

DVD-Video - Technical Conditions

These technical conditions describe the acceptable source data and materials, including documentation required for the DVD-Video production at GZ Digital Media. The customer has the duty to get acquainted with them prior to placing the order. The source data not mentioned in these technical conditions, or source data, which are inconsistent with these conditions, should be consulted in advance with a mastering engineer.

1 Technical Specifications

The technical parameters of the source materials for the production of a DVD-Video must conform to the below mentioned specifications. If the supplied source materials do not conform to this specification, they will be adjusted in the mastering, or will be rejected as non-conforming, should it be impossible to adjust them.

The customer's requirements for the final DVD-Video disc must conform to the specifications for the DVD-Video format; otherwise, the order can be rejected as non-producible.

1.1 Disc format

1.1.1 DVD-Video

1.1.2 Hybrid DVD-Video - contains also the data for the computers (DVD-ROM part)

1.2 Types of discs, indication, capacities and playback times

The DVD playback time as well as the quality of image and sound depends on proper selection of the disc type.

name of disc	DVD-5	DVD-9	DVD-10
layers of disc	single layer	dual layer	single layer
sides of disc	single side	single side	double side
abbreviation used	SL/SS	DL/SS	SL/DS
capacity of disc (aprox. playback time)	4,7 GB (133 min.)	8,5 GB (240 min.)	9,4 GB (2x 133 min.)

NOTE: GB means here the "gigabyte" or 1.000.000.000 bytes. The quantity of data saved in DVD-ROM part of the disc depends on the number of files and folders and size of the individual files (even a file with several bytes will occupy the whole sector of 2048 bytes).

The above-mentioned playback times for the DVD-Video part of disc are just orientation information. As for the image (and usually also for sound), the loss compression is being used. Although it holds generally that the higher is the compression data flow, the better is the quality (and vice-versa), but the total playback time of disc is reduced. The image quality of the resulting DVD-Video disc is influenced by the selection of disc type (see the table), total playing time of all program tracks, number, and type of compression of the soundtracks and by quality of source data supplied.

The double side disc DVD-10 must be turned before playing the second side. DVD-10 are suitable especially for various versions (PAL, NTSC) of the same program or two independent programs.

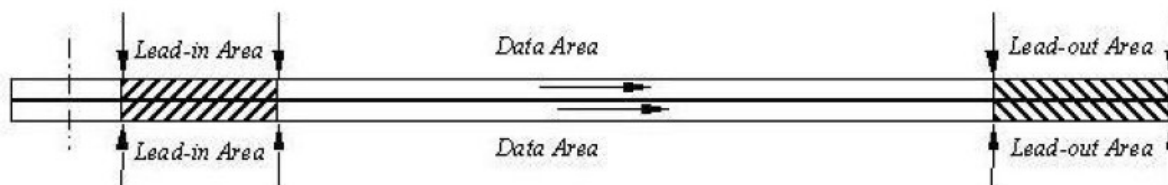
1.3 Arrangement of layers at double layer discs

At the double layer DVD-9 format, the layers can be oriented in two ways from the point of view of the reading direction, namely in the PTP way (parallel track path) and OTP way (opposite track path). The layers are numbered upwardly from zero, i.e. the layer 0 and the layer 1.

We recommend selecting the OTP type at the preparation of masters for the double layer DVD-Video discs.

PTP

The layers are oriented in the same way as with the CD format, where each layer has its lead-in area, data area and lead-out area. The orientation of recording and reading is from the disc inner area (lead-in) to its edge area (lead-out).



PTP is most often used for the DVD-ROM format or hybrid DVD discs, which contain the whole DVD-Video part of disc on one layer, whereas on the second layer there is only the DVD-ROM part. The selection of the PTP format for double layer DVD-Video discs does not cause any malfunction of disc, but the delay at video playback is increased when transiting from layer 0 to layer 1. The playback device must focus from layer 0 to layer 1, move the reading head to the inner area of disc on the start of layer 1, and change the revolutions.

