

DIGITAL ASSET BEST PRACTICES GUIDELINE

Prepared By:



Digital Asset Best Practice Guideline

Release Date	Notes
October 2005	First release of the Imaging Best Practices Guideline
April 2012	First release of the Digital Asset Best Practices Guideline includes updated content from the Imaging Best Practices Guideline and new content for the digital asset types PDF, Video and Audio.
April 2016	Second release of the Digital Asset Best Practices Guideline includes updated content and new content for the digital asset type 360 / 3D images.

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New in this Release

In this release of the Digital Asset Best Practices guideline the following updates have been made:

Digital Asset Data Delivery File:

- The Image View has been changed to Orientation View.
- Fields for sending data with video files have been added.
- Fields for sending data with 3D / 360 image files have been added.

Product Image Specifications:

- JPG has been added as an acceptable file type.
- New article added:
 - 7 Best Practices to Improve Your Product Photography Today!
- Product Image Distribution:
 - Hard drives, USB flash drives, and distribution networks have been added.

Line Art Specifications:

- PDF has been added as an acceptable file format.

Video:

- New information on required video mix has been added.
- Recommended format for a single video file distributed to trading partners has been added.

360 / 3D Product Images:

- A complete description of the digital asset type 360 / 3D product images has been added including how to create them, how the files and folders are structured, and how a 360 / 3D image viewer works.
- Recommended best practices on how to format and distribute 360 / 3D product images have been added.

Digital Asset Data Delivery File Best Practices

Overview

The Digital Asset Data Delivery File is designed to provide the receiver of the digital assets all the information they need to categorize and catalog the digital assets appropriately in their systems.

It is a requirement that anytime digital assets are sent to a receiver that they are accompanied by either a PIES file or the Digital Asset Data Delivery File. If you send a PIES file with the digital assets, the Digital Asset Data Delivery File is not required.

The Digital Asset Data Delivery File is designed to accommodate all types of digital assets from product images, to video, to PDFs. This file replaces the Image Data Delivery file that was previously used to provide receivers data on the product images.

Digital Asset Naming Convention

Defining a specification for the naming convention of digital assets that satisfies both the digital asset creator and the digital asset receiver across the entire Aftermarket industry has not been plausible to date. The best approach to this issue is to allow digital asset creators to generate a file name while ensuring the file name is associated to the other relevant digital asset data. This association is accomplished by entering the digital asset data in the appropriate columns in Digital Asset Data Delivery File and sending that to the receiver along with the digital assets.

Digital Asset Data Delivery File Preferred Format

The preferred format for the Digital Asset Data Delivery File is text with pipe (vertical bar) delimiter; this is consistent with other Auto Care technology group standards. The recommended alternative format is Excel. Check with your trading partner for their acceptable formats.

Digital Asset Data Delivery File – Column Descriptions

For illustration and explanation purposes, the fields and columns in the Digital Asset Data Delivery file have been grouped into 4 segments:

1. General to all digital assets
2. Specific to product images

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- 3. Specific to video
- 4. Specific to 3D / 360 images

When you send digital asset data to your trading partners, you do not need to group the data like it is shown in this document. Simply include all columns in a single file. The Digital Asset Data Delivery File can be downloaded from at <http://autocare.org/what-wedo/technology/technologyhelp/>

The following section provides a sample table for the Digital Asset Data Delivery file and describes each column's intended contents.

General to All Digital Assets

The fields below are relevant to most digital assets and are not specific to a type or types of digital assets.

File Name	Title	File Description	File Type	Part Number	Brand ID	Sub Brand ID	Receiver Line Code	Asset Type	Language	Country

File Name

Enter the name of the digital asset file into this field. The file name should consist only of alphanumeric characters and hyphens. Spaces or other special characters should not be used. All image names must include the extension such as; tiff, .mp4, .pdf, .zip.

Title

Enter the title of the digital asset file into this field i.e. the title of the PDF or video. The title field provides additional information about the digital asset file.

File Description

Enter the full description of the digital asset into this field. This description can be a few words or a paragraph, whatever is appropriate for the specific digital asset.

File Type

Enter the digital asset file type into this field. For example; PDF, TIF, JPG, MP4, MP3, DOC, XLS. Note the file types listed in the table below for video, audio, and containers have not been added to latest

version of PIES. Therefore, the Digital Asset Data Delivery File will need to be used to transfer the file types PIES does not support.

File Type Category	File Type
Product Images	TIF, JPG, EPS, GIF, BMP, PNG
Documents	DOC, TXT, XLS, PDF
Video	FLV, F4V, AVI, WEBM, OGV, MP4, MKV
Audio Files	AIF, WAV, WMA, OGG, PCM, AC3, MIDI, MP3, AAC
Containers	ZIP, RAR, 7Z

Part Number

Enter the part number associated with the digital asset file into this field. It is important that the part number entered into this field matches the part number used by trading partners for other documents and standards such as PIES, ACES and price sheets. This part number should contain special characters used by the other documents and standards but should not include characters that do not match. Some trading partners may have additional requirements for this field.

Brand ID

Enter the brand ID associated with the specific digital asset into this field.

Sub Brand ID

Enter the sub brand ID associated with the specific digital asset into this field.

Receiver Line Code

Enter the appropriate code specific to the recipient of your digital assets. This field is included in the Digital Asset Delivery File to accommodate the cases where digital asset creators have specific receiver line codes that help identify and categorize the digital assets. In many cases this column will be blank when there is no specific code for the receiver.

Asset Type

Enter the appropriate asset type code into this field. The table below contains valid asset type codes.

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Code	Description
BRO	Brochure
BUL	Technical Bulletin
CER	Certificate of Origin
DRW	Technical Drawing
FED	Full Engineering Drawing
INS	Installation Instructions
EBK	Ebook
CAS	Case Study
WHP	White Paper
DAS	Data Sheet
PSS	Product Specifications Sheet
FAB	Features and Benefits
CAT	Catalog
BUY	Buyer's Guide
RES	Research Bulletin
HMS	Hazardous Materials Information Sheet
APG	Application Guide
ISG	Illustration Guide
PST	Price Sheet
USM	User Manual
OWN	Owner's Manual
PDB	Product Brochure
LIN	Line Art
LGO	Logo Image
MSD	Material Safety Data Sheet
P01	Photo – out of package
P02	Photo – in package
P03	Photo – lifestyle view
P04	Photo - Primary
P05	Photo - Close Up
P06	Photo - Mounted

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P07	Photo - Unmounted
PAG	Link To Manufacturer Page
PAL	Pallet Configuration Drawing
PC1	Planogram Consumer Pack 1
PC2	Planogram Consumer Pack 2
PC3	Planogram Consumer Pack 3
PI2	Planogram Inner Pack 2
PI3	Planogram Inner Pack 3
PP1	Planogram Case Pack 1
PP2	Planogram Case Pack 2
PP3	Planogram Case Pack 3
SPE	Specification Sheet Filename
THU	Thumbnail
TON	Tone Art
WAR	Warranty
ZZ1 – ZZ9	User 1 – User 9

Language

Enter the Language code in this column. Language codes are based on the language codes published by the ISO (Internal Organization for Standardization) and can be found at www.iso.org.

Country

Enter the Country code in this column. Country codes are based on the country codes published by the ISO and can be found at www.iso.org.

Specific to Product Images

These fields are specific to product images except for the Orientation View, which can apply to 3D / 360 digital assets, and Date Modified, which can apply to assets such as video.

Actual (A) / Representative (R)	Orientation View	Primary View	Maintenance Type	Date Modified	Actual (A) / Representative (R)

Actual (A) / Representative (R)

Enter an A into this field if the product image is of the actual part or an R if the image is a representative image – see Appendix H for more information on representative images.

Orientation View

Enter the name of the orientation view of the digital asset into this field. Only the views listed in PIES should be entered into this field unless an arrangement has been made with the trading partner – see PIES for more information.

Primary View

If there are multiple views for a part number, enter the view that is to be used as the primary view for the part. The purpose of the Primary View field is to allow the trading partner to identify which image should be used as a 'feature' image. The feature image is generally the first image that displays when the part is searched.

Maintenance Type

Enter the code in this column that applies to the image according to the following definitions:

- 'A' should be used when the image is to be **added** to the trading partner's image repository / server / database
- 'D' should be used when the image is to be **deleted** or removed from the trading partner's image repository / server / database
- 'C' should be used when the image is to **change** or **replace** an existing image in the trading partner's image repository / server / database. The contents of the 'Old Image Name' field will be relevant when this maintenance type is used.
- 'N' should be used when the image does **not change**; in other words the image record is to be ignored. This maintenance type should only be used only when a complete set of images is sent to the trading partner which includes images that need to be added, deleted and/or changed as well as images that do not need to be added, deleted or changed.

Date Modified

Enter the date the digital asset was modified in this column. This will act as a date stamp for the digital asset. This field is relevant to several types of digital assets including product images, audio and video files.

Specific to Video

The fields below are relevant to video digital assets. They can also apply to other types of digital assets.

Keywords	Duration	Date Created	Effective Date	Expiration Date

Keywords

Enter the keywords that describe the video so a potential viewer can search and locate the video on these key terms. For example, if the video shows how to replace brake pads you might include keywords such as; ‘brake pad replacement’ and ‘replace brake pads’. If you include more than one keyword, separate the keywords with a comma such as ‘brake, pad, replacement’.

Duration

Enter the duration of the digital asset in this column. For example, digital assets such as video and audio have a playing time. The duration of the playing time should be entered into this field in the format hours, minutes, and seconds. For one hour twenty minutes and thirty three seconds, you would enter 01,20,33.

Date Created

Enter the date the digital asset was created in this column in YYYY-MM-DD format.

Effective Date

Enter the date that the digital asset becomes effective in this column. Date format is YYYY-MMDD. As an example, if you are sending a video to your trading partners providing details of a special offer or promotion, this field will provide the date when the promotion is effective.

Expiration Date

Enter the date that the digital asset expires and is no longer effective. Date format is YYYY-MMDD. For example, a video showing a special offer that expires on a specific date, this field will provide the date when this promotion has expired and is no longer effective.

Specific to 3D / 360 Images

The fields below are relevant to 3D / 360 images.

Number of Frames	Number of Planes	Frame Number	Plane Number

Number of Frames

Enter the number of image frames that are in the 360 images set in this column. For example, if you are sending a 360 image set that has 24 frames you would enter 24 in this field.

Number of Planes

Enter the number of planes that are in the 3D image set in this column. For example, if you are sending a 3D image set that has 2 planes you would enter 2 in this field.

Frame Number

Enter the number of the image frame in this column. This will only apply when sending 360 image files as individual files and not in a container (i.e. zip file). For example, if you are sending a 360 image set that has 24 frames and you are sending frame number 8 you would enter 8 in this field.

Plane Number

Enter the number of the plane in this column. This will only apply when you are sending 360 image files as individual files and not in a container (i.e. zip file). For example, if you are sending a 3D image set that has 2 planes you would enter 2 in this field.

Product Images Best Practices

The imaging recommendations in this guideline apply only to images used for electronic catalogs. The specification defined in this document does not apply to product and lifestyle images used for print including posters, full-page magazine ads and other high-resolution marketing materials. The image specifications for print are project-specific and should therefore be defined between trading partners.

The Workgroup has developed image specifications for the following image types;

- Electronic catalog digital images
- Electronic catalog line art images

The tables in the next sections provide detailed specifications for each of these image types.

These specifications have been accepted by most major trading partners although it is advisable to consult with your trading partner(s) prior to formatting images.

Electronic Catalog Digital Image Specifications

All digital images to be used in electronic catalogs and on trading partner web sites should be formatted according to the following specifications:

Electronic Catalog	Image Specifications	Notes
Format	TIFF, JPG	TIFF is preferred but JPG is also acceptable, check with your trading partners
Size	Minimum 1,500 pixels on the longest side (height or width)	Setting the minimum height or width to 1,500 pixels ensures that white space between the outer edge of the product and the outer edge of the image canvas is minimized. To illustrate this, a part that is long and thin could have an image canvas 1,500 pixels wide by 400 pixels high
Mode	RGB or CMYK	Grayscale images are not acceptable. Images saved as RGB can have up to a 20% smaller file size (see table below)
Resolution	300 DPI	High resolution image file
Compression	None or LZW	Images with LZW compression can have a 35% smaller file size

Image File Name	When accompanied by a 'Image Data Delivery File' the file name is irrelevant	The image file is associated to the part number and other attributes via the 'Image Delivery Data' file
Platform	PC or Mac	Check with trading partner
White Space	Between 5 and 15 pixels around the edge of the image	Does not apply to close-up images where only a section of the part is in the image
Background	White	RGB: 255, 255, 255 unless the product is white; in this case background color, borders or shadowing can be used
Shadows	Removed	Some shadows are acceptable when used to define a white part on a white background

Table Notes:

- The Size specification defines the minimum image size at 1,500 pixels on the longest side (height or width). This specification has been updated in this version of the Best Practices Guideline and therefore only applies to images that are captured, processed and distributed to trading partners after the release date of this Guideline. Images that were sent to receivers prior to this release date are subject to the “maximum of 1,500 pixels ...” image size and NOT the new “minimum of 1,500 pixels ...” image size.
- Formatting the images as TIFF allows trading partners to open, manipulate and save the images for various uses without losing any image data (no quality loss).
- Formatting the images at 300 DPI allows trading partners to size images for some small print and all electronic catalog projects.
- Formatting the images as CMYK or RGB and compressed and uncompressed can affect the image file size considerably (see the table below).

