XJDF

ICS
INTEROPERABILITY CONFORMANCE SPECIFICATION

Quality Control MIS ICS

Version 2.2

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CIP4 ORGANIZATION

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1 Introduction

The MIS to Quality Control Interoperability Conformance Specification (ICS) defines the exchange of quality control data from MIS or print production system to quality measurement devices, using **XJDF**.

This ICS is part of a series of ICS documents that define the exchange of quality control data from *Customer* to *Print Provider*, *CusQC*, or *MIS* to device, *MisQC*, using **XJDF**. The ICS documents of the series are designed to enable end-to-end communication of quality targets and results from a conforming measurement device to the *Customer* at the level of detail that is appropriate for each interface. This encompasses both the definition of quality control requirements for the *Worker* as well as the reporting of quality control data by the *Worker*.

The major difference between the *CusQC* and *MisQC* ICS is that *CusQC* assumes that the data have been summarized for a *Customer* quality report whereas the *MisQC* ICS provides an interface for immediate data from quality control measurement devices to an *MIS* or print production system. This ICS provides information about the details of the **XJDF** data for quality control. Dynamic modification of quality control requirements by the *Manager* is out of scope of this ICS.

This ICS requires the use of at least **XJDF** version 2.2.

This initial version limits the scope to defining print quality inspection and color quality control of printed sheets and reels. This ICS has no additional normative ICS dependencies.

1.1 General Architecture

This ICS allows for 2 profiles.

- *Static Worker*: A *Static Worker* SHALL be capable of providing **XJMF** for quality reports. Setup of the equipment NEED NOT apply job specific details. *Static Workers* SHALL conform to level 1 of this ICS.
  Note: This allows simple devices to provide measurement feedback according to this ICS but allowing proprietary setup. *Static Workers* have no read requirements from this ICS.
- *Dynamic Worker*: A *Dynamic Worker* SHALL be capable of reading **XJDF** for setup and providing **XJMF** for quality reports. *Dynamic Workers* SHALL conform to level 2 of this ICS.

This ICS specifies the details of quality measurements and has no additional requirements on job submission and job reporting. See [XJDF 2.2].

Returned reports SHALL be defined as individual measurements or summaries of the *Press Runs* or partial *Press Runs* in ***SignalResource*** **XJMF** messages.

1.2 Conventions Used in this Specification

Throughout this document a number of formatting and stylistic conventions have been employed that are intended to help the reader. These are intended to align with those of the **XJDF** specification. See [XJDF 2.2].

1.2.1 Document References

References to other publications are collated in Appendix A References. Within the text these references use a meaningful short symbolic name that may be clicked to allow the reader to navigate directly to the full description in the appendix. These references use a common text style as described in the following section.

1.2.2 Text Styles

There are a number of text styles that are used to identify the various components of the specification. Some of the text styles support dynamic links; these allow the reader to click on the term and navigate to the definition of the term (if it is locally defined).

- ***NodeInfo*** — An **XJDF** or **XJMF** element. Usually these are dynamic links leading to the definition of the element.
- **Process** — A specific *Process* or *Gray Box* such as **ColorSpaceConversion** or **Rendering**. These can be dynamic links leading to the definition of the *Process*.
- @*Attribute* — An **XJDF** or **XJMF** attribute within the context of an element.
- "Value" — The content of an attribute.
- **XJDF** — **XJDF** or **XJMF** are used when referring to the specification in general rather than elements with the same name.
- *Glossary Item* — The document utilizes some specialist terms; these are defined in Table 1.3 Glossary and highlighted throughout the document.

- [XJDF 2.2] Identifies a reference to an item within this specification (such as a particular table, section etc) or to an entry in the references appendix. These are dynamic links leading to the item itself.
- http://www.CIP4.org A hyperlink reference to an external item.

1.2.3 XPath Notation

- *XJDF*/@*JobID* The document utilizes [XPath] notation when it is required to define the particular context for an item. It is particularly useful when there is a conditional term relating to the context, e.g. *XJDF*[@*Types* = "DigitalPrinting"] identifies an **XJDF** *Process* node for digital printing.

1.2.4 Modification Notes

New in ICS 2.2

To help the reader familiar with earlier versions of this ICS, this specification indicates additions and clarifications using the callouts described in Table 1.1 Modification Notes. Please note that not all changes are identified with modified call-out flags. When modification occurs in multiple versions, sometimes only the most recent version is indicated. A few changes have been made globally and are explained in the body of the document and only significant changes have been flagged with callouts, as determined by CIP4 Working Groups.

Table 1.1: Modification Notes

EXAMPLE	CALLOUT MEANING
New in ICS 2.x	New sections, attribute/elements and attribute versions.
Modified in ICS 2.x	Changed syntax or semantics of sections or attributes/elements. Might include clarification as well. Usually there is a modification note describing the change.

1.2.4.1 Location of Modification Notes

A callout occurs after one of the following document elements.

- **Section head:** applies to entire section and all subsections and contained tables.
- **Attribute/Element name:** applies to entire row for the designated attribute/element.
- **Attribute value:** applies to attribute value.

1.2.5 Specification of Cardinality

The following table illustrates the notation of *Manager* and *Worker Conformance Requirements* in ICS tables.

If an attribute, attribute value or element is not specified explicitly or implicitly by a table row of <all other values>, it is assumed to be out of scope. An empty cell for a *Conformance Level* specifies that the *Trait* is out of scope for that *Conformance Level*. Out of scope values MAY be written and MAY be processed, but a conforming processor NEED NOT support them. The implied cardinality of out of scope values is therefore w? r?.

Table 1.2: Specification of cardinality (Sheet 1 of 2)

NOTATION	NAME	DESCRIPTION
w	Write Required	When this cardinality indicator is applied to an attribute or element name, the *Trait* SHALL be written by the *Manager* or *Worker*. When this cardinality indicator is applied to an attribute value that is not a list type it specifies the only acceptable value. When this cardinality indicator is applied to an attribute value that is a list type, it specifies that the value SHALL be present in the list.
w?	Write Optional	The element, or attribute, or attribute value MAY be written by the *Manager* or *Worker*. When this cardinality indicator is applied to an attribute value that is a list type, it specifies that the value MAY be present in the list.

Table 1.2: Specification of cardinality (Sheet 2 of 2)

NOTATION	NAME	DESCRIPTION
w←	Write Conditional	When this cardinality indicator is applied to an attribute or element name, the *Trait* SHALL be written by the *Manager* or *Worker* depending on conditions. The details of the condition will be specified in the description. When this cardinality indicator is applied to an attribute value it specifies that the value is a valid selection from a list of acceptable values. When this cardinality indicator is applied to an attribute value that is a list type, it specifies that the value is a valid selection from a list of acceptable values that SHALL be present in the list.
w!	Write Forbidden	The element, or attribute, or attribute value SHALL NOT be written by the *Manager* or *Worker*. When this cardinality indicator is applied to an attribute value that is a list type, it specifies that the value SHALL NOT be present in the list.
r	Read Required	The element, or attribute, or attribute value SHALL be read by the *Manager* or *Worker*.
r?	Read Optional	The element, or attribute, or attribute value MAY be read by the *Manager* or *Worker*.
r←	Read Conditional	The element, or attribute, or attribute value SHALL be read by the *Manager* or *Worker* depending on conditions. The details of the condition will be specified in the description.

