on a sheet, e.g., an insertion occurs after the page that is on
586 the front side of a two-sided document. In this case, the Printer MUST force a new Media
587 Sheet after the specified page, insert the specified sheet, and place the following pages
588 starting on the first side of the next Media Sheet.

589 5.1.4.2 insert-count (integer(0:MAX))

590 This REQUIRED member attribute specifies how many sheets to insert. If omitted, the
591 Printer assumes a value of '1'. The value '0' indicates that no inserts sheets are to be
592 inserted.

593 5.1.4.3 media (type2 keyword | name(MAX))

594 This REQUIRED member attribute specifies the media to insert. If specified, the "media-col"
595 member attribute (section 5.1.4.4) MUST NOT be specified.

596 5.1.4.4 media-col (collection)

597 This REQUIRED member attribute specifies the media to insert. If specified, the "media"
598 member attribute (section 5.1.4.3) MUST NOT be specified.

599 5.1.5 job-accounting-sheets (collection)

600 This DEPRECATED attribute specifies which Job accounting sheets to print with the Job.
601 Job accounting sheets typically contain information such as the value of the "job-account-
602 id" and "job-accounting-user-id" attributes [PWG5100.7], and the number and type of media

603 sheets used while printing the Job. The exact information contained on a Job accounting
 604 sheet is implementation-dependent but should always be a reflection of the account
 605 information associated with the Job. Typically, Job accounting sheets are printed after the
 606 Job and are not finished, i.e., not stapled, with the Sets. Table 6 lists the member attributes.

607 **Table 6 - "job-accounting-sheets" Member Attributes**

Member Attribute	Conformance
job-accounting-sheets-type (type2 keyword name(MAX))	REQUIRED
media (type2 keyword name(MAX))	REQUIRED
media-col (collection)	REQUIRED
job-accounting-output-bin (type2 keyword name(MAX))	RECOMMENDED

- Deleted: MUST
- Deleted: MUST
- Deleted: MUST
- Deleted: SHOULD

608 **5.1.5.1 job-accounting-sheets-type (type2 keyword | name(MAX))**

609 This REQUIRED member attribute specifies the Job accounting sheets format to use.
 610 Standard keyword values are:

611 'none': Suppress printing of accounting sheets.

612 'standard': Use the standard site accounting sheets.

613 **5.1.5.2 media (type2 keyword | name(MAX))**

614 This REQUIRED member attribute specifies the media to use for the Job accounting sheets.
 615 If specified, the "media-col" member attribute (section 5.1.5.3) MUST NOT be specified.

616 **5.1.5.3 media-col (collection)**

617 This REQUIRED member attribute specifies the media to use for the Job accounting sheets.
 618 If specified, the "media" member attribute (section 5.1.5.2) MUST NOT be specified.

619 **5.1.5.4 job-accounting-output-bin (type2 keyword | name(MAX))**

620 This RECOMMENDED member attribute specifies the output bin [PWG5100.2] in which the
 621 accounting sheets are to be placed. If this member attribute is not supplied by the Client or
 622 is not supported by the Printer, then the Printer places the accounting sheets in the same
 623 output bin as the rest of the Job.

624 **5.1.6 job-error-sheet (collection)**

625 This REQUIRED attribute specifies which Error Sheet to print with the Job. The Error Sheet
 626 lists any known errors or warnings that occurred during processing. For example, a Printer
 627 could put the text "warning: image off page 2," on the Error Sheet to indicate a possible
 628 image processing defect.

629 If the Printer is producing a Job Sheet for this Job, the Printer can print any error and warning
 630 information on the same Job Sheet, i.e., merge the Error Sheet with the Job Sheet. This use

635 of the Job Sheet for errors only applies if the "job-error-sheet" attribute is supplied without
 636 either a "media" or "media-col" member attribute. If the "media" or "media-col" member
 637 attribute is supplied, a separate Error Sheet MUST be used to print errors and warnings.
 638 Table 7 lists the member attributes.

639 **Table 7 - "job-error-sheet" Member Attributes**

Member Attribute	Conformance
job-error-sheet-type (type2 keyword name(MAX))	REQUIRED
job-error-sheet-when (type2 keyword)	REQUIRED
media (type2 keyword name(MAX))	REQUIRED
media-col (collection)	REQUIRED

640 **5.1.6.1 job-error-sheet-type (type2 keyword | name(MAX))**

641 This REQUIRED member attribute specifies the type of Error Sheets to print. Standard
 642 keyword values are:

643 'none': Do not print error information.

644 'standard': Use the standard site or vendor defined error template.

645 **5.1.6.2 job-error-sheet-when (type2 keyword)**

646 This REQUIRED member attribute specifies the conditions under which the Error Sheet
 647 information is to be produced. The standard keyword values are:

648 'on-error': Print the Error Sheet information if and only if errors or warnings occurred
 649 during the life of the Job.

650 'always': Always print the Error Sheet information.

651 **5.1.6.3 media (type2 keyword | name(MAX))**

652 This REQUIRED member attribute specifies the media to use for the Error Sheets. If
 653 specified, the "media-col" member attribute (section 5.1.6.4) MUST NOT be specified.

654 **5.1.6.4 media-col (collection)**

655 This REQUIRED member attribute specifies the media to use for the Error Sheets. If
 656 specified, the "media" member attribute (section 5.1.6.3) MUST NOT be specified.

657 **5.1.7 job-message-to-operator (text(MAX))**

658 This REQUIRED attribute specifies a message from the End User to the Operator to indicate
 659 something about the processing of the print Job. A zero-length value indicates no message.

660 5.1.8 job-sheet-message (text(MAX))

661 This REQUIRED attribute specifies a message that is delivered with the Job and is printed
662 on the specified Job Sheet.

663 5.1.9 media-input-tray-check (type2 keyword | name(MAX))

664 This DEPRECATED attribute specifies that the Printer MUST verify that the characteristics
665 of the media in the identified input tray are the same as characteristics of the media identified
666 by the Job's "media" or "media-col" Job Template attributes. The keyword values are the
667 same input tray keyword values as defined in the PWG Media Standardized Names v2.0
668 (MSN2) [PWG5101.1].

669 Note: Clients SHOULD use the "media-source" member attribute of the "media-col" attribute
670 [PWG5100.7] instead of this attribute.

671 Independent of the "ipp-attributes-fidelity" operation attribute supplied by the Client, if the
672 characteristics differ, the Printer adds the 'resources-are-not-ready' value (see section 6.1)
673 to the Job's "job-state-reasons" attribute and MAY either put the Job into the 'pending-held'
674 state or start to process the Job normally but immediately stop the Job ("job-state" =
675 'processing-stopped') and the Printer ("printer-state" = 'stopped', "printer-state-reasons"
676 includes 'media-needed'). In either implementation, the Operator can change the media in
677 the input tray to agree with the Job or can modify the Job's "media" or "media-col" attributes
678 to agree with the input tray, depending on policy.

