



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".

This is a PWG Working Draft. For a definition of a "PWG Working Draft", see:

<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-ippv20-20200130.docx>
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Table of Contents

67		
68	1. Introduction.....	8
69	2. Terminology.....	8
70	2.1 Conformance Terminology.....	8
71	2.2 Printing Terminology	8
72	2.3 Protocol Role Terminology.....	9
73	2.4 Other Terminology.....	9
74	2.5 Acronyms and Organizations.....	11
75	3. Requirements.....	12
76	3.1 Rationale.....	12
77	3.2 Use Cases	12
78	3.2.1 Printing Bound Books with Printed Covers.....	12
79	3.2.2 Printing Folded Booklets.....	12
80	3.2.3 Separating Copies with Colored Paper.....	13
81	3.3 Exceptions	13
82	3.3.1 Printing a Report on Error	13
83	3.4 Out of Scope.....	13
84	3.5 Design Requirements.....	13
85	4. Model.....	14
86	4.1 Imaging Coordinate System and Units	14
87	4.2 Number Up, Imposition, and Shifting	15
88	4.3 Cover, Insert, and Separator Sheets	16
89	4.4 Error Sheets.....	18
90	5. New Attributes	19
91	5.1 Job Template Attributes	19
92	5.1.1 cover-back (collection) and cover-front (collection).....	19
93	5.1.2 force-front-side (1setOf integer(1:MAX))	20
94	5.1.3 imposition-template (type2 keyword name(MAX))	21
95	5.1.4 insert-sheet (1setOf collection)	22
96	5.1.5 job-accounting-sheets (collection).....	23
97	5.1.6 job-error-sheet (collection)	24
98	5.1.7 job-message-to-operator (text(MAX))	25
99	5.1.8 job-sheet-message (text(MAX))	26
100	5.1.9 media-input-tray-check (type2 keyword name(MAX)).....	26
101	5.1.10 page-delivery (type2 keyword).....	26
102	5.1.11 presentation-direction-number-up (type2 keyword).....	27
103	5.1.12 separator-sheets (collection).....	29
104	5.1.13 x-image-position (type2 keyword)	30
105	5.1.14 x-image-shift (integer(MIN:MAX))	31
106	5.1.15 x-side1-image-shift (integer(MIN:MAX))	31
107	5.1.16 x-side2-image-shift (integer(MIN:MAX))	31
108	5.1.17 y-image-position (type2 keyword)	32
109	5.1.18 y-image-shift (integer(MIN:MAX))	32
110	5.1.19 y-side1-image-shift (integer(MIN:MAX))	33
111	5.1.20 y-side2-image-shift (integer(MIN:MAX))	33
112	5.2 Printer Description Attributes	33

113	5.2.1 cover-back-default (collection no-value)	33
114	5.2.2 cover-back-supported (1setOf keyword).....	34
115	5.2.3 cover-front-default (collection no-value).....	34
116	5.2.4 cover-front-supported (1setOf keyword)	34
117	5.2.5 cover-type-supported (1setOf type2 keyword)	34
118	5.2.6 force-front-side-supported (rangeOfInteger(1:MAX))	34
119	5.2.7 imposition-template-default (type2 keyword name(MAX))	34
120	5.2.8 imposition-template-supported (1setOf (type2 keyword name(MAX))).....	34
121	5.2.9 insert-count-supported (rangeOfInteger(0:MAX)).....	34
122	5.2.10 insert-sheet-default (1setOf collection)	35
123	5.2.11 insert-sheet-supported (1setOf keyword)	35
124	5.2.12 job-accounting-output-bin-supported (1setOf (type2 keyword name(MAX))) .	35
125	5.2.13 job-accounting-sheets-default (collection)	35
126	5.2.14 job-accounting-sheets-supported (1setOf keyword).....	35
127	5.2.15 job-accounting-sheets-type-supported (1setOf (type2 keyword name(MAX)))	
128	35
129	5.2.16 job-error-sheet-default (collection)	35
130	5.2.17 job-error-sheet-supported (1setOf keyword)	35
131	5.2.18 job-error-sheet-type-supported (1setOf (type2 keyword name(MAX)))	36
132	5.2.19 job-error-sheet-when-supported (1setOf type2 keyword)	36
133	5.2.20 job-message-to-operator-supported (boolean).....	36
134	5.2.21 job-sheet-message-supported (boolean).....	36
135	5.2.22 presentation-direction-number-up-default (type2 keyword)	36
136	5.2.23 presentation-direction-number-up-supported (1setOf type2 keyword)	36
137	5.2.24 separator-sheets-default (collection).....	36
138	5.2.25 separator-sheets-supported (1setOf type2 keyword).....	36
139	5.2.26 separator-sheets-type-supported (1setOf (type2 keyword name(MAX))).....	36
140	5.2.27 x-image-position-default (type2 keyword).....	37
141	5.2.28 x-image-position-supported (1setOf type2 keyword).....	37
142	5.2.29 x-image-shift-default (integer(MIN:MAX))	37
143	5.2.30 x-image-shift-supported (rangeOfInteger(MIN:MAX))	37
144	5.2.31 x-side1-image-shift-default (integer(MIN:MAX))	37
145	5.2.32 x-side1-image-shift-supported (rangeOfInteger(MIN:MAX))	37
146	5.2.33 x-side2-image-shift-default (integer(MIN:MAX))	37
147	5.2.34 x-side2-image-shift-supported (rangeOfInteger(MIN:MAX))	37
148	5.2.35 y-image-position-default (type2 keyword).....	37
149	5.2.36 y-image-position-supported (1setOf type2 keyword).....	38
150	5.2.37 y-image-shift-default (integer(MIN:MAX))	38
151	5.2.38 y-image-shift-supported (rangeOfInteger(MIN:MAX))	38
152	5.2.39 y-side1-image-shift-default (integer(MIN:MAX))	38
153	5.2.40 y-side1-image-shift-supported (rangeOfInteger(MIN:MAX))	38
154	5.2.41 y-side2-image-shift-default (integer(MIN:MAX))	38
155	5.2.42 y-side2-image-shift-supported (rangeOfInteger(MIN:MAX))	38
156	6. New Values for Existing Attributes	38
157	6.1 job-state-reasons (1setOf type2 keyword).....	38
158	7. Obsolete Attributes.....	39

