Pagemark XPS Viewer Comparison

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Pagemark XPS Viewer Comparison

The following paper is the outcome of Pagemark's internal analysis of XPS viewers currently available on the market. The scope of our analysis includes standard viewer features, rendering output and performance.

Overview

Today there exist a small number of solutions for viewing XPS document. Currently the reference for correct rendering is the Microsoft Viewer based on the .NET 3.0 framework.

It should be noted that Microsoft provides two XPS viewers. The .NET 3.0 viewer and the EP XPS Viewer. The EP Viewer is not based on the .NET 3.0 framework and it can be shown that the EP Viewer significantly differs from the .NET 3.0 Viewer on many XPS documents.

In our analysis we use the Microsoft Viewer (Not the EP Viewer) as the reference for correct rendering of XPS documents.

The following XPS Viewer applications are publically available for download on the internet.

Microsoft XPS Viewer	– Microsoft
Brava Reader! 3.1.0.16	– Informative Graphics
NiXPS Edit v 2.5	– NiXPS
SANAtech XPS Viewer v1.0	– SANAtech
Acrobat 8.1	– Adobe
Software Imaging XPS Viewer	- Software 2000 Ltd

New 5-28-09

gDoc Fusion	- Global Graphics
XPS Show	– Pagemark Technology, Inc.

Feature Comparison

Feature	PM	SI	BRVA	NXPS	SANA	ACRB	GG	MSFT
Single Page Viewer	•	•	•			•	•	
Continuous Page View	•			•	•	•	•	•
Zero Gaps Between Pages	•					•		
2 Up Viewing	•					•		
Thumbnail View	•		•	•	•	•	•	
Fit Page	•	•	•	•		•	•	•
Fit Width	•	•	•	•		•	•	•
Fit Actual Size	•	•	•			•	•	•
Previous / Next View (navigate view history)	•					•	•	•
90 Degree Rotation	•	•	•			•	•	
Zoom	•	•	•	•	•	•	•	•
Hand Tool	•		•	•		•	•	
Zoom to Selection Tool	•		•	•		•		
Dynamic Zoom Tool	•		•			•	•	
Selection Snap Shot	•		•	•		•		
Select Text and Copy to Clipboard	•		•	•		•	•	•
Select All	•			*1		•	•	•
Column Text Selection	•					•	*2	•
Search Text	•			•		•	•	•
Display Document Properties	•						•	•

Note: *1 Feature is present but does not select the text. *2 Selection is not column based but line based.

Rendering Comparison

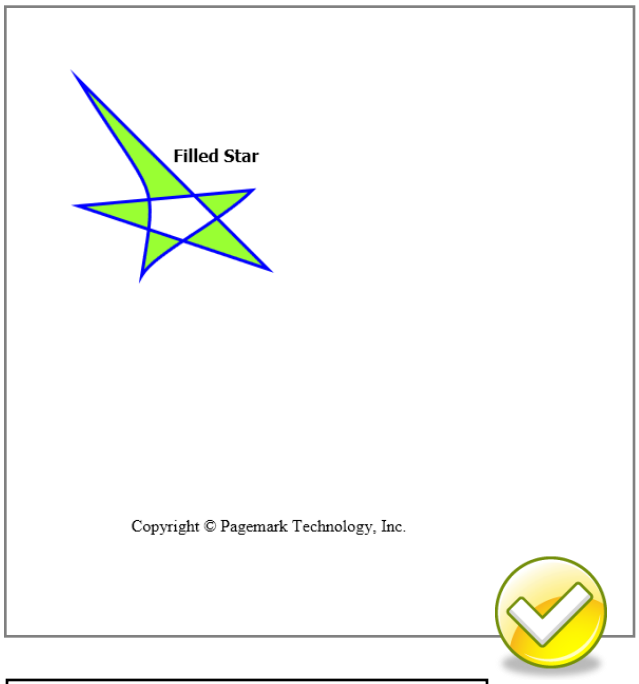
Overview

It should be noted that all viewers compared are capable of viewing at least simple text documents and minimum level of image and vector graphics. Since all of the viewers compared have this in common we chose to test documents that include XPS features that are slightly above the basic level. While these tests include elements that go slightly beyond the basic XPS functionality, they are realistic in that it is very likely many XPS document will utilize the elements found in the documents tested.

New 05-28-09 GhostXPS, Global Graphics, and VeryDoc were added to the rendering comparison.

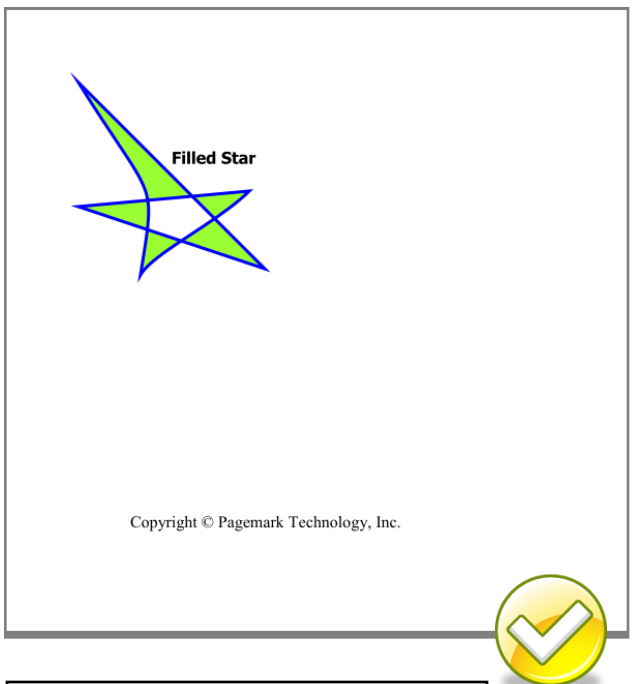
Test	Description
TA0001	PathGeometry – including PolyLineSegments and PolyBezierSegments with Stroke and Fill
TA0002	Canvas that uses a VisualBrush as Opacity Mask
TA0003	Vertically Text
TA0004	Using round End Caps to draw dots
TA0005	ImageBrush as opacity mask
TA0006	Using IsStroked
TA0007	Stroke with multiple Miter style Joints
TA0008	Dashed Lines with Triangle Dash and End Caps
TA0009	Glyph filled with Linear Gradient
TA0010	Stroke with dash offset and round dash caps
TA0011	Paths filled with ImageBrushes tiled with FlipXY, FlipY, FlipY
TA0012	16 Bit TIF Image with an alpha channel

TA0001.XPS



Microsoft Viewer

Pagemark



Software Imaging

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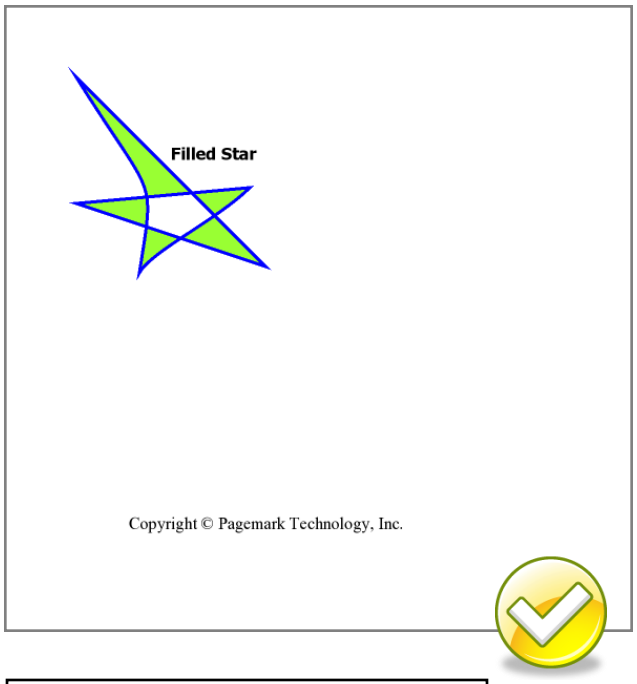
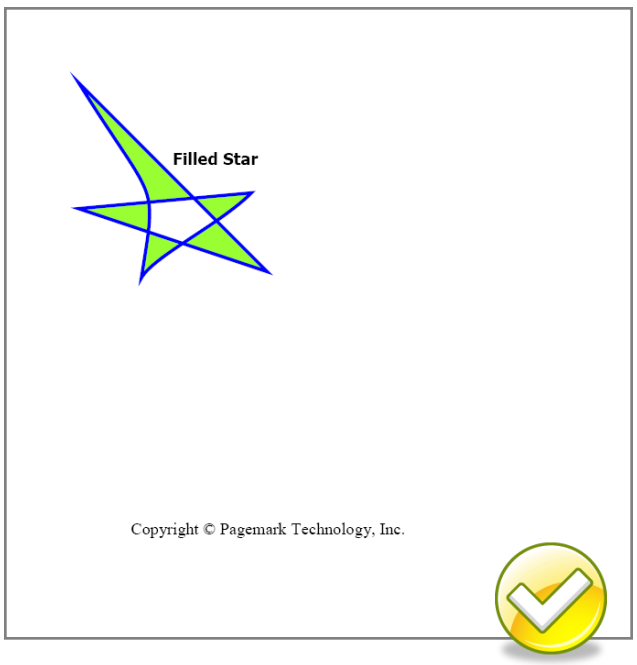
TA0001.XPS



NiXPS Edit

SANATech

Brava! Reader



Acrobat

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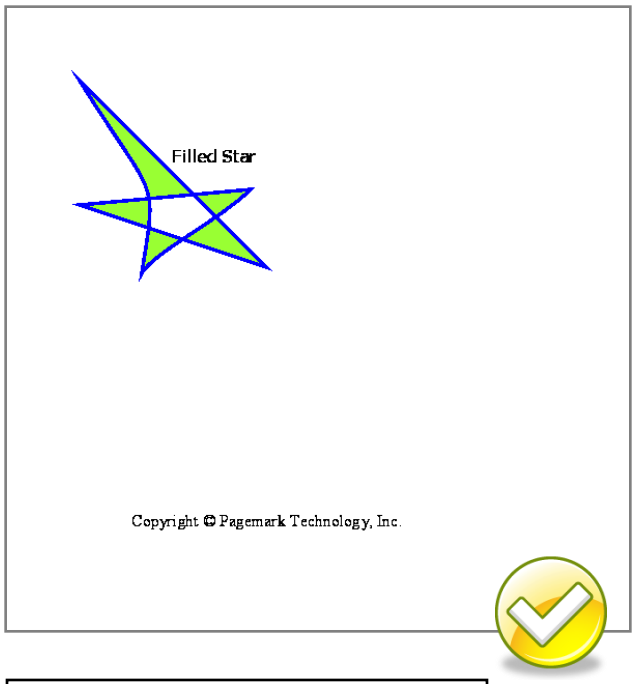
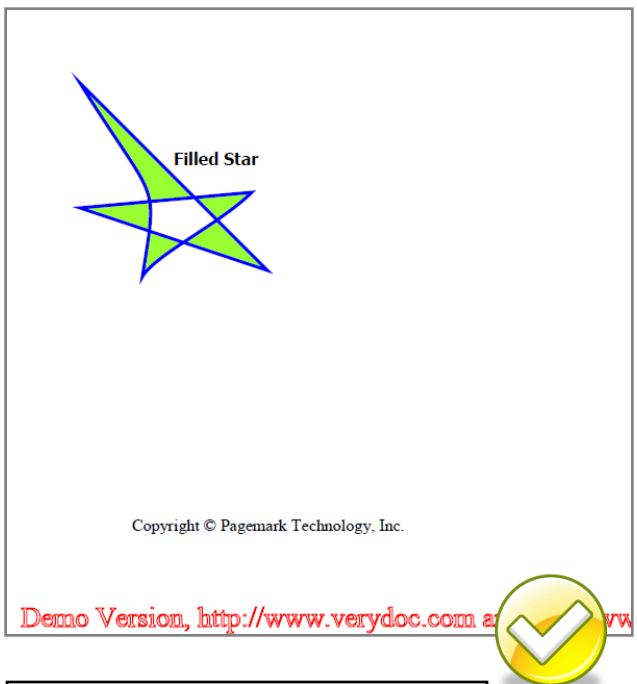
XPS Viewer Comparison

TA0001.XPS



GhostXPS

gDoc Fusion



VeryDoc Xps2Pdf

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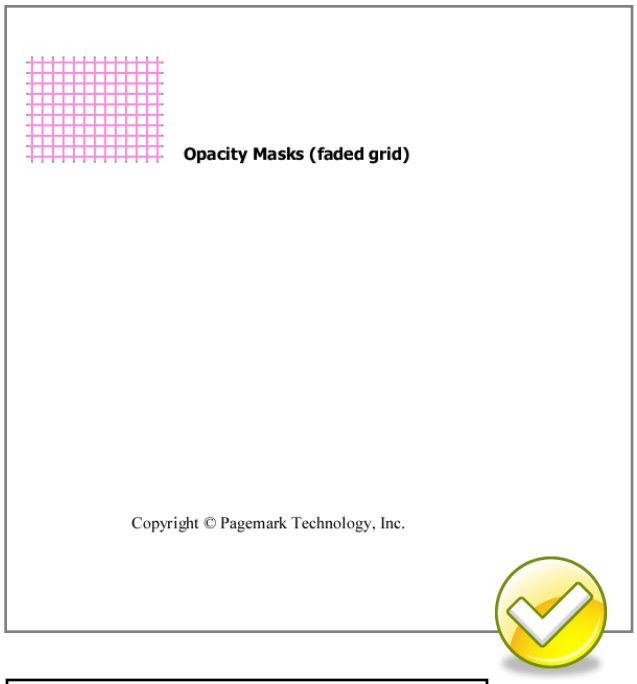
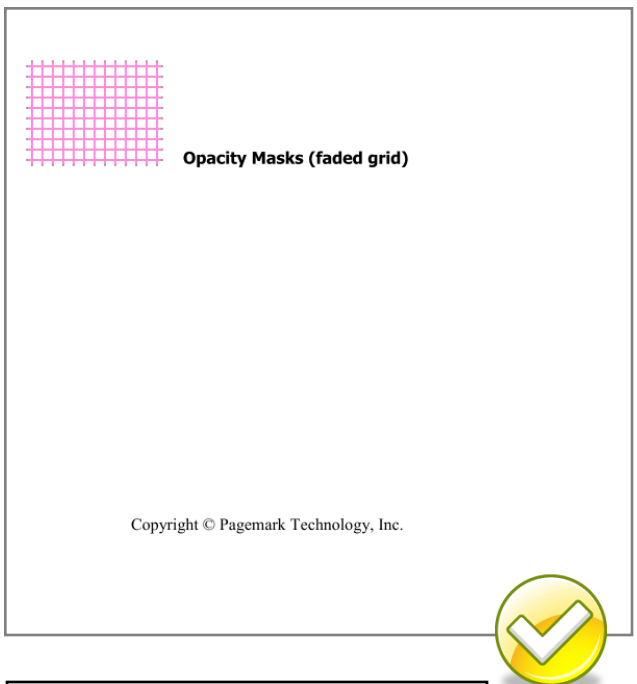
XPS Viewer Comparison

TA0002.XPS

Microsoft Viewer



Pagemark



Software Imaging

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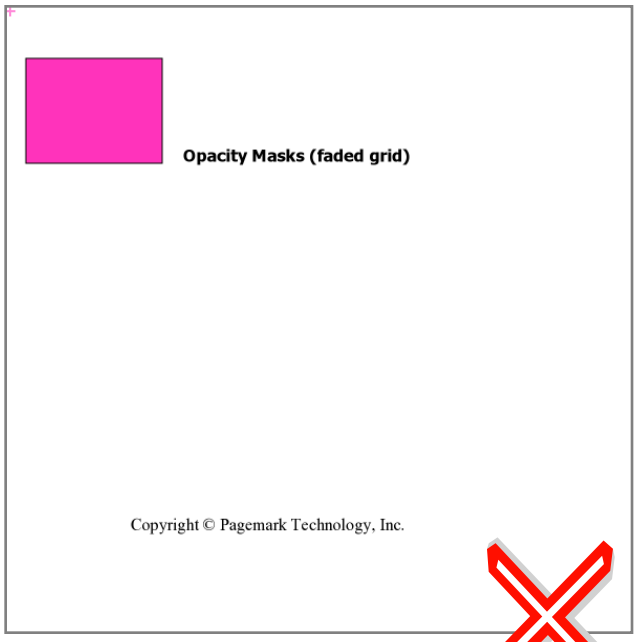
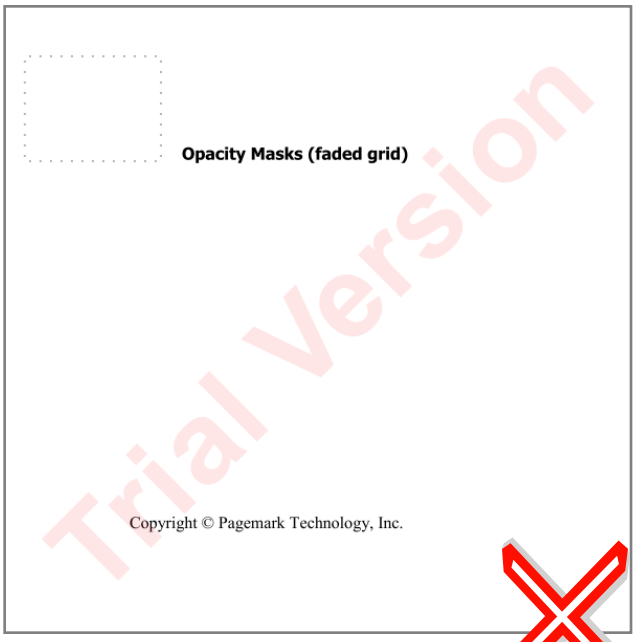
TA0002.XPS

