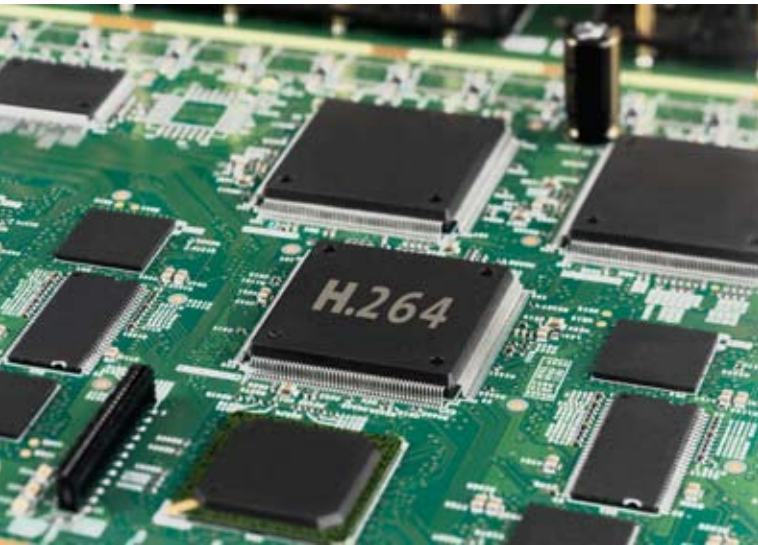




**BOSCH**  
Invented for life

## Bosch and H.264

### A revolution in video surveillance



H.264 is an open standard that utilizes the most efficient video compression techniques available today. This standard follows on from the highly successful MPEG-2 and MPEG-4 video standards and offers advantages in video quality and compression.

Designed to compress and decompress digital video, H.264 is used to reduce the amount of bandwidth required to transmit and store video, offering new possibilities to reduce storage costs and increase efficiency

In applications demanding high resolution and high frame rates (25/30 IPS) as found in the gaming industry, airports and traffic surveillance, Bosch and H.264 will be able to make a difference and deliver big savings by reducing bandwidth and storage needs.

H.264 is expected to be the video standard of choice in the coming years.

#### Bosch uses H.264 to offer you:

- **Lower storage costs** without loss of image quality, frame rate and retention time.
- **Higher quality images** and **higher frame rates** at the same drive size, retention time and bandwidth.

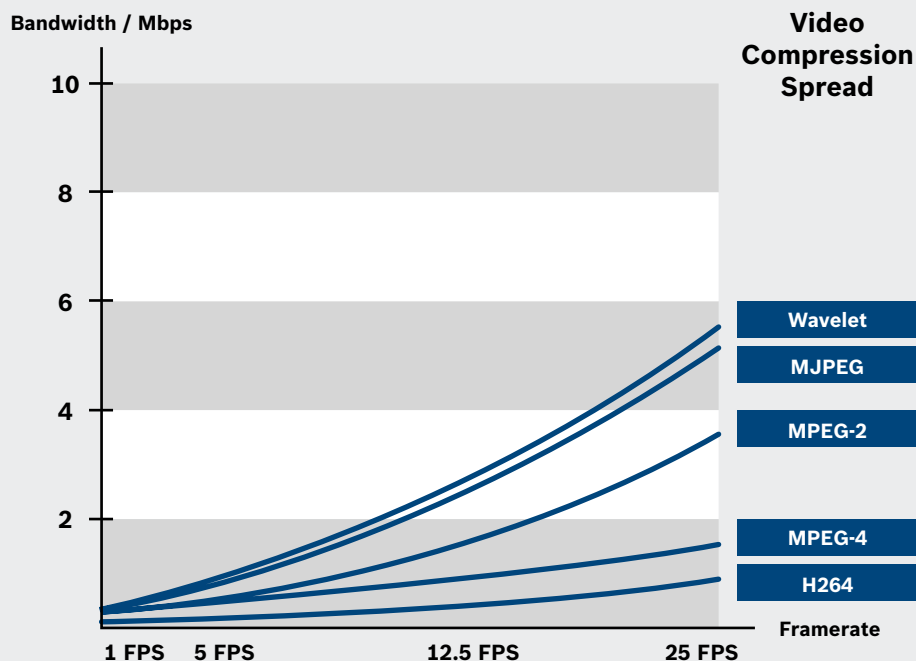
#### Unprecedented video quality

H.264 is the latest innovation in video compression technology used by Bosch to provide clear video for the best possible viewing experience. Every detail in the image is captured without any compromise in frame rate. An indispensable feature for object recognition (such as license plates or a person's face).

#### Less hungry for storage

Without compromising image quality, Bosch and H.264 can reduce the size of recorded video by more than 80% compared with the Motion JPEG format, by as much as 50% compared with the traditional MPEG-2 Part 2 standard, and by an estimated 30% compared with MPEG-4 compression. This is where Bosch and H.264 will make a difference in demanding video surveillance applications.

## Performance of Different Video Compression Algorithms at Various Frame Rates, Spreads shown at 25 FPS



### Network load friendly

For the same amount of video data, with the same image quality, a Bosch video surveillance system supporting H.264 compression will reduce the network load compared with using conventional compression technologies. This means that much less network bandwidth is required for the video stream, resulting in a higher video quality per given bit rate.

### H.264 is the new worldwide standard

With support from many industries and applications for consumer and professional needs, H.264 is expected to replace the majority of compression standards and methods used today.

### Building on standards and innovative future-proof technology

Using industry standards like H.264, Bosch is focusing on minimizing risk and maximizing reliability and stability. The use of future-proof technology ensures that Bosch can meet any new developments in the industry, meaning less risk in terms of expanding our products and systems or integrating them into existing and new installations.