159	7.1 Obsolete Job and Document Template Attributes	39
160	7.2 Obsolete Job Status Attributes	39
161	7.3 Obsolete Printer Description Attributes.....	39
162	8. Conformance Requirements.....	39
163	8.1 Printer Conformance Requirements	39
164	8.2 Client Conformance Requirements.....	40
165	9. Internationalization Considerations	40
166	10. Security Considerations	41
167	11. IANA Considerations.....	41
168	11.1 Attribute Registrations.....	41
169	11.2 Type2 keyword Registrations.....	43
170	12. Overview of Changes.....	45
171	12.1 IPP Production Printing Extensions v1.1	45
172	13. References	46
173	13.1 Normative References.....	46
174	13.2 Informative References	48
175	14. Author's Address	48
176	15. Change History.....	49
177	15.1 January 30, 2020.....	49
178	15.2 December 16, 2019.....	49
179	15.3 September 23, 2019.....	49
180	15.4 September 9, 2019.....	50
181	15.5 June 26, 2019.....	50
182	15.6 May 14, 2019.....	51
183	15.7 May 1, 2019.....	51

184

185

186

List of Figures

187	Figure 1 - IPP Media Sheet Coordinate System	14
188	Figure 2 - Relationship Between Number Up and Imposition.....	15
189	Figure 3 - Cover, Insert, and Separator Sheets	17
190	Figure 4 - "imposition-template" Examples	22
191	Figure 5 - ABNF for "imposition-template" Keyword Values.....	22
192	Figure 6 - "x-image-position" Values	31
193	Figure 7 - "y-image-position" Values	32

194

195

196

List of Tables

197	Table 1 - Number Up, Imposition, and Offset Attributes	16
198	Table 2 - Cover, Insert, and Separator Sheet Attributes.....	17
199	Table 3 - Error Sheet Attributes	18
200	Table 4 - "cover-front" and "cover-back" Member Attributes	19
201	Table 5 - "insert-sheet" Member Attributes	22
202	Table 6 - "job-accounting-sheets" Member Attributes.....	24
203	Table 7 - "job-error-sheet" Member Attributes.....	25

204 Table 8 - Standard Values for the “presentation direction” Attribute 28
205 Table 9 - "separator-sheets" Member Attributes 29
206 Table 10 - OBSOLETE Printer Description Attributes..... 39
207
208

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].