Product Test: Brake Caliper, no background, 80% product / 20% white space, 300 DPI			
Image Size (inches: W X H)	Image Mode	Compression	Image Size (MB)
5" X 5"	CMYK	No	8.8
5" X 5"	RGB	No	6.6
5" X 5"	CMYK	Yes: LZW	6.3
5" X 5"	RGB	Yes: LZW	3.9
3" X 3"	CMYK	No	3.1
3" X 3"	RGB	No	2.3
3" X 3"	CMYK	Yes: LZW	2.4
3" X 3"	RGB	Yes: LZW	1.5

- The ‘Image Name’ should consist only of alphanumeric characters and hyphens; spaces and any other special characters should not be used. All image names must include the extension such as TIF.

Product Imaging Projects - Maximizing Return-on-Investment

For many companies, capturing, processing and distributing product images can be a significant, long term and costly process. The task of acquiring product images is either accomplished with internal resources or out-sourced to a service provider. It can involve hiring photographers, purchasing camera, lighting and studio equipment, deploying internal resources to manage the process and implementing systems and workflows to distribute complete image libraries to trading partners.

So the question becomes – how do you maximize your return-on-investment (ROI) on product imaging projects? Below are a few basic best practices when capturing product images that can help maximize your ROI on product imaging projects:

1. Capture product images at the highest resolution possible.

Product images cannot be formatted to a higher size or resolution than initially captured without sacrificing quality. However, images can always be downsized with quality maintained. The most important component to producing high-resolution / large file size images is the camera. It is a

best practice to invest in a good camera, semi-pro or better, with a high megapixel count – minimum of 12 megapixels. This cost may seem high at the start of the project but in the long run it will pay for itself many times over providing you the ability to produce high-quality images at a high resolution / file size. Not only will you have high-quality images for internal uses but you are well-equipped to satisfy current and future image specification requests from your trading partners.

2. Produce the highest quality images possible.

In an ecommerce sales environment, products from multiple suppliers are compared side-by-side. Often the product that is presented the best wins the sale. Although equipment, photography and post-production image editing can be costly, investing to produce high quality images will increase sales over the long run will more than pay for the added investment.

3. Capture as many image views / parts as you think you will need now and in the future.

The biggest cost associated with product imaging projects is the up-front investment in people, equipment, processes, and training. Once the investment has been made and you are set up to capture, process and distribute product images, it is wise to capture as many views per part as you think you will need at the time the product is pulled from inventory and in the hands of the photographer. It is much more efficient and costeffective to capture additional images views of a product the first time than it is to decide you require more views at a later date and have to order the part again from inventory.

7 Best Practices to Improve Your Product Photography Today!

Operating a productive in-house product photography studio is not simple. It takes planning, knowledge, and execution.

Most in-house studios struggle with the balancing act between product organization, image production, and image quality.

If this sounds like you, below are 7 best practices that will help you produce better images at faster production rates.

1. Use quality equipment
2. Plan your projects

3. Produce clean images
4. Set your white balance
5. Calibrate your monitors
6. Focus on the product
7. Fill the frame

1. Use quality equipment

Producing great product images in a production environment takes quality studio, camera, and lighting equipment. Investing in quality equipment will increase production rates, lower costs, and produce high quality images.

- **Studio Equipment:** This includes your computer system, equipment to move products around the studio, and photography tables.
 - **Computer:** You should have a powerful computer to operate Lightroom, Photoshop, camera control, and production management software concurrently.
 - **Product movement equipment:** You need tables, carts, shelves, and other equipment to move products efficiently around the studio. Make sure they are heavy duty and on wheels.
 - **Photography table:** Point 3 below describes the type of photography table you should build. A well-designed table will help you produce clean images with white backgrounds.
- **Camera Equipment:** It is a common mistake for a studio to buy low quality camera equipment. The \$400 camera, which has similar specs to the \$1,500 camera, is tempting when budgets are tight, but this sacrifice will produce lower quality images and will be far less durable. The same goes for lenses. The image quality produced by a \$1,500 lens is night and day compared to the image quality produced from a \$500 lens.
- **Lighting Equipment:** Strobe lighting and product photography go hand-in-hand. The intense light from strobes can help eliminate background shadows and produce sharp and vibrant images. Buy quality strobe lights, they will last you a long time and produce consistent images.

2. Plan your projects

The most productive approach you can take with product photography is to plan your projects in advance. An 'ad-hoc' approach where you take one-off orders from multiple departments is unproductive. Start by asking all departments and product managers to submit a list of products that require images. On the list, each product should be associated with a product category and each category should have the required image views listed. The product managers should also inform you when they need the images completed.

Once you have request lists, do the following:

- Compile all lists into a master list
- Group the list by product category
- Schedule the products to be delivered to the studio by product category
- When the products arrive at the studio group them by the size and weight
- Further group the products by the image views required
- Prepare a photography schedule
- Prepare the photography stations for the product types and the image views required

Planning ahead will increase production rates by at least 300% when compared to a 'photograph what arrives at the studio' approach. Planning photography into structured projects will allow your company to distribute product images into the market faster increasing sales and reducing returns.

3. Produce clean images

The goal for any studio should be to produce images, straight from the camera, with a white background and no shadows. This makes post-production image editing faster and lowers the overall image cost.

You can produce clean images straight from the camera by following these steps:

- Use a photography table with a clear or translucent plexi / acrylic top
- Position your overhead and side strobe lights as normal
- Place a strobe light on a small stand under the table and set the power to low
- Set your camera's white balance (see point #4 below)

Using this setup, the strobe under the table will blow out the background resulting in an image that has a clean background and no shadows.

4. Set your white balance

When it comes to producing high quality images with accurate colors and tones you need to consider both image input and image output.

- **Image Input** – this is what your camera sees
- **Image Output** – this is what you see in your monitors

The accuracy of the input is addressed by setting the camera's white balance. Setting the white balance tells the camera what pure white is, this allows the lens to calibrate for all colors. The best rule of thumb is to set your white balance daily AND whenever the conditions in which you are shooting changes. This includes a change in your lighting or studio environment changes.

Two things happen if your camera is not seeing colors accurately:

1. Your image editing costs will increase.

When editors see images that are not accurate when compared to the actual products they start adjusting colors and tones. This becomes a subjective guessing game resulting in inconsistent images especially when you have more than one editor working on the images.

2. Inaccurate images in the marketplace.

When the images are inaccurate AND the editors do not adjust them these images end up in the marketplace. Buyers will view and make purchase decisions based on images that do NOT accurately represent your products. This could result in lost sales and higher product returns – very costly!

There are two ways to set your white balance:

1. On the camera:

Each camera does this slightly differently - follow the steps for your camera. You can use a special white lens cap, hold up something white in front of the camera, or shoot a grey card.

2. In your image editing application:

If you are using an application like Lightroom you can set your white balance by taking a picture of a grey card and then using the white balance function in Lightroom to set it for your images. In Lightroom you can also apply the white balance to a set of images with the sync function.

Setting your camera's white balance is simple, do it regularly and save yourself time, cost, and headaches.

5. Calibrate your monitors

The accuracy of the **output** is addressed by calibrating your monitors. A calibrated monitor shows you true images with accurate colors. No second-guessing colors or tones, no wasting time adjusting the image after photography and no issues with tired eyes as the day progresses. What you see is accurate.

The monitors image editors use should also be calibrated to adjust for their work environment. A calibrated monitor will make image editing faster reducing the need for editors to adjust for subjective colors and tones. It is best to calibrate the monitors daily. It only takes 15 minutes and is well worth the effort.

6. Focus on the product

When you are shooting products of all different sizes and shapes it is a constant challenge to get as much of the product in focus as possible. Proper and complete product focus is critical for quality product photography. Focus is achieved by using a small or narrow aperture i.e. f22. A small aperture increases your depth of field which allows more of your product to be in focus. It also allows you to produce a sharp and clear image. Quality images have a big impact on sales – try to keep the product in focus as much as possible.

7. Fill the frame

An image with a product in the middle and tons of white space around it is a big mistake. A best practice is to fill the frame as much as possible with the product. Leave only enough space to crop the image with 10 to 20 pixels of white space around the edges of the product. Your master image, the image that you use as your base to create and format lower resolution images, should be as big as you can make it with the camera equipment you are using. This gives you the most options in the future when you want to create copies of the images in various file types and resolutions. Don't make the mistake of wasting image real estate – fill the frame and maximize the product in the image, you will be glad you did.

Electronic Catalog Line Art Image Specifications

All line art images used in electronic catalogs and on trading partner web sites should be formatted according to the following specifications;

Print & Electronic Line	Art Image Specifications	Notes
Format	TIFF, EPS, PDF	
Size	4,000 pixels @ 800 DPI on the longest side (height or width)	Setting the maximum height or width to 4,000 pixels ensures that white space between the outer edge of the product and the outer edge of the image canvas is minimized. To illustrate this, a part that is long and thin could have an image canvas 4,000 pixels wide by 1,000 pixels high
Mode	Vector Black / White, Vector Color, Bitmap, Grayscale, or Color	
Resolution	800 DPI	
Compression	None or LZW	Images with LZW compression can have a 35% smaller file size (only applicable to TIFF)
Image File Name	When accompanied by a 'Image Data Delivery File' the file name is irrelevant	Image file is associated to the part number and other attributes via the 'Image Delivery Data' file
Platform	PC or Mac	Check with trading partner
White Space	Between 5 and 15 pixels around the edge of the image	Does not apply to close-up images where only a section of the part is in the image
Background	White	RGB: 255, 255, 255
Scale	Must be to scale	
General Quality	1) Proofed for artifacts and smears, 2) Corners, edges and lines must be sharp	

Table Notes:

- Formatting the images as TIFF or EPS at 800 DPI allows trading partners to size the images for most print and electronic catalog purposes.
- The 'Image Name' should consist only of alphanumeric characters and hyphens; spaces and any other special characters should not be used. All image names must include the extension such as TIFF.
- The above image specifications allow the 'receiver' of the images to create image files according to their needs as long as the image size does not exceed 4,000 pixels @ 300 DPI on the longest side (height or width).

Line Art Image Requirements

Depending on the product line and trading partner, line art images may be required in addition to digital images. In general, digital images are required for all parts and line art images are only required for specific product lines. Because the list of part names that require line art images differs considerably between trading partners it is best to check with your trading partners for their specific requirements.

Other Document Specifications

All other documents including MSDS, installation instructions, technical bulletins, and reference drawings should be formatted as an Adobe PDF.

Image Distribution

The three methods of distributing images to trading partners are; 1) sending a CD-ROM or DVD trading partners accompanied by a 'Image Data Delivery' file, 2) accessing the trading partner's web server; the location of the image / image folder URL would be obtained through a PIES file (the 'Image Data Delivery' file does not support a web server URL), or 3) encoding in valid XML characters using BINHEX or BASE64 encoding and sending to trading partners in a PIES file. Trading partners may prefer one method over another, accept either method or require the use of only one method. Consult trading partners for preferences accordingly.

1. **CD-ROM or DVD:** This method can be used when distributing small or large quantities of images to trading partners. The Imaging Workgroup recommends that when large quantities of image files are distributed, this method be used simply because method 3) below will result in an

unmanageably large file. For example, if 2,000 images are sent to trading partner A from image creator B encoded in an XML file, the time to transfer the file would be unreasonable.

Note: When sending images to trading partners on CD-ROM or DVD it is important to separate the images into a logical folder or media structure based on brand or other important differentiating aspects. This will allow the trading partners to easily access the images they need.

2. **Access to trading partner's web server:** This method can be used when an 'image creator' (i.e. a manufacturer) provides trading partner (i.e. retailers / eCat providers) access to a server for the purpose of downloading specific images.
3. **BINHEX or BASE64 encoded:** This method will work well when sending small quantities of image files to trading partners. The following are some examples of when you might use this method;
 - a. Sending a small number of image files for update with your trading partner.
 - b. Sending supporting image documents like MSDS sheets, and reference and installation drawings.
4. **Hard Drives and USB Flash Drives:** This method involves copying your files on to a hard drive or a flash drive and sending it to your trading partners. Distributing digital asset files via drives makes sense when you are sending a large quantity of files and methods like FTP would be too slow.
5. **Distribution Networks:** There are distribution networks with sites or tools that allow you to upload your digital assets directly to their distribution system. These systems then distribute the images to the trading partners you have defined in your account on the distribution network. These networks are efficient because you upload the digital assets to one central location (the distribution network) and they send them to multiple trading partners.

PIES and Product Images

Refer to the most current version of PIES documentation for the PIES tables, codes and fields relevant to product images. The latest version of PIES can be downloaded at <http://autocare.org/pies>

PDF Best Practices

Overview

With the exception of product images, PDFs are widely and frequently distributed digital asset among Aftermarket trading partners. As is evident from the PDF Types table below, there are more than 30 types of PDFs.