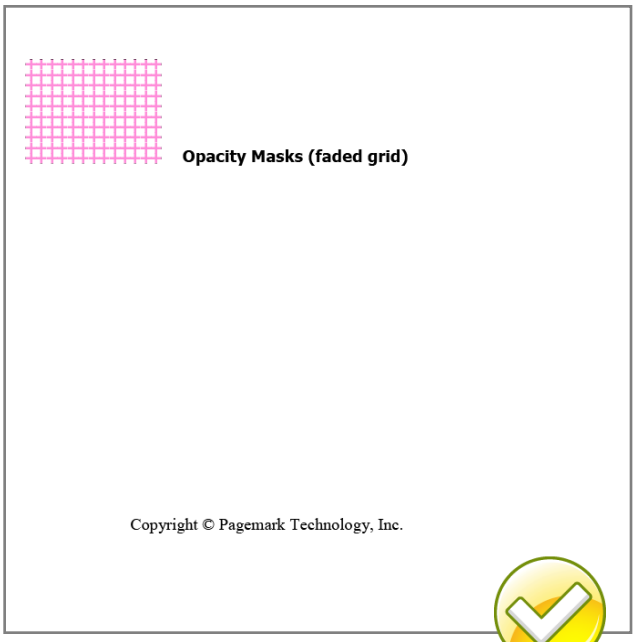


NiXPS



SANATech

Brava! Reader



Acrobat

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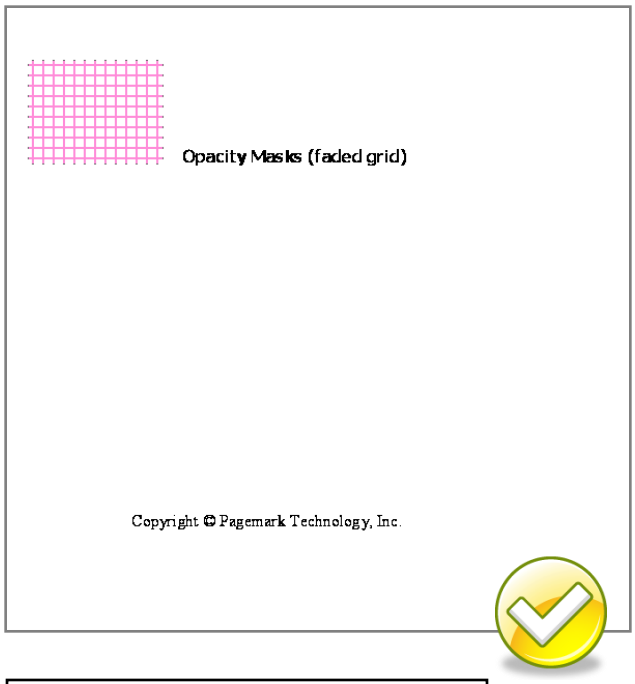
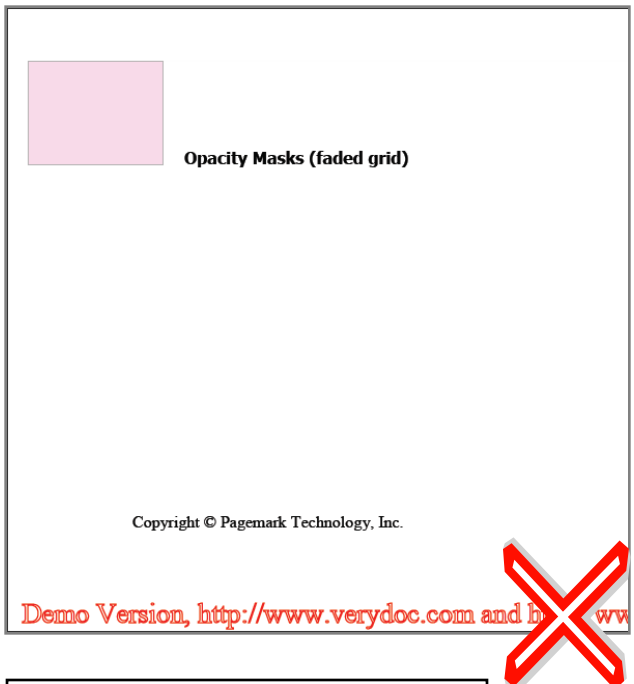
TA0002.XPS



GhostXPS

gDoc Fusion



VeryDoc Xps2Pdf

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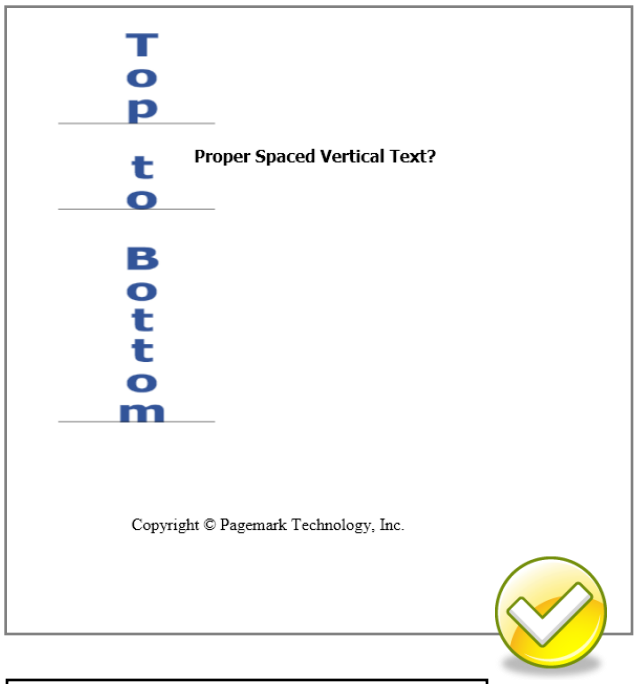
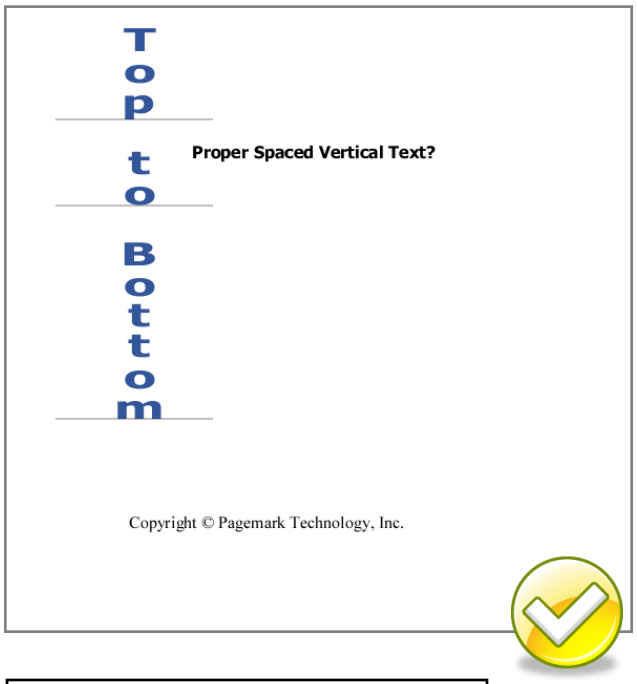
TA0003.XPS



Microsoft Viewer



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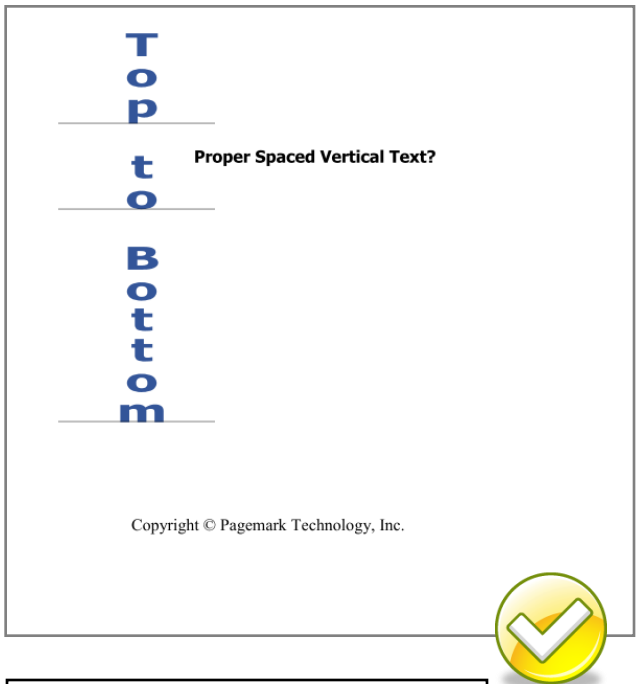

Software Imaging

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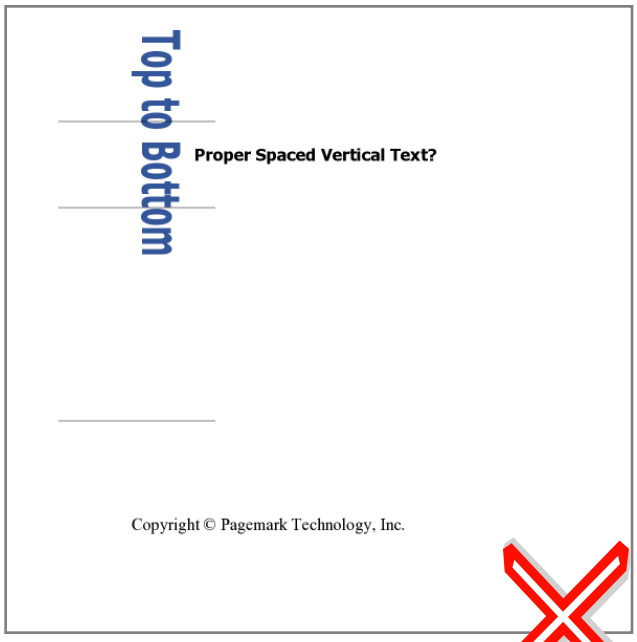
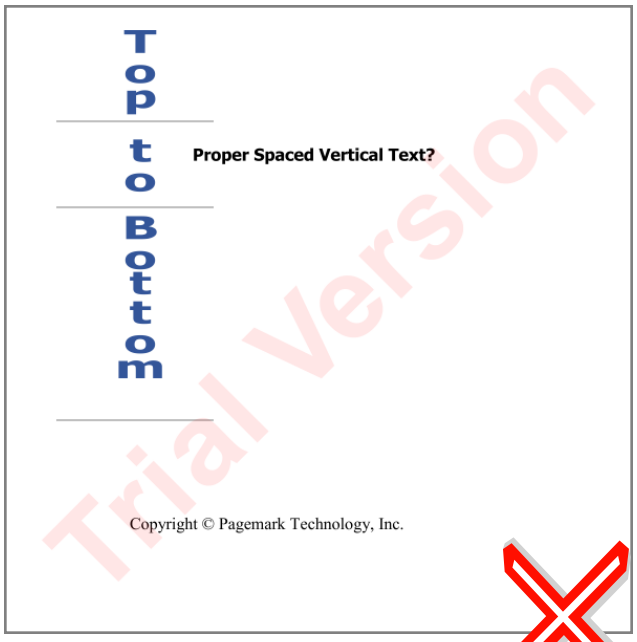
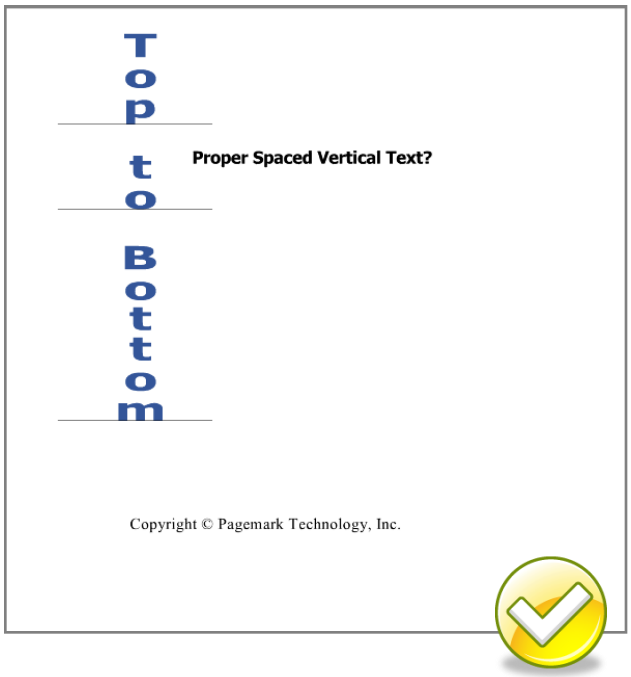
TA0003.XPS



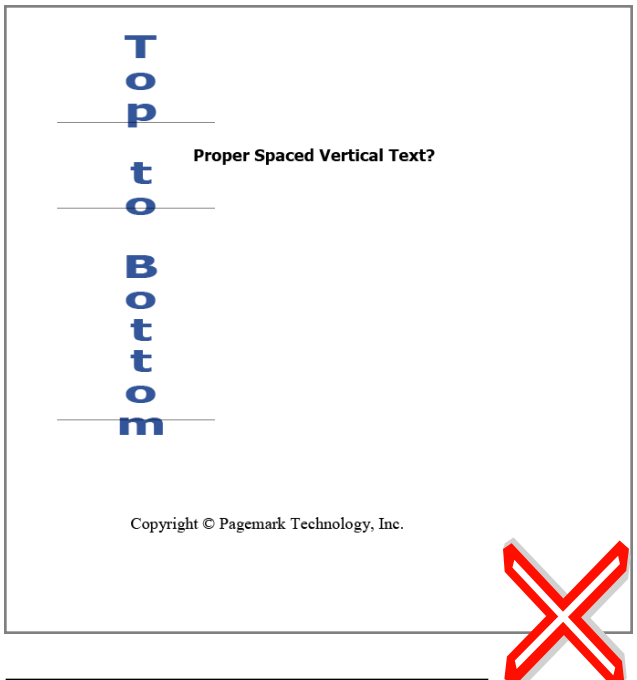
NiXPS



SANATech



Brava! Reader



Acrobat

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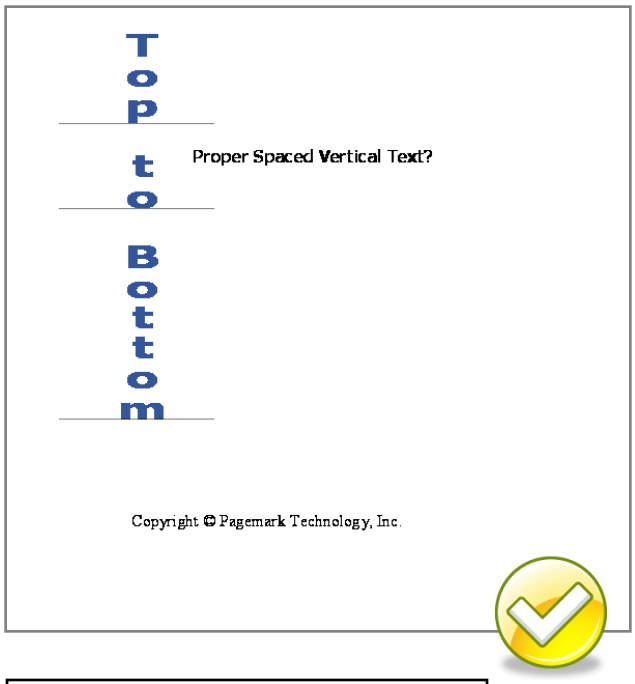
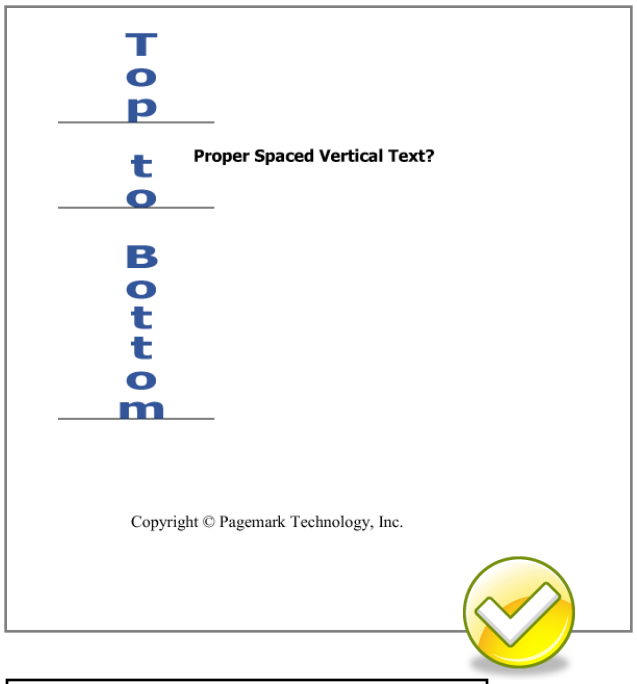
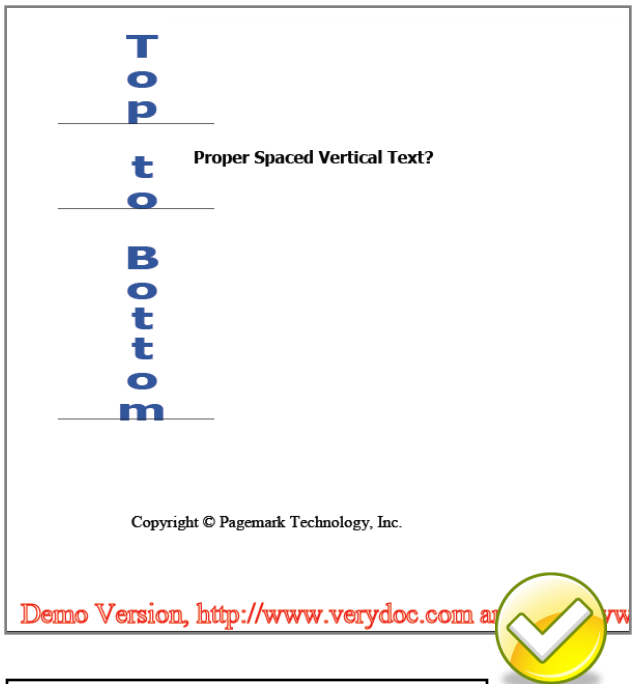
TA0003.XPS