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

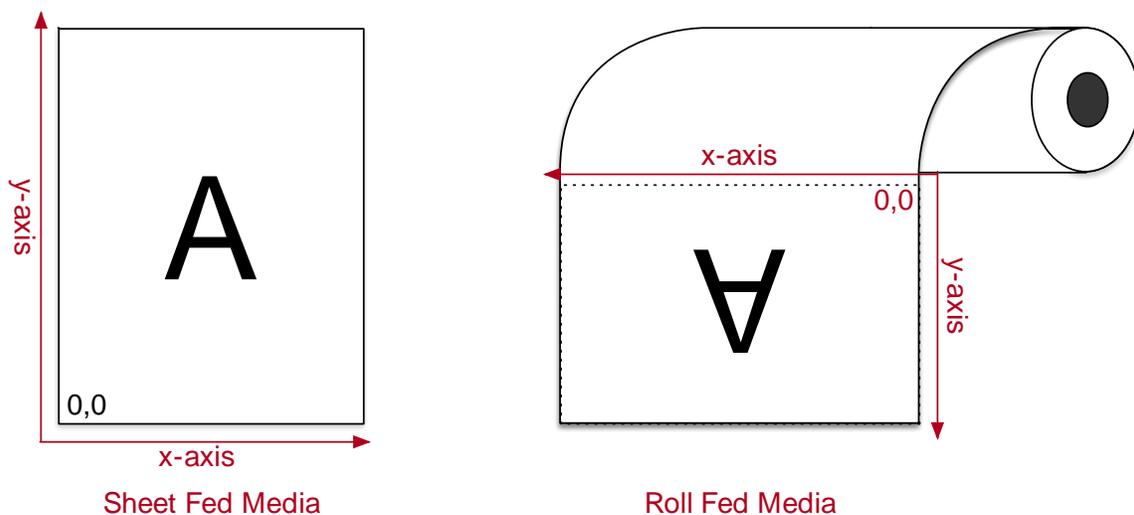
371 4. Model

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

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

383 4.1 Imaging Coordinate System and Units

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



390

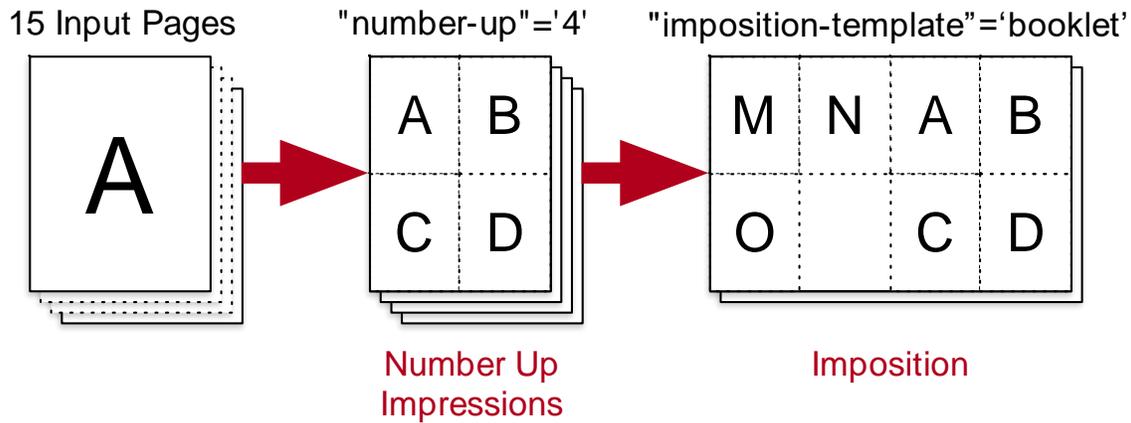
391

Figure 1 - IPP Media Sheet Coordinate System

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

394 4.2 Number Up, Imposition, and Shifting

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



397

398 **Figure 2 - Relationship Between Number Up and Imposition**

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

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

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

419

420

Table 1 - Number Up, Imposition, and Offset Attributes

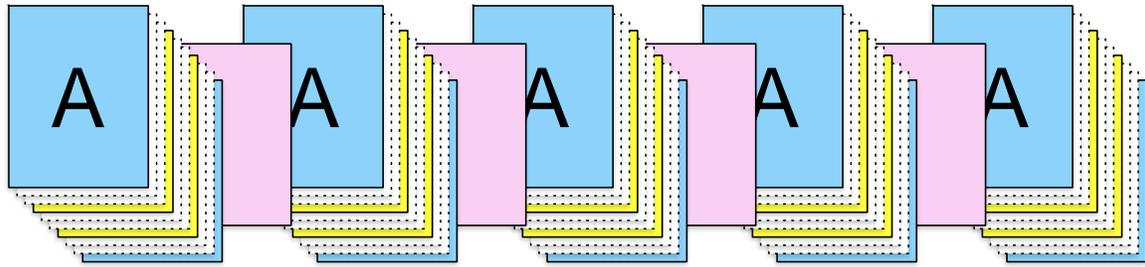
Template Attribute	Default Attribute	Supported Attribute
force-front-side (1setOf integer(1:MAX))	N/A	force-front-side-supported (rangeOfInteger(1:MAX))
imposition-template (type2 keyword name(MAX))	imposition-template-default (type2 keyword name(MAX))	imposition-template-supported (1setOf (type2 keyword 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))

421 **4.3 Cover, Insert, and Separator Sheets**

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

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

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



437

438

Figure 3 - Cover, Insert, and Separator Sheets

439

440

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)))

441

442 **4.4 Error Sheets**

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

445 **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)

446

447

448 5. New Attributes

449 5.1 Job Template Attributes

450 5.1.1 cover-back (collection) and cover-front (collection)

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

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

464 **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

465 5.1.1.1 media (type2 keyword | name(MAX))

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

468 5.1.1.2 media-col (collection)

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

471 5.1.1.3 cover-type (type2 keyword)

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

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

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

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

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

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

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

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

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

501 **5.1.2 force-front-side (1setOf integer(1:MAX))**

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

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

511 5.1.3 imposition-template (type2 keyword | name(MAX))

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

515 'none': No imposition template is applied.

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

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

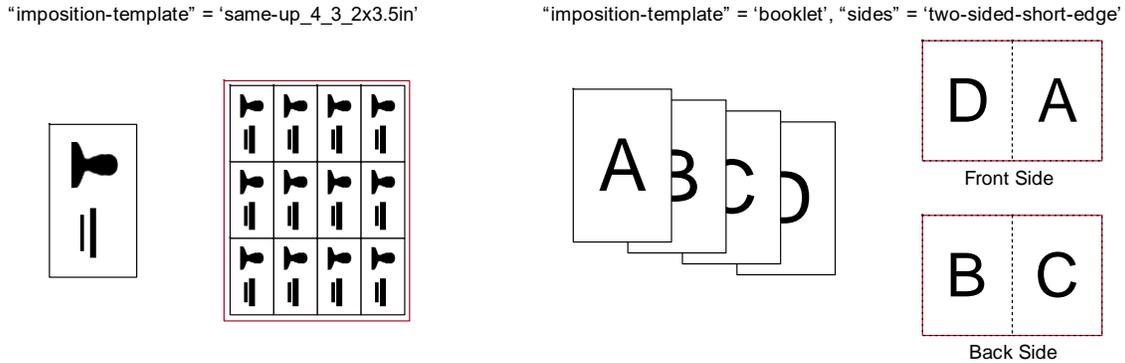
522 'same-up_2_2_3.5x5in': Impressions are duplicated in two columns and two rows
523 using the standard US postcard size, producing four postcard images. For duplex
524 printing, odd-numbered Impressions are duplicated for the front side and even-
525 numbered Impressions are duplicated for the back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

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

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

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

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



540

541

Figure 4 - "imposition-template" Examples

542

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

543

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

544

545

546

547

548

549

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552

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

553

554

555

556

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

557

5.1.4 insert-sheet (1setOf collection)

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562

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.

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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.

569

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

570 **5.1.4.1 insert-after-page-number (integer(0:MAX))**

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

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

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

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

588 **5.1.4.2 insert-count (integer(0:MAX))**

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

592 **5.1.4.3 media (type2 keyword | name(MAX))**

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

595 **5.1.4.4 media-col (collection)**

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

598 **5.1.5 job-accounting-sheets (collection)**

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

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

606 **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

607 **5.1.5.1 job-accounting-sheets-type (type2 keyword | name(MAX))**

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

610 'none': Suppress printing of accounting sheets.

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

612 **5.1.5.2 media (type2 keyword | name(MAX))**

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

615 **5.1.5.3 media-col (collection)**

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

618 **5.1.5.4 job-accounting-output-bin (type2 keyword | name(MAX))**

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

623 **5.1.6 job-error-sheet (collection)**

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

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

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

634 **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

635 **5.1.6.1 job-error-sheet-type (type2 keyword | name(MAX))**

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

638 'none': Do not print error information.

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

640 **5.1.6.2 job-error-sheet-when (type2 keyword)**

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

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

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

646 **5.1.6.3 media (type2 keyword | name(MAX))**

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

649 **5.1.6.4 media-col (collection)**

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

652 **5.1.7 job-message-to-operator (text(MAX))**

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

655 5.1.8 job-sheet-message (text(MAX))

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

658 5.1.9 media-input-tray-check (type2 keyword | name(MAX))

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

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

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

674 5.1.10 page-delivery (type2 keyword)

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

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

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

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

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

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

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

701 **5.1.11 presentation-direction-number-up (type2 keyword)**

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

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

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

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

- 724 1. If the Client supplies the "orientation-requested" Job Template attribute [STD92],
725 that attribute specifies the orientation.
- 726 2. If the Client doesn't supply the "orientation-requested" attribute and the Printer is
727 able to determine the orientation by inspecting the Document, that is the
728 orientation.

729 3. If the Client doesn't supply the "orientation-requested" attribute and the Printer is
 730 unable to determine the orientation by inspecting the Document, the orientation
 731 is the value specified by the "orientation-requested-default" Printer Description
 732 attribute [STD92].

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

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

745 **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'				

746 **5.1.12 separator-sheets (collection)**

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

750 **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

751 **5.1.12.1 separator-sheets-type (type2 keyword | name(MAX))**

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

754 'none': No Separator Sheets are delivered with the printed output.

755 'slip-sheets': A Separator Sheet is printed between each Set of the Job.

756 'start-sheet': A Separator Sheet is printed to indicate the start of each Set of the
 757 Job.

758 'end-sheet': A Separator Sheet is printed to indicate the end of each Set of the Job.

759 'both-sheets': Separator Sheets are printed to indicate both the start and end of
 760 each Set of the Job.