1.2.6 Conformance Terminology

This document uses exactly the same terminology as the **XJDF** specification to indicate the strictness of conformance. See [XJDF 2.2].

1.3 Changes from the Previous Version

This section summarizes the major changes from the previous version of this ICS. Details and additional minor changes are listed in Appendix B Release Notes.

This version of the ICS introduces release notes (see Appendix B Release Notes) and change tracking.

The ICS version has been changed from 2.1 to 2.2.

1.3.1 Additions

There are no significant additions to this version of the specification.

1.3.2 Removals

There are no significant removals from this version of the specification.

1.3.3 Modifications

There are no significant modifications to this version of the specification.

1.4 Glossary

This section defines the terms and definitions that are required for quality measurements. For general **XJDF** terms, please see [XJDF 2.2].

Table 1.3: Glossary (Sheet 1 of 2)

TERM	DEFINITION
Acceptance	Subjective or active consensus of satisfying the requested quality parameters.
Color Register	Accuracy of ink alignment “color-to-color”, i.e. between the print forms of the individual process colors in 2, 3, 4 or multicolor printing.
CusQC	Interface between an end *Customer* and the *Print Provider*.
Customer	Company or person that procures printed material from a *Print Provider*.

Table 1.3: Glossary (Sheet 2 of 2)

TERM	DEFINITION
Cutting Register	Register accuracy “print-to-cut”, i.e. between printed pages and cut-off length after the former fold section in rotary presses.
Dynamic Worker	A *Worker* that reads setup instructions from **XJDF** and sends measurements using **XJMF**.
Inline Measurement	Measurement by a measurement device that is tightly coupled to a *Production Device*.
Lighting Conditions	Quality feature of technical parameters prevailing during a color stimulus or visual assessment; include the illuminant of the light source, the influence of the surroundings and the glare and reflection-free angle of observation.
Manager	See *MIS*.
Measurement System	The device and software that provides the actual measurement, e.g. a spectrophotometer or camera.
MIS	Management Information System or production workflow system. The *MIS* can receive quality data from a *Measurement System* and provide a condensed summary of the quality data to the *Customer*.
MisQC	Interface between a *Print Provider*'s *MIS* and a *Measurement system*.
Offline Measurement	Measurement by a *Measurement system* that is not directly coupled to a *Production Device*, such as a handheld spectrophotometer.
Press Run	One run of a *Sheet* through a press. The press consists of modules that are linearly linked to a chain. One run of a *Sheet* through this chain represents one *Press Run*.
Print Buyer	The customer that is buying a *Print Product*.
Print Product	The printed matter produced by the *Print Provider* according to the specifications from the *Print Buyer*.
Print Provider	The company that produces printed or finished goods for a *Customer*.
Production Device	The device that produces the material that is measured. For color measurements this is typically a printing press.
Recto-verso register	Register accuracy “front-to-back”, i.e. between first and reverse printing on sheetfed and web gravure presses and between blanket-to-blanket printing in web offset presses.
Static Worker	A *Worker* that does not read setup instructions from **XJDF**, but sends measurements using **XJMF**.
Target Value	Desired value of a quality parameter or setpoint in a control system.
Tolerance	Objective or passive consensus of satisfying requested quality parameters
Trait	See ▸ [XJDF 2.2].
Worker	In the context of this ICS the *Worker* is a *Measurement System*. See ▸ [Management Information System ICS].

2 Conformance

2.1 Conformance Requirements

A product conforming to this ICS:

- SHALL produce **XJDF** instances that conform to the [XJDF 2.2] specification
- SHALL be able to read and write XML encoded in UTF-8 (variable number of octet Unicode characters).

Any claim of conformance to any ICS by a product’s vendor SHALL follow the requirements in the “CIP4 Guidelines: For CIP4 and JDF Logo Use” for ICS conformance.

3 XJDF Instance

The details of quality control SHALL be specified as a **QualityControl** process.

3.1 XJDF

XJDF SHALL specify the setup of the quality control process. **XJDF** NEED NOT be supported by *Static Workers*.

3.1.1 XJDF Instance sent by a Manager

Table 3.1: XJDF Instance sent by a Manager (Sheet 1 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
JobID	w	r	@*JobID* SHALL be used to identify the job for quality control and SHALL define the job identifier that is locally defined by the printer. **Note:** This is typically the job identifier of the printer's *MIS*.
Types	w	r	See [XJDF 2.2].
QualityControl	w	r	@*Types* SHALL contain "QualityControl".
<all other values>	w?	r?	Additional values MAY be specified but are out of scope for this ICS.
ICSVersions	w	r	The value of @*ICSVersions* SHALL specify the ICS that a conforming **XJDF** conforms to.
MisQC_L2-2.2	w	r	Specifies conformance to the Quality Control MIS ICS *Conformance Level* 2.
<all other values>	w?	r?	Additional values MAY be specified but are out of scope for this ICS.
Version	w	r?	See [XJDF 2.2].
2.2	w	r?	Specifies conformance to **XJDF** version 2.2.
ResourceSet [@*Name*="Color"]	w	r	A ***Color*** SHALL represent all color separations that are present in the print job. One Resource element SHALL be specified for each color separation. A Resource with no Part element MAY be specified as a container for [ISO 17972-4:2018].
ResourceSet [@*Name*="Colorant Control"]	w	r	A ***ColorantControl*** SHALL represent the print order of color separations that are present on a surface.
ResourceSet [@*Name*="Component"]	w	r	A ***Component*** SHALL represent the end result of the process that is controlled.
ResourceSet [@*Name*="Layout"]	w←	r←	A ***Layout*** SHALL define the geometry of the measurement patches. ***ResourceSet***[@*Name*="Layout"] SHALL be specified if the receiving system is intended to automatically find measurement patches on a Component such as a press sheet and NEED NOT be specified for manually positioned quality measurement systems.
ResourceSet [@*Name*="Preview"]	w←	r?	***Preview*** SHOULD be specified to enable visualization of the press sheet or component that is quality controlled.

Table 3.1: XJDF Instance sent by a Manager (Sheet 2 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
ResourceSet [@*Name*="PrintCondition"]	w←	r?	***PrintCondition*** SHOULD be specified if scoring is requested from the *Worker*.
ResourceSet [@*Name*="QualityControlParams"]	w	r	A ***QualityControlParams*** SHALL contain the details of the quality control setup.

3.1.2 XJDF Instance sent by a Worker

Table 3.2: XJDF Instance sent by a Worker

NAME	MANAGER	WORKER	DESCRIPTION
JobID	r	w	@*JobID* SHALL be used to identify the job for quality control and SHALL define the job identifier that is locally defined by the printer. **Note:** This is typically the job identifier of the printer's *MIS*.
Types	r	w	See ▸ [XJDF 2.2].
QualityControl	r	w	@*Types* SHALL contain "QualityControl".
<all other values>	r?	w?	Additional values MAY be specified but are out of scope for this ICS.
ICSVersions	r	w	The value of @*ICSVersions* SHALL specify the ICS that a conforming **XJDF** conforms to.
MisQC_L2-2.2	r	w	Specifies conformance to the Quality Control MIS ICS *Conformance Level* 2.
<all other values>	r?	w?	Additional values MAY be specified but are out of scope for this ICS.
Version	r?	w	See ▸ [XJDF 2.2].
2.2	r?	w	Specifies conformance to **XJDF** version 2.2.
ResourceSet [@*Name*="QualityControlResult"]	r	w	A ***QualityControlResult*** SHALL contain the results of the quality control measurements.