GhostXPS



gDoc Fusion



VeryDoc Xps2Pdf

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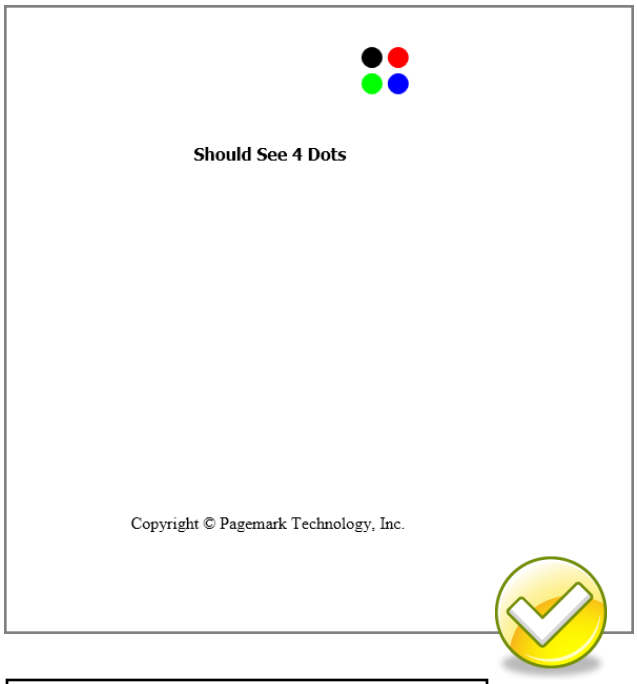
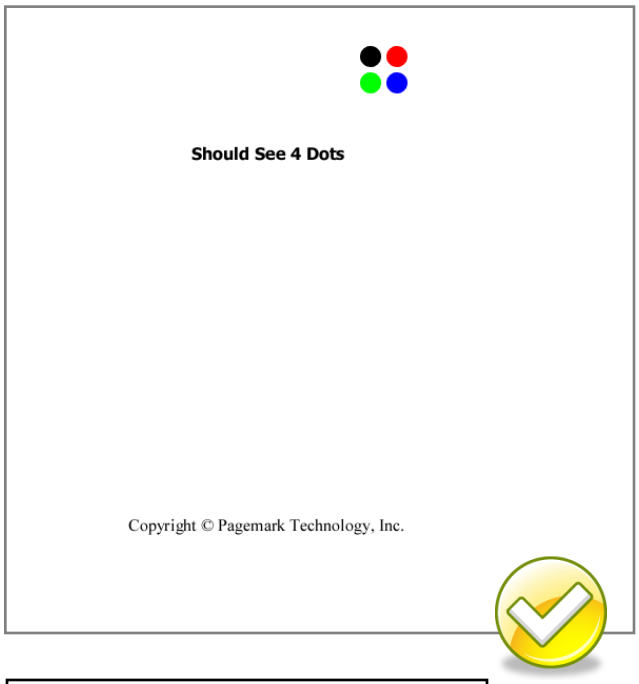
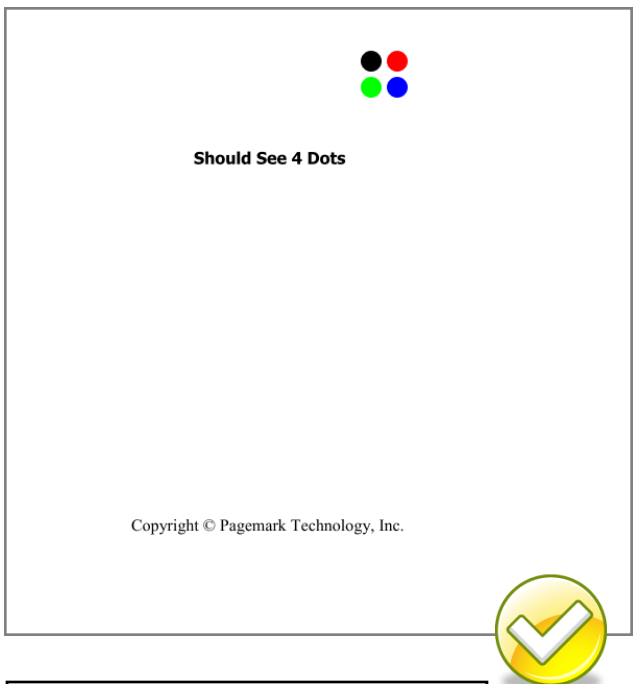
TA0004.XPS



Microsoft Viewer



Pagemark



Software Imaging

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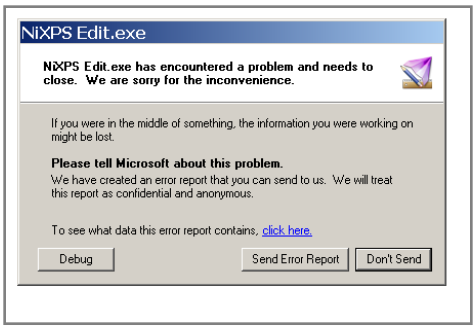
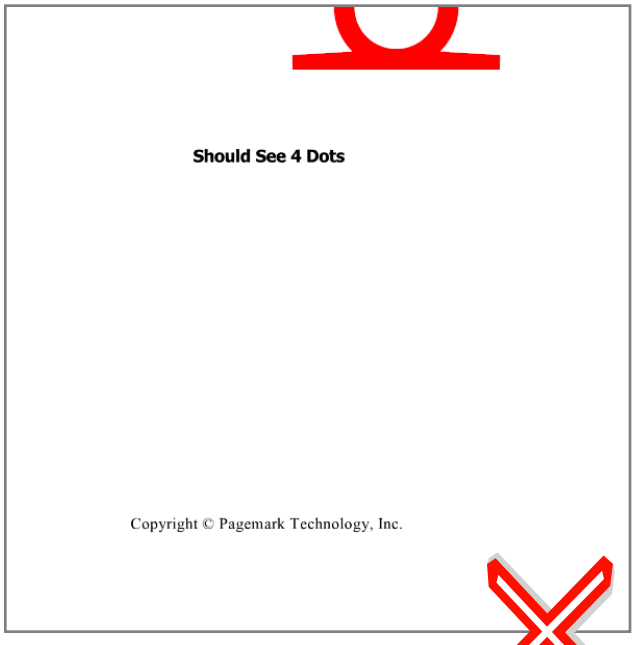
TA0004.XPS

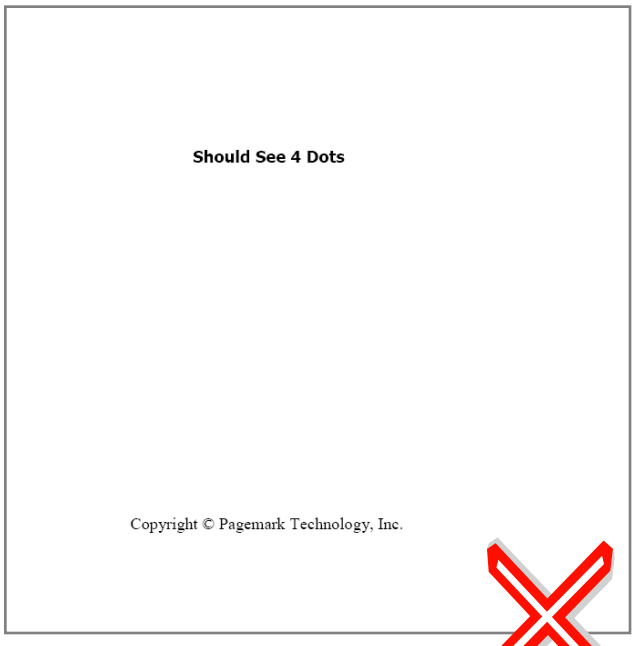


NiXPS

SANATech



Brava! Reader



Acrobat

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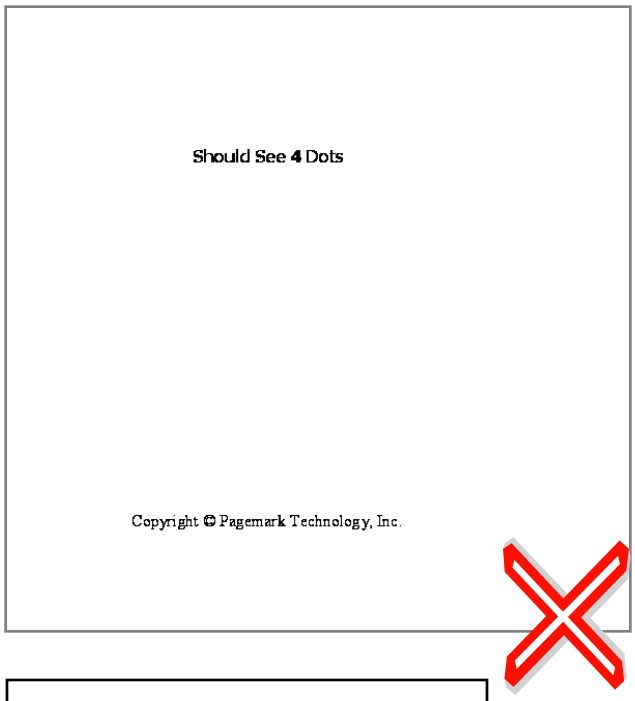
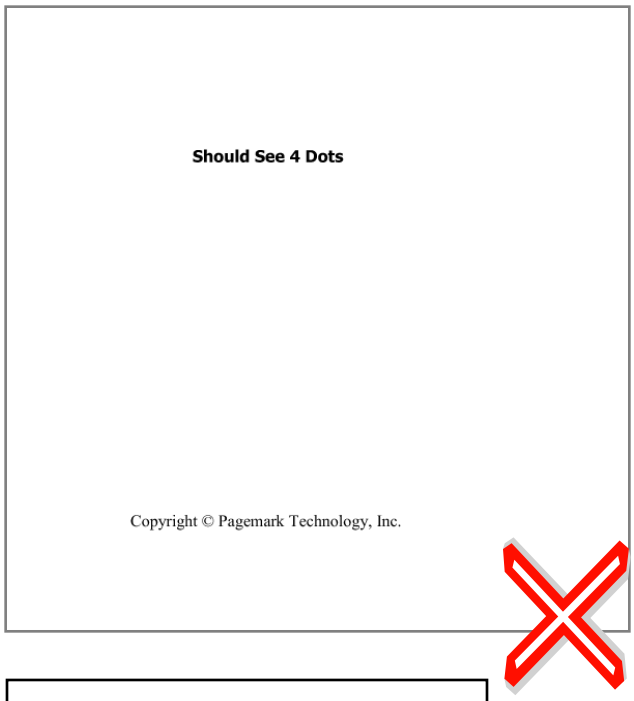
XPS Viewer Comparison

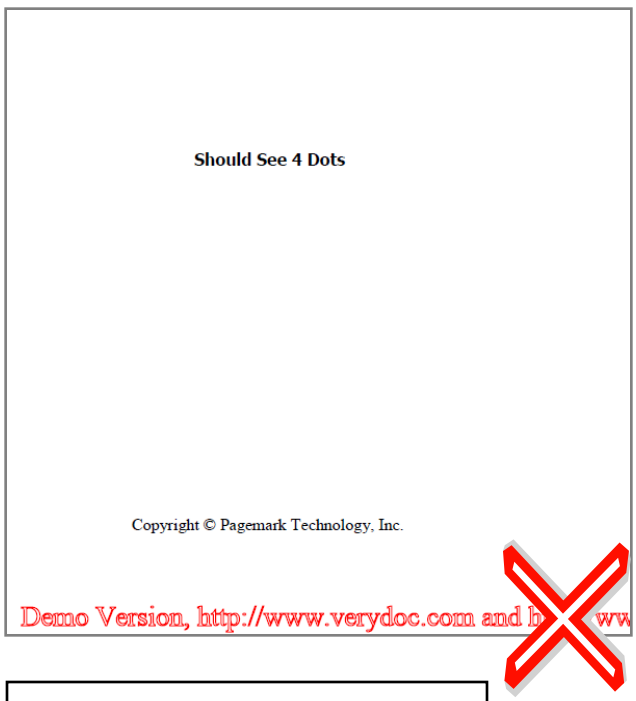
TA0004.XPS



GhostXPS



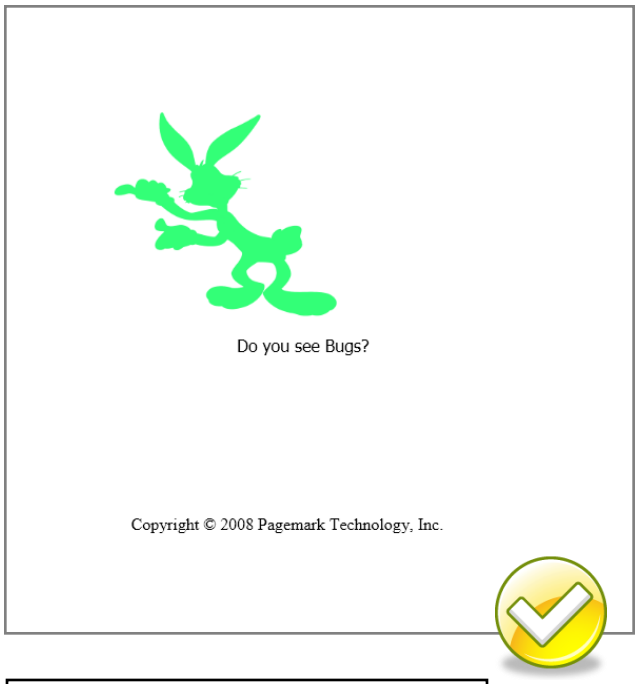
gDoc Fusion



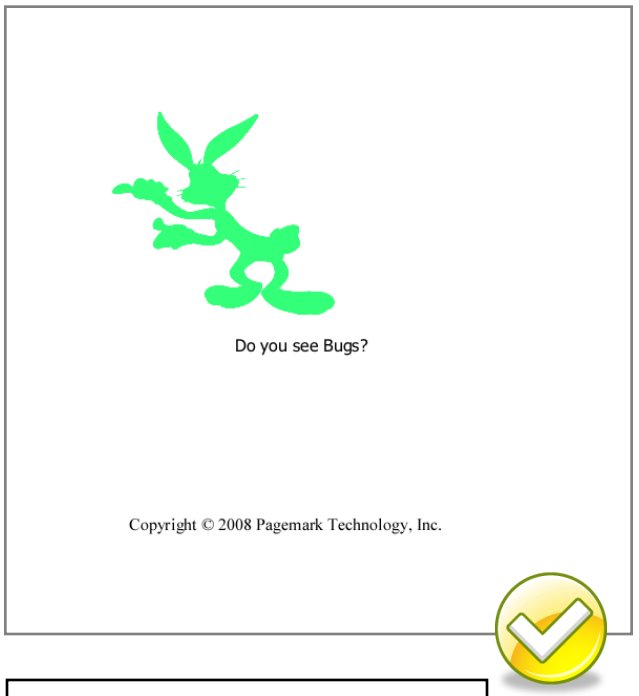
VeryDoc Xps2Pdf

Pagemark Technology
XPS Viewer Comparison

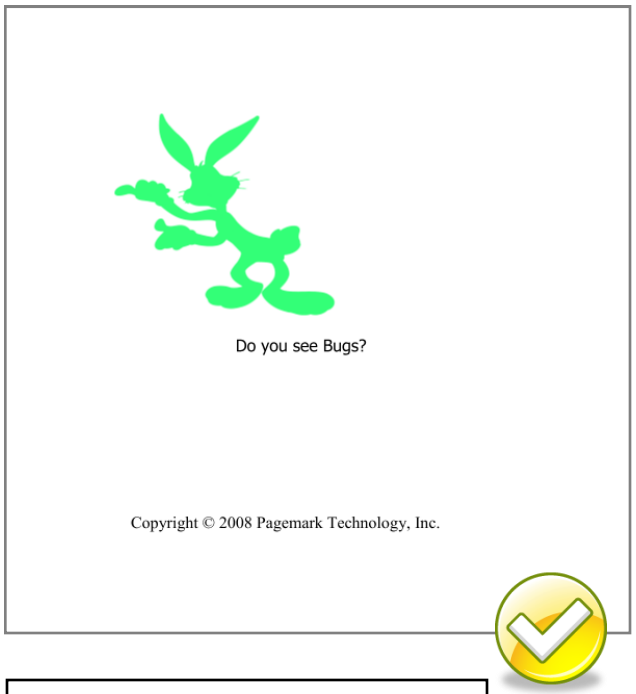
TA0005.XPS



Microsoft Viewer



Pagemark



Software Imaging

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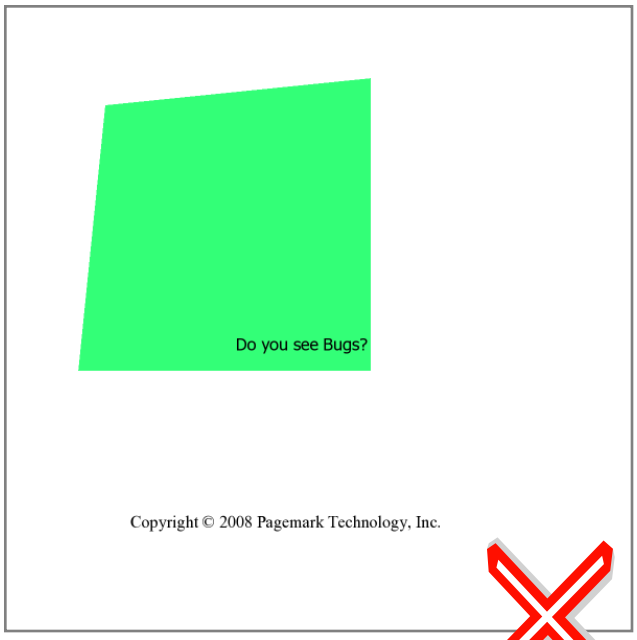
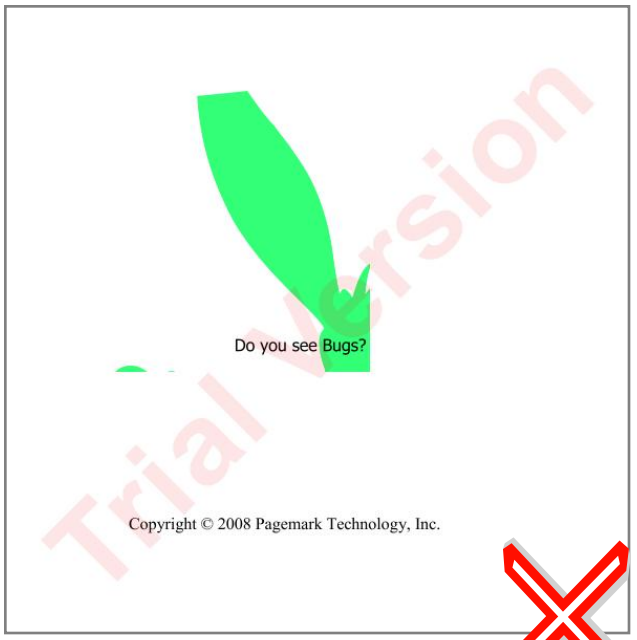
TA0005.XPS