### Not all H.264 is created equal!

Despite being the latest video compression technology standard, the actual performance of H.264 varies significantly. The amount of compression and the resulting image quality are dependent on how it is implemented. That's why Bosch employs a superior form of H.264, putting the best this technology has to offer into our H.264 products. This ensures maximum savings in storage and bandwidth, whilst maintaining the highest possible image quality.

### A closer look at H.264

The H.264 standard includes several profiles, each one comprising a number of 'blocks'. Some blocks are optional but Bosch incorporates all blocks belonging to a profile, maximizing coding benefits.

Two profiles – Baseline and Main – are relevant to CCTV surveillance. In addition we have our own implementation of Baseline, known as Baseline Plus.

### Standard Baseline profile

The standard Baseline profile is the minimum recommendation for H.264 video implementation. It does not support interlaced video (field coding) therefore the maximum resolution is limited to 2CIF. Even so, it delivers powerful compression capability, reducing storage requirements by up to 30% compared to MPEG-4. Baseline profile is only used on cameras and encoders without hardware acceleration for H.264.

### Bosch Baseline Plus profile

By incorporating an extra element – a field coding block – that supports interlacing and improves frame rate, our H.264 Baseline Plus profile increases resolution to full 4CIF while maintaining the same level of video compression as the Baseline profile.

### Bosch Main profile

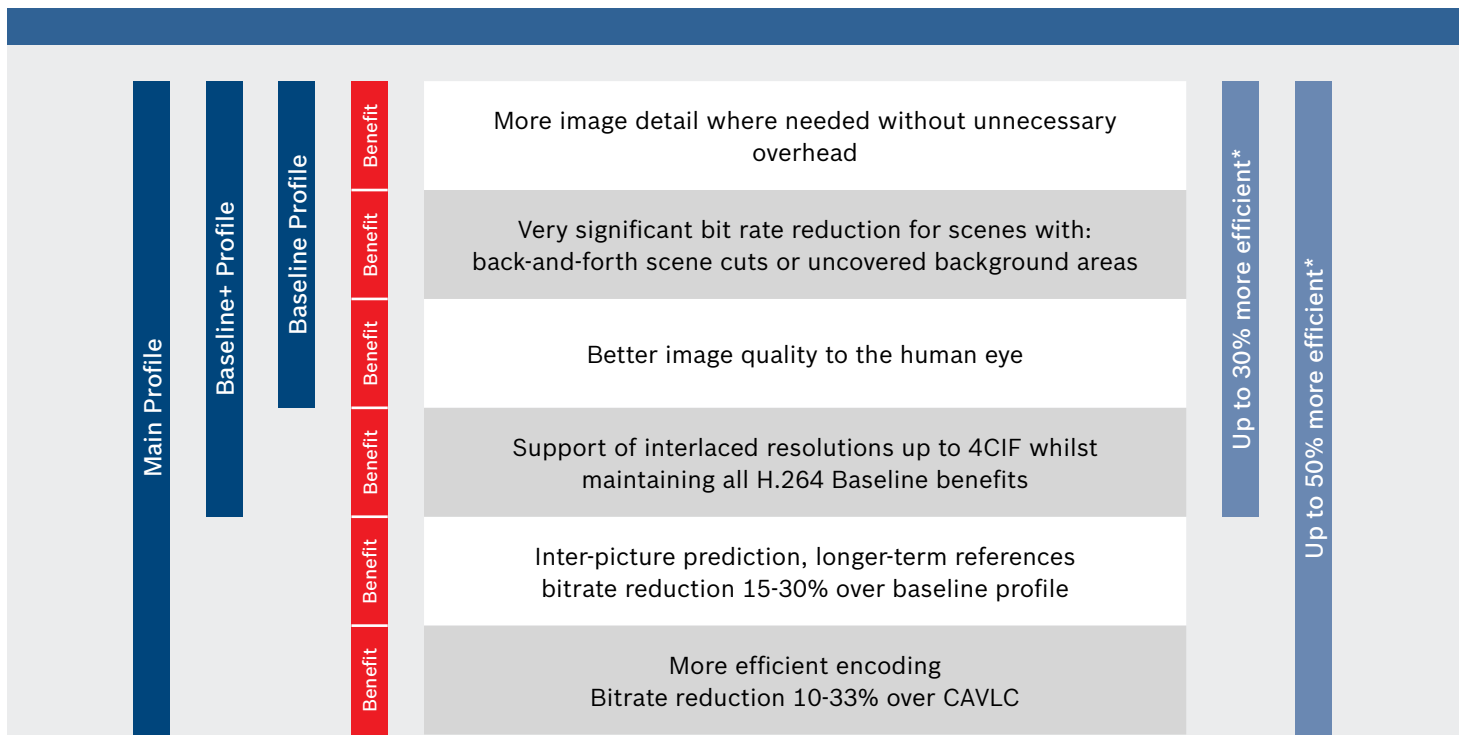
Offering up to 50% greater compression efficiency compared to MPEG-4, without sacrificing image quality, the Main profile is the top-of-the-line H.264 implementation. However, as it utilizes all coding blocks, it does mean that devices supporting Main profile need to have powerful processing performance.

### ONVIF

Founded in 2008 by Bosch, Sony and Axis, ONVIF (Open Network Video Interface Forum) is the first step towards global standardization for interfacing network video products.

ONVIF will introduce global standardization for interfacing network video devices. This will enable broad interoperability and communication between different products. All Bosch VIP X based IP products are full ONVIF compliant when running firmware release 4.1 (released December 2009).

### The benefits of H.264



\* In relation to MPEG4, depending on scene and quality settings