4 XJMF Instance

XJMF is the preferred method to provide quality reports. See ▸ [XJDF 2.2] for additional details and a discussion of the network protocol for **XJMF**.

4.1 XJMF

4.1.1 XJMF Instance sent by a Manager

Table 4.1: XJMF Instance sent by a Manager

NAME	MANAGER	WORKER	DESCRIPTION
Version	w	r?	See ▸ [XJDF 2.2].
2.2	w	r?	Specifies conformance to **XJDF** version 2.2.

4.1.2 XJMF Instance sent by a Worker

Table 4.2: XJMF Instance sent by a Worker

NAME	MANAGER	WORKER	DESCRIPTION
Version	r?	w	See ▸ [XJDF 2.2].
2.2	r?	w	Specifies conformance to **XJDF** version 2.2.
Header	r?	w	***Header*** SHALL contain information about the sender of the XJMF. This NEED NOT be the creator of quality report. See ***SignalResource***/***Header***.
SignalResource	r	w←	Reports that conform to the *MisQC* ICS SHALL be specified as ***SignalResource*** elements that contain a ***SignalResource***/***ResourceSet***[@*Name*="QualityControlResult"]. Multiple ***SignalResource*** elements that contain different subsets of quality reports MAY be specified by the *Worker* and SHALL be processed by the *Manager*. Other **XJMF** message types MAY be sent but are out of scope for the *MisQC* ICS.
<all other messages>	r?	w?	Additional messages MAY be present but are out of scope for this ICS.

4.1.2.1 SignalResource

SignalResource will typically contain individual measurements or sets of measurements that were collected during a production run.

Table 4.3: SignalResource Element

NAME	MANAGER	WORKER	DESCRIPTION
Header	r	w	***Header*** SHALL contain information about the creator of the quality report.
ResourceInfo	r	w	Exactly one ***ResourceInfo*** that contains a ***ResourceSet***[@*Name*="QualityControlResult"] SHALL be present.

5 Resources

5.1 Color

Color SHALL define target properties of individual color separations. Every colorant that is intended to be printed as a separation SHALL be specified as an individual resource element.

5.1.1 ResourceSet

Table 5.1: Color ResourceSet Element

NAME	MANAGER	WORKER	DESCRIPTION
Name	w	r	See [XJDF 2.2].
Color	w	r	The value of @Name SHALL be "Color".
Usage	w	r	See [XJDF 2.2].
Input	w	r	The value of @Usage SHALL be "Input".
Resource	w	r	See [XJDF 2.2].

5.1.2 Resource

Table 5.2: Color Resource Element

NAME	MANAGER	WORKER	DESCRIPTION
Part	w←	r	**Part** SHALL be specified if **Color** is present.
Color	w←	r	Exactly one of **Color** and **cx:CxF** SHALL be present.
cx:CxF	w?	r	**cx:CxF** MAY be specified to describe color target requirements. Not more than one **cx:CxF** element SHALL be present. If **cx:CxF** is present, **Part** SHALL NOT be specified and **Color** SHALL NOT be specified. The requirements for **cx:CxF** are out of scope for this ICS. See [ISO 17972-4:2018] for more information on **cx:CxF**.

5.1.3 Part

Table 5.3: Color Part Element

NAME	MANAGER	WORKER	DESCRIPTION
Separation	w	r	@Separation SHALL be specified.
<all other attributes>	w!		Additional values SHALL NOT be specified.

5.1.4 Color

Table 5.4: Color Element (Sheet 1 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
ActualColorName	w←	r	See [XJDF 2.2].

Table 5.4: Color Element (Sheet 2 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
Density	w←	r	At least one of @*Density* or @*NeutralDensity* SHALL be specified if neither @*Spectrum* nor @*LAB* is present.
LAB	w←	r	If either *Manager* or *Worker* support colorimetric measurements, @*LAB* SHOULD be specified.
NeutralDensity	w←	r	At least one of @*Density* or @*NeutralDensity* SHALL be specified if neither @*Spectrum* nor @*LAB* is present.
Spectrum	w←	r	If either *Manager* or *Worker* support spectral measurements, the color reflectance spectrum SHOULD be specified.
ColorMeasurement Conditions	w?	r	See [XJDF 2.2].

5.2 ColorantControl

ColorantControl SHALL define the sequence in whch individual separations SHALL be printed.

5.2.1 ResourceSet

Table 5.5: ColorantControl ResourceSet Element

NAME	MANAGER	WORKER	DESCRIPTION
Name	w	r	See [XJDF 2.2].
ColorantControl	w	r	The value of @*Name* SHALL be "ColorantControl".
Usage	w	r	See [XJDF 2.2].
Input	w	r	The value of @*Usage* SHALL be "Input".
Resource	w	r	See [XJDF 2.2].

5.2.2 Resource

Table 5.6: ColorantControl Resource Element

NAME	MANAGER	WORKER	DESCRIPTION
Part	w?	r	***Part*** elements MAY be specified if colors vary by *Press Run*.
ColorantControl	w	r	See [XJDF 2.2].

5.2.3 Part

Table 5.7: ColorantControl Part Element

NAME	MANAGER	WORKER	DESCRIPTION
Separation	w?	r	@*Separation* MAY be specified for ***ColorantControl*** partitions that apply to a *Press Run* if multiple *Press Runs* are measured for the same value of @*SheetName* and @*Side*.
SheetName	w?	r	@*SheetName* MAY be specified for ***ColorantControl*** partitions that apply to an individual sheet or impression on a roll.
Side	w?	r	@*Side* MAY be specified for ***ColorantControl*** partitions that applies to an individual surface.

5.2.4 ColorantControl

Table 5.8: ColorantControl Element

NAME	MANAGER	WORKER	DESCRIPTION
ColorantOrder	w	r	See ▸ [XJDF 2.2].
ColorantParams	w	r	See ▸ [XJDF 2.2].

5.3 Component

Components describe the physical objects such as press sheets of printed finished products that SHALL be controlled.

5.3.1 ResourceSet

Table 5.9: Component ResourceSet Element

NAME	MANAGER	WORKER	DESCRIPTION
Name	w	r	See ▸ [XJDF 2.2].
Component	w	r	The value of @*Name* SHALL be "Component".
Usage	w	r	See ▸ [XJDF 2.2].
Input	w	r	The value of @*Usage* SHALL be "Input".
Resource	w	r	See ▸ [XJDF 2.2].

5.3.2 Resource

Table 5.10: Component Resource Element

NAME	MANAGER	WORKER	DESCRIPTION
Part	w?	r	***Part*** MAY be specified if properties of the physical product vary by *Press Run*.
Component	w	r	***Component*** SHALL be present.