There are many PDF specifications that creators need to consider when creating, editing and producing PDFs. The majority of these specifications can be addressed by either following a best practice or by contacting your trading partner to understand the specifications they prefer when formatting PDFs. In general, the majority of PDF specifications are determined between trading partners. This document simply lists the specifications and provides a description of each one for your reference and education. This Guideline includes the stages in the PDF publishing process where you address each specification.

Types of PDFs

There are many different types of PDFs manufacturers send to their customers including:

PDF Type	Existing Code	New Code
Technical Bulletin	BUL	
Research Bulletin		RES
Hazardous Materials Information Sheet		HMS
Material Safety Data Sheet	MSD	
Certificate of Origin	CER	
Warranty Information	WAR	
Pallet Configuration Drawing	PAL	
Planogram Consumer Pack 1-3	PC1, PC2, PC3	
Planogram Inner Pack 2-3	PI2, PI3	
Planogram Case Pack 1-3	PP1, PP2, PP3	
Specification Sheet Filename	SPE	
Brochure	BRO	
Ebook		EBK
Case Study		CAS
White Paper		WHP
Data Sheet		DAS

Product Specification Sheet		PSS
Features and Benefits		FAB
Line Art	LIN	
Catalog		CAT
Buyers Guide		BUY
Technical Drawing	DRW	
Full Engineering Drawing	FED	
Installation Instruction	INS	
Application Guide		APG
Illustration Guide		ISG
Price Sheet		PST
User Manual		USM
Owner's Manual		OWN
Product Brochure		PDB
User 1 – 9	ZZ1 to ZZ9	

PDF Creation, Editing and Publishing Process

PDF specifications are applied to PDFs at various stages in the PDF publishing process. This publishing process starts by creating your document (in Word, a text editor or a design program like InDesign), exporting your document as a PDF, editing your document (in a PDF editing application such as Adobe Acrobat), and then distributing your PDFs to your trading partners accompanied by a Digital Asset Data Delivery File or a PIES file.

The table below summarizes the steps in the PDF publishing process:

PDF Creation, Editing and Publishing Process	PDF Creation, Editing and Publishing Process	PDF Creation, Editing and Publishing Process
Create Document	Create your document using Word, a text document creation application, or a document design application like Adobe InDesign	Microsoft Word Various text editors Adobe InDesign Other design applications

Export to PDF	Save / export the document to PDF. The properties that were defined in the document creation or design application will be maintained in the PDF	Adobe Acrobat Many free or inexpensive document conversion tools
Edit PDF Properties	Open the PDF up in Adobe Acrobat (or another PDF editing application) and edit the PDF properties to adhere to your trading partner specifications	Adobe Acrobat Other PDF editing applications
Distribute to Trading Partner	The formatted and edited PDF is sent to trading partners adhering to their PDF specifications requirements	FTP DVD creation applications File transfer services

PDF Naming Convention

There is no defined naming convention for PDFs. What is important is all PDFs that are distributed to trading partners are accompanied by a Digital Asset Data Delivery File or a PIES file. These files associate the PDF file name to other relevant digital asset data (which make the actual file name of the digital asset unimportant).

PIES and PDFs

Refer to the most current version of PIES documentation for the PIES tables, codes and fields relevant to product images. The latest version of PIES can be downloaded at <http://autocare.org/pies>

PDF Specifications

The table below provides details of the various PDF specifications:

Specification	PDF Publishing Stage	Specification Defined	Action	Notes
File Name	Export / Edit	The name of the PDF file	Include in the appropriate PIES or Digital Asset Data Delivery File	You can name the file anything as long as it is associated with 1) a PIES file or 2) the Digital Asset Data Delivery File

Digital Asset Best Practice Guideline

Meta Data	Create / Export / Edit	Meta data includes title, author, subject, date, keywords, description, and copyright. Meta data can be found in the: Document Properties in Word, File Properties in Adobe Acrobat, & File Info. in InDesign	Creator includes meta data in the PDF as they deem appropriate	The meta data in the PDF concerns the PDF creator and not the PDF receiver. The creator has the right to include meta data in the PDF including copyright information
Bookmarks	Export / Edit	Bookmarks automatically take readers to specific areas in the PDF. Bookmarks appear on the left hand side of the PDF	Consult with your trading partners	Bookmarks can be set up using various PDF creation applications
Orientation	Create	Creating your document in portrait or landscape orientation	Consult with your trading partners	
Hyperlinks	Create / Export / Edit	Hyperlinks take readers to specific areas within the PDF or to external websites	Consult with your trading partners regarding the use of internal hyperlinks. PDF receivers do not allow external hyperlinks	Hyperlinks can be set up using various PDF creation applications. Do not include external hyperlinks as PDFs with these types of links will not be accepted by trading partners
Compatibility	Export / Edit	When you export your PDF you define what version of Adobe Acrobat your PDF will be compatible with. Currently in Adobe InDesign the default is Acrobat 5	Consult with your trading partners	In general, the default settings when you export or edit your PDF will be acceptable.

Specification	PDF Publishing Stage	Specification Defined	Action	Notes
Security	Edit / Export	When you edit your PDF in Adobe Acrobat you have the option to apply security to the document including controlling or password protecting opening, printing, editing and other tasks	Do not apply any security to your PDFs	Receivers do not accept PDFs that have security setting on
Initial View	Edit	You can control how the PDF is navigated e.g. by pages only, bookmarks panel and pages, attachments panel and pages, and layers panel and pages	Consult with your trading partners	Navigation is an advance function of PDF

		You can define how you want the page layout to appear to the user – as a single page or two-up	Consult with your trading partners	The typical setting for PDFs is single page layout
		You can edit your PDF such that it magnifies to a specific size or percentage when it is opened. Options include actual size, fit the page, or zoom to a percentage e.g. 25%, 50%	Consult with your trading partners	It is common to format your PDF to open in its initial view such that readers can clearly see the entire page
		You can define how the PDF appears on the screen e.g. centered on the screen, resized to the original size or displayed in full screen mode	Consult with your trading partners	On screen options are advanced functions of PDF
		You can control the PDF user interface by hiding menu and tool bars and window controls	Consult with your trading partners	On screen options are advanced functions of PDF

Specification	PDF Publishing Stage	Specification Defined	Action	Notes
Specification	Distribute	PDF is hosted with the creator or a 3 rd party hosting service and a link is sent to the receiver	Consult with your trading partners	
URL to PDF	Distribute	Options include FTP, email, physical media, and Internet file transfer service	Consult with your trading partners	
Distribution	Export	You can determine what file size you would like to format the PDF to. Options range from high quality print, the largest high resolution file, to the smallest file size for online viewing	Consult with your trading partners	This PDF function is very important when your PDF has graphics and images. High quality print would result in a file far too large to transfer to your trading partners whereas formatting the PDF to the smallest file size may result in poor quality images and graphics. It is recommended that you export your PDF in various file sizes to see which one strikes the best balance between file size and document quality

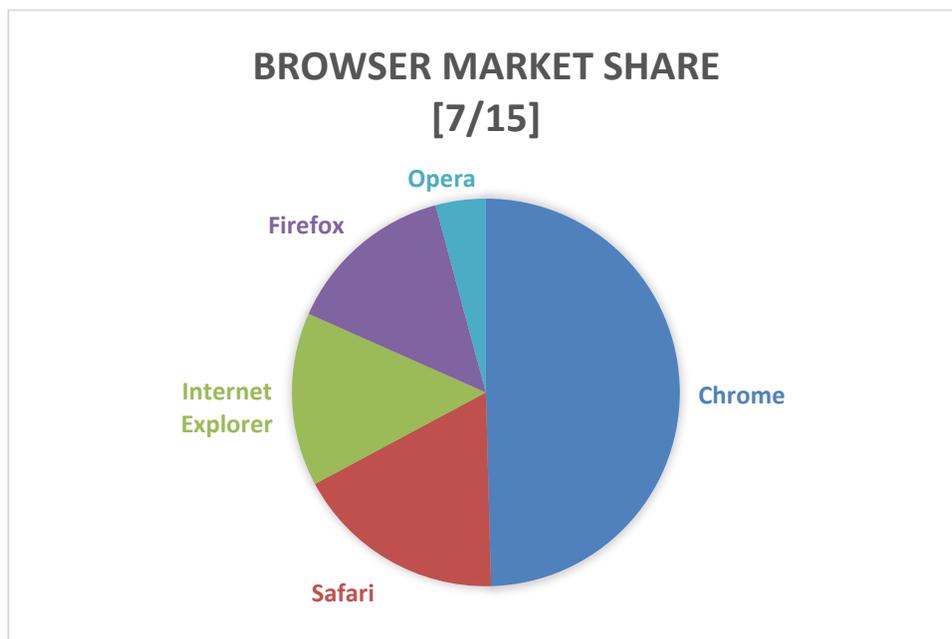
File Size	Export	You can define the quality of the images in the PDF by adjusting how they are compressed upon export. You can set images to color, grayscale or monochrome and define their quality to minimum, low, medium, high and maximum	Consult with your trading partners	It is recommended that you experiment with various settings to see what the final PDF output looks like. As with the file size, you should try and strike a balance between quality viewing and file size
Compression		You can also compress text and line art to reduce the file size	Consult with your trading partners	As with the file size, you should try and strike a balance between quality viewing and file size
	Export	There are several export option for color space	sRGB	sRGB is a standard RGB color space created cooperatively by HP & Microsoft 1996 for use on monitors, printers, and the Internet
Color Space	Edit	Allows various optimization settings to reduce the file size like optimizing images and graphics	Consult with your trading partners	Completed after the PDF has been exported with Adobe Acrobat

Video Best Practices

Overview

The majority of businesses today are using or considering using video as a medium to market their products, services, brand and / or company. Before allocating time and resources to producing videos, there are several to considerations to account for:

1. **Target audience access to videos:** The main goal when creating and publishing video is to ensure that your target audience is able to view your videos whenever they want. In order to achieve this goal, you will need to produce video that can play in all commonly used browsers and on various devices (see point 2 and 3 below).
2. **Cross-browser compatibility:** Your target audience will be accessing your videos using a variety of browsers including Internet Explorer, Firefox, Safari, Chrome and Opera. They will also be running various versions of these browsers. The following chart illustrates the market share by browser as of July 2015.



3. **Variation in devices used to view video:** Your target audience will be viewing your videos on a variety of devices including desktop and notebook computers, smartphones and tablets. Devices

play video differently, for example, if you create Flash videos they will not play on the iPod, iPad or iPhone because Apple does not support Flash.

The 3 Components of Video

When creating and publishing video, it is important to understand the components that make up video. These include containers, video codecs, and audio codecs.

Video Component	Description
Containers	Video container formats define how to store things within them
Video Codecs	Video player decodes the video stream according the video codec
Audio Codecs	Algorithms by which audio stream is encoded

Containers

Video container formats define how to store things within them. The table below includes some of the common video containers.

Container	Description
MP4	<ul style="list-style-type: none"> • MPEG-4 Part 14 or MP4 is a container format standard specified as a part of MPEG-4. It is most commonly used to store digital video and digital audio streams, especially those defined by MPEG, but can also be used to store other data such as subtitles and still images • .mp4 is the global file extension for the official container format defined in the MPEG-4 standard • To create MP4 files use audio and video formats covered by the MPEG-4 Standard • Allows streaming over the Internet • Common video codec is H.264 (see 'Video Codec' section) • Common audio codec is AAC • Works on Apple devices and plays in Quicktime
Ogg	<ul style="list-style-type: none"> • Ogg is an open standard and unencumbered by any known patents • Firefox 3.5, Chrome 4, and Opera 10.5 support Ogg container without requiring a plugin • Ogg video is called Theora • Ogg audio is called Vorbis • .ogv extension

<p>WebM</p>	<ul style="list-style-type: none"> • WebM is a container format designed to provide royalty-free, open video compression for use with HTML5 video • .webm extension • Development is sponsored by Google • All users are granted a worldwide, non-exclusive, no-charge, royalty-free patent license • The WebM project is dedicated to developing a high-quality, open video format for the web that is freely available to everyone • WebM is supported by Mozilla, Opera, Adobe, Google and more than seventy other publishers and software and hardware vendors • It is supported natively, without platform-specific plugins, in the latest versions of Chromium, Google Chrome, Mozilla Firefox, and Opera • Adobe has also announced that a future version of Flash will support WebM video
<p>Flash Video</p>	<ul style="list-style-type: none"> • Flash Video is a container file format used to deliver video over the Internet using Adobe Flash Player • Flash Video content may also be embedded within SWF files • There are two different video file formats known as Flash Video: FLV and F4V • Flash Video is viewable on most operating systems via the Adobe Flash Player and web browser plugins or one of several third-party programs • Apple's iOS devices do not support the Flash Player plugin • Flash Player supports video compressed in H.264, audio compressed using AAC
<p>AVI</p>	<ul style="list-style-type: none"> • Audio Video Interleave (AVI), is a container format introduced by Microsoft in November 1992 as part of its Video for Windows technology • AVI files can allow synchronous audio-with-video playback • It does not support features of recent container formats like embedded metadata • It does not even officially support most of the modern video and audio codecs in use today • .avi extension

Video Codecs

Video players decode the video stream according the video codec. The table below includes the 3 most important video codecs.