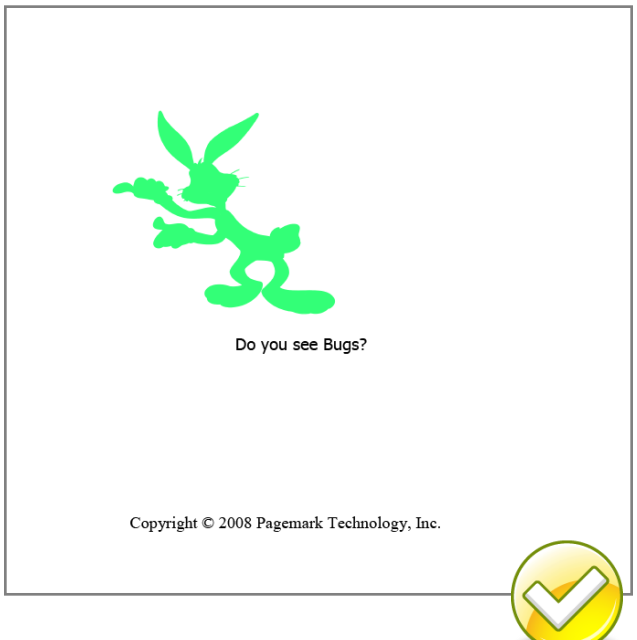


NiXPS



SANATech

Brava! Reader



Acrobat

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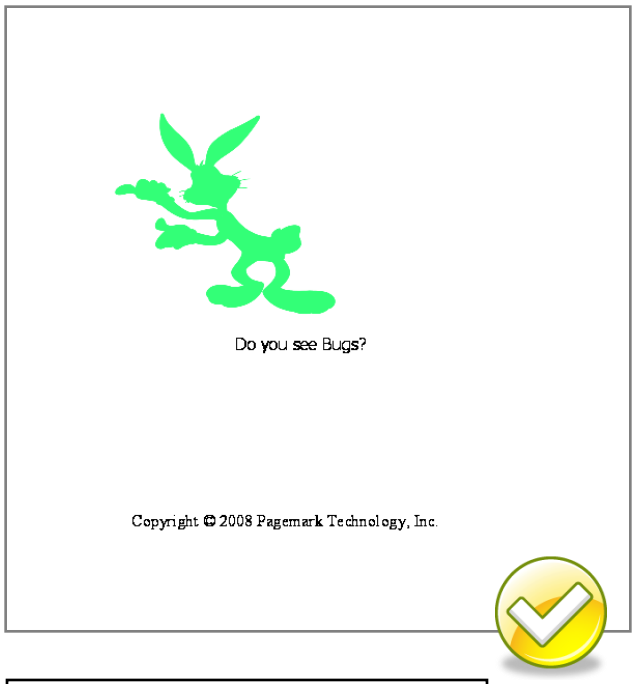
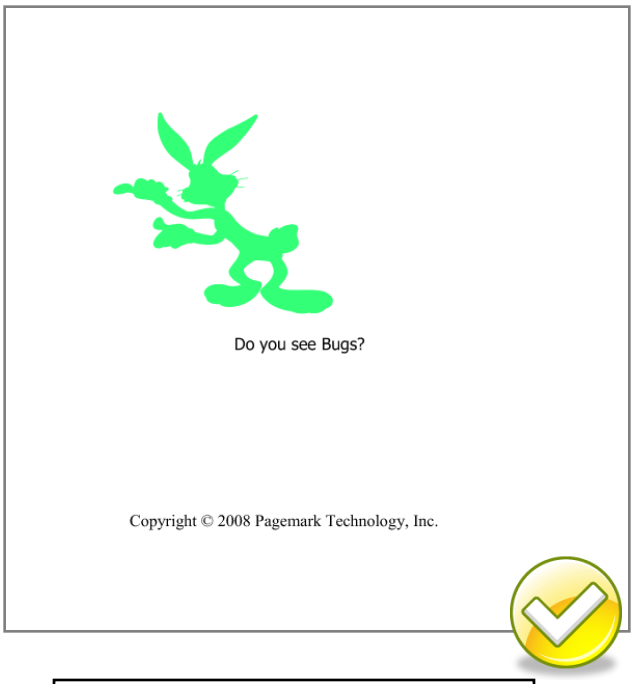
XPS Viewer Comparison

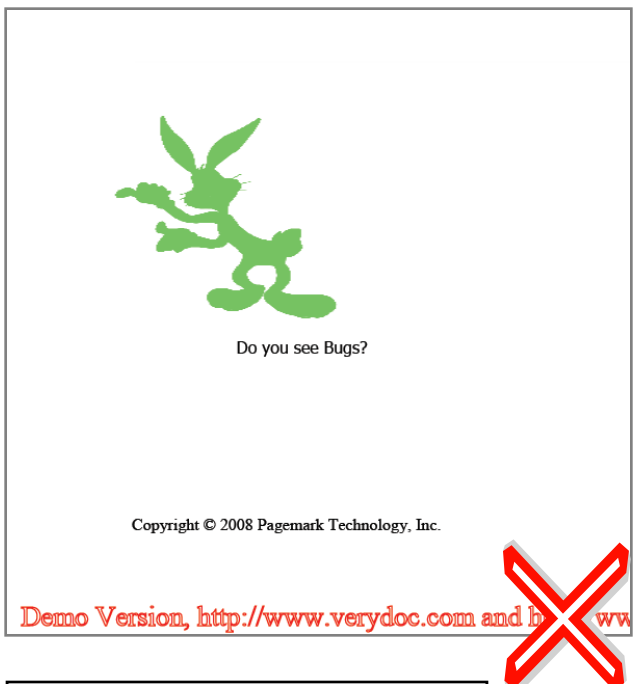
TA0005.XPS



GhostXPS



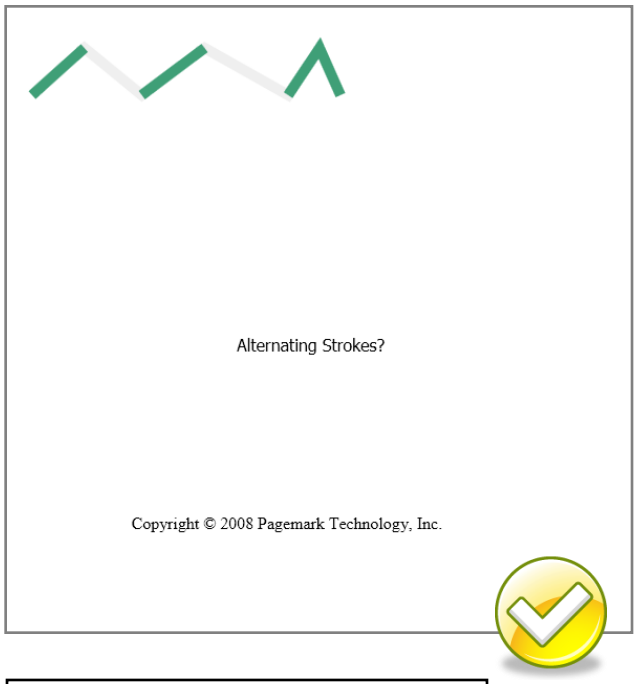
gDoc Fusion



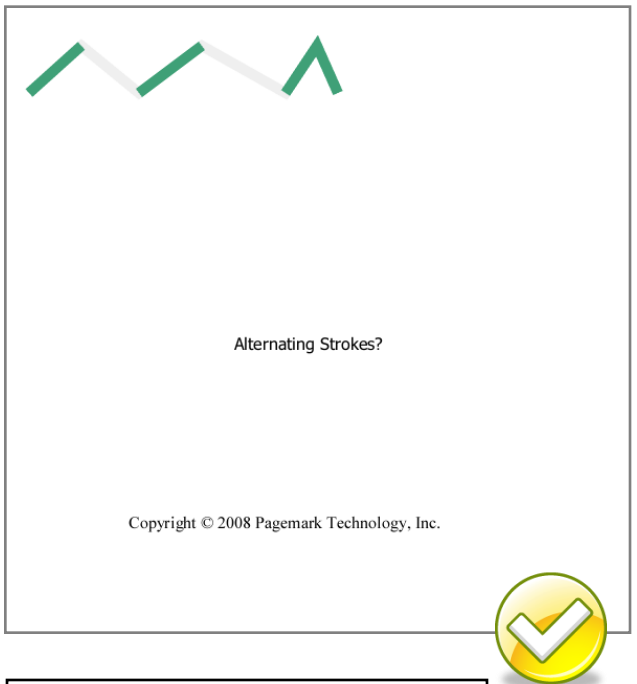
VeryDoc Xps2Pdf

Pagemark Technology
XPS Viewer Comparison

TA0006.XPS



Microsoft Viewer



Pagemark

Software Imaging

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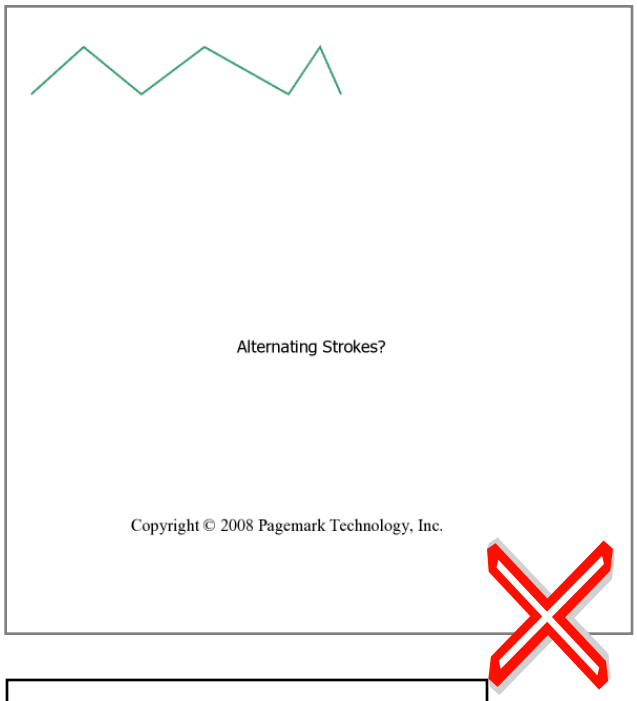
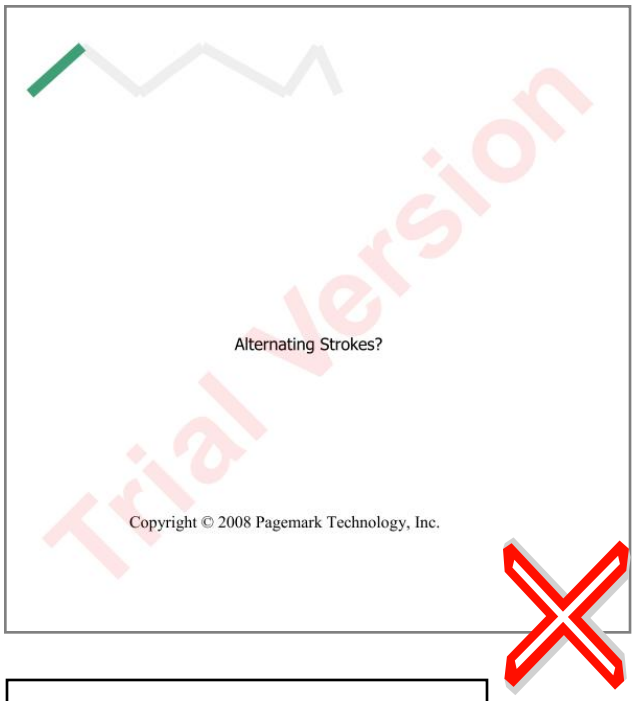
XPS Viewer Comparison

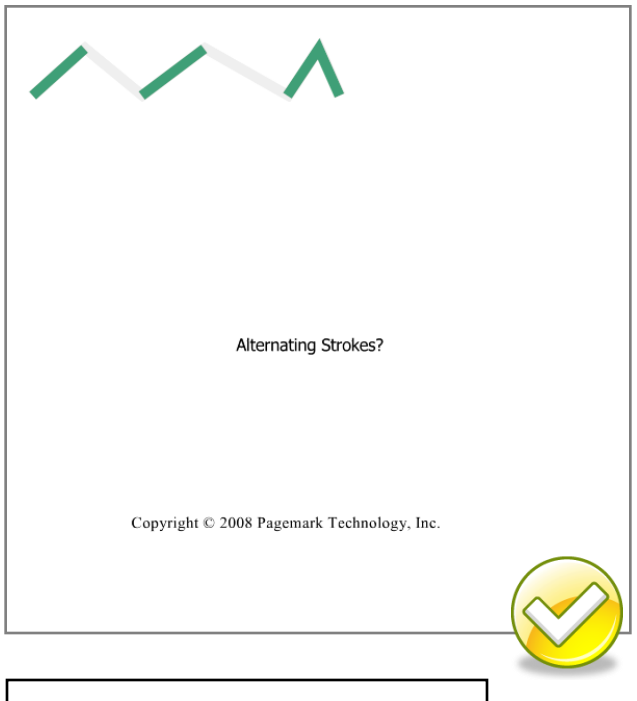
TA0006.XPS



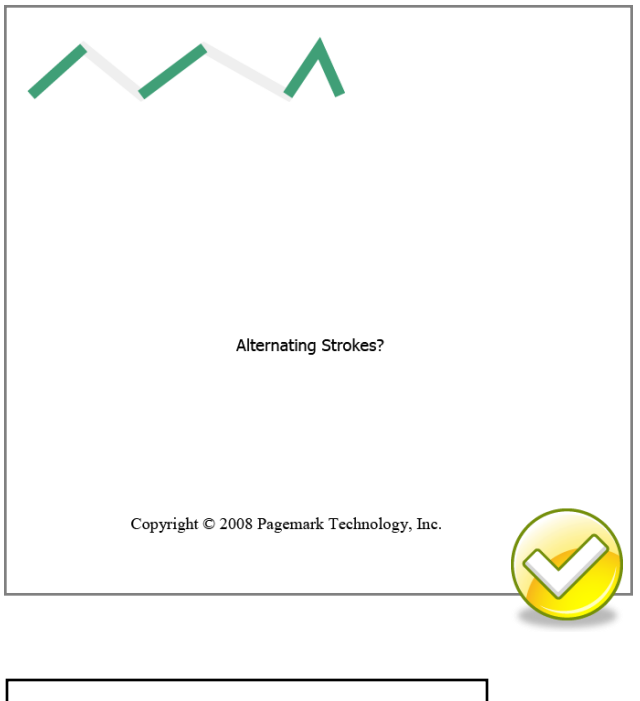
NiXPS



SANATech



Brava! Reader

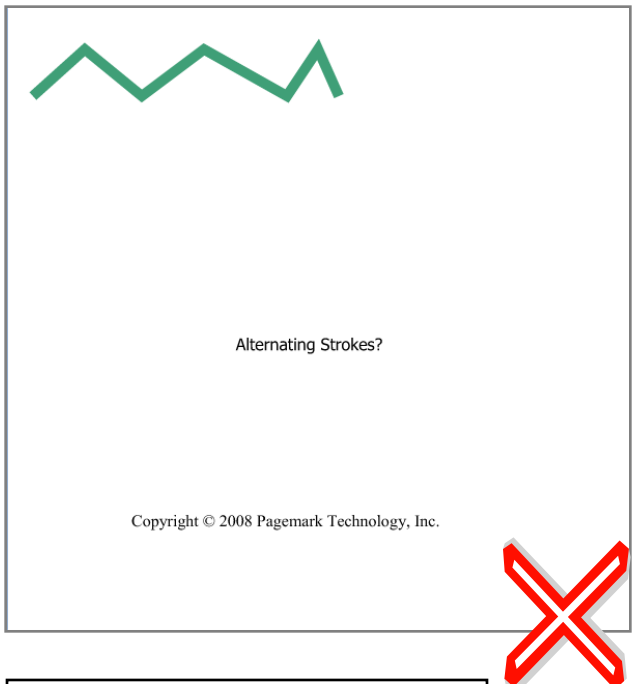


Acrobat

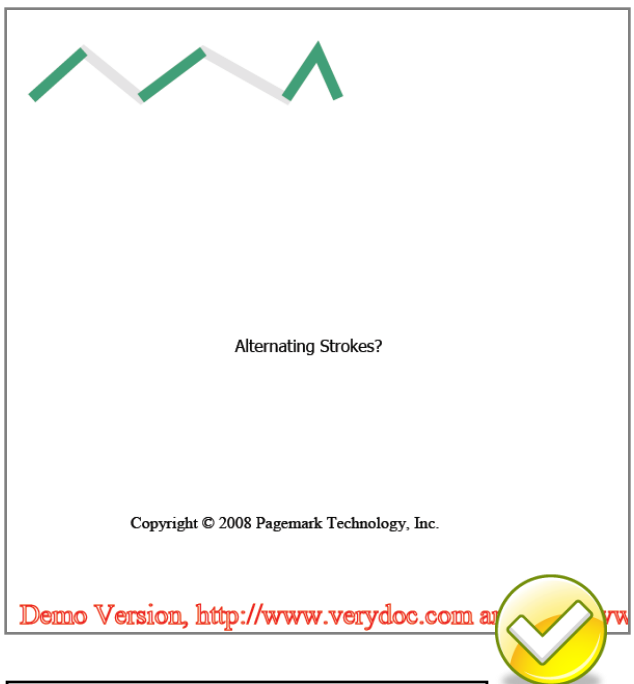
Pagemark Technology
XPS Viewer Comparison

