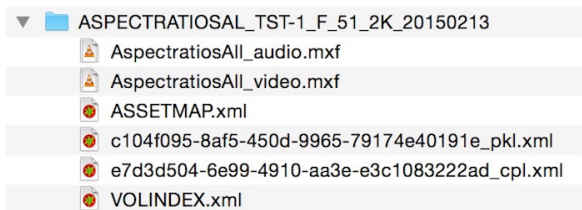


# 24 BEELDEN.nl

## DCP

### What is a DCP?

A DCP is a digital film that can be shown in modern digital cinemas. A DCP is in fact a folder containing several files:



- Picture file or files. Every frame of the film is stored as a JPEG2000 picture with XYZ colour space, all wrapped together in one or more MXF file(s). Often the file name contains **j2c**
- Sound file or files. Sound is wrapped in one or more MXF file(s). Often the file name contains **pcm**
- Subtitle file or files. Subtitles or closed caption (if present) are wrapped in one or more MXF file(s). Often the file name contains **sub**
- CPL file (Composition Play List). XML file that describes which parts of the MXF files must be played and in what order. It also contains the "name" of the film. This is why projectionists ask for the "cpl name" of your film.
- Asset map file. XML file listing all files included in the DCP. It also contains the "annotation" which is visible in certain stages of the process before projection. Preferably it is the same as the cpl name.
- PKL file (Package Key List or Packing list file). XML file that contains the hashes for the MXF files. For checking integrity of the files. It also contains the "annotation" which is visible in certain stages of the process before projection. Preferably it is the same as the cpl name.
- Volume index file. XML file that is used to identify the correct order of media (A single DCP may be distributed on for instance multiple hard disks)

Of all these files only subtitle and sound may be absent in a working DCP. Cinema equipment will only play a DCP if the DCP is not corrupted, which means all needed assets are present and not even one bit is missing or flipped.

### SENDING IN DCP'S

These tips apply to sending in DCP's. Following these guidelines helps your DCP to be okay everywhere around the world. This can come in handy when you need to ship one to Upper-Swahilia...

1. If you have no possibility to test your DCP properly in a cinema, or you are unable or do not want to use DCP-o-matic Player then do NOT make one. You can check if your DCP is correct with the Verify tool of DCP-o-matic Player. Viewing your DCP using EasyDCPPlayer is NOT a test. Send in a ProResLT file or similar instead if you can not verify your DCP is okay.
2. Frame rate 24 fps plays on every DCI-machine. Most play-out servers do 25fps or other speeds, but if you have a choice don't take the risk.
3. There are two picture sizes: 1998x1080px (FLAT, 1:1.85) and 2048x858px (SCOPE, 1:2.39) and their respective 4k variants. HD (1920x1080px = 16:9 = 1:1.78) is not one of them, but allowed by the DCI specifications. There is a slight chance some equipment will not play this content, so if you want to be sure, make your picture 1998x1080 by adding small black borders left and right (so you don't stretch the picture ;-)). Full container (C: 2048x1080px) is DCI compliant, but most projectors are not set up to show this correctly, so don't use this. More details on the [aspect ratio page](#)
4. Make sure both the first and last frame of your DCP are black and max 1 second (black) after end of film. If there is sound in black at the end of your film, please note this on one of the items you will ship (see 17.).
5. Sound should be: WAV, 24 bits, 48 kHz or 98 kHz, uncompressed PCM. Anything else will not work!
6. Whenever possible, provide for a Center channel. When working from a stereo mix create an extra channel by merging L and R (or create only a C). Because DCI does not allow 3.0 but does 5.1 you create a silent track for LFE (=sub), Ls and Rs. If you have a LtRt mix (ProLogic), it means you created separate tracks already before making the LtRt mix. Use these separate tracks! The only correct order is always: L, R, C, LFE, Ls, Rs. If you consider sending in for the Academy Awards, you'll never get it admitted without L, R, C. More details on the [sound page](#).
7. When making a DCP (or having it made) it's possible to set the bandwidth. Don't go over 125MB/s unless you notice lack of quality in the test screening, because your DCP file size will get too big. Your film is never the only one on the play-out server, which has a limited storage capacity. Large file size also means long ingest times and transfer times. These facts can mean your film can not be shown.
8. When making your DCP, make sure the CPL name and the annotation in the PKL file and Asset map file are correct. Read this: [Digital Cinema Naming Convention](#) !!! Just looking at the picture at this site will explain a lot. Be sure to replace the default name software attaches to a DCP! Festival techs will have a very hard time when there are 5 films all titled 'EasyDCPCreator'. It means there is a serious risk your film will be shown in the wrong program or even it will not be shown at all. [DCP-o-matic](#) makes it easy for you to give your DCP a correct CPL name, so use it! Leave blank non-applicable items and those you don't know. Give your film a short name. Observe the examples at [Digital Cinema Naming Convention](#)