The behaviour of disc depends on the playback device used and on the selection of place of the layers' transition (called "layer break") at the production of disc. If the layer break is selected in the place, where no video exists, then the behaviour of PTP disc and OTP disc will be equal and imperceptible for the user.

In the event of supplying the master for double layer DVD-Video disc with PTP orientation, with layer break in the middle of video-track and with layer 0 longer than layer 1, the GZ premastering studio can change the layers' orientation to OTP for the purpose of better disc functionality, without giving notice to the customer.

OTP

The layer 0 starts at the inner part of the disc with the lead-in area, continues with the data area, and ends in the so-called "middle area". The layer 1 starts from the "middle area", continues with the data area up to the lead-out area. At the OTP discs, the layer 1 must not be longer than the layer 0.



1.4 Recommendations for layer break at DVD-9

It is possible to select the place for the data division into 2 layers; however, it must meet the specifications for DVD-Video. The more the full disc capacity is utilized, the shorter is the interval, during which it is possible to search for this place. The most suitable places are the ones outside the video-track, for example at the beginning of any IFO file or BUP file.

If the transition from layer 0 to layer 1 at DVD-9 lies within the video-track, then at some DVD playback devices there may occur a short stop of playing, which shows itself by a short “freeze-up” of image and loss of sound. This characteristic is an integral part of the format and it is impossible to remove it entirely. However, a proper authoring can minimize it. The ideal place is the transition through the black colour with minimal level of sound. If it is impossible to find such a place, then we recommend finding out a place with minimal movement in the image and with minimal level of sound outside the spoken word and music in the background. Authoring studio preparing the source data must carry out this division.

In some cases, it is possible to change the layer break in the supplied source materials in the GZ premastering studio.

1.5 Possibilities of copy protection

The DVD discs of the format DVD-Video may contain the following copy protections:

CSS - Content Scrambling System

The protection prevents the copying of files or of the whole disc by common means.

APS - Analogue Protection System (Macrovision)

It prevents the recording of video by means of the analogue output of the DVD playback device (SCART, Composite, S-Video).

The CSS and APS protections can be combined on one disc. Breaking-through and removal of the copy protections is illegal in the Czech Republic and in most of EU countries.

The GZ Digital Media Premastering Studio can neither remove nor add the CSS and APS protections to the supplied source materials. The customer and the authoring studio preparing the source materials decide on the existence of protection on the source material. In case of the CSS protection, the disc content is then encrypted during the mastering.

We accept only the DDP and CMF formats for the DVD-Video discs with the copy protection. In the documentation there must be mentioned all protections present in the source materials.

2 Formats of input source media

2.1 Complete master

Contains all data in the format, which is directly usable for the production by pressing without necessity of carrying out any changes or adjustments. The studio will carry out only the check of the supplied master, and if required or suitable, also the adjustment of master so that it would meet the specifications of DVD-Video format.

2.1.1 DVD-Video master

Fully functional pressed or burnt disc in the DVD-Video format playable in standalone DVD player. The disc recorded in a standalone recorder is not considered a master. The pressed disc with CSS protection cannot be used as the master, either. We do not accept the shaped DVDs, business cards, etc.

2.1.2 DDP (Disc Description Protocol) format

Worldwide standard for handing-over the source data for production of optical discs supported by all manufacturers of equipment for CD and DVD mastering, as well as by manufacturers of professional workstations for DVD authoring. For DVD-Video we recommend the version 2.00. We also accept the version 2.10.

2.1.3 CMF (Cutting Master Format)

It is similar to DDP. CMF is transferable to DDP. If your workstation supports both DDP and CMF, select the option DDP.

2.1.4 Files with DVD-Video image

Files, which can be used without any adjustments for the DVD-Video master burning, thereby can be transferred to the case 2.1.1.