TA0006.XPS

GhostXPS



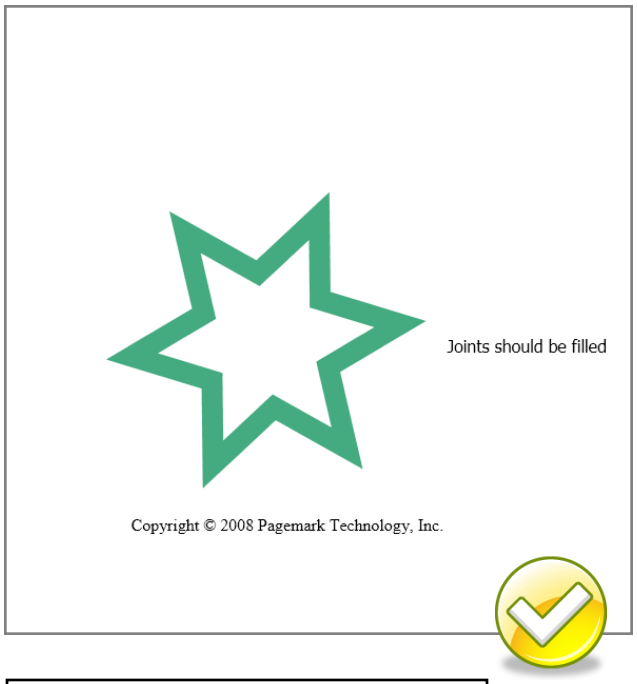
gDoc Fusion



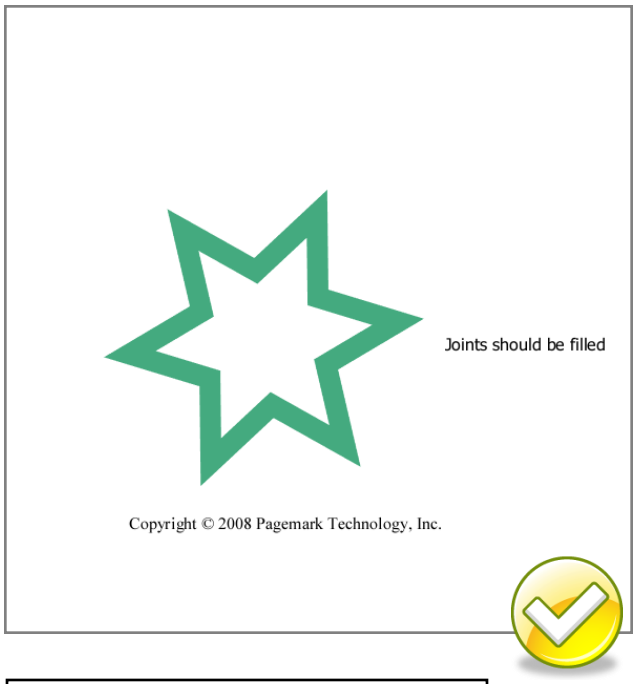
VeryDoc Xps2Pdf

Pagemark Technology
XPS Viewer Comparison

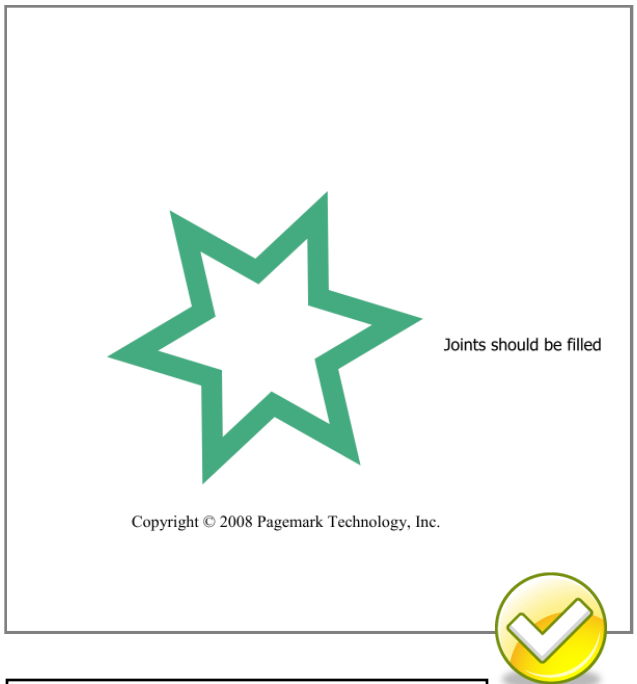
TA0007.XPS



Microsoft Viewer



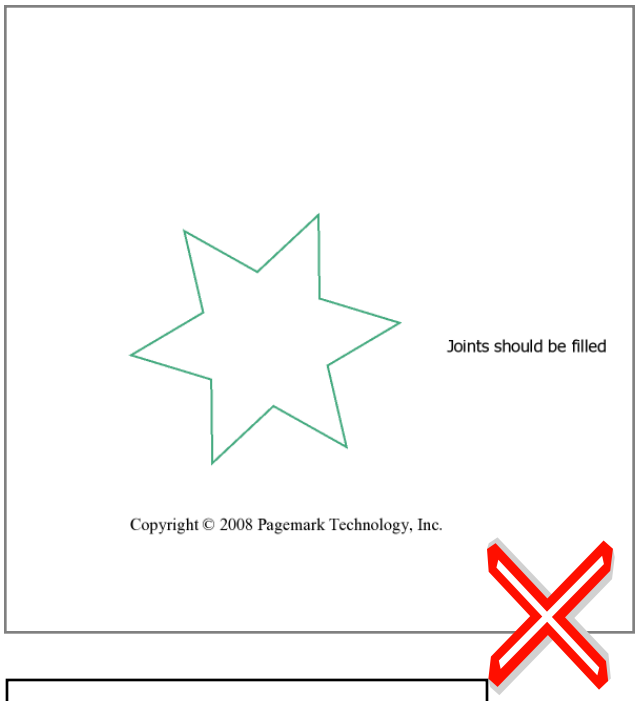
Pagemark



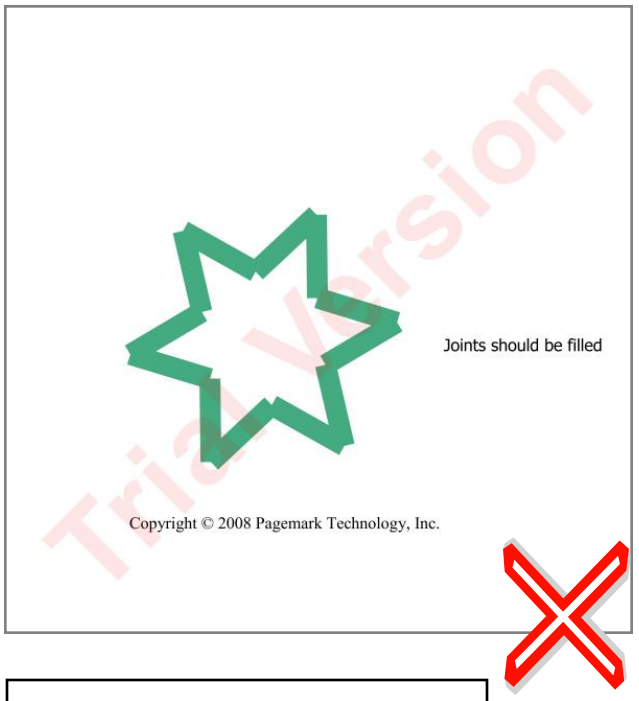
Software Imaging

Pagemark Technology
XPS Viewer Comparison

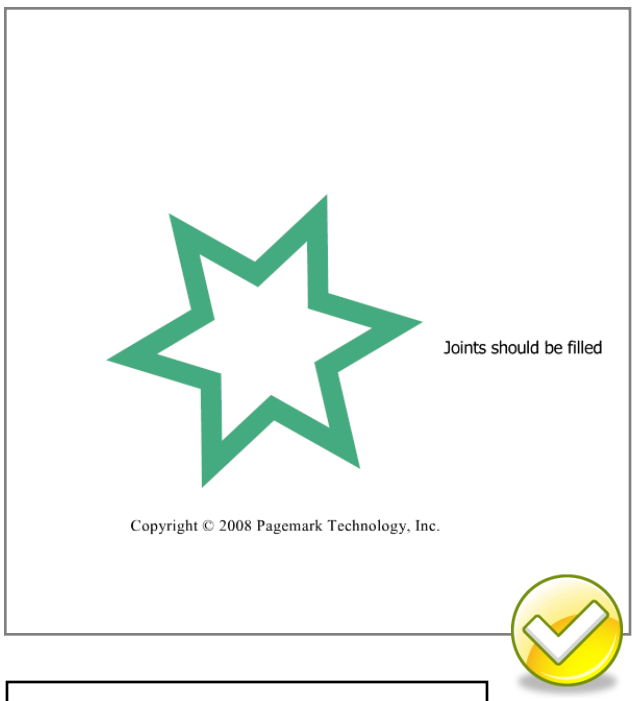
TA0007.XPS



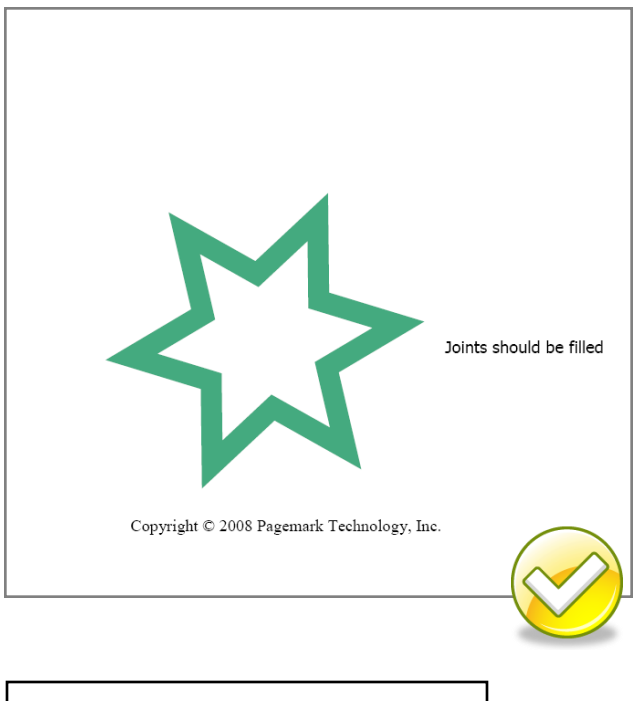
NiXPS



SANATech



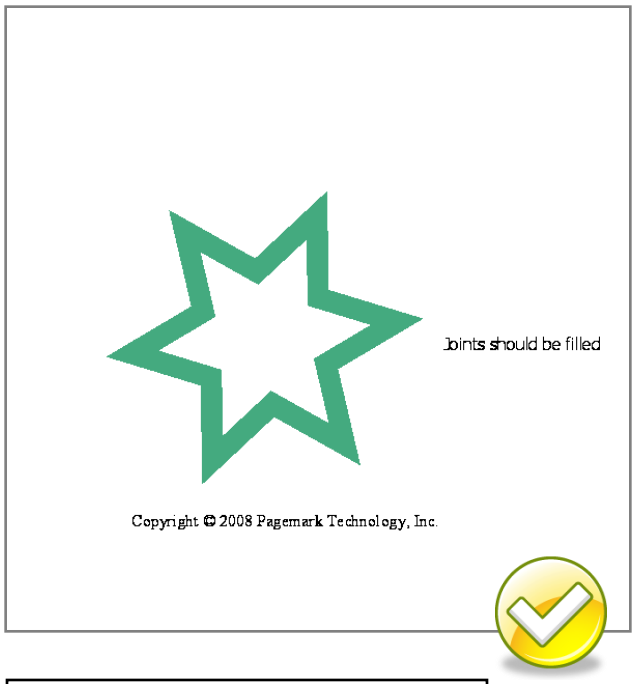
Brava! Reader



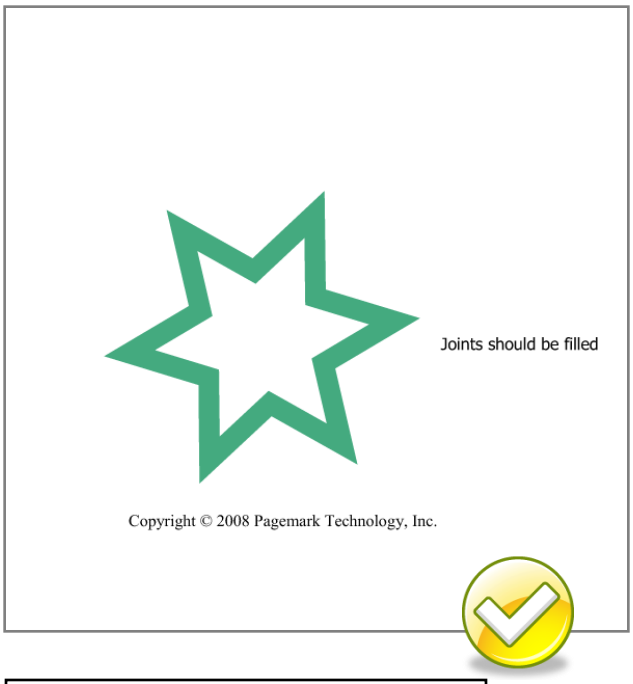
Acrobat

Pagemark Technology
XPS Viewer Comparison

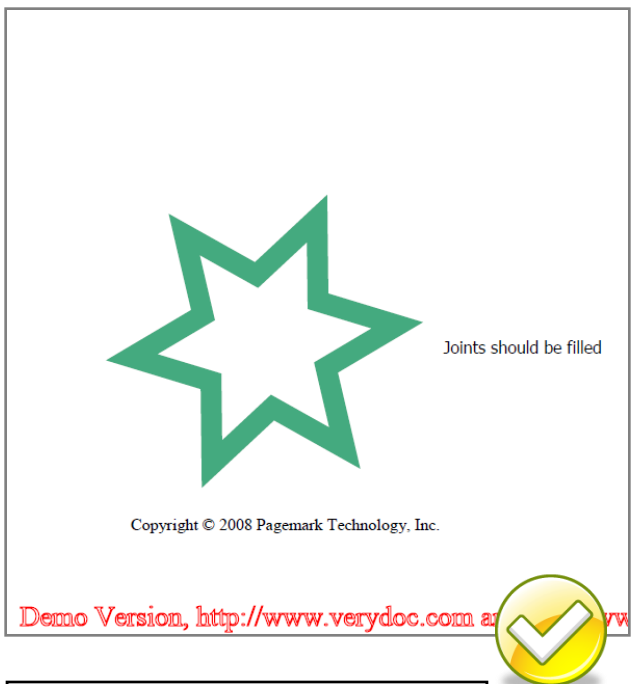
TA0007.XPS



GhostXPS



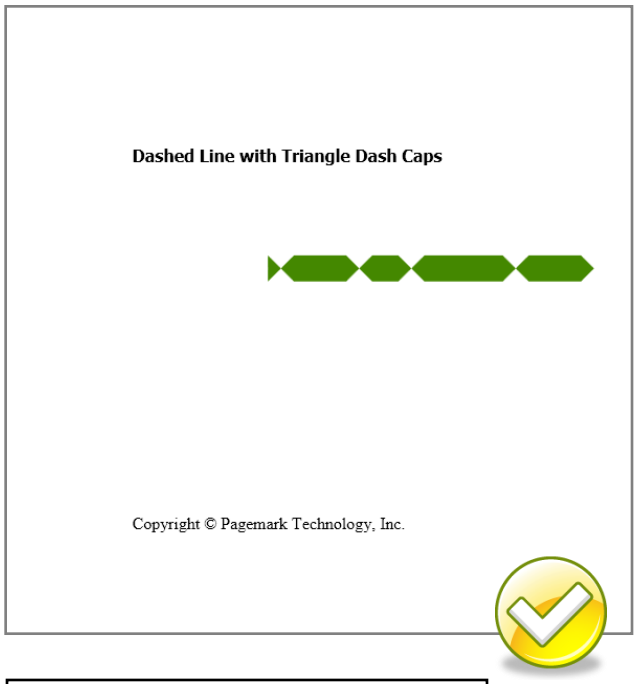
gDoc Fusion



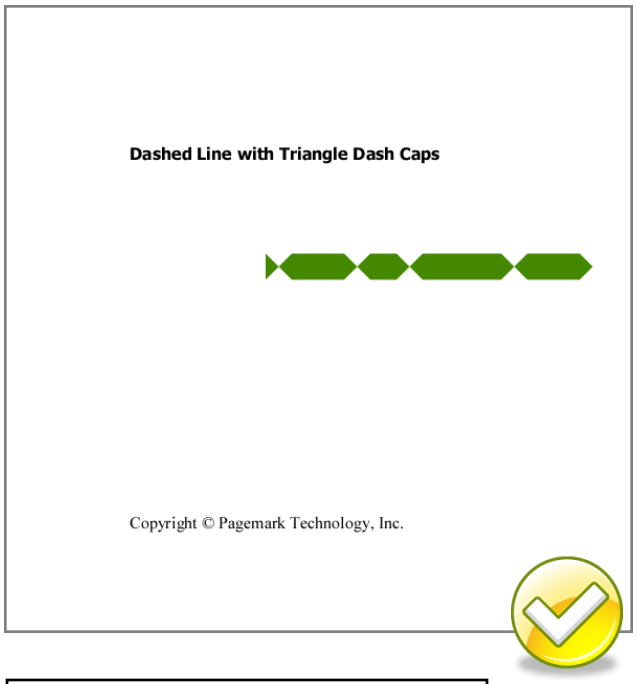
VeryDoc Xps2Pdf

Pagemark Technology
