CIP3

Workflow from Prepress to Postpress – Advantages for the Integrated Production

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Overview

- Introduction
- What is CIP3 PPF?
- Workflow with CIP3 PPF
- What Advantages can be expected by using CIP3 PPF?
- Current Status & Outlook
Process Changes

- trend to small volume
- good color quality
- reasonable price

Low volume printing is characterized by:
- short machine runs, but same time for setup
- more jobs per day required to become profitable

→ reduction of make-ready times
What is Needed?

- introduction of efficient workflow for all areas of print production
- derivation of setup values by using data of previous processing steps
- overcome obstacles against efficient data exchange
- unique, vendor- and platform-independent exchange format
CIP3 Consortium

**CIP3** = International Cooperation for Integration of Prepress, Press, and Postpress

**PPF** = Print Production Format

- technical development by Fraunhofer Institute for Computer Graphics, Darmstadt, Germany
CIP3 PPF Goals

- apply concept of CIM to print production
- collection of data for presetting in order to reduce make-ready times
- use of information already known in previous processing steps
- abstraction from real machine (thereby vendor-independent)
CIP3 History

December 1993  idea
September 1994  1st internal draft specification
December 1994  1st functional prototype
February 1995  foundation of CIP3 group with 15 foundation members
May 1995  CIP3 presentation at DRUPA’95 version 1.0 of CIP3 PPF
August 1995  1st CIP3 PPF file created
August 1996  version 2.0 of CIP3 PPF
June 1997  version 2.1 of CIP3 PPF presentation at Imprinta ’97
June 1998  version 3.0 of CIP3 PPF
October 1999  39 member companies
CIP3 PPF Overview

ideally: description of a complete product

• PPF directory
• product definition
• one or more sheet definitions
CIP3 PPF File

- **Header**
- **Sheet 1**
- **Trailer**

*single-sheet file (since version 1.0)*

- **Header**
- **PPF Directory**
- **Sheet 1**
- **Sheet 2**
- **Sheet 3**
- **Trailer**

*multi-sheet file without product definition (since version 2.1)*

- **Header**
- **PPF Directory**
- **Product Definition**
- **Sheet 1**
- **Sheet 2**
- **Sheet 3**
- **Trailer**

*multi-sheet file with product definition (since version 3.0)*
PPF Directory

- is the "directory" of the sheet definitions
  - position of sheet definition within file
  - length of sheet definition
  - sheet name
- empty directory entries possible
PPF Directory

- Entry 1
- Entry 2
- Entry 3

Sheet Definition
- Sheet 1
- Sheet 2
- Sheet 3
Product Definition

- step by step description of production process
- each single step includes
  - operation name (e.g. AdhesiveBinding)
  - list of input components: sheet, cut block, partial product, external product
  - operation specific parameters
- “FinalProducts” are entry points
Product Definition

- collecting & gathering
- thread sewing & side sewing
- saddle stitching & stitching
- end sheet gluing
- adhesive binding
- gluing in
- trimming
- folding
Product Definition

“Adhesive Binding” Example

1) back preparation including milling and notching
2) gluing application on back side of book block
3) gluing application on front side of book block
4) gluing application on spine of book block
5) gluing of gaze strip onto spine
6) second gluing application on spine of book block
7) scoring and gluing in of soft cover
Sheet Definition

- administrative information
- special data for tools in web presses
- low-resolution preview images
- characteristic curves of transfer
- color and density measuring fields
- color control strips
- register marks
- cutting information
- folding information
- private data / private content
Sheet Definition

- structure nodes form a structure hierarchy
- attributes
  - administrative attributes, e.g. volume
  - specific attributes for web presses
- content
  e.g. preview images, register marks
Structure Hierarchy

- allows for efficient retrieval of information
- inheritance mechanism
- extensible by concept of “private data” structures
Attributes

- administrative information
- special web press information
- characteristic curves of transfer (for ink consumption calculation)
- cut block data
- folding data
- private data
Attributes

- data types
  - boolean: true, false
  - integer: -12, 0, 342
  - real: 0.53, -0.3, 14.5e32
  - name: jack, /Left
  - string: (customer address)
  - array: [1 (text) 5.0]
  - dictionary: << /Tolerance 5.0 /Light /D65 >>
Content