679 5.1.10 page-delivery (type2 keyword)

680 This REQUIRED attribute specifies whether Input Pages of the Job are to be delivered to
681 the output bin or finisher in the same page order as the original document and whether the
682 Input Pages are delivered face up or face down. Standard keyword values for page delivery
683 are:

684 'same-order-face-up': The Media Sheets that represent the printed output MUST be
685 delivered to the output bin or finishing device in the same order as defined by the
686 "page-order-received" attribute. Furthermore, side one of each Media Sheet MUST
687 be delivered face up to the output bin or finishing device.

688 'same-order-face-down': The Media Sheets that represent the printed output MUST
689 be delivered to the output bin or finishing device in the same order as defined by the
690 "page-order-received" attribute. Furthermore, side one of each Media Sheet MUST
691 be delivered face down to the output bin or finishing device.

692 'reverse-order-face-up': The Media Sheets that represent the printed output MUST
693 be delivered to the output bin or finishing device in the reverse order of the "page-
694 order-received" attribute. Furthermore, side one of each Media Sheet MUST be
695 delivered face up to the output bin or finishing device.

696 'reverse-order-face-down': The Media Sheets that represent the printed document
697 MUST be delivered to the output bin or finishing device in the reverse order of the
698 "page-order-received" attribute. Furthermore, side one of each Media Sheet MUST
699 be delivered face down to the output bin or finishing device.

700 'system-specified': The Printer selects the most efficient delivery order based on
701 other Job Template attributes supplied by the Client, such as "finishings",
702 "finishings-col", "page-order-received", and "sides".

703 This attribute is often used in conjunction with online and offline finishing devices. The intent
704 is to be able to deliver the Media Sheets in either the order of the Input Pages or in the
705 reverse of that order.

706 **5.1.11 presentation-direction-number-up (type2 keyword)**

707 This DEPRECATED attribute specifies the order that the Printer places Input Pages with the
708 "number-up" attribute. This attribute is especially useful to control the presentation direction
709 in languages or multi-lingual documents that have more than one presentation direction but
710 may be used with any language. For example, Japanese text on pages can have a
711 presentation direction that is either top-to-bottom-right-to-left or left-to-right-top-to-bottom.
712 Similarly, a mixed English and Hebrew document can have a presentation direction that is
713 either left-to-right-top-to-bottom or right-to-left-top-to-bottom. This attribute allows the Client
714 to specify the placement of Input Pages on Impressions to mirror the direction of the text on
715 pages.

716 Table 8 below shows the standard keyword values. The name of each attribute value
717 suggests the order of laying out Input Pages on a Impression when a human reader is
718 holding the sheet in the proper orientation, i.e., oriented so text is oriented for normal
719 reading. For each 'toxxx-toyyy' value, the images are placed according to the 'toxxx'
720 direction, and then according to the 'toyyy' direction, and the first image is placed in the
721 corner diagonally opposite the 'xxx-yyy' corner. For example, 'tright-tobottom' starts in the
722 upper-left corner which is diagonally opposite the 'right-bottom' corner. The images are
723 placed from left to right in a line, and the line progression is from top to bottom.

724 Unlike other Job Template attributes, the coordinate system for this attribute is relative to
725 the orientation of the Input Pages. The reason that this attribute has a relative coordinate
726 system is that the Client may not know what the orientation of the document actually is,
727 especially if the Client did not generate the document.

728 The Printer determines the Document orientation in the following way:

- 729 1. If the Client supplies the "orientation-requested" Job Template attribute [STD92],
730 that attribute specifies the orientation.
- 731 2. If the Client doesn't supply the "orientation-requested" attribute and the Printer is
732 able to determine the orientation by inspecting the Document, that is the
733 orientation.

734 3. If the Client doesn't supply the "orientation-requested" attribute and the Printer is
 735 unable to determine the orientation by inspecting the Document, the orientation
 736 is the value specified by the "orientation-requested-default" Printer Description
 737 attribute [STD92].

738 The orientation is used by the "presentation-direction-number-up" attribute for laying out
 739 pages on the Impression as follows:

- 740 1. If the value of the "number-up" attribute is a power of 4, e.g., 1, 4, or 16, the
 741 orientation is used as-is.
- 742 2. If the value of the "number-up" attribute is 2 times the power of 4, e.g., 2 and 8,
 743 the orientation used for layout is:
 - 744 a. 'landscape' if the Document orientation is 'portrait';
 - 745 b. 'portrait' if the Document orientation is 'landscape';
 - 746 c. 'reverse-landscape' if the Document orientation is 'reverse-landscape'; and
 - 747 d. 'reverse-landscape' if the Document orientation is 'reverse-landscape';
- 748 3. If the value of "number-up" is any other value, e.g., 3, 6, or 12, the orientation
 749 used for layout is implementation-defined.

750 **Table 8 - Standard Values for the "presentation direction" Attribute**

Value	Portrait	Landscape	Reverse-Landscape	Reverse-Portrait
'tright-tobottom'				
'tobottom-tright'				
'toleft-tobottom'				
'tobottom-toleft'				
'tright-totop'				
'totop-tright'				

Value	Portrait	Landscape	Reverse-Landscape	Reverse-Portrait
'toleft-totop'				
'totop-toleft'				

751 **5.1.12 separator-sheets (collection)**

752 This REQUIRED attribute specifies when Separator Sheets are printed between Sets in the
 753 Job. Separator Sheets can contain Printer-generated content or be blank Media Sheets.
 754 Table 9 lists the member attributes.

755 **Table 9 - "separator-sheets" Member Attributes**

Member Attribute	Conformance
separator-sheets-type (type2 keyword name(MAX))	REQUIRED
media (type2 keyword name(MAX))	REQUIRED
media-col (collection)	REQUIRED

756 **5.1.12.1 separator-sheets-type (type2 keyword | name(MAX))**

757 This REQUIRED member attribute specifies the type of Separator Sheets to use. Standard
 758 keyword values are:

- 759 'none': No Separator Sheets are delivered with the printed output.
- 760 'slip-sheets': A Separator Sheet is printed between each Set of the Job.
- 761 'start-sheet': A Separator Sheet is printed to indicate the start of each Set of the
 762 Job.
- 763 'end-sheet': A Separator Sheet is printed to indicate the end of each Set of the Job.
- 764 'both-sheets': Separator Sheets are printed to indicate both the start and end of
 765 each Set of the Job.

766 For example, a Job is created consisting of a single document, with the value of the "copies"
 767 attribute set to '3', the value of "job-sheets" attribute set to 'job-both-sheets', and the value
 768 of the "separator-sheets-type" attribute set to 'slip-sheets'. If each of the three Sets is
 769 denoted by (J1), (J2), (J3), a Job Sheet is denoted by X, and a Separator Sheet is denoted
 770 by S, then the delivered output would be:

771 X (J1) S (J2) S (J3) X.

772 If the value of the "separator-sheets-type" is 'start-sheet' instead, then the delivered output
773 would be:

774 X S (J1) S (J2) S (J3) X

775 5.1.12.2 media (type2 keyword | name(MAX))

776 This REQUIRED member attribute specifies the media to use for the Separator Sheets. If
777 specified, the "media-col" member attribute (section 5.1.12.3) MUST NOT be specified.