XPS Viewer Comparison

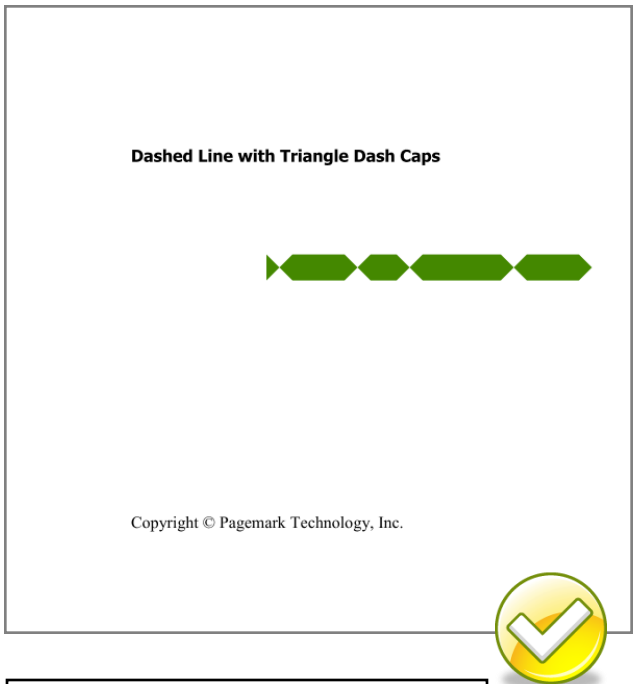
TA0008.XPS



Microsoft Viewer



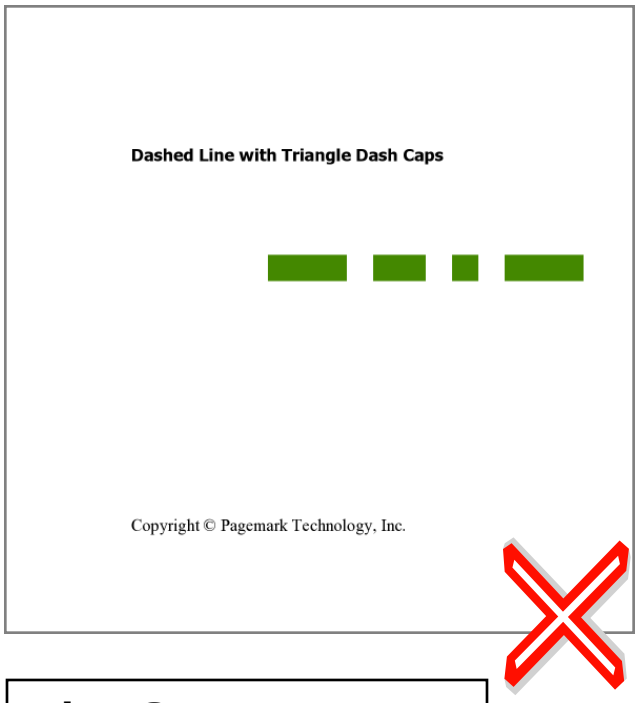
Pagemark



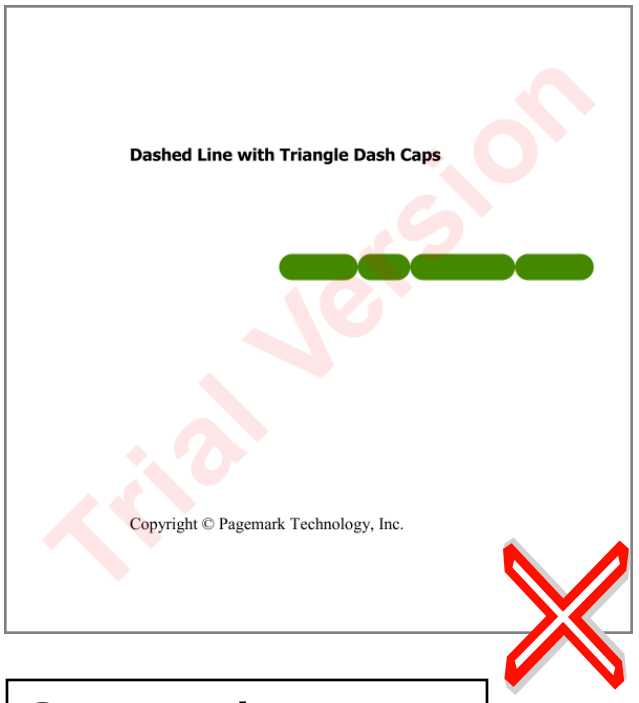
Software Imaging

Pagemark Technology
XPS Viewer Comparison

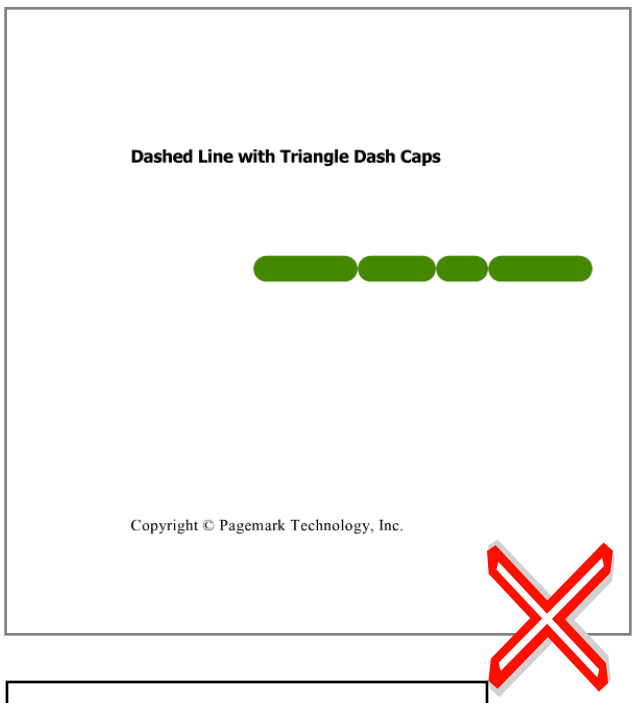
TA0008.XPS



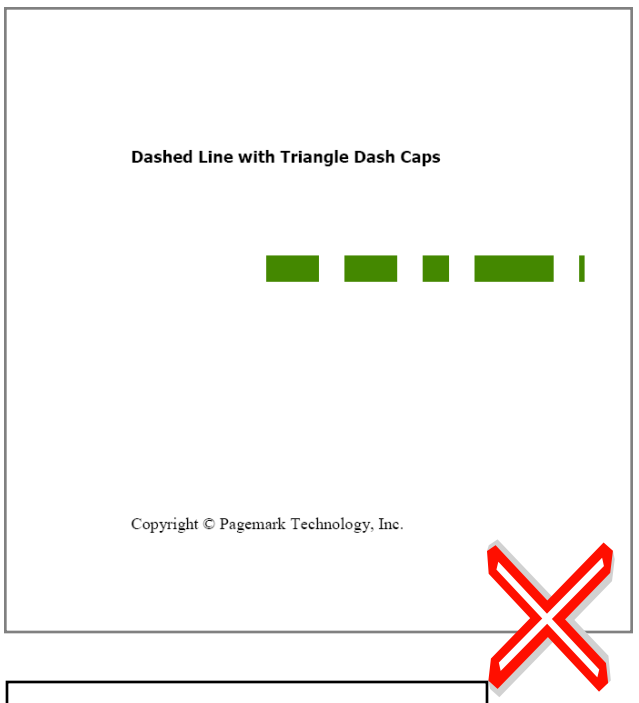
NiXPS



SANATech



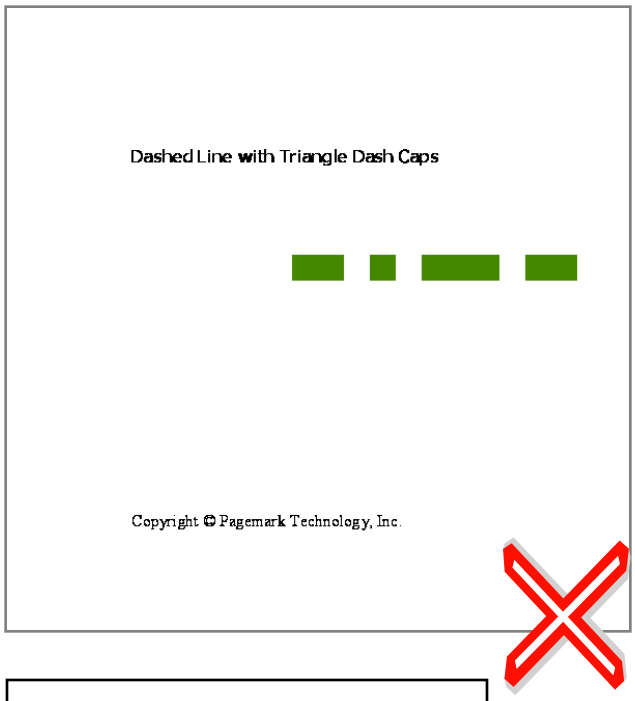
Brava! Reader



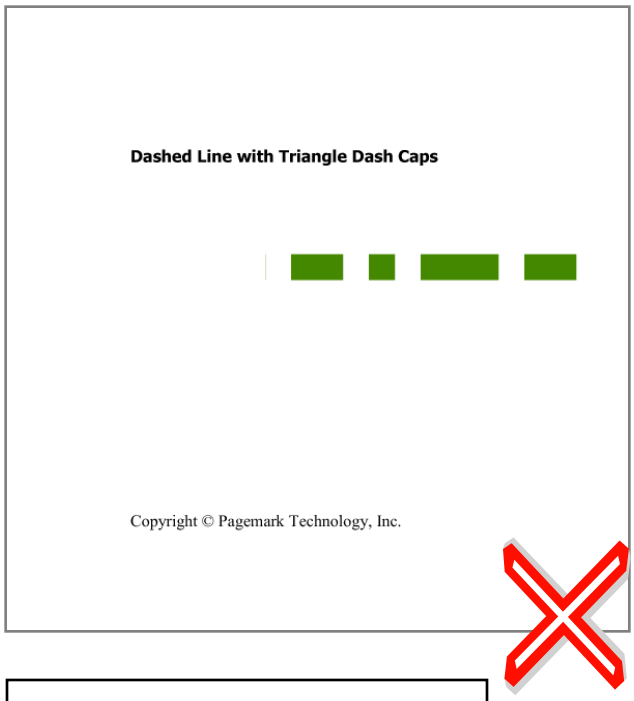
Acrobat

Pagemark Technology
XPS Viewer Comparison

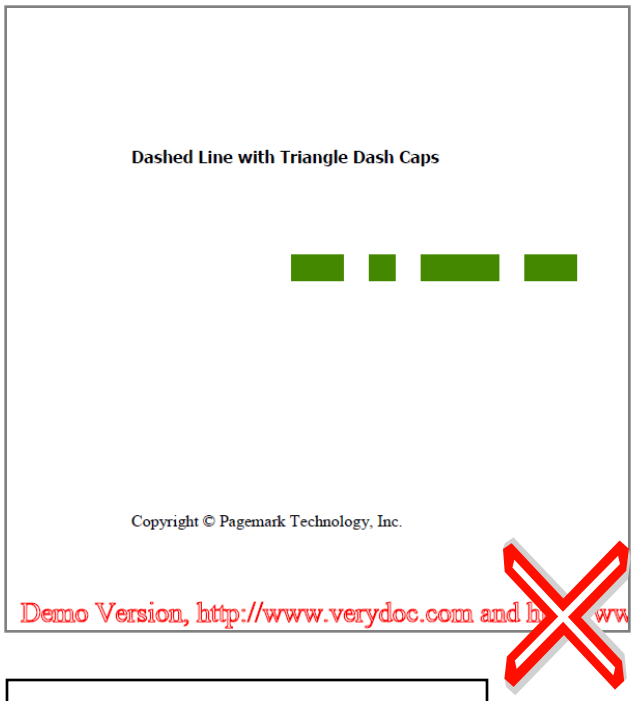
TA0008.XPS



GhostXPS



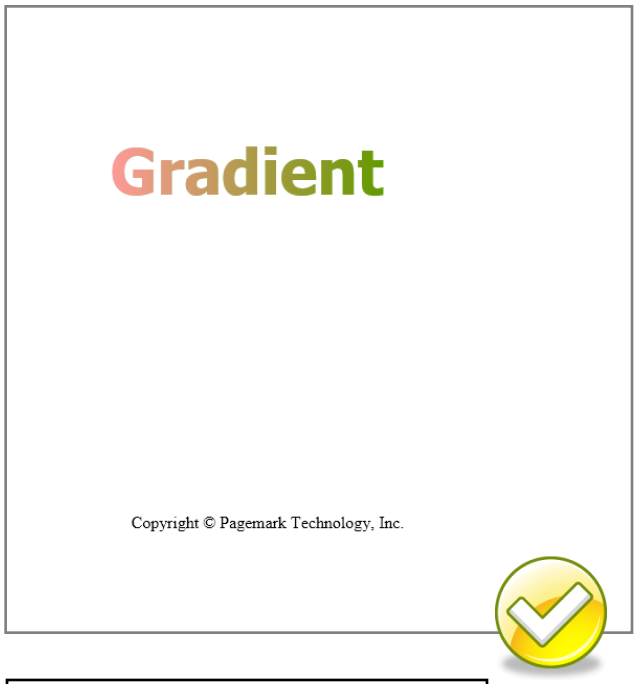
gDoc Fusion



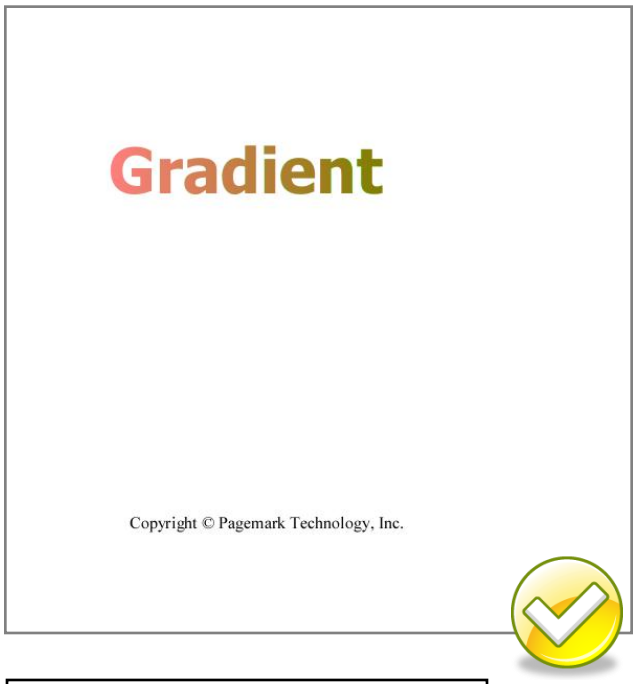
VeryDoc Xps2Pdf

Pagemark Technology
XPS Viewer Comparison

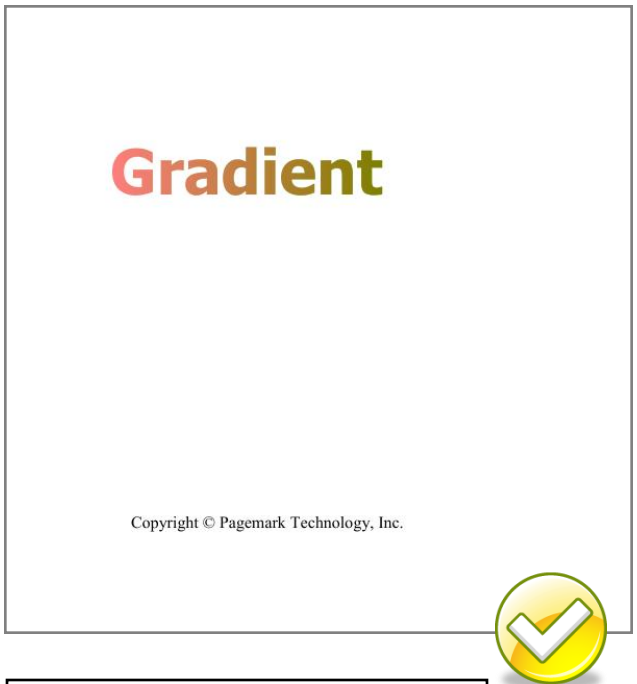
TA0009.XPS



Microsoft Viewer



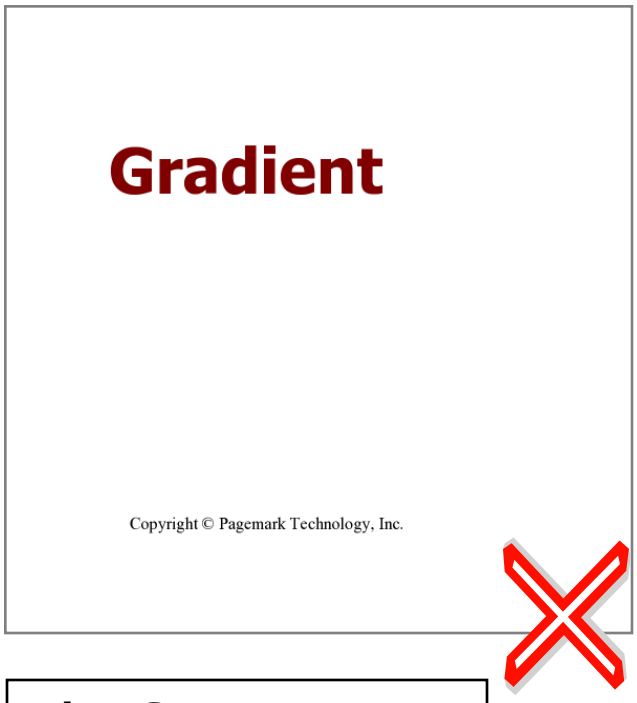
Pagemark



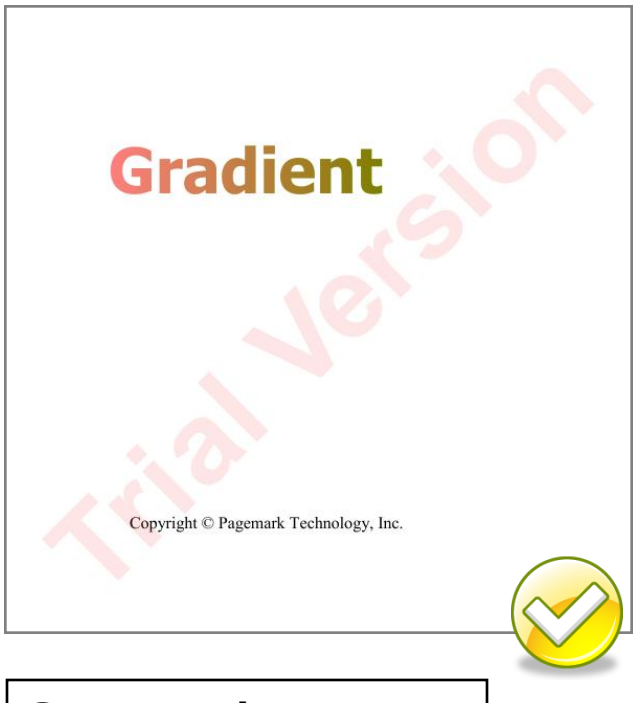