Codec	Description
H.264	<ul style="list-style-type: none"> • H.264 (MPEG-4 AVC) is a standard for video compression, and is currently one of the most commonly used formats for the recording, compression, and distribution of high definition video • H.264 is one of the codec standards for Blu-ray Discs; all Blu-ray Disc players must be able to decode H.264 • Widely used by streaming internet sources, such as videos from Vimeo, YouTube, and the iTunes Store, web software such as the Adobe Flash Player and Microsoft Silverlight • iPhone, iPod, iPad, Apple TV play H.264 • In 2009, the HTML5 working group was split between supporters of Ogg Theora, a free video format whose developers believe is unencumbered by patents, and H.264 which contains patented technology • January 2011, Google announced that they were pulling support for H.264 from their Chrome browser and supporting both Theora and WebM / VP8 to use only open formats • Designed for low and high CPU devices • Patent encumbered
Theora	<ul style="list-style-type: none"> • Theora evolved from the VP3 codec. It is royalty-free codec and not encumbered by patents other than the original VP3 patents, which have been licensed royalty-free • Theora video is developed by the Xiph.Org Foundation and distributed without licensing fees alongside their other free and open media projects, including the Vorbis audio format and the Ogg container • Theora video can be embedded in any container format, although it is most often seen in an Ogg container • Theora is a free lossy video compression format • All major Linux distributions support Theora out-of-the-box, and Mozilla Firefox 3.5 includes native support for Theora video in an Ogg container
VP8	<ul style="list-style-type: none"> • VP8 is an open video compression format created by On2 Technologies • In 2010, Google purchased On2 and released a specification of the format under the Creative Commons Attribution 3.0 license; it is now royalty free • The WebM Project was launched, featuring contributions from Mozilla, Opera, Google and more than forty other publishers, software and hardware vendors to use VP8 as the video format for HTML5 • In the WebM container format, the VP8 video is used with Vorbis audio • Internet Explorer 9 will support VP8 video playback if the proper codec is installed • Android is WebM-enabled • Flash Player will support VP8 playback in a future release

Audio Codec

Audio codecs are algorithms by which audio stream is encoded. The table below includes the 3 most important audio codecs.

Codec	Description
MP3	<ul style="list-style-type: none"> • MPEG-1 or MPEG-2 Audio Layer 3 (MP3), is a patented digital audio encoding format using a form of lossy data compression • MP3 is an audio-specific format designed by the Moving Picture Experts Group (MPEG) as part of its MPEG-1 standard and later extended in MPEG-2 standard • MP3 is a common audio format for consumer audio storage, as well as a de facto standard of digital audio compression for the transfer and playback of music on digital audio players • MP3s can contain up to 2 channels of sound. They can be encoded at different bitrates: 64 kbps, 128 kbps, 192 kbps, and a variety of others from 32 to 320. Higher bitrates mean larger file sizes and better quality audio • MP3 format allows for variable bitrate encoding, which means that some parts of the encoded stream are compressed more than others • MP3s can also be encoded with a constant bitrate • Because MP3 format is patent-encumbered, Linux cannot play MP3 files out of the box • Most portable music player supports standalone MP3 files • MP3 audio streams can be embedded in any video container • Adobe Flash can play both standalone MP3 files and MP3 audio streams within an MP4 video container
AAC	<ul style="list-style-type: none"> • Advanced Audio Coding (AAC) is a standardized, lossy compression and encoding scheme for digital audio • AAC was standardized in 1997, was chosen by Apple as their default format for the iTunes Store • AAC was designed to provide better sound quality than MP3 at the same bitrate, and it can encode audio at any bitrate. (MP3 is limited to a fixed number of bitrates, with an upper bound of 320 kbps.) • AAC can encode up to 48 channels of sound • The quality for stereo is satisfactory to modest requirements at 96 kbit/s in joint stereo mode • It is supported on Nokia, Android, BlackBerry, and webOS-based mobile phones • The AAC format is patent-encumbered; licensing rates are available online

	<ul style="list-style-type: none"> • The AAC format is designed to be playable in real-time on devices with limited CPU power • All current Apple products, including iPods, iPhone, iPad, AppleTV, and QuickTime support certain profiles of AAC in standalone audio files and in audio streams in an MP4 video container • Adobe Flash supports all profiles of AAC in MP4, as do the open source MPlayer and VLC video players
<p>Vorbis</p>	<ul style="list-style-type: none"> • Vorbis is a free software / open source project headed by the Xiph.Org Foundation • Vorbis project produces an audio format specification and software implementation (codec) for lossy audio compression • Vorbis is most commonly used in conjunction with the Ogg container format, this is why it is often referred to as Ogg Vorbis • Vorbis is not encumbered by any known patents and is therefore supported out-of-the-box by all major Linux distributions • Mozilla Firefox 3.5 supports Vorbis audio files in an Ogg container (or Ogg videos with a Vorbis audio track) • Android mobile phones can also play standalone Vorbis audio files • Vorbis audio streams are usually embedded in an Ogg or WebM container, but they can also be embedded in an MP4 or MKV container • Vorbis supports an arbitrary number of sound channels

What Container, Video Codec and Audio Codec to Use?

It is important that your target audience can view your videos using any browser or device. The issue is that browsers and devices do not support a standard container, video codec, and audio codec combination. At the time of writing this guideline, it is not possible to create a single video file that would be universally playable on all browsers and devices. Therefore, in order for your video to play on all devices and browsers, you need to create multiple versions of the video.

There are 3 broad approaches to take when creating these video versions – minimum, moderate, and maximum (Source: Brightcove Inc.). Using these approaches, making multiple video versions will allow you reach audiences on a wider variety of devices and browsers.

A Minimum Approach:

This approach requires that you create 2 videos. This 2-video set will play on fewer devices and browsers when compared to the ‘moderate approach’ and the ‘maximum approach’.

	Video 1	Video 2
Container	WebM	MP4
Video Codec	VP8	H.264 (baseline)
Audio Codec	Vorbis	AAC
Resolutions		640 x 480

- Video 1: Formatted for HTML5
- Video 2: Formatted for HTML5, Flash, and mobile

A Moderate Approach:

This approach requires that you create 3 videos. This 3-video set will play on more devices and browsers than the 'minimum approach' but fewer than the 'maximum approach'.

	Video 1	Video 2	Video 3
Container	WebM	MP4	MP4
Video Codec	VP8	H.264 (High Profile)	H.264 (Baseline Profile)
Audio Codec	Vorbis	AAC	ACC
Resolutions			480 x 360; 640 x 480

- Video 1: Formatted for HTML5
- Video 2: Formatted for HTML5, Flash
- Video 3: Formatted for mobile

A Maximum Approach:

This approach requires that you create 6 videos. This 6-video set will play on the majority of devices and browsers.

	Video 1	Video 2	Video 3	Video 4	Video 5	Video 6
Container	WebM	Ogg	MP4	MP4	MP4	3GP

Video Codec	VP8	Theora	H.264 (High Profile)	H.264 (Baseline Profile)	H.264 (Main Profile)	MPEG4
Audio Codec	Vorbis	Vorbis	AAC	AAC	AAC	AAC
Resolutions				480 x 360	1280 x 720	320 x 240 177 x 144

- Video 1 & Video 2: Formatted for HTML5
- Video 3: Formatted for HTML5, Flash
- Video 4: Formatted for mobile including coverage for older devices • Video 5: Formatted for older iOS devices
- Video 6: Formatted for older mobile devices and non-smartphones

Distribute a Single Video to All Trading Partners

In order to avoid the complexities associated with creating multiple video formats, the majority of receivers in the Automotive Aftermarket are willing to accept a single video file from their suppliers. The receivers will then create versions of the video in order to satisfy their customer base. This simplifies the video creator’s process of distributing videos to their trading partners and leaves the formatting in the hands of the receivers. Below is the specification for this single video format that video creators can send to their trading partners.

	Single Video
Container	MP4
Video Codec	H.264 (High Profile)
Audio Codec	AAC
Resolutions	1920 x 1080

Steps to Create Multiple Video Formats

The following outlines the steps you will take to capture, edit and encode video in the formats listed above.

Step 1: Video Capturing:

www.autocare.org | www.autocarevip.com | [✉ technology@autocare.org](mailto:technology@autocare.org)

It is recommended that you capture the highest quality video you can. Once you have a high quality source video, you can encoded this video in formats suitable for internal use and for distribution to your customers. Below are a few important points to consider when shooting a high quality video:

- **Equipment:** The quality of the video camera and microphone can have a big impact on the quality of the source video you produce. If possible, purchase a good quality video camera and microphone.
- **Video Size:** In order to produce high quality video, it is recommended that you capture video in high definition at 1920 x 1080 pixels resolution. If you have source video in a high resolution you can downsize it when encoding video formats for internal and external uses.
- **Frame Rate:** The number of individual frames that comprise each second of video you record is the frame rate, also known as FPS (frames per second.) The most common frame rates in video are 24, 25 and 30 frames per second. The higher frame rate the smoother objects move in the video.
- **Bit Rate:** Video data, called bits, is saved to a storage media like a flash memory card or hard drive. The amount of video data recorded per second is called a bit rate, and is measured in megabits (one million bits) per second, or Mbps. The more data recorded, the better the quality of your video. Controlling the bit rate not only determines the quality of video but also how long you'll be able to record before running out of memory. Assuming you have enough memory, it is best to capture video at the highest bit rate/quality setting you can. Recommended bit rate is 128 kbps (kilobits per second) to 192 kbps.
- **Compression:** It is best to capture your video in an uncompressed format like a .wav file. By doing this you will maintain a source video in the highest possible quality which can be compressed when exported to other formats for internal and external use.
- **Sample Rate:** The audio sample rate (measured in hertz (Hz) or kilohertz (kHz)) refers to the number of times a sample of a constant sound source is taken over a unit of time. Recommended sample rate is 44.1 kHz or 48 kHz. Note that the audio sample rate must match the sample rate settings of your video project when you are encoding your video file.

Step 2: Video Editing

After you have captured and before you encode your video, you can edit the video using a video editing application such as Final Cut Pro, Adobe Premiere, or Microsoft Movie Maker. These applications allow you to clean up your video, add sections, remove parts that you do not want, add watermarks, add overlays and make many other post production alterations to your video. When you have completed this step, save and backup your source video. The processes and techniques involved in video editing are extensive and unique to specific projects and are therefore beyond the scope of this guideline.

Step 3: Video Encoding

Encode three separate videos, one for each video format outlined in the above table. Video encoding is done with video editing software. When you export your source video with your video editing software, you need to define the aspects of the video you are formatting including:

- **Codec & Containers:** Encode your videos according to the 3 video formats listed above.
- **Multi-pass Encoding:** Also known as 2-pass or 3-pass encoding is a technique for encoding video into another format using multiple passes to keep the best quality. The video encoder analyzes the video many times from the beginning to the end before the actual encoding process. While scanning the file, the encoder writes information about the original video to its own log file and uses that log to determine the best possible way to fit the video within the bitrate limits the user has set for the encoding process.
- **Audio Bitrate:** The bit rate is the rate that bits are streamed to play the file over a set length of time. For example, a 192kbps file pushes 192k bits per second at playback. The higher the bitrate the more information is reproduced and so generally the higher quality the video. Your overall bitrate is a combination of your video stream and audio stream in your file with the majority coming from the video stream. Audio bitrate should be set to between 44.1 kHz and 320 kHz.
- **Video Bitrate:** The bitrate of the video specifies the amount of information stored in the video. The higher the bitrate, the clearer the video. This setting will usually depend on the video resolution. For a basic video a bitrate of between 500Kps and 1Mbs.
- **Video Size (w x h):** If you capture video in high definition (1,920 x 1,080 pixels) you have the option to resize the video during encoding to whatever size you need for internal use and to satisfy trading partner needs. It is recommended that you check with your trading partners to determine their required video size. It is important to note that the video dimensions have a

significant effect on the video file size. For example, a 320 x 240 pixels video will have a much smaller file size than a 1,920 x 1,080 pixel video.

- **Frame Rate:** The frame rate when encoding video (the number of individual frames that comprise each second of video you record) should be consistent with the frame rate of the source video.

Video Production & Distribution Considerations

Other than capturing, editing and encoding your video there are several things to consider when producing video for your business. Below are some of these considerations:

Video Quality

The quality of your video can be impacted by many things including video equipment, video resolution, compression, and frame, bit, and sample rate.

Legal Issues

There are many legal issues related to video creation and distribution including securing releases from all people acting or appearing in the video and rights to feature products, services, brands and companies in the video. Consult legal counsel for all copyright and legal matters concerning video production and distribution. Legal issues relating to video are beyond the scope of this guideline.

Content Guidelines

Videos can be promotional, instructional or educational. Regardless of the type of video, all videos contain one form of content or another. Guidelines for this content can be general in nature or detailed. Additionally, content guidelines are dependent on the parties that create and receive the video.