778 5.1.12.3 media-col (collection)

779 This REQUIRED member attribute specifies the media to use for the Separator Sheets. If
780 specified, the "media" member attribute (section 5.1.12.2) MUST NOT be specified.

781 5.1.13 x-image-position (type2 keyword)

782 This REQUIRED attribute causes the specified point of the Impression to be offset to a
783 specified location. One standard value causes the Impression to be centered along the x-
784 axis on the media to which it is applied. Two other standard values specify that the location
785 is co-incident with the specified edge of the printable area by moving the image parallel to
786 the x-axis on the media to which it is applied.

787 Standard keyword values are:

788 'none': Place the Impression wherever the print data specifies on the medium.

789 'center': Center the Impression between the physical edges of the medium by
790 moving the Impression in a direction parallel to the x-axis

791 'left': Position the left edge of the Impression so that it is co-incident with the left
792 edge of the printable area of the medium.

793 'right': Position the right edge of the Impression so that it is co-incident with the right
794 edge of the printable area of the medium.

795 Note: the 'center' value is centered with respect to the physical edges of the medium rather
796 than the printable area of it because the printable area may have different left and right
797 margins. If this specification defined two separate attributes, one for values that are medium-
798 relative and one for values that are relative to printable area, the rules for defaulting would
799 be too complicated.

800 Figure 6 shows the effect of different values on the location of the printed Impression.

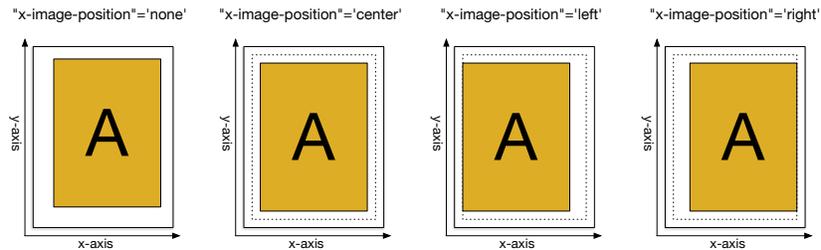


Figure 6 - "x-image-position" Values

801

802

803 **5.1.14 x-image-shift (integer(MIN:MAX))**

804 This REQUIRED attribute causes the Impression (whether it will be on the front side or back
 805 side of a sheet of the Finished Document) to be offset in position with respect to the media
 806 on which the Impression is to be rendered. The direction of shift MUST be along the x-axis
 807 of the Coordinate System (see section 4.1) with respect to the medium. The sign of the value
 808 indicates the direction of the shift.

809 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
 810 1/2540th of an inch resolution.

811 **5.1.15 x-side1-image-shift (integer(MIN:MAX))**

812 This REQUIRED attribute causes each Impression that would be placed on the front side of
 813 a Media Sheet to be offset in position with respect to the media on which the Impression is
 814 to be rendered. The direction MUST be along the x-axis of the Coordinate System (see
 815 section 4.1) with respect to the medium. The sign of the value indicates the direction of the
 816 shift.

817 If the bind edge is along the y-axis, then a bind edge image shift can be accomplished by
 818 applying shifts of equal magnitude, and opposite sign, to the "x-side1-image-shift" and "x-
 819 side2-image-shift" attributes, respectively (assuming that the "sides" attribute is 'two-sided-
 820 long-edge' or imposition has equivalent behavior).

821 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
 822 1/2540th of an inch resolution.

823 **5.1.16 x-side2-image-shift (integer(MIN:MAX))**

824 This REQUIRED attribute causes a Impression that would be placed on the back side of a
 825 Media Sheet to be offset in position with respect to the media on which the Impression is to
 826 be rendered. The direction of shift MUST be along the x-axis of the Coordinate System (see
 827 section 4.1) with respect to the medium. The sign of the value indicates the direction of the
 828 shift.

829 If the bind edge is along the y-axis, then a bind edge image shift can be accomplished by
 830 applying shifts of equal magnitude, and opposite sign, to the "x-side1-image-shift" and "x-
 831 side2-image-shift" attributes, respectively (assuming that the "sides" attribute is 'two-sided-
 832 long-edge' or imposition has equivalent behavior).

833 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
 834 1/2540th of an inch resolution.

835 5.1.17 y-image-position (type2 keyword)

836 This REQUIRED attribute causes the specified point of the Impression to be offset to a
 837 specified location. One standard value causes the Impression to be centered along the y-
 838 axis on the media to which it is applied. Two other standard values specify that the location
 839 is co-incident with the specified edge of the printable area by moving the image parallel to
 840 the y-axis on the media to which it is applied.

841 Standard keyword values are:

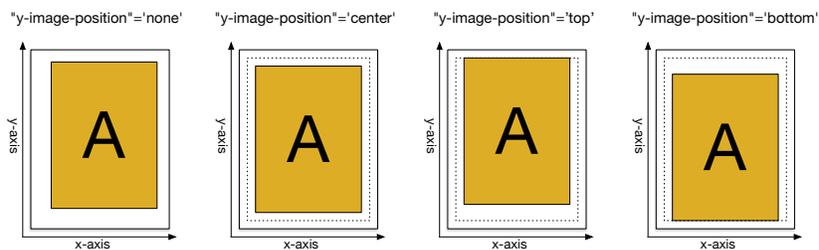
842 'none': Place the Impression wherever the print data specifies on the medium.

843 'center': Center the Impression between the physical edges of the medium by
 844 moving the Impression in the direction parallel to the y-axis

845 'top': Position the top edge of the Impression so that it is co-incident with the top
 846 edge of the printable area of the medium.

847 'bottom': Position the bottom edge of the Impression so that it is co-incident with the
 848 bottom edge of the printable area of the medium.

849 Figure 7 shows the effect of different values on the location of the printed Impression.



850

851

Figure 7 - "y-image-position" Values

852 5.1.18 y-image-shift (integer(MIN:MAX))

853 This REQUIRED attribute causes the Impression (whether it will be on the front side or back
 854 side of a sheet of the Finished Document) to be offset in position with respect to the media

855 on which the Impression is to be rendered. The direction of shift MUST be along the y-axis
856 of the Coordinate System (see section 4.1) with respect to the medium. The sign of the value
857 indicates the direction of the shift.

858 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
859 1/2540th of an inch resolution.

860 **5.1.19 y-side1-image-shift (integer(MIN:MAX))**

861 This REQUIRED attribute causes each Impression that would be placed on the front side of
862 a Media Sheet to be offset in position with respect to the media on which the Impression is
863 to be rendered. The direction of shift MUST be along the y-axis of the Coordinate System
864 (see section 4.1) with respect to the medium. The sign of the value indicates the direction of
865 the shift.