Software Imaging

Pagemark Technology
XPS Viewer Comparison

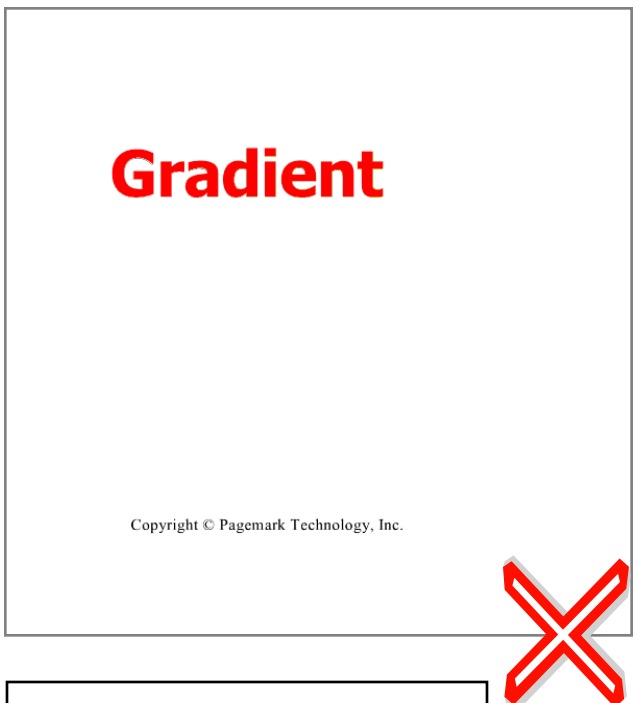
TA0009.XPS



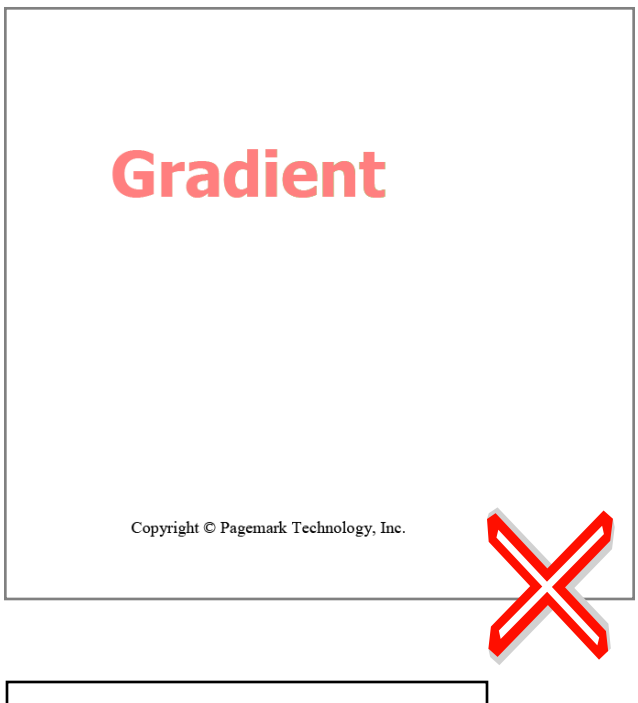
NiXPS



SANATech



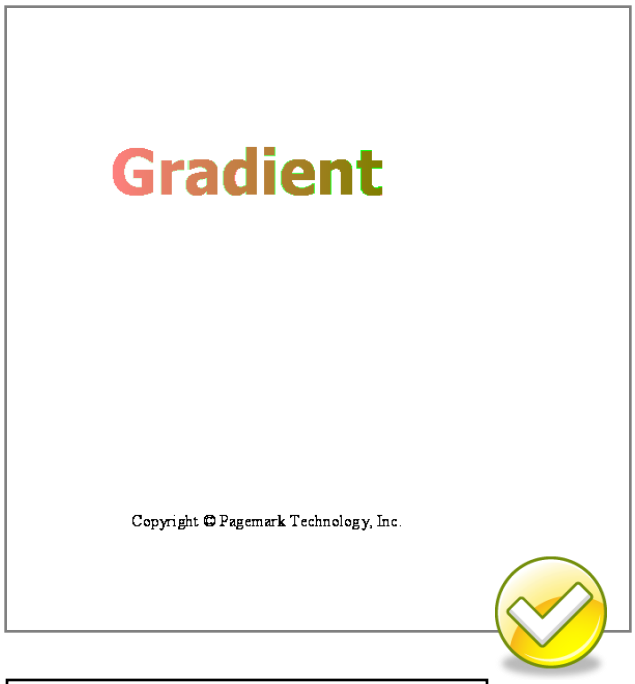
Brava! Reader



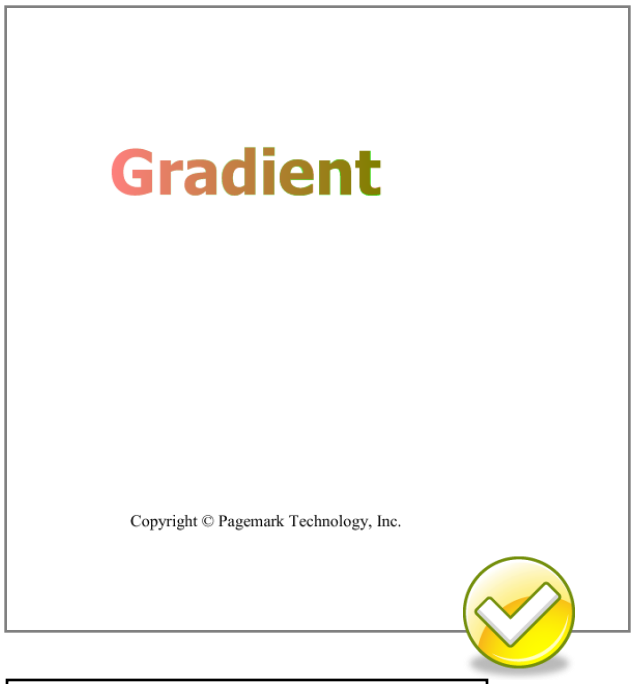
Acrobat

Pagemark Technology
XPS Viewer Comparison

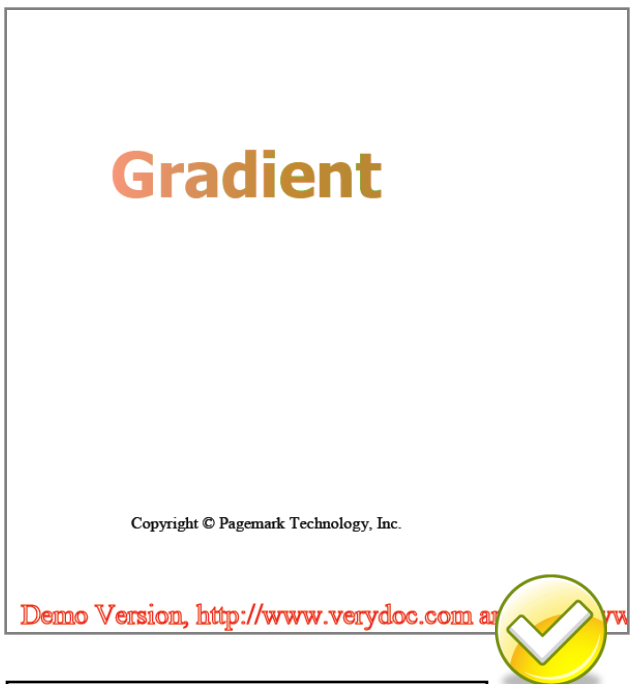
TA0009.XPS



GhostXPS



gDoc Fusion



VeryDoc Xps2Pdf

TA0010.XPS

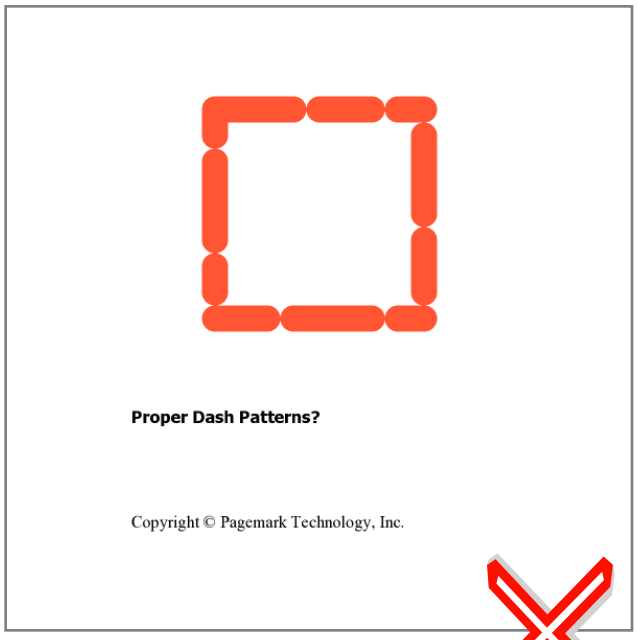
Microsoft Viewer

Pagemark

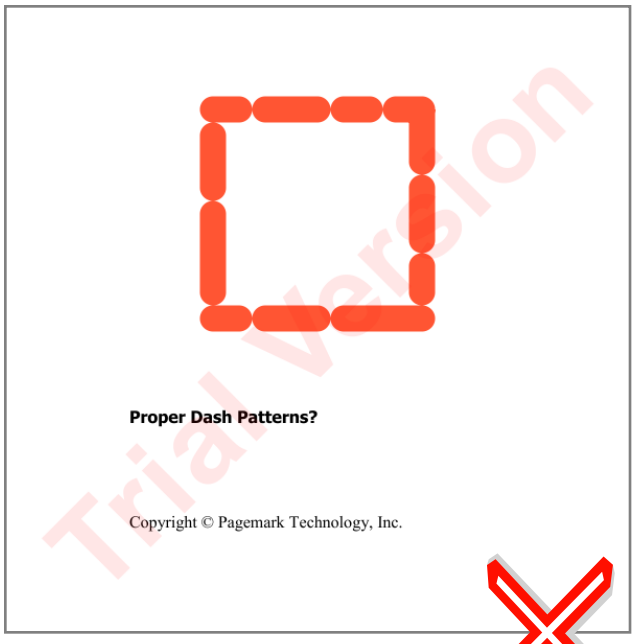
Software Imaging

Pagemark Technology
XPS Viewer Comparison

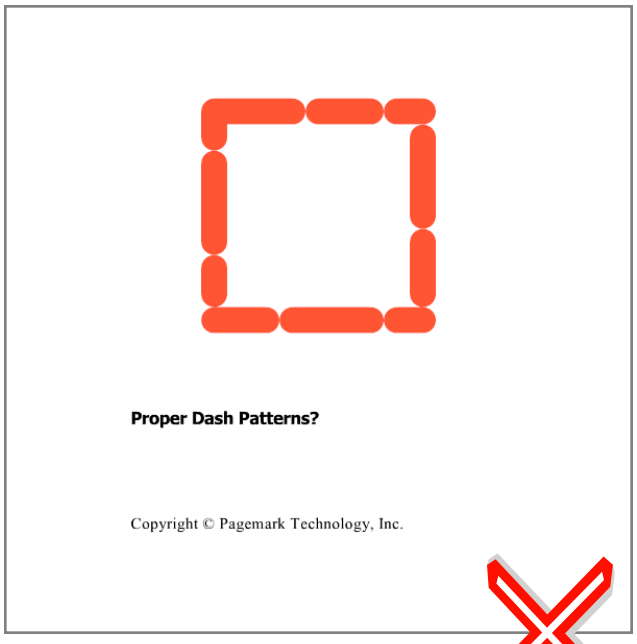
TA0010.XPS



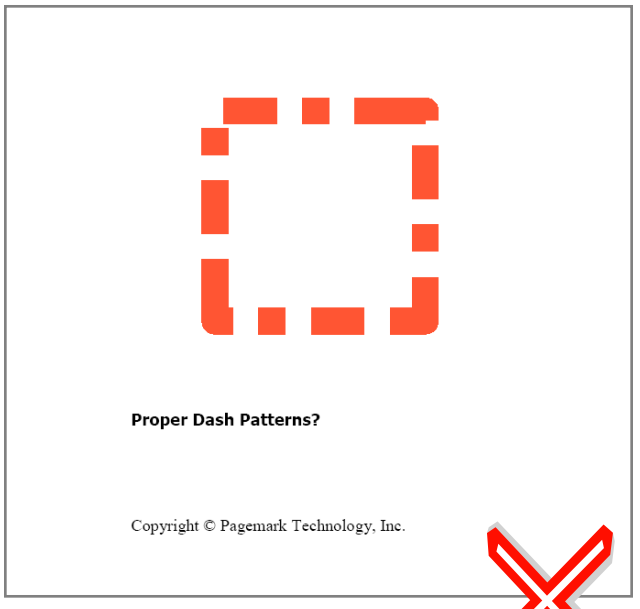
NiXPS



SANATech



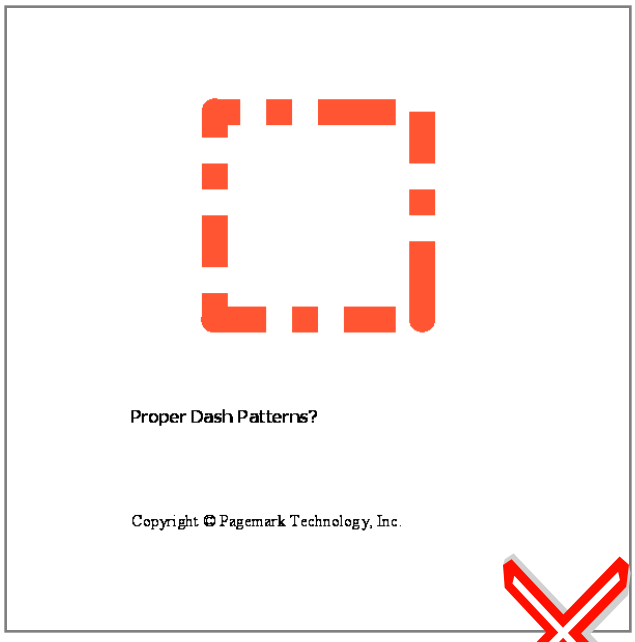
Brava! Reader



Acrobat

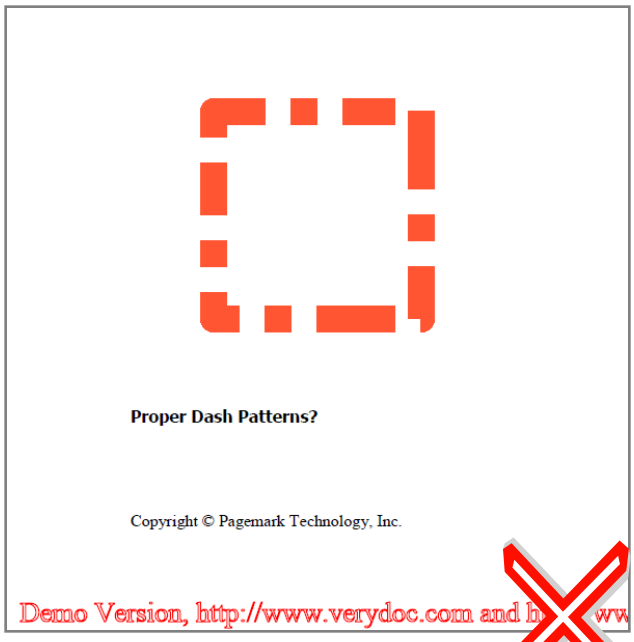
Pagemark Technology
XPS Viewer Comparison