9. A DCP is in fact a collection of files. Distributing and sending a DCP only works fine if the files of which the DCP consists are together in one folder. Give this DCP folder a correct name, preferably equal to the CPL name (see 8.)
10. Many feature films are encrypted to have control over time and place of shows. This is disastrous for festivals because a different key (KDM) is required for every machine. So make yourself happy and the festivals/theaters as well: No encryption! If you do decide to encrypt your film you must organize things well and keep organizing them, or else there will be a fair chance your film will not be able to be shown. It means you have to provide for KDMs for all play-out servers in use by the festival and valid for the complete time frame of the festival including at least one week in advance for testing. Encryption will make your film unacceptable for the Academy Awards.
11. Buy crisps/popcorn/camembert and beer/cola/champagne, invite the people you made your film with (camera, sound, editing,...) and test you DCP at a theatre near you :-)
12. You can ship your film on an external hard disk with USB connectivity or (when the size allows) a USB stick. When using a hard disk a **CRU DX115 kit** is preferred. SATA is a good option because many theaters can handle it. USB is DCI obligatory, so it works everywhere, but it is much slower. If your film takes up a lot of GB (see 7.) be aware that ingesting your film through USB will take a lot of time (about 1.5 times the length of your film) which might prevent your film from being able to be shown when things change in a festival program. Ever more festivals and cinemas accept internet based transfers. Read more **about transfers**.
13. Your hard disk or USB stick must be formatted using ext2 or ext3 (with inode size at 128 bytes) and MBR (you might need Linux for this operation). This is the DCI standard. Some machines are able to read FAT32, HFS+ and/or NTFS, but it's a bet, because there is also equipment in use that will NOT read your disk. This means in fact that you pay for making and shipping a disk without usable content! More details on the **ext3 page**.
14. Put your DCP (that is the folder, see 9.) on your hard disk. More than one DCP on one hard disk works fine. You can also make Version Files (VF), for instance for different language versions and/or subtitled versions. Be sure the names are correct (see 8.)! Check integrity of every DCP you put on the hard disk with the Verify tool of DCP-o-matic Player. Be sure you do not put your DCPs in a subfolder. All DCPs must be in the root of the drive or the cinema system might not find them. The drive must only contain DCPs, so no other files on the disk. Zip files are known to freeze cinema systems, so double check if none of those are present on your disk. Making more than one partition on your hard disk is likely to cause problems, so don't.

15. Hard disks are quite vulnerable so pack it more or less shock proof when shipping it. Try to have things reusable for return shipping or forwarding. Nice plastic and aluminium little suitcases and boxes, filled with shock absorbing foam, are available. [More info here](#).
16. Make sure all hard disk accessories are in the box: USB cable, power supply, etc.
17. Put the name of the film(s) clearly readable on the outside of your box, best is a print of the CPL name(s). Also put your contact information on the outside of the box. Put your name on everything you put in the box (see 16.)

I also made a [short checklist](#) which may be useful if you read this before. Please look at my [Links page](#) for more detailed info!

Henk Rhebergen, updated october 2022