Defining detailed content guidelines for all types of video and for video creators and receivers is beyond the scope of this guideline. The only general, albeit subjective, content guideline worth including in the guideline is one that is obvious to all businesses producing and distributing video – do not publish video content that could be deemed as offensive to your viewers.

Editing

Once you have captured your video it can be edited in video editing software. The most common video editing software is Apple Final Cut Pro and Adobe Premiere. In addition to editing your video, these

applications are also used to encode and export your videos for internal use and for distribution to trading partners.

Watermarks and Overlays

Watermarks and overlays can be applied to your videos during the video editing stage. Consult your trading partners to determine if watermarks and overlays are permitted and, if so, what are the restrictions when applying them.

Backup

It is very important to back up all video files but especially the source video. If individually formatted videos are lost due to a hard drive or system failure they can always be recreated from the source video. If the source video is lost the video will have to be recreated from scratch which is time consuming and costly.

Distribution

Each trading partner will have specific requirements for how they want videos formatted and how they want them delivered (e.g. FTP, physical media, Internet, link). Check with your trading partners before you encode and export your videos, once you understand their video specifications then proceed with the encoding process.

PIES and Video

Refer to the most current version of PIES documentation for the PIES tables, codes and fields relevant to video. The latest version of PIES can be downloaded at <http://autocare.org/pies>

Video and HTML5

HTML5 is being developed by the HTML5 working group as an open standard to be adopted by all web browser developers. HTML5 is the next generation of the HTML standard and has added support for embedding multimedia including video, audio, and dynamic graphics. Video can be directly embedded in web pages with the <video> element without using plug-ins. Prior to HTML5, video was displayed on a web page by embedding the video content using 3rd party plug-ins like Adobe Flash Player, RealPlayer, and QuickTime. If the plug-in was not available or supported the video would simply not play. For example, a Flash video would not play on an Apple device.

While HTML5 is an improvement, it still does not solve all problems related to embedding video. The existing shortcomings of HTML5 include:

1. Currently, there is no single combination of containers and codecs that work in all HTML5 browsers. Google, Apple, Mozilla and Microsoft are still not in agreement on the video formats to support.
2. Currently, HTML5 only supports 3 video formats – Ogg, MPEG4, & WebM.
3. Currently, Google Chrome is the only browser that supports all formats although they announced that they would be pulling support for H.264 and supporting both Theora and WebM/VP8 to use only open formats.

HTML5 Code for Video

Due to the controversy surrounding HTML5 and the supported video formats, you must create the 3 video formats outlined earlier in this document. In order to make sure that your video is viewable regardless of the device or browser accessing your video, use HTML5's video element to link to all 3 source videos. This ensures your video will play on the designated web page.

The example below is for a video that will be displayed in a resolution of 320 x 240 pixels. You can see that the HTML includes links to 3 video formats – MP4, WebM, and Ogg – and their associated codecs.

```
<video width="320" height="240" controls>  
  <source src="pr6.mp4" type='video/mp4; codecs="avc1.42E01E, mp4a.40.2"'>  
  <source src="pr6.webm" type='video/webm; codecs="vp8, vorbis"'>  
  <source src="pr6.ogv" type='video/ogg; codecs="theora, vorbis"'>  
</video>
```

Audio Best Practices

Overview

In many industries, audio is becoming a popular digital asset type. Audio is predominantly used for educational or informational content in the form of podcasts but can also be used to help promote products at the point of sale.

The process of creating and distributing audio is similar to video – you record your audio, edit it and then export it in the formats that meet the needs of your business internally and your trading partners externally. In the following sections, the important aspects of creating, editing and formatting audio files are detailed along with some important items to consider when creating and distributing audio files.

Audio Recording

Below are some considerations when recording high quality audio:

Overall Quality

Similar to recording video, it is best to record your source audio at the highest quality possible. This offers flexibility when it comes to formatting and exporting audio files for your specific uses in the future.

Equipment

If you want to produce good quality audio files you must invest in a good microphone. Your microphone has a significant effect on the quality of your audio recording.

Environment

It is important you control the environment you are recording in as much as possible.

Background noise can affect the audio quality considerably and should be eliminated if possible. The clearer the audio is the better experience your listeners will have.

Sample Rate

Sample Rate indicates the number of digital samples taken of an audio signal each second. A high sampling rate produces better quality sound, but it also produces a large file. For this reason you will need to strike a balance between the sample rate and the file size of your recording.

Below are examples of sample rates and associated audio quality level:

Sample Rate	Quality Level	Frequency Range
11,025 Hz	Low-end multimedia	0 – 5,512 Hz
22,050 Hz	High-end multimedia	0 – 11,025 Hz
32,000 Hz	Standard broadcast rate	0 – 16,000 Hz
44,100 Hz	CD	0 – 22,050 Hz
48,000 Hz	Standard DVD	0 – 24,000 Hz
96,000 Hz	High-end DVD	0 – 48,000 Hz

Bit Depth

Bit depth describes the number of bits of information recorded for each sample. Bit depth directly corresponds to the resolution of each sample in a set of digital audio data. Higher bit depth provides greater dynamic range. The table below lists the bit depth for common audio recordings.

Bit depth	Quality
8-bit	Telephony
16-bit	CD
24-bit	DVD
32-bit	Best

Audio Editing

When you have recorded your source audio you can use audio editing software to adjust and fine tune the audio before you format and export individual audio files. There are several key audio editing software applications including Audacity, Audition, Logic Pro, Soundbooth, and

Soundtrack. The processes and techniques involved in audio editing is beyond the scope of this guideline.

Audio Formatting

As is the case with video, there are multiple audio formats to consider when formatting your source audio files. The table below lists some of the more popular audio formats:

Audio Format	Format Description
Audio Interchange File Format (.aif)	Apple format, not supported by all web browsers or all platforms
Waveform Audio (.wav)	Microsoft, lossless, developed for PC, large file sizes
MPEG-1 Audio Layer 3 (.mp3)	Compressed wav file (1/12th the size), compresses data at a constant bit rate
Windows Media Audio (.wma)	MP3 format for Windows Media Player, compressed three times more than MP3s
Ogg Vorbis (.ogg)	Open source, more compressed than MP3, variable bit rate compression; not accepted by many audio software
Advanced Audio Coding (.aac)	Logical successor to MP3 for medium to high bit rate audio – advanced ways to compress audio
Pulse Code Modulation (.pcm)	High fidelity, uncompressed digital sampling of an analog audio signal
AC3 Audio (.ac3)	Known as Dolby Digital; this format is being replaced by AAC
Musical Instrument Digital Interface (.midi)	MIDI files are extremely small and are supported by many different software applications and Internet browsers

Audio Format Considerations

There are many important considerations in selecting an audio format including:

Ability to compress sound

Audio formats compress audio differently. Depending on the file format you use, the size of your audio file can vary greatly. This will have an impact on the storage space required. Trading partners can also have restrictions on audio file sizes; check with your trading partners before you choose your audio format.

Ability to maintain sound quality

Some audio formats are lossy meaning they lose audio data when they are formatted and therefore audio quality is decreased (although it is minimal). Notable lossy formats are lossy aac and mp3. Other formats are lossless which means they do not lose any audio data when they are created and formatted. The best

example of a lossless audio format is wav. Lossy audio formats produce files that are much smaller than lossless files.

Universal or software dependence

Some audio formats can be played using any music player without restriction whereas other formats restrict functions like copying and sharing.

Ability to stream over the Internet

It is important to consider whether the audio will be streamed over the Internet. Some formats are designed for streaming while other formats may cause delays and interruptions when streaming. The common formats for streaming over the Internet are mp3 and aac.

Varying format requirements between trading partners

It is likely your trading partners will request specific audio formats. For this reason, it is recommended that you check with your trading partner before formatting your audio files.

Use of audio files

Before you format your audio files it is important to consider what they will be used for. Considerations include:

- Will they be played in a Browser? If so, check to see which browsers the audio format is compatible with.
- Will they be played on mobile devices? If so, choose an audio format that is bandwidth friendly.
- Will the audio be short or long? You may consider formatting short audio files differently than long file when balancing audio quality and file size.

Audio Formatting Specifications

The table below provides some general recommendations for formatting your audio files:

Specification Category	Specification / Description
File Format	The file format you choose will depend on the use of the file and the trading partner the file will be sent to
Sample Rate	8,000 Hz to 96,000 Hz

Sample Type	8 to 32 Bit & 32 Bit Float
Bitrate	16 Kbps to 320 Kbps
Frequency	5.5 kHz to 48 kHz
Mono or Stereo	This depends on the audio quality required, most audio will be in stereo
Compression	Some formats offer several compression options when formatting
Quality Mode	Best quality vs. fastest

Formatting Export Comparison Table

The table below provides the necessary bitrate thresholds and audio file should have in order to achieve a specified sound quality.

Sound Quality	MP3	WMA	AAC
FM Radio	96 kbps	96 kbps	96 kbps
OK	128 kbps	128 kbps	128 kbps
Good	192 kbps	160 kbps	160 kbps
High Quality	224 kbps	192 kbps	192 kbps
CD Quality	320 kbps	256 kbps	256 kbps

Audio File Distribution

Audio files can be sent to trading partners via FTP, on physical media and over the Internet. In some cases, your trading partners may accept a link to the audio file. Check with your trading partner to determine how they would like you to distribute audio files to them.

PIES and Audio

Refer to the most current version of PIES documentation for the PIES tables, codes and fields relevant to audio. The latest version of PIES can be downloaded at <http://autocare.org/pies>

3D / 360 Product Images Best Practices

This section of the guideline focuses on 3D / 360 product images. The first few sections provide a general overview of 3D / 360 product images. The last few sections provide details on how to format, name, and distribute 3D / 360 images.

Defining 3D / 360 Product Images

These digital assets are the final output from the 360 degree product photography process. The 360 degree product photography is a process of capturing a series of still product images on specialized equipment that rotates the product on one or more planes. The images are edited, formatted and integrated with a 360 product image viewer that allows the consumer to interact with the product, rotating it from various angles and zooming into it to see the product detail.

The difference between 3D and 360 Product Photography

360 degree product photography is product photography on a single plane – the product rotates on a single plane while the camera takes pictures at specified degree intervals. For example, if you create a single plane 72 frame 360 degree image, the camera takes a picture every 5 degrees as the product rotates on the table.

3D product photography is product photography on more than one plane. For example, you capture 72 images as the product rotates on one plane, then move the camera above the product X degrees and take another 72 images and so on. When the images are edited, formatted, and associated to the image viewer, the consumer can rotate the product along the sides and the top – this is a 3D product image.

Compared to 360s, 3D product images require additional specialized equipment, are only suitable for products that need to be viewed from all angles, and are much more expensive to create. For these reasons, more than 90% of rotating product images are 360s.

The difference between still and 360 product photography

Still product photography involves capturing various static 'views' of your product – front, top, back, bottom, side etc. These are taken using a standard table top product photography set up with camera and stand, strobe or continuous lights, backdrops and laptop with image production management software.

These images are edited and formatted for your websites and electronic catalogs and distributed to your customers. Still product photography is easier and less expensive compared to 360 product photography.

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360 product photography uses some of the same equipment as still photography including camera and stand, lights, and software and laptop. But it also involves equipment for rotating the products when they are laying on a platform or suspended from an overhead device. A viewer is also required so that the consumer is able to interact with the product during the buying process.

Deciding between still and 360 product images

Should you invest your time and money in still images, 360 images or a combination of both? Only you can answer this question. There are many factors to this decision including budget, product mix, competition, and customer requirements. It is not uncommon for companies to have still images for the majority of their products and 360s for featured or top selling products. A good approach is to pick a few top selling products; create both stills and 360 images for these products and test which sells more. Compare the sales increase of the 360 products to the cost of creating 360s to determine if you will achieve a ROI for 360s.

The benefits to 360 product images

360 degree product photography is more complex and costly than still product photography. So why consider it an option for your product marketing? There are three strong reasons to consider 360 product photography:

1. **Sell more product:** 360 product images allow the consumer to see detailed product features from all sides and up close. It is almost a tactile buying experience. It provides the online buyer the opportunity to determine whether the product is what they want to buy or not.
2. **Reduce product returns:** Product returns in many industries represent a massive cost – to the point where a small reduction in returns can represent tens of thousands in cost savings. 360 product images allow the consumer to view the product in detail and to ensure they are buying the right product – this leads to reduced return volume and costs.
3. **Beat the competition:** Competition is fierce and any advantage is welcomed. Ecommerce is commonly characterized by side-by-side sales. For example, if you manufacturer brake pads, your products will be displayed on your customer's ecommerce site beside your competitors. If your products have 360 degree images and your competitors do not, you have a better chance to close the sale.

It is important to note that not all products are a good fit for 360 product photography. For example, if you sell products that look similar from all angles (i.e. bushings), providing your customers with interactive 360 product images would not be worth the investment. On the other hand, if your products have important features on all sides (i.e. alternators), 360 product photography would be a good fit.