5.3.3 Part

Table 5.11: Component Part Element

NAME	MANAGER	WORKER	DESCRIPTION
QualityMeasurement	w!		@*QualityMeasurement* SHALL NOT be specified for ***Component***.
Separation	w!		@*Separation* SHALL NOT be specified for ***Component***.
SheetName	w?	r	@*SheetName* MAY be specified for ***Component*** partitions that apply to an individual sheet or impression on a roll.
Side	w!		@*Side* SHALL NOT be specified for ***Component***.

5.3.4 Component

Table 5.12: Component Element (Sheet 1 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
Dimensions	w	r	The size of the measured object SHALL be specified.

Table 5.12: Component Element (Sheet 2 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
MediaRef	w	r	@*MediaRef* SHALL reference a ***Media*** using the value of ***ResourceSet***/***Resource***/@*ID*.

5.4 Layout

This ICS provides normative usage rules for ***Layout*** as used by a **QualityControl** process. ***Layout*** SHALL specify the geometry of the press sheets and measurement patches.

Note: ***Layout*** contains additional information for the **Stripping** and/or **Imposition** processes. The use of this information for imposition purposes is out of scope for this ICS.

5.4.1 ResourceSet

Table 5.13: Layout ResourceSet Element

NAME	MANAGER	WORKER	DESCRIPTION
Name	w	r	See ▸ [XJDF 2.2].
Layout	w	r	The value of @*Name* SHALL be "Layout".
Usage	w	r	See ▸ [XJDF 2.2].
Input	w	r	The value of @*Usage* SHALL be "Input".
Resource	w	r	See ▸ [XJDF 2.2].

5.4.2 Resource

Table 5.14: Layout Resource Element

NAME	MANAGER	WORKER	DESCRIPTION
Part	w	r	***Part*** SHALL be present.
Layout	w	r	***Layout*** SHALL be present.

5.4.3 Part

Table 5.15: Layout Part Element

NAME	MANAGER	WORKER	DESCRIPTION
SheetName	w	r	@*SheetName* SHALL be specified for ***Layout***.
Side	w←	r	@*Side* SHALL be specified for at least one ***Layout*** partition.
<all other attributes>	w!		Additional attributes SHALL NOT be specified.

5.4.4 Layout

Table 5.16: Layout Element

NAME	MANAGER	WORKER	DESCRIPTION
PlacedObject	w	r	***PlacedObject*** elements define the details of individual marks and content. At least one ***PlacedObject***/***MarkObject*** SHALL be present.

5.4.4.1 PlacedObject

PlacedObject SHALL provide a detailed definition of print content and production marks.

Table 5.17: PlacedObject Element

NAME	MANAGER	WORKER	DESCRIPTION
CTM	w	r	See [XJDF 2.2].
ContentObject	w?	r?	***ContentObject*** elements provide details of the print content. The evaluation of print content is out of scope for this ICS.
MarkObject	w←	r	***MarkObject*** elements provide details of production marks. At least one conforming ***MarkObject*** that provides details for quality measurements SHALL be present.

5.4.4.2 MarkObject

Table 5.18: MarkObject Element

NAME	MANAGER	WORKER	DESCRIPTION
ColorControlStrip	w←	r←	***ColorControlStrip*** SHALL define a set of color measurement patch target color definitions. This includes target positions and color targets. At least one ***ColorControlStrip*** SHALL be specified in the context of one **XJDF** by the *Manager* if @*QualityControlMethods* contains one of "Colorimetry", "ColorSpectrophotometry" or "Densitometry". ***ColorControlStrip*** SHALL be evaluated by the *Worker* if @*QualityControlMethods* contains one of "Colorimetry", "ColorSpectrophotometry" or "Densitometry".
RegisterMark	w←	r←	At least one ***RegisterMark*** SHALL be specified in the context of one **XJDF** by the *Manager* if @*QualityControlMethods* contains "Registration". ***RegisterMark*** SHALL be evaluated by the *Worker* if @*QualityControlMethods* contains "Registration". See [XJDF 2.2].

5.4.4.3 RegisterMark

Table 5.19: RegisterMark Element

NAME	MANAGER	WORKER	DESCRIPTION
Center	w←	r	@*Center* SHALL be specified by the *Manager* if ***RegisterMark*** is in a descendant of ***Layout***.
MarkType	w!		@*MarkType* has been deprecated in **XJDF 2.1**.
MarkUsage	w	r	See [XJDF 2.2].
Color	w←	r	Color should be specified for register marks used for separation color registration.
<all other values>	w?	r?	All other values may be specified, but are out of scope of this ICS.
Rotation	w←	r	@*Rotation* SHALL be specified by the *Manager* if @*Center* is present.
Separations	w!		@*Separations* has been deprecated in **XJDF 2.1**.
Size	w←	r	@*Size* SHALL be specified by the *Manager* if @*Center* is present.
MarkElement	w?	r	See [XJDF 2.2].

5.4.4.4 MarkElement

Table 5.20: MarkElement Element

NAME	MANAGER	WORKER	DESCRIPTION
Center	w	r	See ▸ [XJDF 2.2].
MarkType	w	r	See ▸ [XJDF 2.2].
MarkUsage	w	r	See ▸ [XJDF 2.2].
Rotation	w←	r	See ▸ [XJDF 2.2].
Separation	w	r	See ▸ [XJDF 2.2].
Size	w	r	See ▸ [XJDF 2.2].

5.5 Media

Media resources describe physical media e.g. that used by press sheets.

5.5.1 ResourceSet

Table 5.21: Media ResourceSet Element

NAME	MANAGER	WORKER	DESCRIPTION
ID	w!		@*ID* SHALL NOT be specified for ***Media*** resources used by ***Component***.
Name	w	r	See ▸ [XJDF 2.2].
Media	w	r	The value of @*Name* SHALL be "Media".
Usage	w	r	See ▸ [XJDF 2.2].
Input	w	r	The value of @*Usage* SHALL be "Input".
Resource	w	r	See ▸ [XJDF 2.2].

5.5.2 Resource

Table 5.22: Media Resource Element

NAME	MANAGER	WORKER	DESCRIPTION
ID	w←	r	@*ID* SHALL be specified for ***Media*** resources used by ***Component***.
Part	w?	r	***Part*** MAY be specified if properties of the physical product vary by *Press Run*.
Media	w	r	***Media*** SHALL be present.

5.5.3 Part

Table 5.23: Media Part Element (Sheet 1 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
QualityMeasurement	w!		@*QualityMeasurement* SHALL NOT be specified for ***Media***.
Separation	w!		@*Separation* SHALL NOT be specified for ***Media***.

Table 5.23: Media Part Element (Sheet 2 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
SheetName	w?	r	@*SheetName* MAY be specified for ***Media*** partitions that apply to an individual sheet or impression on a roll.
Side	w!		@*Side* SHALL NOT be specified for ***Media***.

5.5.4 Media

Table 5.24: Media Element

NAME	MANAGER	WORKER	DESCRIPTION
Dimension	w	r	The size of the ***Media*** SHALL be specified.
ISOPaperSubstrate	w←	r	@*IsoPaperSubstrate* SHOULD be specified if scoring is requested from the *Worker*. **Note:** Trade associations define tolerances for measurements based on the paper substrate.
MediaType	w	r	@*MediaType* SHALL specify the type of the printed material.
Paper	w←	r	See ▸ [XJDF 2.2].
<all other values>	w?	r	Other media types MAY be specified but are out of scope for this ICS.