Recommended formats:

- ISO, IMG – images of DVD-Video discs (user data in sectors of 2048 bytes)
for double layer discs we recommend pair of files ISO+MDS, e.g.
from ImgBurn application
- NRG (Nero) – image of DVD-Video disc

Acceptable formats:

- BIN/CUE
- MDF/MDS (Alcohol 120%)
- IMG/CCD (Clone CD)
- IBP/IBQ (IsoBuster)
- CDI (DiscJuggler)
- CIF (Easy CD Creator)
- BWT/BWI, B5T/B5I, B6T/B6I (BlindWrite)
- DMG (Apple Macintosh) - disc images for Apple Macintosh
- TOAST, DVDR (Toast, Apple Disc Utils)
- ISZ (UltraISO)
- UIF (MagicISO)

2.1 Output of authoring software – VIDEO_TS folder

It cannot be used directly for the production by pressing. It is necessary to create the master before production. The processing includes the check of supplied files, possibly adding the DVD-ROM data part, DVD image compilation from the supplied files and folders, and entering the volume label, which must be already specified by the customer in the order.

3 Physical carriers

Scope of liability for damage: Company GZ Digital Media, a.s. is liable for damage or loss of the medium only up to the price of new medium, not for the price of the medium content.

Physical carriers must be readable in the entire length of the programme. In the event that the supplied carrier contains non-correctable reading errors, the processing of order shall be suspended. The customer will be asked for supplying new source data.

If one data carrier contains the files for more titles, the files must be stored in a separate folder named according to the catalogue number, in accordance with the supplied documentation and order.

The particular carriers must be unambiguously identifiable in accordance with the supplied documentation and order (catalogue number, customer). The description must also contain the format of data, which are stored on the carrier (for example DVD-Video master, DDP master or VIDEO_TS folder). The description must appear both on the cover and on the medium itself. However, it must not prevent its error-free reading (self-adhesive labels and stickers, description of DVD media using a hard-core pens, etc.).

Recommendation: For the production, please send always copies of your original masters. For CD and DVD media we recommend sending 2 identical copies clearly identified as master and backup copy. We will use the backup copy in order to minimise the risk of delays that could occur in case of master readability failure, in which case the material would need to be sent again.

3.1 Pressed or burnt optical disc – DVD-Video master

Fully functional pressed or burnt disc in the DVD-Video format playable in the standalone DVD player. The disc recorded in a standalone recorder is not considered a master. The pressed disc with CSS protection cannot be used as the master, either.

We do not accept the shaped DVDs, business cards, etc.

3.1.1 Methods of recording on DVD-R(W), DVD+R(W):

- singlesession (DAO - disc At Once) – RECOMMENDED
- multisession (SAO - Session At Once) – NOT ACCEPTED!!!!

3.1.2 Instructions for burning the DVD-R(W), DVD+R(W):

- As for the double layer DVD-Video discs, pay attention especially to placing a correct layers' division in a suitable place; therefore, please, use for the burning and producing of the ISO image from the VIDEO_TS folders only the professional software, possibly freeware application ImgBurn
- Please use preferably DVD+R DL discs („plus“ format) for double layer DVD-Video titles. They offer more possibilities for setting up of the layer break.
- Use only high quality media from a major brand, preferably the higher versions from the relevant manufacturer (e.g. Verbatim DVD+R DL 2.4x)
- The quality of burning depends above all on a proper combination of the burning mechanics and burning software with a concrete type of media. Therefore, it is impossible to recommend a sole most suitable speed of burning or a sole “guaranteed” method.
- We recommend to find out the optimal combination by means of burning several testing discs and to test the quality of burning in the program “KProbe2” or “Nero CD-DVD Speed”. Then use the combination of the burning device, software, and media with the best results for the DVD masters preparation.

- At higher recording speeds there will occur the step change of burning speed and operation of laser (zone burning). Thereby the readability of disc is worsened.
- Supply the error checking protocol for DVD-R(W), DVD+R(W), if it is available.
- Not cover the DVD with paper tapes or other self-adhesive tapes; however it is possible to use the technologies for burning of graphic information on the side of disc labelling (LightScribe, etc.).
- Describe the medium only on the labelling side, and only with a felt tip marker intended for that use. Common felt tip markers are not suitable. Using hard-core pencils and ballpoints will damage the medium.
- We recommend test viewing of the complete DVD-Video disc in standalone DVD player (not only in the computer) prior to sending it to the production, and checking the correct behaviour of the menu navigation, if contained in the disc.