866 If the bind edge is along the x-axis, then a bind edge image shift can be accomplished by
867 applying shifts of equal magnitude, and opposite sign, to the "y-side1-image-shift" and "y-
868 side2-image-shift" attributes, respectively (assuming that the "sides" attribute is 'two-sided-
869 short-edge' or imposition has equivalent behavior).

870 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
871 1/2540th of an inch resolution.

872 **5.1.20 y-side2-image-shift (integer(MIN:MAX))**

873 This REQUIRED attribute causes each Impression that would be placed on the back side of
874 a Media Sheet to be offset in position with respect to the media on which the Impression is
875 to be rendered. The direction of shift MUST be along the y-axis of the Coordinate System
876 (see section 4.1) with respect to the medium. The sign of the value indicates the direction of
877 the shift.

878 If the bind edge is along the x-axis, then bind edge image shift can be accomplished by
879 applying shifts of equal magnitude, and opposite sign, to the "y-side1-image-shift" and "y-
880 side2-image-shift" attributes, respectively (assuming that the "sides" attribute is 'two-sided-
881 short-edge' or imposition has equivalent behavior).

882 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
883 1/2540th of an inch resolution.

884 **5.2 Printer Description Attributes**

885 **5.2.1 cover-back-default (collection | no-value)**

886 This CONDITIONALLY REQUIRED attribute specifies the default value of the "cover-back"
887 Job Template attribute (section 5.1.1). This attribute MUST be supported if the "cover-back"
888 attribute is supported.

889 5.2.2 cover-back-supported (1setOf keyword)

890 This CONDITIONALLY REQUIRED attribute lists the supported "cover-back" Job Template
891 attribute (section 5.1.1) member attributes. This attribute MUST be supported if the "cover-
892 back" attribute is supported.

893 5.2.3 cover-front-default (collection | no-value)

894 This CONDITIONALLY REQUIRED attribute specifies the default value of the "cover-front"
895 Job Template attribute (section **Error! Reference source not found.**). This attribute MUST
896 be supported if the "cover-front" attribute is supported.

897 5.2.4 cover-front-supported (1setOf keyword)

898 This CONDITIONALLY REQUIRED attribute lists the supported "cover-front" Job Template
899 attribute (section **Error! Reference source not found.**) member attributes. This attribute
900 MUST be supported if the "cover-front" attribute is supported.

901 5.2.5 cover-type-supported (1setOf type2 keyword)

902 This CONDITIONALLY REQUIRED attribute lists the supported values of the "cover-type"
903 member attribute (section 5.1.1.3). Printers that support the "cover-type" member attribute
904 MUST support this attribute.

905 5.2.6 force-front-side-supported (rangeOfInteger(1:MAX))

906 This CONDITIONALLY REQUIRED attribute specifies the range of supported "force-front-
907 side" Job Template attribute (section 5.1.2) values. Printers MUST support this attribute if
908 the "force-front-side" attribute is supported.

909 5.2.7 imposition-template-default (type2 keyword | name(MAX))

910 This CONDITIONALLY REQUIRED attribute specifies the default value of the "imposition-
911 template" Job Template attribute (section 5.1.3). Printers MUST support this attribute if the
912 "imposition-template" attribute is supported.

913 5.2.8 imposition-template-supported (1setOf (type2 keyword | name(MAX)))

914 This CONDITIONALLY REQUIRED attribute lists the supported values of the "imposition-
915 template" Job Template attribute (section 5.1.3). Printers MUST support this attribute if the
916 "imposition-template" attribute is supported.

917 5.2.9 insert-count-supported (rangeOfInteger(0:MAX))

918 This REQUIRED attribute specifies the supported range of values of the "insert-count"
919 member attribute (section 5.1.4.2).

920 5.2.10 insert-sheet-default (1setOf collection)

921 This REQUIRED attribute specifies the default value of the "insert-sheet" Job Template
922 attribute (section 5.1.4).

923 5.2.11 insert-sheet-supported (1setOf keyword)

924 This REQUIRED attribute lists the supported member attributes of the "insert-sheet" Job
925 Template attribute (section 5.1.4).

926 5.2.12 job-accounting-output-bin-supported (1setOf (type2 keyword | name(MAX)))

927 This DEPRECATED attribute lists the supported output bins for Job accounting sheets.
928 Printers that support the "job-accounting-output-bin" attribute (section 5.1.5.4) MUST
929 support this attribute.

930 5.2.13 job-accounting-sheets-default (collection)

931 This DEPRECATED attribute specifies the default value of the "job-accounting-sheets" Job
932 Template attribute (section 5.1.5). Printers MUST support this attribute if the "job-
933 accounting-sheets" attribute is supported.

934 5.2.14 job-accounting-sheets-supported (1setOf keyword)

935 This DEPRECATED attribute lists the supported member attributes of the "job-accounting-
936 sheets" Job Template attribute (section 5.1.5). Printers MUST support this attribute if the
937 "job-accounting-sheets" attribute is supported.

938 5.2.15 job-accounting-sheets-type-supported (1setOf (type2 keyword | name(MAX)))

939 This DEPRECATED attribute lists the supported values of the "job-accounting-sheets-type"
940 member attribute (section 5.1.5.1). Printers that support the "job-accounting-sheets"
941 attribute (section 5.1.5) MUST support this attribute.

942 5.2.16 job-error-sheet-default (collection)

943 This REQUIRED attribute specifies the default value of the "job-error-sheet" Job Template
944 attribute (section 5.1.6). Printers that support the "job-error-sheet" attribute MUST support
945 this attribute.

946 5.2.17 job-error-sheet-supported (1setOf keyword)

947 This REQUIRED attribute lists the supported member attributes of the "job-error-sheet" Job
948 Template attribute (section 5.1.6). Printers that support the "job-error-sheet" attribute MUST
949 support this attribute.

950 5.2.18 job-error-sheet-type-supported (1setOf (type2 keyword | name(MAX)))

951 This REQUIRED attribute lists the supported values of the "job-error-sheet-type" member
952 attribute (section 5.1.6.1). Printers that support the "job-error-sheet" Job Template attribute
953 (section 5.1.6) MUST support this attribute.

954 5.2.19 job-error-sheet-when-supported (1setOf type2 keyword)

955 This REQUIRED attribute lists the supported values of the "job-error-sheet-when" member
956 attribute (section 5.1.6.2).

957 5.2.20 job-message-to-operator-supported (boolean)

958 This REQUIRED attribute specifies whether the "job-message-to-operator" Job Template
959 attribute (section 5.1.7) is supported.

960 5.2.21 job-sheet-message-supported (boolean)

961 This REQUIRED attribute specifies whether the "job-sheet-message" Job Template attribute
962 (section 5.1.8) is supported.