5.6 Preview

Preview SHOULD be specified to allow visualization of the press sheet or component that is quality controlled. If ***Preview*** is specified for color measurements, it SHALL contain the color control strips.

5.6.1 ResourceSet

Table 5.25: Preview ResourceSet Element

NAME	MANAGER	WORKER	DESCRIPTION
Name	w	r	See ▸ [XJDF 2.2].
Preview	w	r	The value of @*Name* SHALL be "Preview".
Usage	w	r	See ▸ [XJDF 2.2].
Input	w	r	The value of @*Usage* SHALL be "Input".
Resource	w	r	See ▸ [XJDF 2.2].

5.6.2 Resource

Table 5.26: Preview Resource Element (Sheet 1 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
Orientation	w?	r	See ▸ [XJDF 2.2].
Rotate0	w←	r	See ▸ [XJDF 2.2].
Rotate90	w←	r	See ▸ [XJDF 2.2].
Rotate180	w←	r	See ▸ [XJDF 2.2].
Rotate270	w←	r	See ▸ [XJDF 2.2].
<all other values>	w?	r?	Mirrored images MAY be specified, e.g. to describe negative images, but are out of scope for this ICS.

Table 5.26: Preview Resource Element (Sheet 2 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
Transformation	w!		Image rotation SHALL be specified in @*Orientation*. See ▸ [XJDF 2.2].
Part	w←	r←	***Part*** SHALL be specified if multiple previews are specified.
Preview	w	r?	The ***Preview*** MAY be evaluated by the *Worker* to analyze quality issues that are image related.

5.6.3 Part

Table 5.27: Preview Part Element

NAME	MANAGER	WORKER	DESCRIPTION
QualityMeasurement	w!		@*QualityMeasurement* SHALL NOT be specified for ***Preview***.
Separation	w?	r	@*Separation* MAY be specified for ***Preview*** partitions that apply to a *Press Run* if multiple *Press Runs* are measured for the same @*SheetName* and @*Side*.
SheetName	w?	r	@*SheetName* MAY be specified for ***Preview*** partitions that apply to an individual sheet or impression on a roll.
Side	w?	r	@*Side* MAY be specified for ***Preview*** partitions that apply to an individual surface.

5.6.4 Preview

Table 5.28: Preview Element

NAME	MANAGER	WORKER	DESCRIPTION
CTM	w!		@*CTM* has been deprecated in **XJDF 2.1**.
PreviewFileType	w	r?	See ▸ [XJDF 2.2].
PNG	w	r	A value of "PNG" SHALL be specified.
FileSpec	w	r	See ▸ [XJDF 2.2].

5.7 PrintCondition

PrintCondition SHOULD be specified if scoring is requested from the *Worker*.
Note: Trade associations define tolerances for measurements based on the print condition.

5.7.1 ResourceSet

Table 5.29: PrintCondition ResourceSet Element

NAME	MANAGER	WORKER	DESCRIPTION
Name	w	r	See ▸ [XJDF 2.2].
PrintCondition	w	r	The value of @*Name* SHALL be "PrintCondition".
Usage	w	r	See ▸ [XJDF 2.2].
Input	w	r	The value of @*Usage* SHALL be "Input".
Resource	w	r	See ▸ [XJDF 2.2].

5.7.2 Resource

Table 5.30: PrintCondition Resource Element

NAME	MANAGER	WORKER	DESCRIPTION
Part	w←	r	*Part* SHALL be specified if multiple print conditions are required within one job.
PrintCondition	w	r	The *PrintCondition* SHALL be specified.

5.7.3 Part

Table 5.31: PrintCondition Part Element

NAME	MANAGER	WORKER	DESCRIPTION
QualityMeasurement	w!		@*QualityMeasurement* SHALL NOT be specified for *PrintCondition*.
SheetName	w←	r	@*SheetName* SHALL be specified for *PrintCondition* partitions that apply to an individual sheet or impression on a roll.
Side	w←	r	@*Side* SHALL be specified for *PrintCondition* partitions that apply to an individual surface.

5.7.4 PrintCondition

Table 5.32: PrintCondition Element

NAME	MANAGER	WORKER	DESCRIPTION
Name	w	r	See ▸ [XJDF 2.2].

5.8 QualityControlParams

QualityControlParams defines the setup for quality control.

5.8.1 ResourceSet

Table 5.33: QualityControlParams ResourceSet Element

NAME	MANAGER	WORKER	DESCRIPTION
Name	w	r	See ▸ [XJDF 2.2].
QualityControlParams	w	r	The value of @*Name* SHALL be "QualityControlParams".
Usage	w	r	See ▸ [XJDF 2.2].
Input	w	r	The value of @*Usage* SHALL be "Input".
Resource	w	r	See ▸ [XJDF 2.2].

5.8.2 Resource

Table 5.34: QualityControlParams Resource Element (Sheet 1 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
Comment	w←	r	*Comment* SHALL be specified for all manual quality control steps and SHALL specifiy the requested actions as human readable text. *Comment* NEED NOT be specified for fully automated quality control.

Table 5.34: QualityControlParams Resource Element (Sheet 2 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
Part	w?	r	***Part*** MAY be specified if measurement requirements vary by *Press Run*.
QualityControlParams	w	r	***QualityControlParams*** SHALL be present.

5.8.3 Comment

Table 5.35: Comment Element

NAME	MANAGER	WORKER	DESCRIPTION
Type	w	r	@*Type* SHALL be present.
Instruction	w←	r	The human readable instructions SHALL be marked with @*Type*="Instruction".
<all other values>	w?	r?	Other comments with a different type MAY be specified, but are out of scope for this ICS.
<element text>	w	r	The human readable setup and measurement instructions SHALL be specified.

5.8.4 Part

Table 5.36: QualityControlParams Part Element

NAME	MANAGER	WORKER	DESCRIPTION
QualityMeasurement	w!		@*QualityMeasurement* SHALL NOT be specified for ***QualityControlParams***.
Separation	w?	r	@*Separation* MAY be specified for ***QualityControlParams*** partitions that apply to a *Press Run* if multiple *Press Runs* are measured for the same @*SheetName* and @*Side*.
SheetName	w?	r	@*SheetName* MAY be specified for ***QualityControlParams*** partitions that apply to an individual sheet or impression on a roll.
Side	w?	r	@*Side* MAY be specified for ***QualityControlParams*** partitions that apply to an individual surface.

5.8.5 QualityControlParams

Table 5.37: QualityControlParams Element (Sheet 1 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
Position	w?	r	@*Position* SHALL NOT be specified if ***Part***/@*Side* is present.
QualityBase	w?	r	See ▸ [XJDF 2.2].
Absolute	w?	r	Any calculations of ***QualityControlResult***/@*Severity* SHALL be based on absolute values. See ▸ [XJDF 2.2].
Master	w?	r	Any calculations of ***QualityControlResult***/@*Severity* SHALL be based on values specified in ***QualityControlResult***[@*MeasurementUsage*="Master"]. See ▸ [XJDF 2.2].