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

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

767 If the value of the “separator-sheets-type” is ‘start-sheet’ instead, then the delivered output
768 would be:

769 X S (J1) S (J2) S (J3) X

770 **5.1.12.2 media (type2 keyword | name(MAX))**

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

773 **5.1.12.3 media-col (collection)**

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

776 **5.1.13 x-image-position (type2 keyword)**

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

782 Standard keyword values are:

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

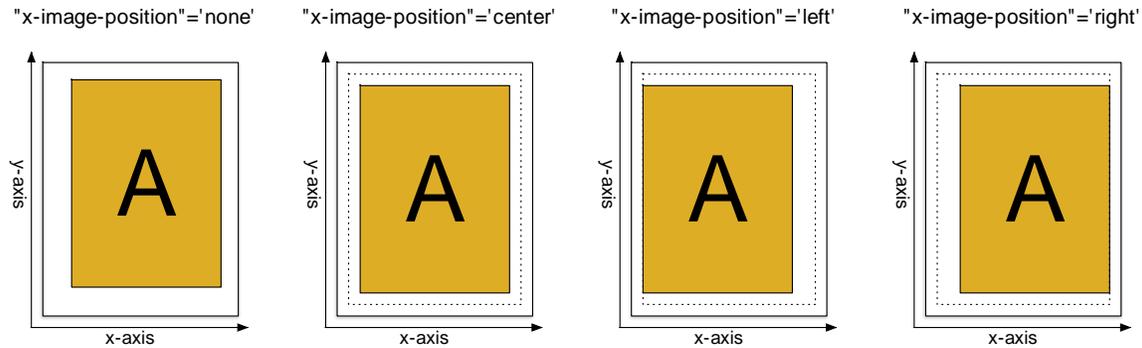
784 'center': Center the Impression between the physical edges of the medium by
785 moving the Impression in a direction parallel to the x-axis

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

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

790 Note: the ‘center’ value is centered with respect to the physical edges of the medium rather
791 than the printable area of it because the printable area may have different left and right
792 margins. If this specification defined two separate attributes, one for values that are medium-
793 relative and one for values that are relative to printable area, the rules for defaulting would
794 be too complicated.

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



796

797

Figure 6 - "x-image-position" Values

798 5.1.14 x-image-shift (integer(MIN:MAX))

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

804 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
805 1/2540th of an inch resolution.

806 5.1.15 x-side1-image-shift (integer(MIN:MAX))

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

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

816 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
817 1/2540th of an inch resolution.

818 5.1.16 x-side2-image-shift (integer(MIN:MAX))

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

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

828 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
 829 1/2540th of an inch resolution.

830 5.1.17 y-image-position (type2 keyword)

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

836 Standard keyword values are:

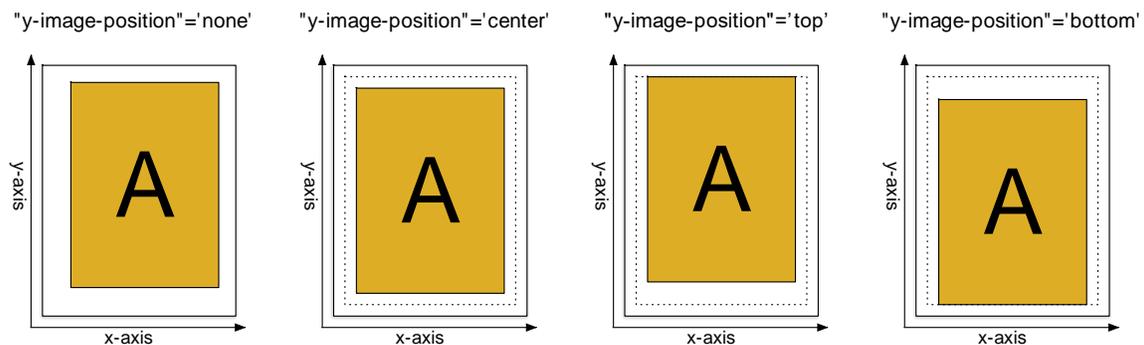
837 'none': Place the Impression wherever the print data specifies on the medium.

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

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

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

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



845

846

Figure 7 - "y-image-position" Values

847 5.1.18 y-image-shift (integer(MIN:MAX))

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

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

853 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
854 1/2540th of an inch resolution.

855 **5.1.19 y-side1-image-shift (integer(MIN:MAX))**

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

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

865 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
866 1/2540th of an inch resolution.

867 **5.1.20 y-side2-image-shift (integer(MIN:MAX))**

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

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

877 The unit of measure for this attribute is hundredths of a millimeter. This is equivalent to
878 1/2540th of an inch resolution.

879 **5.2 Printer Description Attributes**

880 **5.2.1 cover-back-default (collection | no-value)**

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

884 5.2.2 cover-back-supported (1setOf keyword)

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

888 5.2.3 cover-front-default (collection | no-value)

889 This CONDITIONALLY REQUIRED attribute specifies the default value of the "cover-front"
890 Job Template attribute (section **Error! Reference source not found.**). This attribute MUST b
891 e supported if the "cover-front" attribute is supported.

892 5.2.4 cover-front-supported (1setOf keyword)

893 This CONDITIONALLY REQUIRED attribute lists the supported "cover-front" Job Template
894 attribute (section **Error! Reference source not found.**) member attributes. This attribute M
895 UST be supported if the "cover-front" attribute is supported.

896 5.2.5 cover-type-supported (1setOf type2 keyword)

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

900 5.2.6 force-front-side-supported (rangeOfInteger(1:MAX))

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

904 5.2.7 imposition-template-default (type2 keyword | name(MAX))

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

908 5.2.8 imposition-template-supported (1setOf (type2 keyword | name(MAX)))

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

912 5.2.9 insert-count-supported (rangeOfInteger(0:MAX))

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

915 5.2.10 insert-sheet-default (1setOf collection)

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

918 5.2.11 insert-sheet-supported (1setOf keyword)

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

921 5.2.12 job-accounting-output-bin-supported (1setOf (type2 keyword | name(MAX)))

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

925 5.2.13 job-accounting-sheets-default (collection)

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

929 5.2.14 job-accounting-sheets-supported (1setOf keyword)

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

933 5.2.15 job-accounting-sheets-type-supported (1setOf (type2 keyword | name(MAX)))

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

937 5.2.16 job-error-sheet-default (collection)

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

941 5.2.17 job-error-sheet-supported (1setOf keyword)