963 5.2.22 presentation-direction-number-up-default (type2 keyword)

964 This DEPRECATED attribute specifies the default value of the "presentation-direction-
965 number-up" Job Template attribute (section 5.1.11). Printers that support the "presentation-
966 direction-number-up" attribute MUST support this attribute.

967 5.2.23 presentation-direction-number-up-supported (1setOf type2 keyword)

968 This DEPRECATED attribute lists the supported values of the "presentation-direction-
969 number-up" Job Template attribute (section 5.1.11). Printers that support the "presentation-
970 direction-number-up" attribute MUST support this attribute.

971 5.2.24 separator-sheets-default (collection)

972 This REQUIRED attribute specifies the default value of the "separator-sheets" Job Template
973 attribute (section 5.1.12). Printers MUST support the same member attributes for this default
974 collection attribute as it supports for the corresponding "separator-sheets" attribute.

975 5.2.25 separator-sheets-supported (1setOf type2 keyword)

976 This REQUIRED attribute lists the supported member attributes of the "separator-sheets"
977 Job Template attribute (section 5.1.12).

978 5.2.26 separator-sheets-type-supported (1setOf (type2 keyword | name(MAX)))

979 This REQUIRED attribute lists the supported values of the "separator-sheets-type" member
980 attribute (section 5.1.12.1).

981 **5.2.27 x-image-position-default (type2 keyword)**

982 This REQUIRED attribute specifies the default value of the "x-image-position" Job Template
983 attribute (section 5.1.13).

984 **5.2.28 x-image-position-supported (1setOf type2 keyword)**

985 This REQUIRED attribute lists the supported values of the "x-image-position" Job Template
986 attribute (section 5.1.13).

987 **5.2.29 x-image-shift-default (integer(MIN:MAX))**

988 This REQUIRED attribute specifies the default value of the "x-image-shift" Job Template
989 attribute (section 5.1.14).

990 **5.2.30 x-image-shift-supported (rangeOfInteger(MIN:MAX))**

991 This REQUIRED attribute specifies the range of supported values of the "x-image-shift" Job
992 Template attribute (section 5.1.14).

993 **5.2.31 x-side1-image-shift-default (integer(MIN:MAX))**

994 This REQUIRED attribute specifies the default value of the "x-side1-image-shift" Job
995 Template attribute (section 5.1.15).

996 **5.2.32 x-side1-image-shift-supported (rangeOfInteger(MIN:MAX))**

997 This REQUIRED attribute specifies the range of supported values of the "x-side1-image-
998 shift" Job Template attribute (section 5.1.15).

999 **5.2.33 x-side2-image-shift-default (integer(MIN:MAX))**

1000 This REQUIRED attribute specifies the default value of the "x-side2-image-shift" Job
1001 Template attribute (section 5.1.16).

1002 **5.2.34 x-side2-image-shift-supported (rangeOfInteger(MIN:MAX))**

1003 This REQUIRED attribute specifies the range of supported values of the "x-side2-image-
1004 shift" Job Template attribute (section 5.1.16).

1005 **5.2.35 y-image-position-default (type2 keyword)**

1006 This REQUIRED attribute specifies the default value of the "y-image-position" Job Template
1007 attribute (section 5.1.17).

1008 5.2.36 y-image-position-supported (1setOf type2 keyword)

1009 This REQUIRED attribute lists the supported values of the "y-image-position" Job Template
1010 attribute (section 5.1.17).

1011 5.2.37 y-image-shift-default (integer(MIN:MAX))

1012 This REQUIRED attribute specifies the default value of the "y-image-shift" Job Template
1013 attribute (section 5.1.18).

1014 5.2.38 y-image-shift-supported (rangeOfInteger(MIN:MAX))

1015 This REQUIRED attribute specifies the range of supported values of the "y-image-shift" Job
1016 Template attribute (section 5.1.18).

1017 5.2.39 y-side1-image-shift-default (integer(MIN:MAX))

1018 This REQUIRED attribute specifies the default value of the "y-side1-image-shift" Job
1019 Template attribute (section 5.1.19).

1020 5.2.40 y-side1-image-shift-supported (rangeOfInteger(MIN:MAX))

1021 This REQUIRED attribute specifies the range of supported values of the "y-side1-image-
1022 shift" Job Template attribute (section 5.1.19).

1023 5.2.41 y-side2-image-shift-default (integer(MIN:MAX))

1024 This REQUIRED attribute specifies the default value of the "y-side2-image-shift" Job
1025 Template attribute (section 5.1.20).

1026 5.2.42 y-side2-image-shift-supported (rangeOfInteger(MIN:MAX))

1027 This REQUIRED attribute specifies the range of supported values of the "y-side2-image-
1028 shift" Job Template attribute (section 5.1.20).

1029 6. New Values for Existing Attributes**1030 6.1 job-state-reasons (1setOf type2 keyword)**

1031 This specification defines the 'resources-are-not-supported' value for the "job-state-reasons"
1032 Job Status attribute [STD92]. When present, at least one of the resources needed by the
1033 Job, such as media, fonts, resource objects, etc., is not supported on any of the physical
1034 Printer's for which the Job is a candidate. This condition can be detected when the Job is
1035 accepted, or subsequently while the Job is pending or processing, depending on
1036 implementation. The Job can:

1037 1. Remain in its current state,

- 1038 2. Be moved to the 'pending-held' state, depending on implementation and/or Job
 1039 scheduling policy, or
 1040 3. Be scheduled normally, but the Printer is put into the 'stopped' state when the
 1041 Job is attempted to be processed on the Printer.

1042 7. Obsolete Attributes

1043 7.1 Obsolete Job and Document Template Attributes

1044 This specification makes the "page-order-received (type2 keyword)" Job and Document
 1045 Template attribute [PWG5100.3-2001] OBSOLETE because it causes interoperability issues
 1046 with any IPP attribute that specifies page numbers or ranges.

1047 7.2 Obsolete Job Status Attributes

1048 This specification makes the "current-page-order (type2 keyword)" Job Status attribute
 1049 [PWG5100.3-2001] OBSOLETE because IPP does not expose the implementation details
 1050 of Document processing and because many implementations do not change Document Data
 1051 in-place.

1052 7.3 Obsolete Printer Description Attributes

1053 Table 10 lists the Printer Description attributes from the previous version of this specification
 1054 [PWG5100.3-2001] which are now OBSOLETE.

1055 **Table 10 - OBSOLETE Printer Description Attributes**

Attribute	Notes
insert-after-page-number-supported (rangeOfInteger(0:MAX))	Unnecessary
job-accounting-output-bin-default (type2 keyword name(MAX))	Unnecessary
page-order-received-default (type2 keyword)	See section 7.1
page-order-received-supported (1setOf type2 keyword)	See section 7.1
user-defined-values-supported (1setOf keyword)	Unnecessary

1056 8. Conformance Requirements

1057 8.1 Printer Conformance Requirements

1058 In order for a Printer to claim conformance to this specification, a Printer MUST support:

- 1059 1. The required attributes and values defined in section 5;
 1060 2. The additional values defined in section 6;
 1061 3. The internationalization considerations defined in section 9; and
 1062 4. The security considerations defined in section 10.