3.2 Optical discs DVD-R(W), DVD+R(W), CD-R(W) with data content

Those are data DVDs or CDs with the content according to the points 2.1.2 - 2.1.4 or 2.2.

Discs must contain a compatible file system (ISO9660, Joliet, HFS or UDF).

One disc may contain the data for more titles.

We do not accept the shaped DVDs, business cards, etc.

A DVD-ROM disc with DDP files is the most suitable way of suppling source materials for production of titles with CSS protecion.

3.3 DLT tapes

We accept DDP and CMF formats also on DLT tapes compatible with following drives: DLT 8000, DLT1 and SDLT 320 (DLT Tape III, DLT Tape IIIXT, DLT Tape IV or SDLT Tape I).

Every layer of double layer DVD master must be written on a separate DLT tape.

3.4 Hard discs

We accept all sizes of hard discs (3.5", 2.5"), all applicable possibilities of connection (IDE, SCSI, SATA, eSATA, USB, Firewire, LAN).

We recommend using the external discs; however we also accept the internal discs.

One disc may contain the data for more titles.

Format of disc:

- NTFS (Windows 2000, XP, Vista) - we recommend
- FAT32 (Windows 9X) – we accept (the maximal size of file is 4294967294 bytes)
- EXT2, EXT3 (Linux) – we accept
- HFS (Apple) – we accept

3.5 Storage media

We accept the following memory cards: SD, SDHC, XD, MMC, Compact Flash, Memory Stick and storage media USB Flash disc.

One storage medium disc may contain the data for more titles.

For more information contact the premastering engineers.

4 Data transmission via FTP server

The source data for production transmitted via FTP server must contain the check codes (checksums) enabling the verification of data integrity prior to the production itself. Without check codes it is impossible to guarantee the conformity of files received by the manufacturer to the original files on the side of customer.

The orders, which do not contain the check codes, are suspended until the customer sends the data in acceptable format. If the customer insists on the production from non-secured data, he will assume all risks related to any possible undesirable changes of data during its transmission and storage.

The check codes can be supplied in one of the following ways:

4.1 The check code supplied separately

There must be supplied the check codes, by means of which it is possible to verify any damage to data or an unauthorised manipulation with data.

We accept the MD5, CRC32 and SHA1 codes. The code must be calculated separately for each file and a "List of files with checking codes" must be attached to the documentation. The check codes can be created using applications HashCalc, MD5summer or FreeCommander which are available on internet and may be used free of charge.

4.2 Format of source data, which already contains the check codes

ISZ, UIF – compressed formats of DVD image with the check codes

4.3 Source data packed in the archive

The files representing the image of disc, DDP, CMF or individual files, which do not contain any check codes, must be packed in one single file that can contain even the documentation.

Acceptable archive files: RAR, 7Z, ZIP, SIT, ALZ, BZ2, ARJ, ACE, other formats might be accepted only with prior agreement with the premastering department.

5 Location and identification of data files

If the customer supplies the source data in the form of files on a data carrier or via FTP transmission, there must be chosen such location into folders and names of files so that the data identification would be unambiguous, and in accordance with the supplied accompanying documentation and order.

The observance of all below mentioned recommendations will secure the continuous and problem-free processing of the whole order and reduce the risk of production delay or even of mistake of data.

We recommend naming the archive files and files of disc image according to the catalogue number of order and not adding any additional information to the name (date, etc.).

The source data saved on FTP into a disc space allocated to the customer, or saved on a data carrier must be located in a folder with the name, which is identical to the catalogue number of title. Any file or folder, even inside the archive, must not contain any inadmissible characters of operating systems for PC and Apple Macintosh: / \ > < : * ? |

As for the double layer DVD-Video discs with separated source materials for the particular layers, these source materials must be saved in unambiguously distinguishable separate subfolders, for example Layer0, Layer1, etc.