Determining the number of frames in your 360 product images

How many images are best – 8, 16, 24, 36, 72, 144, more? Here are a few factors to consider:

1. **Product category:** If your products are simple and do not have many features on the various sides, a 360 with fewer images, say 16, would work fine. On the other hand, if your products are complex with many features on all sides, a 360 with more images would be better.
2. **Rotating smoothness:** The more images in a 360 the smoother the product rotates. For example, a 360 with 72 images will rotate much smoother on the screen than the 360 image with 24 image frames. The number of frames depends on your industry, product lines, and how you want your products to display online.
3. **360 image load times:** An individual image in a 360 can be anywhere from 60 and 100kbs (and these images would have been downsized). Before the consumer can pan and zoom around the 360 all image frames must load in the viewer. Naturally, if you have 24 images your load time is much less than if you have 72 images. Consider your customer experience with the load times.
4. **Budget:** Whether you do 360 product photography in-house or you hire a service provider, more images increase cost. This is especially true if the images require postproduction work to remove backgrounds.
5. **Industry best practices (trading partner expectations):** Before you start photography check with your trading partners to determine if they have a minimum requirement for image frames for 3D / 360 product images.
 - In the case of the Automotive Aftermarket, after extensive Workgroup discussions, the consensus of the receivers involved in the Workgroup was that 24 image frames was the acceptable minimum for 3D / 360 product images. Check with your trading partners to confirm.

3D / 360 product photography equipment required

360 product photography requires most of the same equipment as still photography with the addition of some specialized equipment and software. Below is a high-level equipment list:

- Camera and camera stand
- Strobe or continuous lights with stands (3 or 4)
- 360 product turntable – for products that lay on a table
- 360 product suspension – for products that must be suspended or hung
- Swing arm if you are doing 3D images (more than one plane)
- Laptop
- Image Production Management software
- Software that operates the 360 equipment
- Software for image editing – i.e. Lightroom, Photoshop

360 product image viewers – an overview

If you are considering adding 360 product images to your marketing it is important to understand what a 360 product viewer is, how it works, and how it displays images on your website. This document addresses 7 common 360 product viewer questions:

1. What is a 360 product viewer and how does it work?
2. What steps are involved in publishing 360 product images?
3. What should I consider when selecting a viewer?
4. What are the different types of viewers?
5. How do I format images to play in a viewer?
6. How do I install a viewer on my website?

1. What is a 360 product viewer and how does it work?

A 360 product viewer is a software application that plays in a browser. The HTML code on the webpage loads the viewer and the viewer loads the product images. Both the viewer and the images reside on the web server. The consumer can interact with the product according to the viewer's built-in functionality. Common viewer functionality includes rotating the product on one or more planes, zooming in to areas for more detail, and clicking on hot spots to display additional images or textual content.

Let's look at this definition in more detail:

- **A software application that plays in a browser:** Most 360 product viewer applications are built using Adobe Flash. Most browsers have the ability to run an Adobe Flash plugin that will play Flash-based viewer applications.
- **Viewer application and images reside on the web server:** The 360 product viewer application and the product images reside on the server where the website is hosted. When a website visitor arrives at a page, the HTML code initiates the viewer and the viewer will display the product images.

A 360 product image consists of a series of sequentially numbered still product images (image 1, image 2, image 3... image 72). These images are captured using specialized 360 product photography software and equipment. Once edited, these product images are uploaded to a folder on the web server. When the webpage loads, the viewer loads the image files and displays them to the visitor allowing the visitor to interact with the images according to the viewer's functionality – pan, zoom, rotate etc.

- **Viewer functionality and visitor interaction:** Once the images are loaded, the viewer controls what the visitor can do with the images. Common features include panning around and zooming into the product, rotating the product with toolbar controls or using a mouse, and drilling into hot spots, which, when clicked, can display detailed still images or textual content. Viewers can also be customized to control some of these functions such as maximum zoom, toolbar position, and rotation on initial loading.

2. What steps are involved in publishing 360 product images?

These are the main step in the process of capturing, formatting and publishing 360 product images:

1. Capture images using 360 product photography software and equipment.

2. Edit images according to your quality standards e.g. removing shadows, cleaning backgrounds, and cropping.
3. Format 2 sets of images for the viewer, a low resolution set that displays in the viewer when it first loads on the web page, and a high resolution set that the viewer uses when the visitor zooms into the product to view close-up details. A second set of images may not be necessary although in most situations it is recommended when considering load times.

3. What should I consider when selecting a viewer?

There are 3 main considerations when choosing a 360 product viewer – functionality, customization and device compatibility.

- **Functionality:** When you evaluate 360 product viewers think about the functionality you wish to provide viewers as they interact with your 360 product images. Below are some examples of viewer functionality:
 - Toolbar controls for play, pause, rotate left, rotate right, zoom, full screen, pan, and 3D rotate (if your products were photographed on more than one axis).
 - Mouse controls to rotate, zoom, and pan.
 - Hot spots in specific locations on the images – when you hover over or click the hotspots images or text appears, the text can be formatted and include hyperlinks.
- **Customization:** Consider how customizable you want the viewer to be. Depending on the viewer, you may be able to customize the following functions:
 - **Height and width** – height and width of the viewer on the web page.
 - **Buttons toolbar** – align the buttons on the toolbar to the left, right or center.
 - **Multiple image sets** – include both low and high resolution images for the viewer to access. When a 360 image is initially displayed on a web page, lower resolution images are shown in the viewer. If you want to provide your visitors the ability to zoom deeply into the images (e.g. 600%) without losing image quality then you will want to include a set of high resolution images that the viewer will switch to when the visitor zooms.

- **Hot spots** – specify where the hot spots are positioned on the product, what content is displayed when the hotspot is hovered over or clicked (text or image) and how the text is displayed (HTML is used to customize the text appearance).
 - **Skins** – select different skins for the viewer to match the look and feel of your website and brand e.g. toolbar color, border color.
 - **Maximum zoom** – control the percentage that the visitor can zoom into the product (you do this to ensure that the visitor is not able to zoom to a point where image quality is compromised).
 - **Rotation** – customizations include how fast the product rotates, whether the product rotates when the webpage first loads, if so how many rotations, and what direction it rotates.
- **Device compatibility:** It is important to consider the viewer's compatibility with various browsers and devices. The goal is to have your 360 product images play regardless of the browser or device your visitors use. If the viewer is a Flash only viewer it will play on most but not all browsers and will not play on iOS devices like iPhones and iPads. Viewers that are Flash with HTML / JavaScript support will play on all Flash browsers and devices and on iOS devices with limited functionality. Viewers that are Flash with full HTML5 / JavaScript support will play on all Flash browsers and devices and on iOS devices with additional functionality.

4. What are the different types of viewers?

There are 4 types of viewers to choose from:

- **Flash Only** – The majority of viewers are built in Adobe Flash. There are two main reasons for this 1) Flash allows developers to create feature-rich viewers, and 2) the majority of browsers support the Flash plugin and can play Flash applications. However, Flash does not play on iOS devices - iPhones and iPads. As the use of these devices increases the potential number of visitors unable to view your 360 images increase.
- **Flash and HTML / HTML5 / JavaScript** – Most Flash viewers today are not Flash only viewers, they offer at least some support for HTML and HTML5. If the browser or device does not play Flash the viewer will fall back to HTML or HTML5 to play the viewer in a limited capacity and display the 360 images.

- **HTML5 / JavaScript** – There are some viewers that are built using HTML5 and JavaScript only. There are a few key advantages to HTML5, 1) it is much faster than Flash, and 2) the future promise that all devices will support it and it will be feature-rich. The downside to HTML5 is the fact that at this point the standard is not fully defined nor is it universally accepted.
- **HTML / JavaScript** – The most basic viewers are straight HTML / JavaScript viewers. The big advantage is that these viewers will play in any browser and on any device. The disadvantages include speed (they are slow) and limited functionality.

5. How do I format images to play in a viewer?

When you format your product images there are 4 factors to consider:

- **Image Quality setting** – When you save images using Photoshop you can set the image ‘Quality’ to low, medium, high, very high, and maximum. Images saved with a higher Quality setting will have more data and will therefore be sharper and clearer when the visitor zooms into the image.
- **Image file size** – The size of an image (in KBs or MBs) is affected by several factors including 1) image Quality setting, the height and width of the image, 2) the height and width of the images, and 3) the file format (JPEG, PNG, TIF). Consider these factors when you format your images to play in your viewer. The table below illustrates the effect of the image Quality setting on a JPG image, 500 pixels by 500 pixels.

 Shoe-Maximum-Image-Quality	JPG File	115 KB
 Shoe-High-Image-Quality	JPG File	50 KB
 Shoe-Medium-Image-Quality	JPG File	39 KB
 Shoe-Low-Image-Quality	JPG File	36 KB

The image was formatted at the 4 image Quality settings – maximum (115 KB), high (50 KB), medium (39 KB) and low (36 KB). You can see that the image formatted at medium quality – which is fine quality for the web – is 34% of the size of the image formatted at maximum quality.

- **Zoom** – If you want your visitors to zoom deep into your products you should format two sets of images:

- **Low resolution images** – The first set of images should be formatted to match the height and width that your viewer will be displayed on your web page. For example, if your viewer is 500 pixels square then you should format your images at 500 pixels x 500 pixels. It is also best to format your images at medium Quality as the file size is small (loads quickly) and the image quality is fine for the web. Low resolution images load in the viewer when the web page loads. ○
- **High resolution images** – The second set of images should be formatted at a size equal to the percentage you want your visitors to zoom to, multiplied by the height and width of the low resolution images. For example, if you want your visitors to be able to zoom 600% and your low resolution images are 500 pixels x 500 pixels, your high resolution images should be 3,000 pixels x 3,000 pixels (6 times the height and width of the low resolution images). Now your visitors will be able to zoom into the images up to 600% with no loss in quality. In most viewers the high resolution images load into the viewer in the background after the low resolution images have loaded. This minimizes the time it takes to display the zoomed images.
- **Number of images** – The number of images in your 360 has a big effect on how you format your images for the viewer. For example, if you have a 24-image 360, the total file size of your low resolution images formatted at high quality would be just over 1 MB (assuming 500 x 500 images at 50 KB per image). At this total file size the delay for the visitor to view the images would be minimal. If you have 72 high quality images the total size of the images that need to load is over 3.5 MBs, even on a fast connection the visitor will be waiting for the images to load. In this case you may consider formatting your images at low or medium quality in order to reduce the time your visitor is waiting to view the images.

Formatting 3D / 360 Product Images

There are many things to consider when formatting your 3D / 360 product images for distribution to your trading partners including the factors that affect file size, file type, and naming conventions.

Factors Affecting Image Size and Quality

Because a 3D / 360 product image is a series of still images – anywhere from 16 to 144 or more – the total file size can get large. Adjusting the image dimensions and the quality setting will lower the individual image frame and overall container file size.

Image dimensions

This refers to the height and width, in pixels, of the individual image frames. When you photograph a product using a 360 photography system you crop the image frames as a set directly after photography. You do this using the software that came with your 360 product photography system or using image manipulation software like Lightroom or Capture One.

When you crop the images make sure that you crop them 1) as a set, and 2) with generous white space (i.e. 20 pixels) around the product in the images. You do this to ensure that when the images rotate in the viewer all image frames have enough white space around them.

You now have a master set of individual image frames that make up the 360 product image. Each image frame may be over 3,000 x 2,000 pixels depending on the resolution of your camera and over 5MB each. That means that the 360 product image set could be over 100mb. Changing the dimensions of the image frames will make a big difference in the files size. For example, if you resize your images to 1,500 x 1,000 your file size could decrease by 70%.

Image quality

The second factor that impacts the image frame file size is the quality setting. This is a setting in Photoshop that allows you to save images with a Maximum, Very High, High, Medium, and Low Quality setting.

The quality setting can be lowered without losing perceptible image quality until you go to Medium or below. Downgrading the quality setting from Maximum to High will lower the file size by 70% with no perceptible decrease in image quality. Image dimensions / image quality comparison chart

The table below illustrates how the various image dimensions and Quality settings affect the size of a zip file containing 24 image frames.

	Image Size 4,928 x 3,264 pixels	Image Size 2,464 x 1,632 pixels
Image Quality Setting	Estimated Zip File	Estimated Zip File
Maximum (12)	31.7 MB	9.8 MB
Very High (10)	13.0 MB	4.2 MB
High (8)	10.0 MB	3.0 MB
Medium (6)	7.2 MB	2.2 MB
Low (4)	5.8 MB	1.3 MB

Workgroup Recommendation

When sending 3D / 360 product image sets to your trading partners, the Workgroup recommends the following:

- Do NOT resize the images, send the master image files regardless of how large the file size is. This gives the receiver the option to resize the images according to their needs and / or to publish the 360 images with maximum zoom (resized images limit the percentage of zoom the viewer can allow).
- Do NOT lower the quality setting. When you send your 360 image frames or a container file with the frames (i.e. a zip file) the images should have a quality setting of Maximum (a quality setting of 12 in Photoshop).

Formats

The individual image frames making up the 3D / 360 product image should be formatted as JPGs.

Naming Convention

There is a naming convention for the individual image frames and one for the containers (zip, rar, and 7z). Below are the details. Always check with your trading partner as they may have special naming requirements.