1063 Printer MUST NOT support the OBSOLETE attributes listed in section 7.

1064 8.2 Client Conformance Requirements

1065 In order for a Client to claim conformance to this specification, a Client MUST support:

- 1066 1. The required attributes and values defined in section 5;
- 1067 2. The additional values defined in section 6;
- 1068 3. The internationalization considerations defined in section 9; and
- 1069 4. The security considerations defined in section 10.

1070 9. Internationalization Considerations

1071 For interoperability and basic support for multiple languages, conforming implementations
1072 MUST support:

- 1073 1. The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8)
- 1074 [STD63] encoding of Unicode [UNICODE] [ISO10646]; and
- 1075 1. The Unicode Format for Network Interchange [RFC5198] which requires
- 1076 transmission of well-formed UTF-8 strings and recommends transmission of
- 1077 normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

1078 Unicode NFC is defined as the result of performing Canonical Decomposition (into base
1079 characters and combining marks) followed by Canonical Composition (into canonical
1080 composed characters wherever Unicode has assigned them).

1081 WARNING – Performing normalization on UTF-8 strings received from Clients and
1082 subsequently storing the results (e.g., in Job objects) could cause false negatives in Client
1083 searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now
1084 'hidden').

1085 Implementations of this specification SHOULD conform to the following standards on
1086 processing of human-readable Unicode text strings, see:

1087 Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical

1088 Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping

1089 Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]

1090 Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences

1091 Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization

1092 Unicode Collation Algorithm [UTS10] – sorting

1093 Unicode Locale Data Markup Language [UTS35] – locale databases

1094 Implementations of this specification are advised to also review the following informational
1095 documents on processing of human-readable Unicode text strings:

1096 Unicode Character Encoding Model [UTR17] – multi-layer character model

1097 Unicode Character Property Model [UTR23] – character properties

1098 Unicode Conformance Model [UTR33] – Unicode conformance basis

1099 **10. Security Considerations**

1100 The IPP extensions defined in this document require the same security considerations as
1101 defined in the Internet Printing Protocol/1.1 [STD92].

1102 Implementations of this specification SHOULD conform to the following standard on
1103 processing of human-readable Unicode text strings, see:

1104 Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks

1105 Implementations of this specification are advised to also review the following informational
1106 document on processing of human-readable Unicode text strings:

1107 Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

1108 **11. IANA Considerations**

1109 **11.1 Attribute Registrations**

1110 The attributes defined in this specification will be published by IANA according to the
1111 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1112 <https://www.iana.org/assignments/ipp-registrations>

1113 The registry entries will contain the following information:

1114	Job Status attributes:	Reference
1115	-----	-----
1116	current-page-order (obsolete) (type2 keyword)	[PWG5100.3]
1117		
1118	Job Template attributes:	Reference
1119	-----	-----
1120	cover-back (collection)	[PWG5100.3]
1121	cover-type (type2 keyword name(MAX))	[PWG5100.3]
1122	media (type2 keyword name(MAX))	[PWG5100.3]
1123	media-col (collection)	[PWG5100.3]
1124	cover-front (collection)	[PWG5100.3]
1125	< member attributes are the same as "cover-back" >	[PWG5100.3]
1126	force-front-side (1setOf integer(1:MAX))	[PWG5100.3]

1127	imposition-template (type2 keyword name(MAX))	[PWG5100.3]
1128	insert-sheet (lsetOf collection)	[PWG5100.3]
1129	insert-after-page-number (integer(0:MAX))	[PWG5100.3]
1130	insert-count (integer(0:MAX))	[PWG5100.3]
1131	media (type2 keyword name(MAX))	[PWG5100.3]
1132	media-col (collection)	[PWG5100.3]
1133	job-accounting-sheets (collection)	[PWG5100.3]
1134	job-accounting-output-bin (type2 keyword name(MAX))	[PWG5100.3]
1135	job-accounting-sheets-type (type2 keyword name(MAX))	[PWG5100.3]
1136	media (type2 keyword name(MAX))	[PWG5100.3]
1137	media-col (collection)	[PWG5100.3]
1138	job-error-sheet (collection)	[PWG5100.3]
1139	job-error-sheet-type (type2 keyword name(MAX))	[PWG5100.3]
1140	job-error-sheet-when (type2 keyword)	[PWG5100.3]
1141	media (type2 keyword name(MAX))	[PWG5100.3]
1142	media-col (collection)	[PWG5100.3]
1143	job-message-to-operator (text(MAX))	[PWG5100.3]
1144	job-sheet-message (text(MAX))	[PWG5100.3]
1145	media-input-tray-check(deprecated) (type2 keyword name(MAX))	[PWG5100.3]
1146		[PWG5100.3]
1147	page-delivery (type2 keyword)	[PWG5100.3]
1148	page-order-received(obsolete) (type2 keyword)	[PWG5100.3]
1149	presentation-direction-number-up (type2 keyword)	[PWG5100.3]
1150	separator-sheets (collection)	[PWG5100.3]
1151	media (type2 keyword name(MAX))	[PWG5100.3]
1152	media-col (collection)	[PWG5100.3]
1153	separator-sheets-type (type2 keyword name(MAX))	[PWG5100.3]
1154	x-image-position (type2 keyword)	[PWG5100.3]
1155	x-image-shift (integer(MIN:MAX))	[PWG5100.3]
1156	x-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
1157	x-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]
1158	y-image-position (type2 keyword)	[PWG5100.3]
1159	y-image-shift (integer(MIN:MAX))	[PWG5100.3]
1160	y-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
1161	y-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]
1162		
1163	Printer Description attributes:	Reference
1164	-----	-----
1165	cover-back-default (collection no-value)	[PWG5100.3]
1166	cover-back-supported (lsetOf keyword)	[PWG5100.3]
1167	cover-front-default (collection no-value)	[PWG5100.3]
1168	cover-front-supported (lsetOf keyword)	[PWG5100.3]
1169	cover-type-supported (lsetOf type2 keyword)	[PWG5100.3]
1170	force-front-side-supported (rangeOfInteger(1:MAX))	[PWG5100.3]
1171	imposition-template-default (type2 keyword name(MAX))	[PWG5100.3]
1172	imposition-template-supported (lsetOf (type2 keyword name(MAX)))	[PWG5100.3]
1173		[PWG5100.3]
1174	insert-after-page-number-supported(obsolete) (rangeOfInteger(0:MAX))	[PWG5100.3]
1175		[PWG5100.3]
1176	insert-count-supported (rangeOfInteger(0:MAX))	[PWG5100.3]
1177	insert-sheet-default (lsetOf collection)	[PWG5100.3]
1178	insert-sheet-supported (lsetOf keyword)	[PWG5100.3]
1179	job-account-id-default (name(MAX) no-value)	[PWG5100.3]
1180	job-account-id-supported (boolean)	[PWG5100.3]
1181	job-accounting-output-bin-default(obsolete) (type2 keyword name(MAX))	[PWG5100.3]
1182		[PWG5100.3]