In the event of supplying one image file containing the data for two layers (for example one ISO image), there must be also supplied the information about the layer break, either in an attached file of MDS format (for example from the application Alcohol or ImgBurn), or in the form of a figure indicating the number of sectors of layer 0, which is contained in the text file or in the accompanying documentation

Recommendation for preparing of complete master:

5.1 Location of the files in DVD-ROM part of hybrid discs

Place the frequently used and short files (index files, database files, program files, ...) (if the burning software so allows) at the beginning of DVD, where the access time is shorter. Place the long files, such as audio and video clips, at the end of the DVD. When reading these files, the access time is not decisive, but the transfer rate, which is higher at the edge of the disc in most of advanced mechanisms.

5.2 Check of content of DVD-ROM part of hybrid discs

Check the content of prepared master by an antivirus program with the updated virus database. Furthermore compare the bit conformity, as well as the number and sizes of files and directories of the resulting master with the original source data.

Make a special notice if the source medium contains system files or hidden files, and specify whether or not those files are to be put on the DVD. Unless specified otherwise, the entire data content of the medium will be transferred without change.

5.3 Check of functionality of hybrid DVD discs in computers

Burn the prepared master onto DVD disc and test the functionality of Autorun and all executable applications even on other computers or operating systems, which are different from those computers and operating systems, on which the applications were developed. That is to say the end user might not have the same standard software installed, which was used or presumed when developing the application (audio and video decoders, media players, runtime libraries etc.).

5.4 Check of functionality in standalone DVD player

We recommend test viewing of the complete DVD-Video disc in standalone DVD player (not only in the computer) prior to sending it to the production and checking the correct behaviour of the menu navigation, if contained in the disc.

5.5 Check of data integrity

Check the data integrity by means of copying all files from the prepared master to another medium, for example hard disc.

6 Documentation

The documentation must unambiguously and undoubtedly identify the supplied source data so that it would enable making a decision about the accuracy of data during the input check and subsequent processing. It is necessary to specify mainly all non-standard elements and abnormalities, such as errors allowed within the recording, intentional exceptions to the specification, required protections against copying, etc.

The processing of orders (titles) without the documentation required is suspended until the customer supplies the source data and documentation conforming to the technical conditions. If the customer insists on the production without the documentation supplied, he will assume all risks related mainly to the mistake of titles or mistake of compositions.

The documentation must contain the following information:

6.1 Identification information

Catalogue number, name of customer, name of title, etc

6.2 Information about source data supplied

6.2.1 Type of source data supplied

6.2.2 Location of source data on FTP server: directory and name of file

6.2.3 Format of source data (DVD-Video master, DDP, disc image, VIDEO_TS folder)

6.3 Description of the resulting product

6.3.1 Name of disc

Name of the disc as displayed in the computer (volume label)

6.3.2 Number of files, folders and total capacity of user data

This combination is so unique for each disc with DVD-ROM part that it will enable the identification of disc. It is possible to obtain this information by marking all files and folders of the root of disc, and by subsequent selection of "Properties".

6.3.3 Autorun

If the DVD contains the function of autorun in Windows, we recommend describing its function, for example: "the presentation of company will start up – START.EXE"

6.3.4 Information about the DVD-Video disc

We recommend to specify also the following information, which facilitate us the check of supplied source data and enable us to find out possible mistakes and errors of DVD authoring:

a) TV standard: PAL or NTSC

b) Picture aspect ratio: 4:3, 4:3 letterbox, 16:9 widescreen

c) Playback time of main movie: e.g. „138 minutes“

d) Format and number of audio tracks: e.g. „2x Dolby Digital 2.0 + 1x DTS 5.1“

e) Subtitle tracks: e.g. „czech, english, german“

f) Regions, in which is allowed to play the disc