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

945 5.2.18 job-error-sheet-type-supported (1setOf (type2 keyword | name(MAX)))

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

949 5.2.19 job-error-sheet-when-supported (1setOf type2 keyword)

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

952 5.2.20 job-message-to-operator-supported (boolean)

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

955 5.2.21 job-sheet-message-supported (boolean)

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

958 5.2.22 presentation-direction-number-up-default (type2 keyword)

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

962 5.2.23 presentation-direction-number-up-supported (1setOf type2 keyword)

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

966 5.2.24 separator-sheets-default (collection)

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

970 5.2.25 separator-sheets-supported (1setOf type2 keyword)

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

973 5.2.26 separator-sheets-type-supported (1setOf (type2 keyword | name(MAX)))

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

976 5.2.27 x-image-position-default (type2 keyword)

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

979 5.2.28 x-image-position-supported (1setOf type2 keyword)

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

982 5.2.29 x-image-shift-default (integer(MIN:MAX))

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

985 5.2.30 x-image-shift-supported (rangeOfInteger(MIN:MAX))

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

988 5.2.31 x-side1-image-shift-default (integer(MIN:MAX))

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

991 5.2.32 x-side1-image-shift-supported (rangeOfInteger(MIN:MAX))

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

994 5.2.33 x-side2-image-shift-default (integer(MIN:MAX))

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

997 5.2.34 x-side2-image-shift-supported (rangeOfInteger(MIN:MAX))

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

1000 5.2.35 y-image-position-default (type2 keyword)

1001 This REQUIRED attribute specifies the default value of the "y-image-position" Job Template
1002 attribute (section 5.1.17).

1003 5.2.36 y-image-position-supported (1setOf type2 keyword)

1004 This REQUIRED attribute lists the supported values of the "y-image-position" Job Template
1005 attribute (section 5.1.17).

1006 5.2.37 y-image-shift-default (integer(MIN:MAX))

1007 This REQUIRED attribute specifies the default value of the "y-image-shift" Job Template
1008 attribute (section 5.1.18).

1009 5.2.38 y-image-shift-supported (rangeOfInteger(MIN:MAX))

1010 This REQUIRED attribute specifies the range of supported values of the "y-image-shift" Job
1011 Template attribute (section 5.1.18).

1012 5.2.39 y-side1-image-shift-default (integer(MIN:MAX))

1013 This REQUIRED attribute specifies the default value of the "y-side1-image-shift" Job
1014 Template attribute (section 5.1.19).

1015 5.2.40 y-side1-image-shift-supported (rangeOfInteger(MIN:MAX))

1016 This REQUIRED attribute specifies the range of supported values of the "y-side1-image-
1017 shift" Job Template attribute (section 5.1.19).

1018 5.2.41 y-side2-image-shift-default (integer(MIN:MAX))

1019 This REQUIRED attribute specifies the default value of the "y-side2-image-shift" Job
1020 Template attribute (section 5.1.20).

1021 5.2.42 y-side2-image-shift-supported (rangeOfInteger(MIN:MAX))

1022 This REQUIRED attribute specifies the range of supported values of the "y-side2-image-
1023 shift" Job Template attribute (section 5.1.20).

1024 6. New Values for Existing Attributes**1025 6.1 job-state-reasons (1setOf type2 keyword)**

1026 This specification defines the 'resources-are-not-supported' value for the "job-state-reasons"
1027 Job Status attribute [STD92]. When present, at least one of the resources needed by the
1028 Job, such as media, fonts, resource objects, etc., is not supported on any of the physical
1029 Printer's for which the Job is a candidate. This condition can be detected when the Job is
1030 accepted, or subsequently while the Job is pending or processing, depending on
1031 implementation. The Job can:

1032 1. Remain in its current state,

- 1033 2. Be moved to the 'pending-held' state, depending on implementation and/or Job
 1034 scheduling policy, or
 1035 3. Be scheduled normally, but the Printer is put into the 'stopped' state when the
 1036 Job is attempted to be processed on the Printer.

1037 7. Obsolete Attributes

1038 7.1 Obsolete Job and Document Template Attributes

1039 This specification makes the "page-order-received (type2 keyword)" Job and Document
 1040 Template attribute [PWG5100.3-2001] OBSOLETE because it causes interoperability issues
 1041 with any IPP attribute that specifies page numbers or ranges.

1042 7.2 Obsolete Job Status Attributes

1043 This specification makes the "current-page-order (type2 keyword)" Job Status attribute
 1044 [PWG5100.3-2001] OBSOLETE because IPP does not expose the implementation details
 1045 of Document processing and because many implementations do not change Document Data
 1046 in-place.

1047 7.3 Obsolete Printer Description Attributes

1048 Table 10 lists the Printer Description attributes from the previous version of this specification
 1049 [PWG5100.3-2001] which are now OBSOLETE.

1050 **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

1051 8. Conformance Requirements

1052 8.1 Printer Conformance Requirements

1053 In order for a Printer to claim conformance to this specification, a Printer MUST support:

- 1054 1. The required attributes and values defined in section 5;
 1055 2. The additional values defined in section 6;
 1056 3. The internationalization considerations defined in section 9; and
 1057 4. The security considerations defined in section 10.

1058 Printer MUST NOT support the OBSOLETE attributes listed in section 7.

1059 **8.2 Client Conformance Requirements**

1060 In order for a Client to claim conformance to this specification, a Client MUST support:

- 1061 1. The required attributes and values defined in section 5;
- 1062 2. The additional values defined in section 6;
- 1063 3. The internationalization considerations defined in section 9; and
- 1064 4. The security considerations defined in section 10.

1065 **9. Internationalization Considerations**

1066 For interoperability and basic support for multiple languages, conforming implementations
1067 MUST support:

- 1068 1. The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8)
1069 [STD63] encoding of Unicode [UNICODE] [ISO10646]; and
- 1070 1. The Unicode Format for Network Interchange [RFC5198] which requires
1071 transmission of well-formed UTF-8 strings and recommends transmission of
1072 normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

1073 Unicode NFC is defined as the result of performing Canonical Decomposition (into base
1074 characters and combining marks) followed by Canonical Composition (into canonical
1075 composed characters wherever Unicode has assigned them).

1076 WARNING – Performing normalization on UTF-8 strings received from Clients and
1077 subsequently storing the results (e.g., in Job objects) could cause false negatives in Client
1078 searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now
1079 'hidden').