1183	job-accounting-output-bin-supported(deprecated) (1setOf (type2 keyword	
1184	name(MAX)))	[PWG5100.3]
1185	job-accounting-sheets-default (collection)	[PWG5100.3]
1186	job-accounting-sheets-supported (1setOf keyword)	[PWG5100.3]
1187	job-accounting-sheets-type-supported (1setOf (type2 keyword name(MAX)))	
1188		[PWG5100.3]
1189	job-accounting-user-id-default (name(MAX))	[PWG5100.3]
1190	job-accounting-user-id-supported (boolean)	[PWG5100.3]
1191	job-error-sheet-default (collection)	[PWG5100.3]
1192	job-error-sheet-supported (1setOf keyword)	[PWG5100.3]
1193	job-error-sheet-type-supported (1setOf (type2 keyword name(MAX)))	
1194		[PWG5100.3]
1195	job-error-sheet-when-supported (1setOf type2 keyword)	[PWG5100.3]
1196	job-message-to-operator-supported (boolean)	[PWG5100.3]
1197	job-sheet-message-supported (boolean)	[PWG5100.3]
1198	job-sheets-col-default (collection)	[PWG5100.3]
1199	job-sheets-col-supported (1setOf keyword)	[PWG5100.3]
1200	page-delivery-default (type2 keyword)	[PWG5100.3]
1201	page-delivery-supported (1setOf type2 keyword)	[PWG5100.3]
1202	page-order-received-default(obsolete) (type2 keyword)	[PWG5100.3]
1203	page-order-received-supported(obsolete) (1setOf type2 keyword)	
1204		[PWG5100.3]
1205	presentation-direction-number-up-default (type2 keyword)	[PWG5100.3]
1206	presentation-direction-number-up-supported (1setOf type2 keyword)	
1207		[PWG5100.3]
1208	separator-sheets-default (collection)	[PWG5100.3]
1209	separator-sheets-supported (1setOf keyword)	[PWG5100.3]
1210	user-defined-values-supported(obsolete) (1setOf keyword)	[PWG5100.3]
1211	x-image-position-default (type2 keyword)	[PWG5100.3]
1212	x-image-position-supported (1setOf type2 keyword)	[PWG5100.3]
1213	x-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1214	x-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1215	x-side1-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1216	x-side1-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1217	x-side2-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1218	x-side2-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1219	y-image-position-default (type2 keyword)	[PWG5100.3]
1220	y-image-position-supported (1setOf type2 keyword)	[PWG5100.3]
1221	y-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1222	y-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1223	y-side1-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1224	y-side1-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1225	y-side2-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1226	y-side2-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]

1227 11.2 Type2 keyword Registrations

1228 The keyword values defined in this specification will be published by IANA according to the
 1229 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1230 <https://www.iana.org/assignments/ipp-registrations>

1231 The registry entries will contain the following information:

1232	Attributes (attribute syntax)	
1233	Keyword Attribute Value	Reference
1234	-----	-----
1235	cover-type (type2 keyword)	[PWG5100.3]
1236	no-cover	[PWG5100.3]
1237	print-back	[PWG5100.3]
1238	print-both	[PWG5100.3]
1239	print-front	[PWG5100.3]
1240	print-none	[PWG5100.3]
1241		
1242	imposition-template (type2 keyword name(MAX))	[PWG5100.3]
1243	booklet	[PWG5100.3]
1244	none	[PWG5100.3]
1245	same-up_2_2_3.5x5in	[PWG5100.3]
1246	same-up_2_2_104x148mm	[PWG5100.3]
1247	same-up_4_3_2x3.5in	[PWG5100.3]
1248	signature (deprecated)	[PWG5100.3]
1249	<u>tile</u>	<u>[PWG5100.3]</u>
1250		
1251	job-accounting-output-bin (type2 keyword name(MAX))	[PWG5100.3]
1252	< any "output-bin" value >	[PWG5100.3]
1253		
1254	job-accounting-sheets-type (type2 keyword name(MAX))	[PWG5100.3]
1255	none	[PWG5100.3]
1256	standard	[PWG5100.3]
1257		
1258	job-error-sheet-type (type2 keyword name(MAX))	[PWG5100.3]
1259	none	[PWG5100.3]
1260	standard	[PWG5100.3]
1261		
1262	job-error-sheet-when (type2 keyword)	[PWG5100.3]
1263	always	[PWG5100.3]
1264	on-error	[PWG5100.3]
1265		
1266	job-state-reasons (1setOf type2 keyword)	[STD92]
1267	resources-are-not-supported	[PWG5100.3]
1268		
1269	page-delivery (type2 keyword)	[PWG5100.3]
1270	reverse-order-face-down	[PWG5100.3]
1271	reverse-order-face-up	[PWG5100.3]
1272	same-order-face-down	[PWG5100.3]
1273	same-order-face-up	[PWG5100.3]
1274	system-specified	[PWG5100.3]
1275		
1276	separator-sheets-type (type2 keyword name(MAX))	[PWG5100.3]
1277	both-sheets	[PWG5100.3]
1278	end-sheet	[PWG5100.3]
1279	none	[PWG5100.3]
1280	slip-sheets	[PWG5100.3]
1281	start-sheet	[PWG5100.3]
1282		
1283	x-image-position (type2 keyword)	[PWG5100.3]
1284	center	[PWG5100.3]
1285	left	[PWG5100.3]
1286	none	[PWG5100.3]
1287	right	[PWG5100.3]

1288		
1289	y-image-position (type2 keyword)	[PWG5100.3]
1290	bottom	[PWG5100.3]
1291	center	[PWG5100.3]
1292	none	[PWG5100.3]
1293	top	[PWG5100.3]

1294 12. Overview of Changes

1295 12.1 IPP Production Printing Extensions v1.1

1296 The following changes were made to the previous version of this specification [PWG5100.3-
1297 2001]:

- 1298 • Finishing attributes have been moved to the IPP Finishings v2.1 specification
1299 [PWG5100.1];
- 1300 • The "job-account-id", "job-accounting-user-id", "job-sheets-col", and "media-col"
1301 attributes have been moved to the IPP Job Extensions v2.0 specification
1302 [PWG5100.7];
- 1303 • References to the original page overrides draft and attributes have been removed
1304 since that specification was withdrawn;
- 1305 • The "insert-sheet", "job-error-sheet", "job-message-to-operator", "job-sheet-
1306 message", "page-delivery", "separator-sheets", "x-image-position", "x-image-shift",
1307 "x-side1-image-shift", "x-side2-image-shift", "y-image-position", "y-image-shift", "y-
1308 side1-image-shift", and "y-side2-image-shift" Job Template attributes and
1309 corresponding Printer Description attributes have been made REQUIRED;
- 1310 • The "cover-back", "cover-front", "force-front-side", and "imposition-template" Job
1311 Template attributes have been made RECOMMENDED and the corresponding
1312 Printer Description attributes have been made CONDITIONALLY REQUIRED;
- 1313 • The "media-col" member attribute is now REQUIRED for the "cover-back", "cover-
1314 front", "insert-sheet", "job-accounting-sheets", "job-error-sheet", and "separator-
1315 sheets" Job Template attributes;
- 1316 • The "job-accounting-sheets" Job Template attribute and corresponding Printer
1317 Description attributes have been DEPRECATED because they are no longer needed;
- 1318 • The "media-input-tray-check" Job Template attribute has been DEPRECATED
1319 because the functionality is provided by the "media-source" member attribute of the
1320 "media-col" Job and Document Template attribute;
- 1321 • The "presentation-direction-number-up" Job Template attribute and "presentation-
1322 direction-number-up-default" and "presentation-direction-number-up-supported"