Table 5.37: QualityControlParams Element (Sheet 2 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
QualityControlMethods	w	r	@*QualityControlMethods* SHALL be specified. If a reader encounters an unsupported value, it SHOULD reject the ticket. Values SHOULD be selected from the following:
Barcode	w←	r	Barcode SHOULD be specified for measurements that test the quality of barcodes. **Note:** This includes linear and 3-d barcodes.
Colorimetry	w←	r	Colorimetry SHOULD be specified for colorimetric measurements that cannot measure spectral data. At most one of Colorimetry, ColorSpectrophotometry and Densitometry SHALL be specified.
ColorSpectrophotometry	w←	r	A value of ColorSpectrophotometry SHALL be specified for measurement devices that support spectral measurements. At most one of Colorimetry, ColorSpectrophotometry and Densitometry SHALL be specified.
Densitometry	w←	r	Densitometry SHOULD be specified for color measurements that contain only density measurements. At most one of Colorimetry, ColorSpectrophotometry and Densitometry SHALL be specified.
Inspection	w←	r	Inspection SHOULD be specified for measurements of general image and product quality.
Registration	w←	r	Registration SHOULD be specified for color separation registration measurements.
<all other values>	r?	r?	Additional methods MAY be specified but are out of scope for this ICS.
SampleInterval	w?	r	@*SampleInterval* SHALL specifiy the number of samples between tests. Not more than one of @*TimeInterval* and @*SampleInterval* SHALL be specified.
TimeInterval	w?	r	@*TimeInterval* SHALL specifiy the time span between tests. Not more than one of @*TimeInterval* and @*SampleInterval* SHALL be specified.
ColorMeasurement	w←	r←	***ColorMeasurement***/***ColorControlStrip*** SHOULD be specified for ***QualityControlParams***.
FileSpec (Image)	w←	r	***FileSpec*** (Image) SHALL be specified by the *Manager* if @*QualityControlMethods*="Inspection" and the *Measurement System* is an automated image inspection system. See ‣ [XJDF 2.2].
FileSpec (Setup)	w!		A reference to a proprietary setup SHALL NOT be specified and is out of scope for this ICS.
RegistrationQuality	w←	r←	***RegistrationQuality*** SHOULD be specified if @*QualityControlMethods* contains "Registration".

5.9 QualityControlResult

5.9.1 ResourceSet

Table 5.38: QualityControlResult ResourceSet Element (Sheet 1 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
Name	r	w←	See ‣ [XJDF 2.2].

Table 5.38: QualityControlResult ResourceSet Element (Sheet 2 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
QualityControlResult	r	w←	The value of @*Name* SHALL be "QualityControlResult".
Usage	r	w←	See [XJDF 2.2].
Output	r	w←	The value of @*Usage* SHALL be "Output".
Resource	r	w←	See [XJDF 2.2].

5.9.2 Resource

Table 5.39: QualityControlResult Resource Element

NAME	MANAGER	WORKER	DESCRIPTION
Part	r	w←	***Part*** SHALL define the context of the measurement. The values of ***Part*** SHALL be retained from ***QualityControlParams*** to ***QualityControlResult***. Missing partition keys SHALL be added to ***Part*** to provide additional context of the measurement.
QualityControlResult	r	w	***QualityControlResult*** SHALL be present.

5.9.3 Part

Table 5.40: QualityControlResult Part Element

NAME	MANAGER	WORKER	DESCRIPTION
QualityMeasurement	r	w←	@*QualityMeasurement* SHALL be specified for all ***QualityControlResult*** measurements where multiple measure-ments types are made for a single *Press Run*. ***QualityControlResult***/@*Sample* SHALL NOT overlap if @*QualityMeasurement* differs.
Separation	r	w←	@*Separation* SHALL be specified for ***QualityControlResult*** mea-surement partitions that apply to a *Press Run* if multiple *Press Runs* are measured for the same values of @*SheetName* and @*Side*.
SheetName	r	w←	@*SheetName* SHALL be specified for all ***QualityControlResult*** measurement partitions that apply to an individual sheet or impression on a roll.
Side	r	w←	@*Side* SHALL be specified for all ***QualityControlResult*** mea-surements partitions that apply to an individual surface.

5.9.4 QualityControlResult

Table 5.41: QualityControlResult Element (Sheet 1 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
End	r	w	Date and time when the measurement was completed.
Failed	r	w←	@*Failed* SHALL be specified, if any measurement was detected that did not pass the criteria as specified in ***QualityControlParams***.
Measurements	r	w	Total number of measurements.
MeasurementUsage	r	w	See [XJDF 2.2].

Table 5.41: QualityControlResult Element (Sheet 2 of 2)

NAME	MANAGER	WORKER	DESCRIPTION
Master	r	w←	A value of "Master" SHALL NOT be specified if the value of *QualityControlParams*/@*QualityBase*="Absolute". See [XJDF 2.2].
Standard	r	w←	See [XJDF 2.2].
Passed	r	w←	@*Passed* SHALL be specified, if any measurement was detected that passed the criteria as specified in *QualityControlParams*.
Position	r	w?	@*Position* SHALL NOT be specified if *Part*/@*Side* is present.
QualityControlMethods	r	w	@*QualityControlMethods* SHALL be specified and contain copies of the supported values specified in *QualityControlParams*/@*QualityControlMethods*. Values SHOULD be one of the following:
Barcode	r←	w←	Barcode SHOULD be specified for measurements that test the quality of barcodes. Note: this includes linear and 2-d barcodes.
ColorDensitometry	r←	w←	ColorDensitometry SHOULD be specified for measurements that contain only density measurements.
Colorimetry	r←	w←	Colorimetry SHOULD be specified for measurements that cannot measure spectral data.
ColorSpectrophotometry	r←	w←	A value of ColorSpectrophotometry SHALL be specified for measurement devices that support spectral measurements. Additional values MAY be specified.
Inspection	r←	w←	Inspection SHOULD be specified for measurements of general image quality.
Registration	r←	w←	Registration SHOULD be specified for color separation registration measurements.
<all other values>	r?	w?	Additional methods MAY be specified but are out of scope for this ICS.
Sample	r	w←	@*Sample* SHALL be specified and SHALL not overlap if multiple measurements occur during one *Press Run*. **Note:** @*Sample* will typically be based on job good counters or device counters.
Severity	r←	w←	@*Severity* SHALL define the overall severity of all defects on a scale of 0(no defects present) ,1(trivial) to 100 (fatally severe).
SourceDeviceID	r	w←	@*SourceDeviceID* SHALL contain the identifier of the device if it is an *Inline Measurement* device. @*SourceDeviceID* SHOULD contain the identifier of the device if it is an *Offline Measurement* device.
Start	r	w	Date and time when the measurement was started.
ColorMeasurement	r←	w←	***ColorMeasurement***/***ColorControlStrip*** SHALL be specified if the *Manager* specified ***QualityControlParams***/***ColorMeasurement*** and SHOULD be specified otherwise.
Inspection	r←	w←	***Inspection*** SHALL be specified if the *Manager* specified ***QualityControlParams***/@*QualityControlMethods*="Inspection".
RegistrationQuality	r←	w←	***RegistrationQuality*** SHALL be specified if the *Manager* specified ***QualityControlParams***/***RegistrationQuality***.
FileSpec		w!	A reference to proprietary data SHALL NOT be specified in the scope of this ICS.

