

A Basic Guide to Video File Formats



With the rapid migration from tape to tapeless delivery I thought it might be useful to put together a simple guide to help you understand a few of the basic principles. This is only a guide but hopefully will give you a bit of an insight into how it all works

Video Containers (The Car)



The container is designed to store the different data types. These include audio, video, and sometimes even subtitles. They're like cars in which we drive around in.

Note that the biggest difference between these containers lies in the support they give for underlying bits of information. Different containers provide support for different audio and video compressions. Some will enable the inclusion of multiple audio, or subtitle tracks, where others will allow only one, or none at all. If you want to add subtitles to an AVI or WMV file, you might have to burn them into the picture (Think of them as different types of car (2 seater sports, MPV, Hatchback Estate, Off Road etc). Each one is a car, but each has different abilities. Additionally there are different manufacturers like Ford or Toyota only in the case of video files we have QuickTime, Flv, AVI, MXF Op1A, XDCAMHD or MP4 and many others.

These are what most popular containers used for various video files. You should know most of these by their names. The most popular ones include:



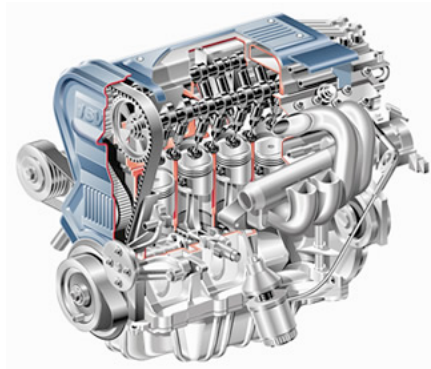
- **3GP** (used by many mobile phones)
- **MXF (OP1A)** (used in Pro Video)
- **AVI** (the standard Microsoft Windows container)
- **XDCAMHD** High Definition Video container
- **Flash Video** (FLV, F4V) (container for video and audio from Adobe Systems, used a lot on the internet)
- **Matroska** (MKV) (not limited to any codec or system, as it can hold virtually anything. It is an open standard and open source container format).
- **JPEG 2000** (Used in Digital Cinema)
- **QuickTime MOV** File Format (standard QuickTime video container from Apple Inc.)
- **MPEG** program stream (standard container for MPEG-1 and MPEG-2 streams on reasonably reliable media such as disks; used also on DVD-Video discs)
- **MP4** (standard audio and video container for the MPEG-4)
- **Ogg** (standard container for Xiph.org audio format Vorbis and video format Theora)
- **Real** (standard container for Real Video and Real Audio)
- **Windows Media** (Used by Microsoft)

Video/Audio Codecs (The Engine/Gearbox)

The *real* difference between most video files relies less on the used container (and if so, only by means of restriction), but more on the **video or audio codec** – what's *in* the box (It's like The Engine and Gearbox). The video codec defines *how* the information is processed. Some of the most popular video codecs include.

Video compressor

- MPEG 2
- H264
- Apple Pro Res
- DVCPRO 25/50
- AVC INTRA
- DNX



Audio compressor

- AAC
- PCM
- WAV
- MP3



You should remember that the content, or the way the content is stored is not always *defined* by the container, although it's often *limited* (e.g. some containers support multiple audio streams, whereas others only supports one). As a result, there are several different available combinations between containers (Cars), codecs (Engines) and Audio (Seats)

Different codecs produce different sound or picture quality in relation to file size.

We normally recommend using the **PRO RES** codec (which has a *high* quality file size / ratio). You can use it with a **QuickTime (.mov)** container if you're planning to use multiple audio and subtitle tracks. Other alternatives include IMX (MPEG2) SD which fits in an MXF OP1a container (Ford Mondeo) which can include large amounts of metadata

Bitrate (The Speed)

A bitrate defines the speed of the data transfer. In terms of video, this means more data is included in a shorter audio/visual interval.

Higher bitrate means a bigger data stream, so for the ultimate quality/file size ratio, your bitrate shouldn't be too low (Entering a hatchback in the Grand Prix), nor too high (Shopping in a Formula One Car). You also need to see how much weight you are carrying, remember the further you need to go the more fuel you need. And your high definition (Sports Car) will need more fuel (Bigger File Size) than your standard definition (City Car) to go the same distance.

Remember your city car won't go very fast so telling it to go at 150mph is a waste of time. Whilst driving your Ferrari at 10 M.P.H. loaded with luggage on the roof will make you look rubbish.

In a lot of applications, it's also possible to calculate the bitrate of a movie by providing a target size. This allows you to get the best quality out of your video, while staying under a set file size.



What extras can I put in my car? (Luggage)

- Meta Data "Equivalent to a VT Report" (On board computer). This can include programme information for use with EPG's
- Subtitles (Sat Nav)
- + Don't forget the amount of seats (Audio) you need



**Make sure you have the
right car
for the
job.**



Conclusion



This is a very simplified version of how this all works but I hope that it gives you a bit more info on the basics. As you can see there often is no specific requirement and as with cars sometimes the choice can be personal or based on subsequent usage.

So like cars, there are many manufacturers (Ford, Mercedes, Fiat etc.) and within these manufactures a whole range of models and delivery options.

Many do the similar things to each other (**Ford Mondeo** and **Vauxhall Insignia "Pro Res-QuickTime"** and **"MXF-Op1A"**) it often comes

down to individual choice or what you need to include and your ultimate file size.