- 1323 Printer Description attributes have been DEPRECATED because the functionality is
1324 typically provided by the Client operating system;
- 1325 • The "page-order-received" Job and Document Template attribute has been made
1326 OBSOLETE because it causes interoperability issues;
- 1327 • The "current-page-order" Job Status attribute has been made OBSOLETE because
1328 the parent attribute has been made OBSOLETE, IPP does not expose the
1329 implementation details of Document processing, and because many implementations
1330 do not change Document Data in-place;
- 1331 • The "insert-after-page-number-supported" Printer Description attribute has been
1332 made OBSOLETE because it is unnecessary;
- 1333 • The "job-accounting-output-bin-default" Printer Description attribute has been made
1334 OBSOLETE because it is unnecessary;
- 1335 • The "page-order-received-default" and "page-order-received-supported" Printer
1336 Description attributes have been made OBSOLETE because the corresponding Job
1337 and Document Template attribute is OBSOLETE; and
- 1338 • The "user-defined-values-supported" Printer Description attribute has been made
1339 OBSOLETE because it is unnecessary.

1340 13. References

1341 13.1 Normative References

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1418 Kirk Ocke (Co-author of previous version)
1419 Tom Hastings (Co-author of previous version)

1420 **15. Change History**

1421 This section will be removed when this document is published.

1422 **15.1 January 30, 2020**

- 1423 • Section 3.3: One exception, not multiple
- 1424 • Sections 5.1.3 and 11.2: Added 'tile' imposition template
- 1425 • Table 6: Changed MUST to REQUIRED and SHOULD to RECOMMENDED

1426 **15.2 December 16, 2019**

- 1427 • Added new boilerplate explaining the title changes from the prior version.

1428 **15.3 September 23, 2019**

- 1429 • Status: Prototype
- 1430 • Updated Unicode references (publication dates)
- 1431 • Section 2.4: Updated Error Sheets definition
- 1432 • Section 4.2: Updated imposition-template example and figure
- 1433 • Section 4.3: Fixed editorial issues
- 1434 • Merged sections 5.1.1 and 5.1.2 (cover-back and cover-front)
- 1435 • Section 5.1.3: Made attribute RECOMMENDED, 'signature' DEPRECATED, added
1436 same-up and booklet templates, redefined signature as implementation-defined
1437 signature, added ABNF for keyword values, figure showing same-up and booklet
1438 impositions
- 1439 • Section 5.2.17: REQUIRED
- 1440 • Section 5.2.x: Added imposition-template-default and imposition-template-supported
1441 attributes
- 1442 • Section 11: Updated IPP registrations
- 1443 • Section 12: Updated list of recommended and required attributes
- 1444 • Added STD68 (ABNF) and collected ABNF references

1445 • Global: Dropped "REQUIRED" from member attribute table names, added
1446 conformance column instead

1447 • Global: Error Sheets, Separator Sheets (capitalized terms)

1448 **15.4 September 9, 2019**

1449 • Status: Interim

1450 • Updated the conformance requirements of the new attributes based on the August
1451 2019 F2F meeting discussions

1452 • Section 2.4: Added Error Sheet, Insert Sheet, and Separator Sheet definitions

1453 • Section 4.3: Added a figure showing cover, insert, and separator sheets, clarified
1454 description to include terms

1455 • Sections 5.1.1 and 5.1.2: Clarified cover-front and cover-back definitions

1456 • Section 5.1.4: Updated definition of imposition-template, added comment for
1457 discussion

1458 • Section 5.1.6: Fixed references for job-account-id and job-accounting-user-id which
1459 are now in 5100.7.

1460 • Section 12.1: Updated the list of changes to match the new conformance
1461 requirements and obsolete/deprecated attributes

1462 • Section 13.1: Updated PWG 5100.7 and Unicode references

1463 • Section 13.2: Dropped PostScript red book reference

1464 • Fixed a bunch of broken references

1465 **15.5 June 26, 2019**

1466 • Status: Prototype

1467 • Section 4.1: Figure 1 was duplicated (figure was part of the caption)

1468 • Section 4.2: Fixed table 1 reference

1469 • Section 4.3: Typos and clarifications, fixed table 2 reference

1470 • Section 4.4: Fixed table 3 reference

- 1471 • Updated conformance requirements in section 8.
- 1472 **15.6 May 14, 2019**
- 1473 • Updated abstract and introduction
- 1474 • Version 2.0
- 1475 • Moved all of the job-account-id, job-accounting-user-id, and job-sheets-col definitions
1476 to the Job Extensions v2.0 specification
- 1477 • Moved all of the media-col definitions to the Job Extensions v2.0 specification
- 1478 • Made page-order-received and friends obsolete
- 1479 • Expanded discussion of features in section 4
- 1480 • Updated figure showing roll media as a roll.
- 1481 **15.7 May 1, 2019**
- 1482 • Initial changes to the published 5100.3-2001
- 1483 • Dropped all references to the old page overrides spec (which was eventually
1484 abandoned in favor of document overrides)
- 1485 • Dropped all new media values, which are now covered by PWG 5101.1 (MSN2)
- 1486 • Dropped all finishings attributes, which are now covered by PWG 5100.1 (FIN)
- 1487 • Updated (and shortened!) abstract
- 1488 • Section 1: Rewritten and shortened.
- 1489 • Global: Client, Document, Document Data, Input Pages (instead of print-stream
1490 pages), Job, Job Error Sheet, Job Sheet, Printer, End User, and other terminology
1491 properly capitalized
- 1492 • Global: type3 keyword changed to type2 keyword
- 1493 • Section 2: Updated with modern terminology
- 1494 • Section 3: Added rationale, use cases, etc.
- 1495 • Section 4: Expanded to include all of the background information that was inline with
1496 the attribute definitions.

- 1497 • Section 5: Split Job Template and Printer Description attributes
- 1498 • Removed references to "job-warnings-detected" since a) that is defined in PWG
- 1499 5100.7 and b) the final standardized names were different.