1080 Implementations of this specification SHOULD conform to the following standards on
1081 processing of human-readable Unicode text strings, see:

1082 Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical

1083 Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping

1084 Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]

1085 Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences

1086 Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization

1087 Unicode Collation Algorithm [UTS10] – sorting

1088 Unicode Locale Data Markup Language [UTS35] – locale databases

1089 Implementations of this specification are advised to also review the following informational
1090 documents on processing of human-readable Unicode text strings:

1091 Unicode Character Encoding Model [UTR17] – multi-layer character model

1092 Unicode Character Property Model [UTR23] – character properties

1093 Unicode Conformance Model [UTR33] – Unicode conformance basis

1094 **10. Security Considerations**

1095 The IPP extensions defined in this document require the same security considerations as
1096 defined in the Internet Printing Protocol/1.1 [STD92].

1097 Implementations of this specification SHOULD conform to the following standard on
1098 processing of human-readable Unicode text strings, see:

1099 Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks

1100 Implementations of this specification are advised to also review the following informational
1101 document on processing of human-readable Unicode text strings:

1102 Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

1103 **11. IANA Considerations**

1104 **11.1 Attribute Registrations**

1105 The attributes defined in this specification will be published by IANA according to the
1106 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1107 <https://www.iana.org/assignments/ipp-registrations>

1108 The registry entries will contain the following information:

1109	Job Status attributes:	Reference
1110	-----	-----
1111	current-page-order(obsolete) (type2 keyword)	[PWG5100.3]
1112		
1113	Job Template attributes:	Reference
1114	-----	-----
1115	cover-back (collection)	[PWG5100.3]
1116	cover-type (type2 keyword name(MAX))	[PWG5100.3]
1117	media (type2 keyword name(MAX))	[PWG5100.3]
1118	media-col (collection)	[PWG5100.3]
1119	cover-front (collection)	[PWG5100.3]
1120	< member attributes are the same as "cover-back" >	[PWG5100.3]
1121	force-front-side (1setOf integer(1:MAX))	[PWG5100.3]

1122	imposition-template (type2 keyword name(MAX))	[PWG5100.3]
1123	insert-sheet (1setOf collection)	[PWG5100.3]
1124	insert-after-page-number (integer(0:MAX))	[PWG5100.3]
1125	insert-count (integer(0:MAX))	[PWG5100.3]
1126	media (type2 keyword name(MAX))	[PWG5100.3]
1127	media-col (collection)	[PWG5100.3]
1128	job-accounting-sheets (collection)	[PWG5100.3]
1129	job-accounting-output-bin (type2 keyword name(MAX))	[PWG5100.3]
1130	job-accounting-sheets-type (type2 keyword name(MAX))	[PWG5100.3]
1131	media (type2 keyword name(MAX))	[PWG5100.3]
1132	media-col (collection)	[PWG5100.3]
1133	job-error-sheet (collection)	[PWG5100.3]
1134	job-error-sheet-type (type2 keyword name(MAX))	[PWG5100.3]
1135	job-error-sheet-when (type2 keyword)	[PWG5100.3]
1136	media (type2 keyword name(MAX))	[PWG5100.3]
1137	media-col (collection)	[PWG5100.3]
1138	job-message-to-operator (text(MAX))	[PWG5100.3]
1139	job-sheet-message (text(MAX))	[PWG5100.3]
1140	media-input-tray-check(deprecated) (type2 keyword name(MAX))	[PWG5100.3]
1141		
1142	page-delivery (type2 keyword)	[PWG5100.3]
1143	page-order-received(obsolete) (type2 keyword)	[PWG5100.3]
1144	presentation-direction-number-up (type2 keyword)	[PWG5100.3]
1145	separator-sheets (collection)	[PWG5100.3]
1146	media (type2 keyword name(MAX))	[PWG5100.3]
1147	media-col (collection)	[PWG5100.3]
1148	separator-sheets-type (type2 keyword name(MAX))	[PWG5100.3]
1149	x-image-position (type2 keyword)	[PWG5100.3]
1150	x-image-shift (integer(MIN:MAX))	[PWG5100.3]
1151	x-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
1152	x-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]
1153	y-image-position (type2 keyword)	[PWG5100.3]
1154	y-image-shift (integer(MIN:MAX))	[PWG5100.3]
1155	y-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
1156	y-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]
1157		
1158	Printer Description attributes:	Reference
1159	-----	-----
1160	cover-back-default (collection no-value)	[PWG5100.3]
1161	cover-back-supported (1setOf keyword)	[PWG5100.3]
1162	cover-front-default (collection no-value)	[PWG5100.3]
1163	cover-front-supported (1setOf keyword)	[PWG5100.3]
1164	cover-type-supported (1setOf type2 keyword)	[PWG5100.3]
1165	force-front-side-supported (rangeOfInteger(1:MAX))	[PWG5100.3]
1166	imposition-template-default (type2 keyword name(MAX))	[PWG5100.3]
1167	imposition-template-supported (1setOf (type2 keyword name(MAX)))	[PWG5100.3]
1168		
1169	insert-after-page-number-supported(obsolete) (rangeOfInteger(0:MAX))	[PWG5100.3]
1170		
1171	insert-count-supported (rangeOfInteger(0:MAX))	[PWG5100.3]
1172	insert-sheet-default (1setOf collection)	[PWG5100.3]
1173	insert-sheet-supported (1setOf keyword)	[PWG5100.3]
1174	job-account-id-default (name(MAX) no-value)	[PWG5100.3]
1175	job-account-id-supported (boolean)	[PWG5100.3]
1176	job-accounting-output-bin-default(obsolete) (type2 keyword name(MAX))	[PWG5100.3]
1177		