Individual Files

The naming convention for the individual image files is:

[Standard Still Image Part Number] '_' plane (2 digits)(S for southern hemisphere is necessary) '_' frame (3 digits) '.' file extension

- [Standard Still Image Part Number] represents how you would name still images if you are sending them to specific trading partners. Most will require the product number followed by an underscore followed by the image view name. Some receivers will require a prefix in front of the product number followed by an underscore (this could be a manufacturer code). Some receivers will require the image view name replaced with the PIES image view code, i.e. front would be FRO, bottom would be BOT).
 - Check with your trading partner on the standard still image naming convention.

- All separators will be an underscore ‘_’ and not a dash ‘-’.
- The ‘plane’ is a 2-digit number that denotes the plane that the 360 image set refers to:
 - The plane ‘01’ represents the plane on the equator when describing a complete 3D image as a globe with a northern hemisphere (top) and southern hemisphere (bottom).
 - All standard 360 image sets that are not 3D sets (have more than one plane) will have 01 as the ‘plane’ number.
 - A 3D product image set can have multiple planes above the equator – the northern hemisphere – and multiple planes below the equator – the southern hemisphere. It is not necessary to put in N for the northern hemisphere in the file name but if you have any planes in the southern hemisphere you must include an ‘S’ directly after the ‘plane’ number, i.e. 02S for the second plane in the southern hemisphere.
 - If there is no letter directly following the plane number the plane refers to a northern hemisphere 360 only (there is no southern hemisphere).
 - The ‘frame’ is a 3-digit number that denotes the number of the image in the 360 sequence i.e. a frame number 012 refers to the 12th frame in a 360 product image.
- Examples of the naming convention:
 - 12345_01_022.jpg
 - Part number: 12345
 - Plane: first, northern hemisphere
 - Image Frame: 22nd
 - Notes: this is the standard naming convention for a 360 image (if it was a 3D image there would be more than 1 plane)
 - 12345_01S_014.jpg
 - Part number: 12345
 - Plane: first, southern hemisphere
 - Image Frame: 14th

- Notes: because this image file name has an 'S' directly after the plane number this is a 3D image

This naming convention has the following benefits:

- It can be easily modified by the receiver to match their system and image viewer requirements.
- 3D / 360 product image creators will be able to name their files according to this naming convention without any issues.
- 360 image viewers will be able to play the images without renaming them.

Container Files

3D / 360 product image creators will often send these files in a container. There are 3 options for containers – zip, rar, and 7z files. When sending 3D / 360 image file sets in a container file use the following naming convention:

[Standard Still Image Part Number] '_' [Image Orientation View]'. ' file extension

- [Standard Still Image Part Number] – see the individual file naming convention section above.
- All separators will be an underscore '_' and not a dash '-'.
- [Image View Orientation] will be '360' as that is the image view name.
- Example of the naming convention:
 - 12345_360.zip
 - Part number: 12345
 - Image view orientation: 360

Distributing 3D / 360 Product Images

Because the receivers have their own 360 image viewer they do not need all the associated viewer files. Only send the individual image frames one-by-one or in a container (i.e. zip file). If you are sending the image frames in a container file do not include any other files in the container, only the images. The receivers will reformat the files according to their needs i.e. rename them to a unique internal naming structure, create a second low resolution image set. The files can be sent via FTP, which is the preferred

method, but if firewall issues exist and FTP does not work, send the files on a physical media such as a hard drive.

Appendix A: Mission Statement

The mission of the Auto Care Digital Asset Workgroup is to establish a comprehensive set of Best Practices and Industry Guidelines for digital asset creation, formatting, management and supply chain distribution in the Automotive Aftermarket. To carry out the mission, the Workgroup's membership includes; 'motor and equipment' and 'specialty equipment' manufacturers, retailers, distributors, and electronic catalog and software solution providers.

The Digital Asset Workgroup will function as a workgroup of the Auto Care Technology Standards and Solutions Committee. The resulting standards and best practices will be published as an open standard by the Auto Care. The Auto Care will publish and promote the use of these standards and best practices for the benefit of the members of Auto Care as well as other trade associations.

The goals of the Workgroup include:

- Digital Asset Best Practices Guideline Development: to create imaging best practices and guidelines satisfying the present and future requirements of the Automotive Aftermarket in the following areas;
 - Image specifications including image; quality, views, background, format, resolution, mode, size, compression, and naming convention.
 - Image distribution to supply chain trading partners.
 - Image update procedures for new product introductions and distribution to supply chain trading partners.
 - Image use in print, electronic and other marketing purposes.
- Advisement: make recommendations regarding the adoption of these Best Practices and Guidelines by trading partners within the Automotive Aftermarket.
- Communication:
 - The Digital Asset Workgroup will share and report the 'Best Practices' for image format, management and distribution with members of related committees and associations.
 - Share information in a supportive, collaborative manner with other Workgroup members.
 - Value input from all Workgroup members in a fair and equitable manner.

Appendix B: Best Practices Guideline vs. Industry Standard

This document represents a 'Best Practice Guideline' for image capture, management and distribution in the Automotive Aftermarket. At the outset of the Imaging Workgroup process, members decided that developing a 'Best Practices Guideline' would be a better approach than developing a 'Standards' document. Best practices has the benefit of providing recommendations for the most important imaging issues facing the automotive aftermarket without mandating a firm standard that must be followed by all trading partners. The automotive aftermarket is a large, diverse industry; establishing a set of firm standards for trading images that must be followed by all supply chain participants would may overly restrict some parties. The Best Practices approach provides recommendations for imaging related issues while also providing the flexibility to accommodate diverse product lines and unique trading partner circumstances.

The workgroup has decided on the 'Best Practices' approach for the following reasons:

- **De Facto Standard:** This Best Practices Guideline document has gone through a thorough, collaborative discussion process by a diverse group of retailers, manufacturers, and electronic catalog and solution providers. If, in time, the guideline's recommendations prove to be efficient for image capture, management and distribution within the Automotive Aftermarket it should become a de facto standard adopted by all trading partners.
- **Trading Partner Negotiation:** Due to the diverse nature of product lines in the Automotive Aftermarket, efficient trading of part images requires flexibility for negotiations between trading partners. For example, if a manufacturer of a particular product line is not able to meet one or two of the 'Image Specifications' requirements outlined in this document they would have the flexibility to discuss possible alternatives and approaches with their trading partners.
- **Product Line Uniqueness:** The Automotive Aftermarket includes light, medium and heavy duty motor and equipment parts and specialty equipment and performance parts. For the management and trading of part images to work efficiently in a vast and diverse industry there has to be flexibility in the requirements and approach. The 'Best Practices' approach provides this flexibility.

Appendix C: Supply Chain Participant Responsibilities

To facilitate the efficient creation and distribution of images throughout the Automotive Aftermarket supply chain, this Best Practices Guideline has defined the responsibilities of the supply chain participants.

The ‘creator’ of the digital asset;

- The creator of the images is typically the manufacturer.
- They are responsible for creating and formatting their images according to one image specification accepted by all supply chain trading partners. This image specification is detailed in this document.
- They are responsible for formatting and including a ‘Digital Asset Data Delivery’ file when they deliver their images to trading partners. This ‘Digital Asset Data Delivery’ file is detailed in this document.

The ‘receiver’ of the images;

- The receiver of the images is typically the retailer or electronic catalog provider.
- They will receive the images from the image creators formatted according to the image specifications detailed in this document.
- They will accept the ‘Digital Asset Data Delivery’ file as detailed in this document.
- Once they have received the images they can format them according to their unique standards and purposes of use.

Appendix D: Product Image Capture and Formatting

Image Capture

There are many effective methods used to capture high-quality part images. Because there is no 'right' way to capture high-quality images, this document does not provide specific recommendations on image capture equipment, techniques and methods. The following section presents information on the advantages and disadvantages of image capture formats and sizes.

Image Format

Most digital cameras allow for capture in JPEG and TIFF format and many of the newer cameras also include RAW format. Below is a brief description of each format and the advantages and disadvantages of each mode.

JPEG

This is the most popular mode used for image capture. JPEG format has the smallest file sizes out of the camera and high quality images that can be used for electronic and print purposes. Although, when a JPEG is saved by the camera and manipulated and saved at a later time an undetermined amount of data is permanently lost.

Capturing images in JPEG format has the following *advantages*:

- Small file size allows for maximum images to be stored on the camera's drive
- Universal compatibility
- High quality images
- Saves quickly on camera drive
- Images are ready to be used for electronic purposes
- Ready for image processing
- Does not require conversion software to be used; it can be used immediately straight out of the camera

Capturing images in JPEG format has the following *disadvantages*:

- Due to the 'lossy' format of JPEG, image data is permanently discarded when compression is used
- Opening, manipulating and saving a JPEG image file causes permanent data loss
- Due to camera manipulation upon capture, JPEG quality can be lower than that of TIFF and RAW

TIFF

Most digital cameras have the option to save images in TIFF mode. When you capture images in TIFF mode you lose very little, if any, image data, the image quality is very high but the file size limits the numbers of images you can capture at one time and the camera's processing time for each image can be high.

Capturing images in TIFF format has the following *advantages*:

- Very high image quality
- Compatibility with the print industry
- Due to TIFF's 'lossless' format, it will not lose any image data when compressed using LZW
- There is no image data loss when the image is manipulated and saved
- The image does not require conversion software to be used; it can be used immediately straight out of the camera

Capturing images in TIFF format has the following *disadvantages*:

- Large file size minimizes the number of images that can be stored on the camera's drive
- The large file size out of the camera makes transfer times and storage requirements a consideration
- Takes longer to process in the camera than with a JPEG

RAW

Most high-end and newer cameras offer the option to capture images in RAW format. As the name suggests, images captured in RAW format are unaltered by the camera in any way. These images are in their purest form; the camera does not process the image as it is captured. RAW format is not an

established format, each camera manufacturer has a proprietary RAW format, and the image file sizes can be very large.

Capturing images in RAW format has the following *advantages*:

- The image file is unprocessed by the camera with no image data manipulation or loss
- The highest quality images when compared to JPEG and TIFF
- Maintain control over the final image quality; the camera does not do any image processing

Capturing images in RAW format has the following *disadvantages*:

- The image file must be converted prior to printing
- Image manipulation software must be used to convert the image into a compatible format i.e. TIFF. Adobe Photoshop, above 7.01, has this capability
- The large file size out of the camera makes transfer times and store requirements a consideration
- There is no standard for RAW image format; each camera OEM has their own proprietary RAW format

Image Format: Conclusion

The choice for image format is subjective and depends on the camera equipment and the end use of the image. If the priority is image quality and file size and compatibility are less important than RAW format would be the best choice, with TIFF a close second. If the camera does not support RAW format and/or the priorities are download speed, file size, and compatibility then JPEG is the best choice. Because TIFF image files can be manipulated without losing data, a good approach is to capture the image in JPEG format and convert it immediately to TIFF before any image manipulation is done. By doing this, the highest image quality will be retained.

Appendix E: Acceptable Part Image View Definition

An acceptable image view of a part is an image view that displays the key physical characteristics of the part from the perspective of the persons who are viewing the image. The persons viewing the image should be able to clearly identify and determine that this image represents the right part satisfying their need and application. Specifically, an acceptable part image view should meet the following conditions;

1. **Key Part Features:** The image view or views of the part should clearly display the important features and physical attributes of the part or parts.
2. **Part Connectors:** If the part has connectors and these connectors are important for the viewer of the image to accurately determine whether the image represents the part they require, these connectors should be imaged at an angle offering the user a definitive view of the connectors so that they can confirm the image represents the part they require.
3. **Installer / Fitment Views:** Image views of the part should be captured so that an installer can clearly see the features of the part that are important from the perspective of installing the part on a make / model / year vehicle.

Below are several examples of parts and their image views as well as descriptions of why these image views are important. This will help illustrate an acceptable image view.

Part Example #1: Radiator

Image Style	Image View	Part Attribute Highlighted
Photo - Primary	Front	Offers the viewer a full, wide angle straight-on view of the entire radiator positioned with the hose connector side up.
Photo - Close Up	Left	Offers the viewer a close-up view showing one side of the radiator cooler tank with the hose connector side up.
Photo - Close Up	Right	Offers the viewer a close-up view showing the other side of the radiator cooler tank with the hose connector side up.
Photo - Close Up	Top	Offers the viewer a close-up view showing the upper hose connector.
Photo - Close Up	Bottom	Offers the viewer a close-up view showing the lower hose connector.
Photo - Close Up	Angle	Offers the viewer a close-up 3/4 angled view showing the opening of the fill neck.

Photo - Out of package	Angle	Offers the viewer a close-up 3/4 angled view showing the opening of the drain.
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Part Example #2: Compressor

Image Style	Image View	Part Attribute Highlighted
Photo - Primary	Top	Offers the viewer a full wide 3/4 side / top view showing the entire compressor.
Photo - Out of package	Connector	Offers the viewer a close-up view showing the terminals and indexing tabs of the electrical connector.
Photo - Close Up	Connector	Offers the viewer a close-up view showing the hose connection ports.
Photo - Close Up	Back	Offers the viewer a close-up view showing the back of the compressor with any mounting area details.
Photo - Close Up	Front	Offers the viewer a close-up front view slightly angled showing the front of the compressor with mounting area details.
Photo - Close Up	Side	Offers the viewer a close-up view showing the side of the compressor capturing the pulley groves and any mounting area details.