5.9.4.1 Inspection

Inspection SHALL contain the details of an automated or visual inspection.

Table 5.42: Inspection Element

NAME	MANAGER	WORKER	DESCRIPTION
Defect	r	w←	One ***Defect*** element SHALL be specified for each detected defect. The detection threshold is implementation dependent.

5.9.4.2 Defect

Table 5.43: Defect Element

NAME	MANAGER	WORKER	DESCRIPTION
Box	r	w←	If a defect size is known, the outer bounding box SHALL be specified in @*Box*. The details how the size of a defect is calculated are implementation dependent.
DefectType	r	w	@*DefectType* SHALL be specified.
ImageDefect	r	w←	ImageDefect SHOULD be specified by automated sytems that compare measured and target images.
<all other values>	r	w?	Other defect types MAY be specified, but are out of scope for this ICS.
DefectTypeDetails	r	w	@*DefectTypeDetails* SHALL be specified.
ImageMismatch	r	w←	ImageMismatch SHOULD be specified by automated sytems that compare measured and target images.
<all other values>	r	w?	Other defect type details MAY be specified, but are out of scope for this ICS.
Face	r	w←	See [XJDF 2.2].
Severity	r	w?	@*Severity* SHOULD be specified if a ranking of defects is implemented by the *Worker*.
Size	r	w←	If a defect size is known, the area of the defect SHALL be specified in @*Box*. The details how the size of a defect is calculated are implementation dependent.
Comment	r	w?	A human readable description of the individual defect MAY be specified. **Note:** This will typically be useful in manual quality measurement processes.

5.9.4.3 Comment

Comment SHALL contain a human readable description of the individual defect.

Table 5.44: Comment Element

NAME	MANAGER	WORKER	DESCRIPTION
<element text>	r	w?	The *Worker* SHOULD provide human readable content in the body of the ***Comment*** element.

6 Subelements

6.1 ColorControlStrip

ColorControlStrip SHALL provide a detailed definition of the measurement patches.

6.1.1 ColorControlStrip sent by a Manager

If ***ColorControlStrip*** is specified as a descendent of ***Layout***, geometrical information SHALL be specified by the *Manager* as specified below. If ***ColorControlStrip*** is specified as a child of ***QualityControlParams*** it SHALL specify color quality *Target Values*.

Table 6.1: ColorControlStrip Element sent by a Manager

NAME	MANAGER	WORKER	DESCRIPTION
Center	w←	r	@*Center* SHALL be specified by the *Manager* if ***ColorControlStrip*** is in a descendant of ***Layout***.
Rotation	w←	r	@*Rotation* SHALL be specified by the *Manager* if @*Center* is present.
Size	w←	r	@*Size* SHALL be specified by the *Manager* if @*Center* is present.
StripType	w←	r	@*StripType* is the name or type of the ***ColorControlStrip***. At least one of ***Patch*** or @*StripType* SHALL be specified. **Note:** The exchange, synchronization and measurement setup for ***ColorControlStrip*** elements that are specified by @*StripType* is out of scope for this ICS.
ColorMeasurement Conditions	w←	r	***ColorMeasurementConditions*** SHALL specify the color measurement conditions that SHALL be used for this ***ColorControlStrip***. ***ColorMeasurementConditions*** SHALL be specified by the *Manager* if ***ColorControlStrip*** is in a child of ***QualityControlParams***.
Patch	w←	r	***Patch*** provides the descriptions of the individual color patches. ***Patch*** NEED NOT be specified by the *Manager* if @*StripType* is present and refers to a standard strip that is known by the *Worker*. At least one of ***Patch*** or @*StripType* SHALL be specified.

6.1.2 ColorControlStrip sent by a Worker

If ***ColorControlStrip*** is specified as a child of ***QualityControlResult*** it SHALL specify color quality measurements results.

Table 6.2: ColorControlStrip Element sent by a Worker

NAME	MANAGER	WORKER	DESCRIPTION
StripType	r	w?	@*StripType* is the name or type of the ***ColorControlStrip***.
ColorMeasurement Conditions	r	w	***ColorMeasurementConditions*** SHALL specify the color measurement conditions that have been used for this ***ColorControlStrip***.
Patch	r	w	***Patch*** SHALL specify the results of the color measurements that were performed by the *Worker*.

6.2 ColorMeasurement

ColorMeasurement SHALL provide a detailed definition of the color measurements.

6.2.1 ColorMeasurement sent by a Manager

If ***ColorMeasurement*** is specified as a child of ***QualityControlParams*** it SHALL specify color quality *Target Values*.

Table 6.3: ColorMeasurement Element sent by a Manager

NAME	MANAGER	WORKER	DESCRIPTION
ColorControlStrip	w	r	See [XJDF 2.2].

6.2.2 ColorMeasurement sent by a Worker

Table 6.4: ColorMeasurement Element sent by a Worker

NAME	MANAGER	WORKER	DESCRIPTION
ColorControlStrip	r	w	Details of the color control strip. If ***ColorMeasurement*** is specified as a child of ***QualityControlResult*** it SHALL specify color quality measurements results in the ***ColorControlStrip***.

6.3 ColorMeasurementConditions

6.3.1 ColorMeasurementConditions sent by a Manager

ColorMeasurementConditions SHALL specify the requested color measurement conditions.

Table 6.5: ColorMeasurementConditions Element sent by a Manager

NAME	MANAGER	WORKER	DESCRIPTION
MeasurementMode	w	r	Measurement mode SHOULD be a valid mode as specified in [ISO13655:2017]. **Note:** The exchange, synchronization and measurement setup for proprietary ***ColorMeasurementConditions*** that are not defined by [ISO13655:2017] is out of scope for this ICS.
WhiteBase	w?	r←	See [XJDF 2.2].

6.3.2 ColorMeasurementConditions sent by a Worker

ColorMeasurementConditions SHALL specify the actual color measurement conditions.

Table 6.6: ColorMeasurementConditions Element sent by a Worker

NAME	MANAGER	WORKER	DESCRIPTION
MeasurementMode	r	w	Measurement mode SHOULD be a valid mode as specified in [ISO13655:2017]. **Note:** The exchange, synchronization and measurement setup for proprietary ***ColorMeasurementConditions*** that are not defined by [ISO13655:2017] is out of scope for this ICS.
WhiteBase	r	w	See [XJDF 2.2] for details. @*WhiteBase* SHALL be specified for actual measurements from the device. If a *Measurement System* is capable of switching white base modes and the *Manager* requests a certain value of @*WhiteBase*, the *Worker* SHOULD honor the request.

6.4 FileSpec

FileSpec SHALL reference explicit URLs in the context of this ICS.

Table 6.7: FileSpec Element

NAME	MANAGER	WORKER	DESCRIPTION
FileFormat	w!		See ▸ [XJDF 2.2].
FileTemplate	w!		See ▸ [XJDF 2.2].
ResourceUsage	w←	r	@*ResourceUsage* SHALL be specified if the parent contains muliple ***FileSpec*** elements. @*ResourceUsage* NEED NOT be specified if the parent contains a single ***FileSpec*** element. For multiple ***FileSpec*** elements with a common parent, values of ***FileSpec***/@*ResourceUsage* SHALL be unique.
Image	w←	r	A value of "Image" SHALL be specified if the ***FileSpec*** element references a master image for image inspection.
<all other values>	w?	r?	Other values MAY be specified, but are out of scope of this ICS.
UID	w!		See ▸ [XJDF 2.2].
URL	w	r	See ▸ [XJDF 2.2].