1178	job-accounting-output-bin-supported(deprecated) (1setOf (type2 keyword	
1179	name(MAX)))	[PWG5100.3]
1180	job-accounting-sheets-default (collection)	[PWG5100.3]
1181	job-accounting-sheets-supported (1setOf keyword)	[PWG5100.3]
1182	job-accounting-sheets-type-supported (1setOf (type2 keyword name(MAX)))	
1183		[PWG5100.3]
1184	job-accounting-user-id-default (name(MAX))	[PWG5100.3]
1185	job-accounting-user-id-supported (boolean)	[PWG5100.3]
1186	job-error-sheet-default (collection)	[PWG5100.3]
1187	job-error-sheet-supported (1setOf keyword)	[PWG5100.3]
1188	job-error-sheet-type-supported (1setOf (type2 keyword name(MAX)))	
1189		[PWG5100.3]
1190	job-error-sheet-when-supported (1setOf type2 keyword)	[PWG5100.3]
1191	job-message-to-operator-supported (boolean)	[PWG5100.3]
1192	job-sheet-message-supported (boolean)	[PWG5100.3]
1193	job-sheets-col-default (collection)	[PWG5100.3]
1194	job-sheets-col-supported (1setOf keyword)	[PWG5100.3]
1195	page-delivery-default (type2 keyword)	[PWG5100.3]
1196	page-delivery-supported (1setOf type2 keyword)	[PWG5100.3]
1197	page-order-received-default(obsolete) (type2 keyword)	[PWG5100.3]
1198	page-order-received-supported(obsolete) (1setOf type2 keyword)	
1199		[PWG5100.3]
1200	presentation-direction-number-up-default (type2 keyword)	[PWG5100.3]
1201	presentation-direction-number-up-supported (1setOf type2 keyword)	
1202		[PWG5100.3]
1203	separator-sheets-default (collection)	[PWG5100.3]
1204	separator-sheets-supported (1setOf keyword)	[PWG5100.3]
1205	user-defined-values-supported(obsolete) (1setOf keyword)	[PWG5100.3]
1206	x-image-position-default (type2 keyword)	[PWG5100.3]
1207	x-image-position-supported (1setOf type2 keyword)	[PWG5100.3]
1208	x-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1209	x-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1210	x-side1-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1211	x-side1-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1212	x-side2-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1213	x-side2-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1214	y-image-position-default (type2 keyword)	[PWG5100.3]
1215	y-image-position-supported (1setOf type2 keyword)	[PWG5100.3]
1216	y-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1217	y-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1218	y-side1-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1219	y-side1-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]
1220	y-side2-image-shift-default (integer(MIN:MAX))	[PWG5100.3]
1221	y-side2-image-shift-supported (rangeOfInteger(MIN:MAX))	[PWG5100.3]

1222 11.2 Type2 keyword Registrations

1223 The keyword values defined in this specification will be published by IANA according to the
1224 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1225 <https://www.iana.org/assignments/ipp-registrations>

1226 The registry entries will contain the following information:

1227	Attributes (attribute syntax)	
1228	Keyword Attribute Value	Reference
1229	-----	-----
1230	cover-type (type2 keyword)	[PWG5100.3]
1231	no-cover	[PWG5100.3]
1232	print-back	[PWG5100.3]
1233	print-both	[PWG5100.3]
1234	print-front	[PWG5100.3]
1235	print-none	[PWG5100.3]
1236		
1237	imposition-template (type2 keyword name(MAX))	[PWG5100.3]
1238	booklet	[PWG5100.3]
1239	none	[PWG5100.3]
1240	same-up_2_2_3.5x5in	[PWG5100.3]
1241	same-up_2_2_104x148mm	[PWG5100.3]
1242	same-up_4_3_2x3.5in	[PWG5100.3]
1243	signature(deprecated)	[PWG5100.3]
1244	tile	[PWG5100.3]
1245		
1246	job-accounting-output-bin (type2 keyword name(MAX))	[PWG5100.3]
1247	< any "output-bin" value >	[PWG5100.3]
1248		
1249	job-accounting-sheets-type (type2 keyword name(MAX))	[PWG5100.3]
1250	none	[PWG5100.3]
1251	standard	[PWG5100.3]
1252		
1253	job-error-sheet-type (type2 keyword name(MAX))	[PWG5100.3]
1254	none	[PWG5100.3]
1255	standard	[PWG5100.3]
1256		
1257	job-error-sheet-when (type2 keyword)	[PWG5100.3]
1258	always	[PWG5100.3]
1259	on-error	[PWG5100.3]
1260		
1261	job-state-reasons (1setOf type2 keyword)	[STD92]
1262	resources-are-not-supported	[PWG5100.3]
1263		
1264	page-delivery (type2 keyword)	[PWG5100.3]
1265	reverse-order-face-down	[PWG5100.3]
1266	reverse-order-face-up	[PWG5100.3]
1267	same-order-face-down	[PWG5100.3]
1268	same-order-face-up	[PWG5100.3]
1269	system-specified	[PWG5100.3]
1270		
1271	separator-sheets-type (type2 keyword name(MAX))	[PWG5100.3]
1272	both-sheets	[PWG5100.3]
1273	end-sheet	[PWG5100.3]
1274	none	[PWG5100.3]
1275	slip-sheets	[PWG5100.3]
1276	start-sheet	[PWG5100.3]
1277		
1278	x-image-position (type2 keyword)	[PWG5100.3]
1279	center	[PWG5100.3]
1280	left	[PWG5100.3]
1281	none	[PWG5100.3]
1282	right	[PWG5100.3]

1283		
1284	y-image-position (type2 keyword)	[PWG5100.3]
1285	bottom	[PWG5100.3]
1286	center	[PWG5100.3]
1287	none	[PWG5100.3]
1288	top	[PWG5100.3]

1289 12. Overview of Changes

1290 12.1 IPP Production Printing Extensions v1.1

1291 The following changes were made to the previous version of this specification [PWG5100.3-
1292 2001]:

- 1293 • Finishing attributes have been moved to the IPP Finishings v2.1 specification
1294 [PWG5100.1];
- 1295 • The "job-account-id", "job-accounting-user-id", "job-sheets-col", and "media-col"
1296 attributes have been moved to the IPP Job Extensions v2.0 specification
1297 [PWG5100.7];
- 1298 • References to the original page overrides draft and attributes have been removed
1299 since that specification was withdrawn;
- 1300 • The "insert-sheet", "job-error-sheet", "job-message-to-operator", "job-sheet-
1301 message", "page-delivery", "separator-sheets", "x-image-position", "x-image-shift",
1302 "x-side1-image-shift", "x-side2-image-shift", "y-image-position", "y-image-shift", "y-
1303 side1-image-shift", and "y-side2-image-shift" Job Template attributes and
1304 corresponding Printer Description attributes have been made REQUIRED;
- 1305 • The "cover-back", "cover-front", "force-front-side", and "imposition-template" Job
1306 Template attributes have been made RECOMMENDED and the corresponding
1307 Printer Description attributes have been made CONDITIONALLY REQUIRED;
- 1308 • The "media-col" member attribute is now REQUIRED for the "cover-back", "cover-
1309 front", "insert-sheet", "job-accounting-sheets", "job-error-sheet", and "separator-
1310 sheets" Job Template attributes;
- 1311 • The "job-accounting-sheets" Job Template attribute and corresponding Printer
1312 Description attributes have been DEPRECATED because they are no longer needed;
- 1313 • The "media-input-tray-check" Job Template attribute has been DEPRECATED
1314 because the functionality is provided by the "media-source" member attribute of the
1315 "media-col" Job and Document Template attribute;
- 1316 • The "presentation-direction-number-up" Job Template attribute and "presentation-
1317 direction-number-up-default" and "presentation-direction-number-up-supported"