Part Example #3: Fuel Pump

Image Style	Image View	Part Attribute Highlighted
Photo - Primary	Top	Offers the viewer a full wide 3/4 side / top view showing the entire fuel pump.
Photo - Close Up	Connector	Offers the viewer a close-up view showing the terminals and indexing tabs of the electrical connector.
Photo - Out of package	Connector	Offers the viewer a close-up view showing the fuel line connector.
Photo - Close Up	Top	Offers the viewer a close-up view showing the full top of the part.
Photo - Close Up	Side	Offers the viewer a close-up view showing the full side view of the part.
Photo - Out of package	Kit	Offers a view showing the part with additional component parts included with the package.

Part Example #4: Fuel Injector

Image Style	Image View	Part Attribute Highlighted
Photo - Primary	Top	Offers the viewer a full wide 3/4 side / top view showing the entire fuel injector.
Photo - Close Up	Connector	Offers the viewer a close-up view showing the terminals and indexing tabs of the electrical connector.
Photo - Close Up	Side	Offers the viewer a close-up view showing the full side view of the part.
Photo - Close Up	Top	Offers the viewer a close-up view showing the top inlet end of the part.
Photo - Close Up	Bottom	Offers the viewer a close-up view showing the bottom outlet nozzle end of the part.

Part Example #5: Alternator

Image Style	Image View	Part Attribute Highlighted
Photo - Primary	Top	Offers the viewer a full wide 3/4 side / top view showing the entire alternator.
Photo - Close Up	Connector	Offers the viewer a close-up view showing the terminals and indexing tabs of the electrical connector.
Photo - Close Up	Front	Offers the viewer a close-up front view slightly angled showing the front of the part with mounting area details.
Photo - Close Up	Back	Offers the viewer a close-up view showing the rear of the part with mounting area details.
Photo - Close Up	Side	Offers the viewer a close-up view showing the side of the part capturing the pulley groves and mounting area details.

Appendix F: Representative Images

A Representative Image is a digital image that is an “exact likeness” of a part number, but it is not captured from the actual part number being described. Thus, to the naked eye, a representative image appears identical to one or more part numbers. The following conditions must be satisfied in order to qualify as a representative image. If any of these conditions are not met, a separate image of each part number is required.

1. **Color:** The color of the part in the representative image must match the color of the actual parts exactly. The exception to this is if the representative image is accompanied by a color swatch. This color swatch can be a separate image file or as part of the representative image file. Text describing the color codes can also be included on the color swatch, positioned below each color i.e. 01 White, 02 Black etc.
2. **Shape:** The shape of the part in the representative image must match the shape of the actual parts exactly.
3. **Material:** The material of the part in the representative image must match the material of the actual parts exactly. The exception to this is if the representative image is accompanied by a material swatch. This material swatch can be a separate image file or as part of the representative image file. Text describing the material codes can also be included on the material swatch below each material sample i.e. 01 Smooth, 02 Ridged etc.
4. **Physical characteristics:** The human eye cannot discern any physical characteristic differences between the representative image and the actual parts.
5. **Labels, stampings and part numbers:** If the labels, stampings and/or part numbers on the part in the representative image match the labels, stampings and/or part numbers of the actual parts exactly then they must not be removed from the representative image. If the color, shape, material and physical characteristics conditions (points 1-4 above) are met and the labels, stampings and/or part numbers on the part in the representative image are different than the labels, stampings and/or part numbers of the actual parts they must be removed from the representative image. Note: only remove the part attributes that are different; for example, if the labels and stampings are the same for all the actual parts that the representative image is representing but the part numbers are different on each actual part, remove only the part numbers from the representative image and do not remove the labels and stampings

Appendix G: Image Processing / Editing

The methods, techniques, and equipment employed when capturing and processing part images are subjective and not within the scope of the Digital Asset Workgroup discussions. The quality of the final image depends on many factors working in unison. Although, the imaging specifications guidelines included in this document will have a positive effect on the overall quality of the image i.e. a white background and the removal of shadows. Image quality depends on;

- The equipment used; camera and lighting
- Environmental control; lighting, product angles, shadows etc.
- Photography techniques

Postproduction image processing; color correction, background, levels etc.

Appendix H: Image Management and Distribution

There are many aspects of image management and distribution that are important to all supply chain participants including;

- Image library management: This includes managing images by part number, trading partner, image views, date images captured, date images delivered, etc.
- Image coverage management: This includes managing images that have and have not been captured and delivered to trading partners.
- Image delivery management: This includes managing when and which images are delivered to trading partners.
- Image delivery procedures: This includes the procedures that retailers and electronic catalog providers establish for delivering images and image related data.
- Supplier approval / reject procedures: This includes the procedures established by trading partners for the approval and rejection of images.
- Image update procedures: This includes the procedures for sending replacement images to trading partners.

Although these issues and procedures are very important, for the most part they are managed between trading partners and therefore not within the scope of the Imaging Workgroup Best Practices Guidelines.

Appendix I: Image Protection, Copyright and Ownership

The issues regarding the protection, copyright and ownership of images as they are traded throughout the supply chain is a concern to both the creator of the images and the trading partner who is using the images. The main area of concern is the use of the images for electronic purposes; online catalogs, Extranets, and e-commerce sites. Images published online are vulnerable to misappropriation. The image creator (the supplier) requires an assurance that their images are being reasonably protected while in use by their trading partners against theft and misuse. The receivers of the images (the retailers and eCat providers) require the flexibility to use the images in various marketing capacities in order to maximize their ability to sell parts. The following are the Workgroup recommendations regarding image protection, copyright and ownership;

- **Image Protection:** This issue involves protecting the creator's images while they are in use by the trading partner for both print and electronic purposes.
 - **Image Watermarks:** The majority of retailers and eCat providers feel that watermarks are a distraction to the viewer of the image and should therefore not be used. Although, in certain cases trading partners will accept watermarked images. It is recommended that before watermarks are applied each trading partner's policy regarding this issue is reviewed.
 - **Intended Image Use:** All retailers and eCat providers are using the images for the purpose of selling more of the right parts to the right customers. The workgroup consensus is that the image receivers will protect the images electronically to the best of their ability and they will discontinue using the images if the image creator no longer supplies the parts that the images represent to the trading partner.
 - **Legal Agreements:** Some retailers and eCat providers are prepared to enter into legal agreements with the image creators addressing the use, protection, and ownership of the images. The image creators should check with their trading partners to discuss possible legal agreements that protect the image creator's asset (the images).
- **Ownership and Copyright:** This issue addresses image copyright and ownership:
 - The issue of copyright and ownership involves determining whether or not the creator of the images owns the copyright to the images after they have been distributed to supply

chain trading partners. In other words, does the copyright of the image transfer to the trading partner or is it retained by the image creator. The Workgroup's viewpoint is that ownership and copyright of the images is a legal issue between trading partners and therefore not within the scope of the Workgroup's discussions. Ultimately the ownership of and right to use an image will be governed by the agreement between the image creator and the trading partner.

Appendix J: Additions, Suggestions and Feedback Process

This document is the result of a collaborative effort between a diverse group of retailers, manufacturers, and electronic catalog and solution providers. Overtime, and as a result of feedback from the industry some of the recommendations in this guideline may be changed and updated. The Imaging Workgroup encourages as much feedback as possible from the Automotive Aftermarket. To provide feedback to the Imaging Workgroup follow the process below;

1. Contact an Imaging Workgroup member or a member of Auto Care's Standards and Technology Committee by writing to technology@aftermarket.org.
2. Explain the issue(s) or make a recommendation(s).
3. The issue(s) or recommendation(s) will be brought up and discussed by the members of the Imaging Workgroup at regularly scheduled meetings.
4. The Imaging Workgroup will make a recommendation(s) which will be included in the next updated version of the Imaging Best Practices Guideline.
5. The recommendation(s) will be published by Auto Care in the latest version of the guideline.

Appendix K: Marketing Copy Use Cases

Market Copy Segment

Definition and Use:

The Market Copy Segment is a new Optional segment of the PIES Standard, intended for use to convey up to 2000 characters of freeform Marketing Copy and/or collateral digital assets, which relate to a company, division of a company, a brand, a sub-brand, a Part Terminology, a Product Category, a Manufacturer-defined Product Group or Sub-Group, or other user-defined categories.

The Market Copy Segment is NOT intended to be used to convey specifics about an item. Itemlevel marketing content is intended to be conveyed in the Description Segment (C01) of the PIES Standard. The Description Segment has provisions for Long Descriptions (Code EXT is 240 characters) and specific Market Copy (Code MKT is 2000 characters in length). Collateral material in respect to an Item is intended to be conveyed in the Digital Assets Segment (P01P99).

SPECIAL NOTE:

While the intent of use of the Market Copy segment is for descriptions and collateral digital assets other than that of the ITEM content, additional ITEM content can be sent to a trading partner using the User Defined Codes (ZZ1-9) described in the Market Copy Code Table in conjunction with the Part Number assigned in B15 of the ITEM Segment. As a best practice, this method should be used ONLY to convey ADDITIONAL Item information.

Example of Use:

The Market Copy Segment has been designed to loop at the root of the PIES structure, to enable the inclusion of multiple content elements in a single PIES file. For example, a manufacturer could include both marketing copy about the Company, and marketing copy about a Brand (using Segment Code A83 and the value “BPR” (Brand Parent) to identify the following record pertains to the Company) Segment Code A85 would be populated with the 4-character Auto Care Parent Brand Code assigned to that Company. The subsequent loop would populate A83 with “BRD” to indicate the following record was a Brand Statement, and Segment Code A85 would be populated with the 4-character Auto Care Brand Code assigned to that Brand.

The same treatment would apply for different Designators and Code combinations. Based upon the A83 and A85 Designator and Code, a receiver will link the Market Copy contained in A87 to the relevant parts, as additional reference information.

Technical Description:

The Market Copy Segment defines the Market Copy Content field (A87), of up-to 2000 characters, at several category levels above the Part Number. The Market Copy Code in field #A83 (see Market Copy Code Table below) defines the level at which the supplier wishes to provide a marketing statement. The Market Copy Reference field contains the supplier-provided code (e.g. the Auto Care Brand ID) that is used by the receiver to link all of that supplier’s Part Numbers to the related Market Copy Content field (A87). The segment “loops” on Market Copy Code, Market Copy Reference and Language Code.

Market Copy Segment Code	Code Description
A81	Maintenance Type
A83	Market Copy Code
A85	Market Copy Reference
A87	Market Copy Content
A89	Language Code

The Market Copy Code Table for field A83 contains the following designators:

Market Copy Code Table (A83)

Code	Code Description	Field # - Market Copy Reference Requirements
BRD	Auto Care Brand	B20 - Auto Care Brand ID Code (4 Char)
BOW	Auto Care Brand Owner	A23 - Auto Care Brand Owner Code (4 Char)
BPR	Auto Care Brand Parent	A13 - Auto Care Brand Parent Code (4 Char)
SBR	Auto Care Sub-Brand	B27 - Auto Care Sub-Brand ID Code (4 Char)
PTI	Auto Care Part Terminology	B64 - Part Terminology ID (4-5 Char)
PGC	Product Group	B60 - Supplier-assigned Major Product Category (10 Char)
PSG	Product Sub-Group	B61- Supplier-assigned Minor Product Category (10 Char)
PCC	Auto Care Product Category	B62 – Product Category Code (6 Char)
ZZ1-9	User Defined Codes	Bnn – Item Segment Applicable Reference for User Defined Code

Digital Asset Sub-Segment of Marketing Copy

The Digital Asset Sub-Segment of Marketing Copy is used to relay information about any media types which support the related Marketing Copy Segment Reference Codes. The available Reference Codes include Auto Care Brand or Sub-Brand, Brand Owner, Parent Company, Auto

Care Part Terminology, Suppliers Product Group or Sub-Group, Auto Care Product Category (NPD) or several User-Defined codes. The Asset Type Table (P10) is used to identify what type of digital asset is being defined. Some of the Asset Type references that could be provided are listed below. The Brochure could introduce a new product group or category, and a PhotoPrimary could represent a product sub-group. The example below indicates the Asset Codes which are MOST LIKELY to be used in the Market Code Segment. For a full list of reference codes, please refer to PIES Technical Documentation “ASST Codes”.

Asset Type Table (P10) Example

Asset Type Table (Partial List) Codes	Description
BRO	Brochure
BUL	Technical Bulletin
LGO	Logo Image
MSD	Material Safety Data Sheet
P03	Photo – lifestyle view
P04	Photo - Primary

M01-M99 Digital Asset Loop (Market Copy Segment)

The Digital Asset Loop of the Market Copy Segment (M01-M99) is an exact replica of the main Digital Asset Loop of the Item Segment. Please refer to Use of the Digital Asset Segment (P01P99) for details, in conjunction with the Imaging Best Practices document, available at www.autocare.org.