- preview images
- register marks
- color and measuring fields
- color control strips
- cut marks
- comments and annotations
- private content
Preview Images

• several separations
  – 1 bit or 8 bit per pixel

or

• composite CMYK image
  – 32 bit per pixel
  – no special colors
  – no other sequence possible
Preview Images

Encoding & Compression

- encoding
  - binary /Binary
  - hexadecimal /ASCIIHexDecode
  - ASCII85 /ASCII85Decode

- compression:
  - none /None
  - run length /RunLengthDecode
  - JPEG /DCTDecode
  - fax group 3 + 4 /CCITTFaxDecode
Requirements for Preview Images

• goal:
  total error for ink coverage calculation < 1%

• requirements
  – spatial resolution: at least 50.8 ppi
  – number of tonal values: at least 64 shades

• possible solution
  – ripping with ca. 400 ppi (without screening)
  – filtering with anti-aliasing by a factor of 8
Preview Images
Code Example

... 
CIP3BeginPreviewImage
CIP3BeginSeparation
(First separation of Front) CIP3Comment
/CIP3PreviewImageWidth 420 def
/CIP3PreviewImageHeight 593 def
/CIP3PreviewImageBitsPerComp 8 def
/CIP3PreviewImageComponents 1 def
/CIP3PreviewImageMatrix [420 0 0 593 0 0] def
/CIP3PreviewImageResolution [50.8 50.8] def
/CIP3PreviewImageEncoding /ASCIIHexDecode def
/CIP3PreviewImageCompression /None def
CIP3PreviewImage
  < ... hex encoded image data ... >
CIP3EndSeparation
...


Typical Areas of Application

- **Prepress**: imposition, ripping, plate making
- **Press**: ink key presetting, register control, color quality control
- **Postpress**: cutting, folding, collecting, binding, trimming, ...
CIP3 PPF & Workflow

- is not a workflow system
- is one valuable piece within a workflow solution
- supports a digital workflow
- can be used for archiving (by using “private data” even the storage of final machine settings is possible)
CIP3 PPF & Workflow

digital information interchange using CIP3 Print Production Format
Prepress Workflow

planning & estimation → page layout → imposition → ripping → filtering of image data

cutting & folding information, register marks, color/density measuring fields

preview images

CIP3 PPF file
Press Workflow

- **Plate Making**: Transformation matrices
- **Preset Press**: Preview images, register marks, color/density measuring fields, transformation matrices
- **Press Run**: Private data (e.g., machine setting for repeat runs)

*CIP3 PPF file*
Postpress Workflow

- cutting
- folding
- collecting
- binding
- three side trimming

Cutting information → Folding information → Collection information → Binding information → Trimming information

CIP3 PPF file
Advantages of CIP3 PPF

- only one acquisition of the same data
- support of computer-to-plate and thereby avoiding film chemistry
- faster machine setup
- shorter production cycles
- better quality control
- less error-prone through automation
- less garbage

→ improved productivity and reduction of costs
Status

• version 3.0 of CIP3 PPF specification available since June 1998

• current products:
  – products generating CIP3 PPF (layout and imposition software, RIP’s)
  – products for ink key presetting at press
  – product for presetting of cutting machines

• future plans:
  – development of PJTF-based encoding
Prerequisites for the Use of CIP3 PPF

- software generating **CIP3** PPF files
  - e.g. imposition and ripping software

- software consuming **CIP3** PPF files, i.e. software able to
  - read and interpret CIP3 PPF files
  - convert the retrieved data into machine-specific data
  - provide a data link to the machine (e.g. via storage medium or via network)
Further Information about CIP3 Print Production Format available on CIP3 WWW Server:
http://www.cip3.org
Welcome to the CIP3 WWW site

This website is maintained by the department Document Imaging of the Fraunhofer Institute for Computer Graphics in Darmstadt, Germany.
CIP3 Members

Adobe
Agfa
Akiyama Printing Machinery
Baldwin Technology Company
Barco Graphics
Creo
DALiM Software
Ekotrading-Inkflow
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