- 1318 Printer Description attributes have been DEPRECATED because the functionality is
1319 typically provided by the Client operating system;
- 1320 • The "page-order-received" Job and Document Template attribute has been made
1321 OBSOLETE because it causes interoperability issues;
 - 1322 • The "current-page-order" Job Status attribute has been made OBSOLETE because
1323 the parent attribute has been made OBSOLETE, IPP does not expose the
1324 implementation details of Document processing, and because many implementations
1325 do not change Document Data in-place;
 - 1326 • The "insert-after-page-number-supported" Printer Description attribute has been
1327 made OBSOLETE because it is unnecessary;
 - 1328 • The "job-accounting-output-bin-default" Printer Description attribute has been made
1329 OBSOLETE because it is unnecessary;
 - 1330 • The "page-order-received-default" and "page-order-received-supported" Printer
1331 Description attributes have been made OBSOLETE because the corresponding Job
1332 and Document Template attribute is OBSOLETE; and
 - 1333 • The "user-defined-values-supported" Printer Description attribute has been made
1334 OBSOLETE because it is unnecessary.

1335 13. References

1336 13.1 Normative References

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1412 specification:

1413 Kirk Ocke (Co-author of previous version)
1414 Tom Hastings (Co-author of previous version)

1415 **15. Change History**

1416 **This section will be removed when this document is published.**

1417 **15.1 January 30, 2020**

- 1418 • Section 3.3: One exception, not multiple
- 1419 • Sections 5.1.3 and 11.2: Added 'tile' imposition template
- 1420 • Table 6: Changed MUST to REQUIRED and SHOULD to RECOMMENDED

1421 **15.2 December 16, 2019**

- 1422 • Added new boilerplate explaining the title changes from the prior version.

1423 **15.3 September 23, 2019**

- 1424 • Status: Prototype
- 1425 • Updated Unicode references (publication dates)
- 1426 • Section 2.4: Updated Error Sheets definition
- 1427 • Section 4.2: Updated imposition-template example and figure
- 1428 • Section 4.3: Fixed editorial issues
- 1429 • Merged sections 5.1.1 and 5.1.2 (cover-back and cover-front)
- 1430 • Section 5.1.3: Made attribute RECOMMENDED, 'signature' DEPRECATED, added
1431 same-up and booklet templates, redefined signature as implementation-defined
1432 signature, added ABNF for keyword values, figure showing same-up and booklet
1433 impositions
- 1434 • Section 5.2.17: REQUIRED
- 1435 • Section 5.2.x: Added imposition-template-default and imposition-template-supported
1436 attributes
- 1437 • Section 11: Updated IPP registrations
- 1438 • Section 12: Updated list of recommended and required attributes
- 1439 • Added STD68 (ABNF) and collected ABNF references

1440 • Global: Dropped "REQUIRED" from member attribute table names, added
1441 conformance column instead

1442 • Global: Error Sheets, Separator Sheets (capitalized terms)

1443 **15.4 September 9, 2019**

1444 • Status: Interim

1445 • Updated the conformance requirements of the new attributes based on the August
1446 2019 F2F meeting discussions

1447 • Section 2.4: Added Error Sheet, Insert Sheet, and Separator Sheet definitions

1448 • Section 4.3: Added a figure showing cover, insert, and separator sheets, clarified
1449 description to include terms

1450 • Sections 5.1.1 and 5.1.2: Clarified cover-front and cover-back definitions

1451 • Section 5.1.4: Updated definition of imposition-template, added comment for
1452 discussion

1453 • Section 5.1.6: Fixed references for job-account-id and job-accounting-user-id which
1454 are now in 5100.7.

1455 • Section 12.1: Updated the list of changes to match the new conformance
1456 requirements and obsolete/deprecated attributes

1457 • Section 13.1: Updated PWG 5100.7 and Unicode references

1458 • Section 13.2: Dropped PostScript red book reference

1459 • Fixed a bunch of broken references

1460 **15.5 June 26, 2019**

1461 • Status: Prototype

1462 • Section 4.1: Figure 1 was duplicated (figure was part of the caption)

1463 • Section 4.2: Fixed table 1 reference

1464 • Section 4.3: Typos and clarifications, fixed table 2 reference

1465 • Section 4.4: Fixed table 3 reference

- 1466
- Updated conformance requirements in section 8.

1467 **15.6 May 14, 2019**

- 1468
- Updated abstract and introduction

- 1469
- Version 2.0

- 1470
- Moved all of the job-account-id, job-accounting-user-id, and job-sheets-col definitions
- 1471 to the Job Extensions v2.0 specification

- 1472
- Moved all of the media-col definitions to the Job Extensions v2.0 specification

- 1473
- Made page-order-received and friends obsolete

- 1474
- Expanded discussion of features in section 4

- 1475
- Updated figure showing roll media as a roll.

1476 **15.7 May 1, 2019**

- 1477
- Initial changes to the published 5100.3-2001

- 1478
- Dropped all references to the old page overrides spec (which was eventually
- 1479 abandoned in favor of document overrides)

- 1480
- Dropped all new media values, which are now covered by PWG 5101.1 (MSN2)

- 1481
- Dropped all finishings attributes, which are now covered by PWG 5100.1 (FIN)

- 1482
- Updated (and shortened!) abstract

- 1483
- Section 1: Rewritten and shortened.

- 1484
- Global: Client, Document, Document Data, Input Pages (instead of print-stream
- 1485 pages), Job, Job Error Sheet, Job Sheet, Printer, End User, and other terminology
- 1486 properly capitalized

- 1487
- Global: type3 keyword changed to type2 keyword

- 1488
- Section 2: Updated with modern terminology

- 1489
- Section 3: Added rationale, use cases, etc.

- 1490
- Section 4: Expanded to include all of the background information that was inline with
- 1491 the attribute definitions.

- 1492 • Section 5: Split Job Template and Printer Description attributes
- 1493 • Removed references to "job-warnings-detected" since a) that is defined in PWG
- 1494 5100.7 and b) the final standardized names were different.