6.5 Header

Table 6.8: Header Element

NAME	MANAGER	WORKER	DESCRIPTION
ICSVersions	r?	w	The *Worker* SHALL supply a set of NMTOKEN values, one for each ICS with which the ***SignalResource*** instance complies.
MisQC_L1-2.2	r?	w←	Specifies conformance to the Quality Control MIS ICS *Conformance Level* 1. A conforming Quality Control MIS document from a *Static Worker* SHALL contain this value.
MisQC_L2-2.2	r?	w←	Specifies conformance to the Quality Control MIS ICS *Conformance Level* 2. A conforming Quality Control MIS document from a *Dynamic Worker* SHALL contain this value.
<all other values>	r?	w?	@*ICSVersions* MAY contain the values specified in other ICS documents that require conformance to this ICS.
Time	r	w	@*Time* SHALL define the time when the quality report was generated. **Note:** Times of measurement are defined in ***QualityControlResult***/@*Start* and ***QualityControlResult***/@*End*.

6.6 Patch

Patch SHALL provide a detailed definition of the an individual color measurement patch.

6.6.1 Patch sent by a Manager

The usage of **Patch** as a target is identical to the usage of the parent **ColorControlStrip**.

Table 6.9: Patch Element sent by a Manager

NAME	MANAGER	WORKER	DESCRIPTION
Lab	w?	r?	@*Lab* SHOULD be specified if @*Spectrum* is present.
PatchUsage	w	r	See [XJDF 2.2].
Color	w←	r	A value of @*PatchUsage*="Color" SHALL specify that the patch is present and SHALL be measured.
Ignore	w←	r	A value of @*PatchUsage*="Ignore" SHALL specify that the patch is present but not relevant for measurements.
<all other values>	w?	r?	Other uses for the patch MAY be specified, but are out of scope of this ICS.
SeparationTint	w?	r	

6.6.1.1 SeparationTint

See [XJDF 2.2].

6.6.2 Patch sent by a Worker

Patch SHALL provide a detailed definition of the an individual color measurement patch. The usage of **Patch** as a measurement is identical to the usage of the parent **ColorControlStrip**.

Table 6.10: Patch Element sent by a Worker

NAME	MANAGER	WORKER	DESCRIPTION
Density	r	w←	@*Density* SHALL be specified by the *Worker* if the *Worker* measured the density directly.
Lab	r	w←	@*Lab* SHALL be specified by the *Worker* if the *Worker* is capable of measuring an Lab value. @*Lab* SHOULD be specified if @*Spectrum* is present.
NeutralDensity	r	w←	@*NeutralDensity* SHALL be specified by the *Worker* if the *Worker* measured the neutral density directly.
PatchUsage	r	w	See [XJDF 2.2].
Color	r	w←	A value of @*PatchUsage*="Color" SHALL specify that the patch is present and has been measured.
Ignore	r	w←	The *Worker* SHALL specify a value of @*PatchUsage*="Ignore" if measurement errors occurred that make the measurement invalid.
<all other values>	r?	w?	Other uses for the patch MAY be specified, but are out of scope of this ICS.
Spectrum	r	w←	@*Spectrum* SHALL be specified by the *Worker* if the *Worker* is capable of measuring a color reflectance spectrum.

6.7 RegistrationQuality

6.7.1 RegistrationQuality sent by a Manager

Table 6.11: RegistrationQuality Element sent by a Manager

NAME	MANAGER	WORKER	DESCRIPTION
Offset	w	r	See [XJDF 2.2].
Reference	w	r	See [XJDF 2.2].

6.7.2 RegistrationQuality sent by a Worker

Table 6.12: RegistrationQuality Element sent by a Worker

NAME	MANAGER	WORKER	DESCRIPTION
Offset	r	w	See [XJDF 2.2].
Reference	r	w	See [XJDF 2.2].

6.8 ResourceInfo

This section defines the restrictions for a ***ResourceInfo*** that pertain to a quality report. ***ResourceInfo*** elements that are unrelated to quality control MAY be present in other ***SignalResource*** elements.

Note: For instance, ***ConventionalPrintingParams***, ***DigitalPrintingParams*** and ***PrintCondition*** can be specified to specify the print method. ***Media***, ***MiscConsumable*** or ***Ink*** can be specified to specify the paper and other consumables that were consumed. The details of these resources in the context of ***ResourceInfo*** are out of scope for this ICS.

Table 6.13: ResourceInfo Element

NAME	MANAGER	WORKER	DESCRIPTION
ResourceSet [@*Name*="QualityControlResult"]	r	w	A ***QualityControlResult*** SHALL contain the results of the quality control measurements. The value of @*Usage* SHALL be "Output".

Appendix A

A References

Table A.1: References

SYMBOLIC NAME	REFERENCED DOCUMENT
[Automatic Print Procurement ICS]	*Automated Print Procurement ICS* Date: October 2024 Version: 2.2 Produced by: CIP4 Organization Available at: http://www.CIP4.org
[ISO 17972-4:2018]	*Graphic technology -- Colour data exchange format (CxF/X) -- Part 4: Spot colour characterisation data (CxF/X-4)* Date: 2018 Produced by: ISO Available at: https://www.iso.org/store.html
[ISO12647-2:2013]	*Graphic technology -- Process control for the production of half-tone color separations, proof and production prints - Part 2: Offset lithographic processes* Date: 2013 Produced by: ISO Available at: https://www.iso.org/store.html
[ISO12647-3:2013]	*Graphic technology - Process control for the production of half-tone colour separations, proof and production prints - Part 3: Coldset offset lithography on newsprint.* Date: 2014 Produced by: ISO Available at: https://www.iso.org/store.html
[ISO12647-4:2014]	*Graphic technology - Process control for the production of half-tone colour separations, proof and production prints - Part 4: Publication gravure printing.* Date: 2014 Produced by: ISO Available at: https://www.iso.org/store.html
[ISO13655:2017]	*Graphic technology -- Spectral measurement and colorimetric computation for graphic arts images* Date: 2017 Produced by: ISO Available at: https://www.iso.org/store.html
[Management Information System ICS]	*Management Information Systems ICS* Date: October 2024 Version: 2.2 Produced by: CIP4 Organization Available at: http://www.CIP4.org
[MIS to Conventional Printing ICS]	*MIS to Conventional Printing ICS* Date: To be released Version: 2.2 Produced by: CIP4 Organization Available at: http://www.CIP4.org

Table A.1: References

SYMBOLIC NAME	REFERENCED DOCUMENT
[XJDF 2.2]	*Exchange Job Definition Format Specification* Date: May 2024 Version: 2.2 Produced by: CIP4 Organization Available at: http://www.cip4.org
[XPath]	*XML Path Language (XPath) 2.0 (Second Edition)* *Version W3C Recommendation 14 December 2010* Date: 14 December 2010 Produced by: World Wide Web Consortium Available at: http://www.w3.org/TR/xpath20/

INTEGRATION THROUGH COOPERATION

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