TA0010.XPS



GhostXPS

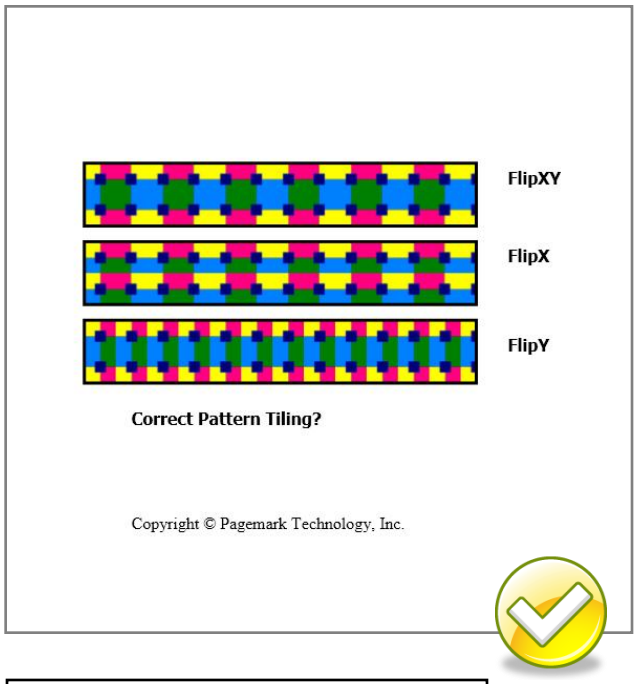
gDoc Fusion



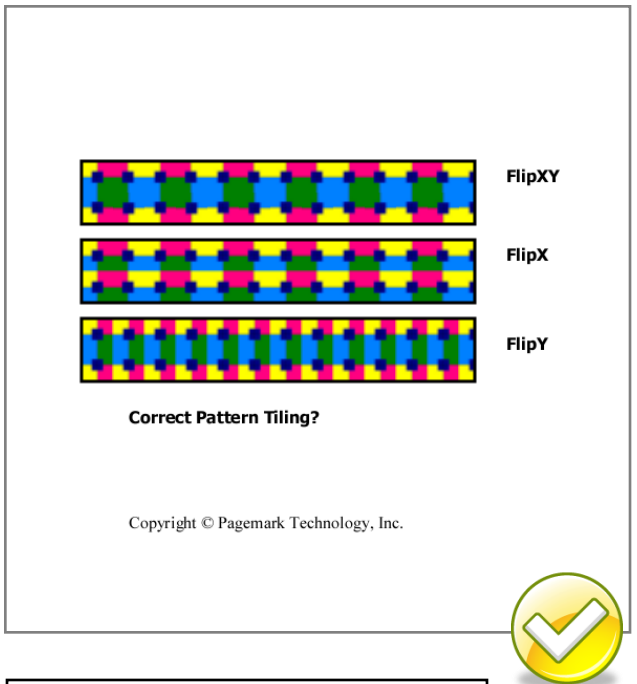
VeryDoc Xps2Pdf

Pagemark Technology
XPS Viewer Comparison

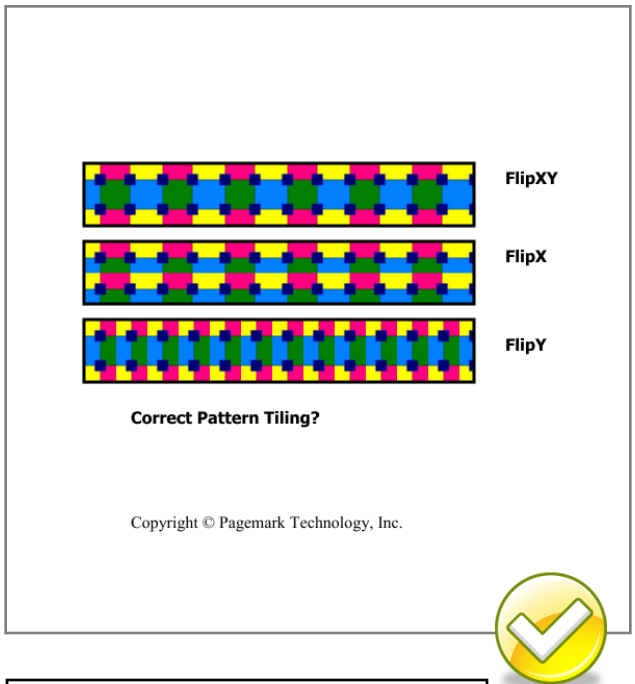
TA0011.XPS



Microsoft Viewer



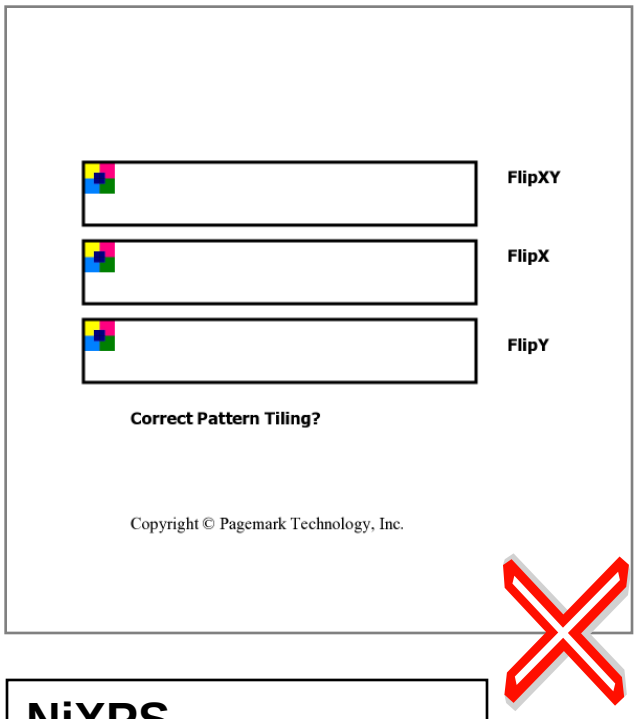
Pagemark



Software Imaging

Pagemark Technology
XPS Viewer Comparison

TA0011.XPS



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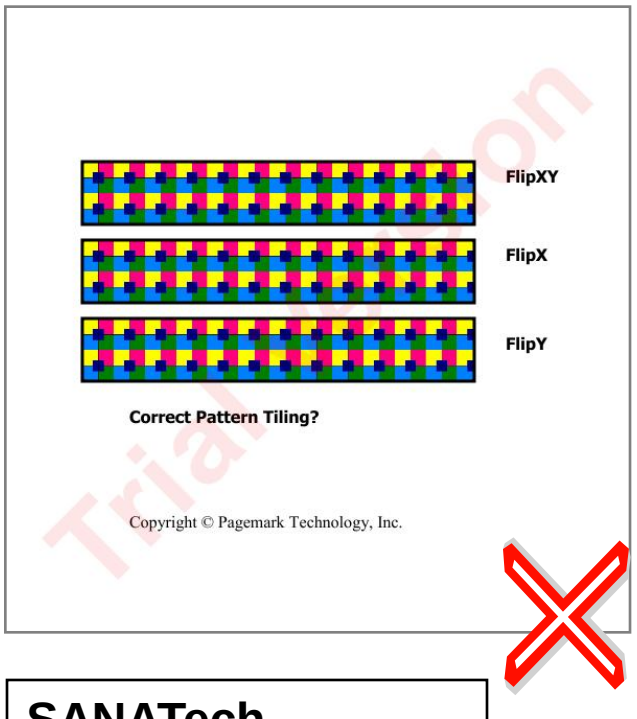
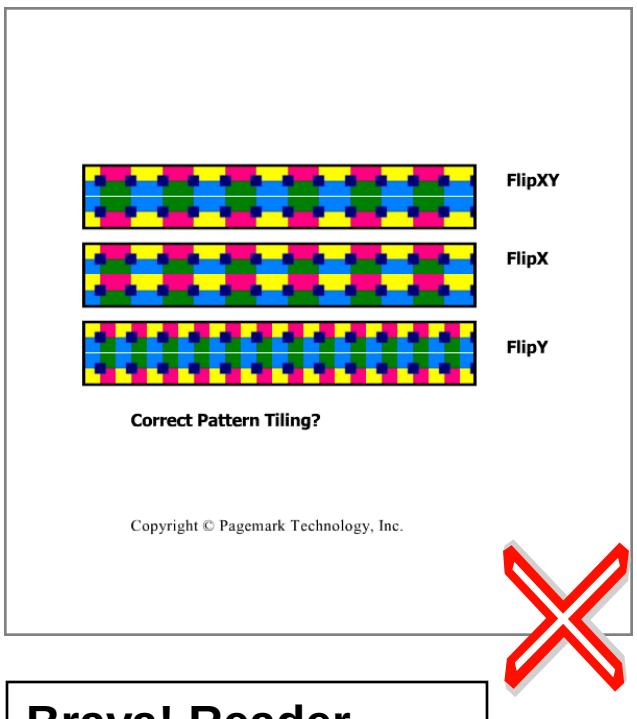
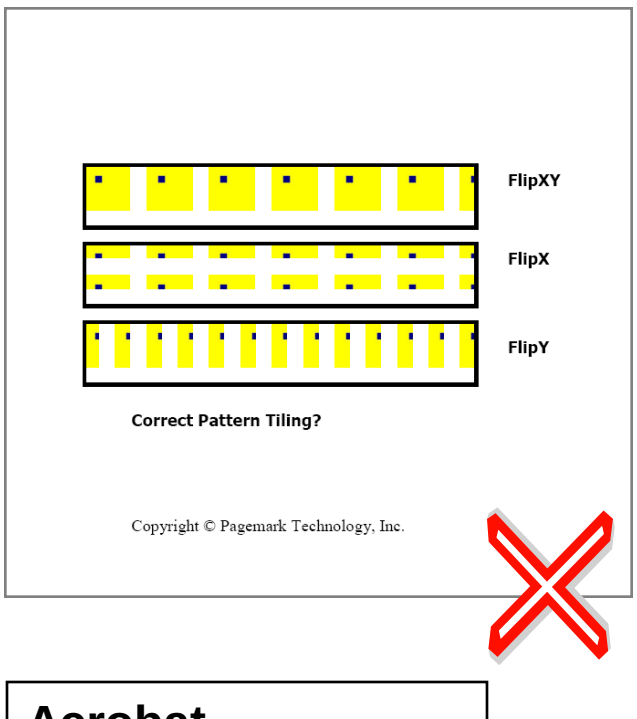


SANATech



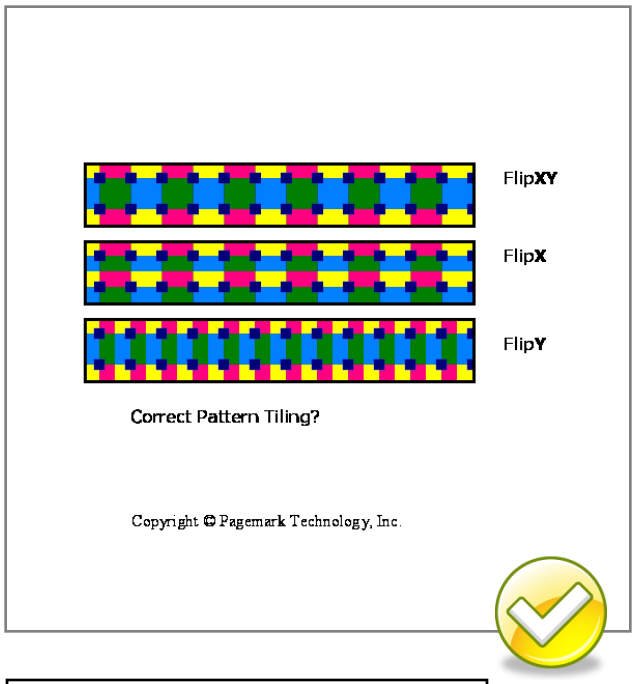
Brava! Reader



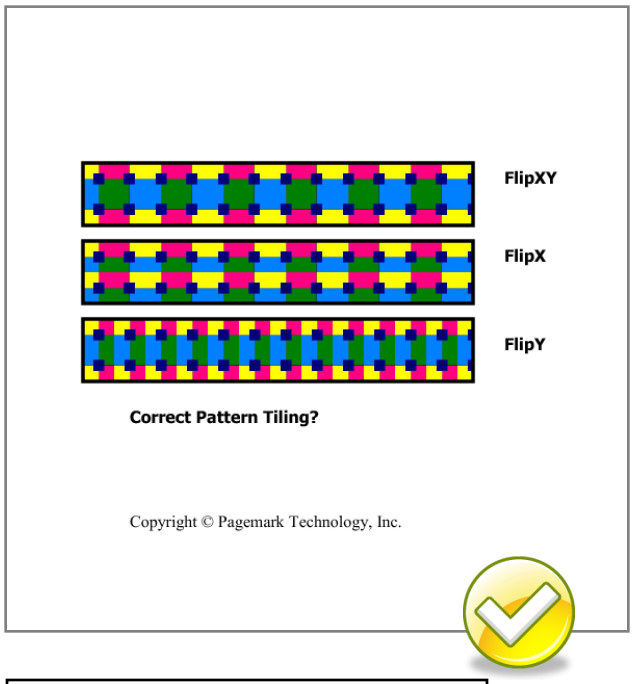
Acrobat

Pagemark Technology
XPS Viewer Comparison

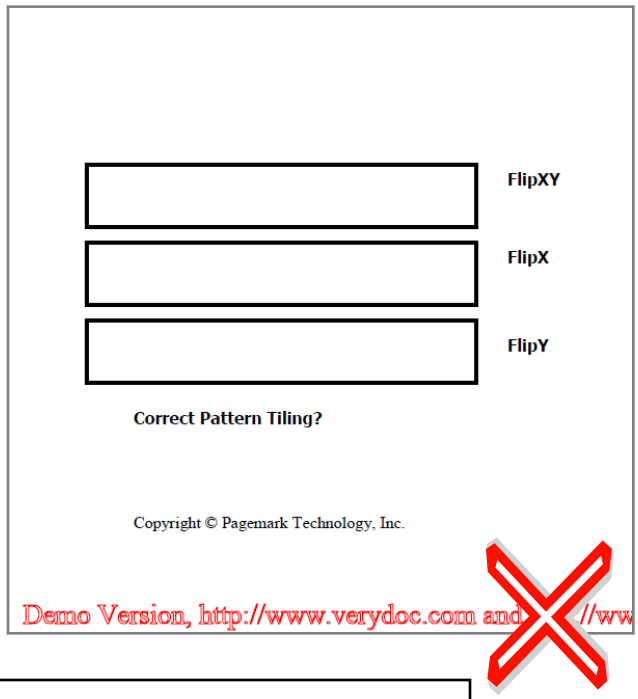
TA0011.XPS



GhostXPS



gDoc Fusion



VeryDoc Xps2Pdf

Pagemark Technology
XPS Viewer Comparison

TA0012.XPS

Should see transparent gradient over image

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Microsoft Viewer

Should see transparent gradient over image

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Pagemark

Should see transparent gradient over image

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Software Imaging

Pagemark Technology
XPS Viewer Comparison

TA0012.XPS

Should see transparent gradient over image

NiXPS

Should see transparent gradient over image

SANATech

Should see transparent gradient over image

Brava! Reader

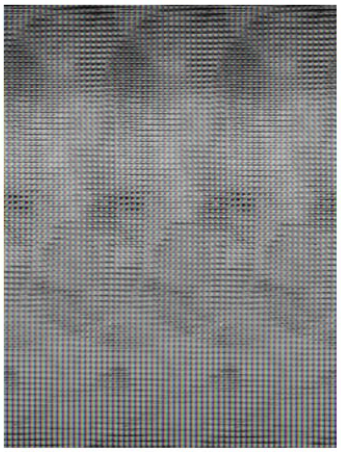
Should see transparent gradient over image

Acrobat

Pagemark Technology
XPS Viewer Comparison

TA0012.XPS

Should see transparent gradient over image



GhostXPS

Should see transparent gradient over image

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gDoc Fusion

Should see transparent gradient over image

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VeryDoc Xps2Pdf

Pagemark Technology
XPS Viewer Comparison

Performance Comparison

Overview

Rendering performance was measured by using C-XPS Speed Suite from XPS Associates (http://www.c-xps.com/)

The C-XPS Speed Suite utilizes 27 sets of targets (189 in total) with specific page objects placed randomly on the page and include Path figures (Vector) objects with different fill brushes and glyphs (text) objects.

For comparisons between the Software Imaging Viewer, Brava Viewer and the Microsoft Viewer you can review the article at http://www.xpsreview.com.

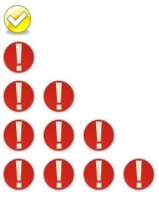
Here we provide performance comparisons between the *Software Imaging XPS Viewer* and the *Pagemark XPS Viewer.*
***New* - 05/28/09 –** *Global Graphics gDoc Fusion* was tested using the same methodology.

The testing was performed on an IBM T43p Thinkpad running with a 2.14Ghz Pentium Processor and 1GB of RAM.

Methodology

Each XPS document tested contains 3000 objects. The total time to render and display the document was measured with a stopwatch. From this, the number of objects per millisecond was calculated and reported below.

Test	Number of Objects Rendered per Millisec.		
	SI	GG	PM
Path Figure without Fill	1.91	1.10	3.30
Path Figure with Solid Color Brush Fill (sRGB)	1.76	1.03	2.70
Path Figure with Solid Color Brush and Alpha	1.88	0.82	3.66
Path Figure with Linear Gradient Brush (sRGB)	0.17	0.24	1.76
Path Figure with Radial Gradient Brush (sRGB)	0.17	**FAIL**	1.88
Path Figure with Image Brush	0.30	**FAIL**	2.19
Path Figure without Fill rotated 45 degrees	1.76	1.00	2.52
Circular Path Figure without Fill	0.37	0.91	2.36
Glyph with 6 Point Roman Character	2.00	0.86	2.44
Glyph with 6 Point Roman Character (bilevel)	2.00	0.86	2.05
Glyph with 6 Point Roman Character (isSideways)	2.00	0.91	3.00
Path Figure with Image Brush - 8 bit TIF	0.67	**FAIL**	1.46
Path Figure with Image Brush - 8 bit PNG	0.26	**FAIL**	1.82
Path Figure with Image Brush - 8 bit HDP	0.17	**FAIL**	2.17
Path Figure with Image Brush - 16 bit TIF	0.12	**FAIL**	1.07
Path Figure with Image Brush - 16 bit PNG	0.09	**FAIL**	1.03
Path Figure with Image Brush -16 bit HDP	0.07	**FAIL**	1.17
Glyph with 6 Point Kanji Character	1.88	**FAIL**	2.00



Pagemark Rendered Faster
More than 2 times faster
More than 5 times faster
More than 10 times faster
More than 15 times faster

FAIL After 3 minutes the document was not rendered

Comparison Summary

Features

The Pagemark XPS viewer supports a large number of useful features above and beyond those offered by the available XPS viewers. Adobe Acrobat supports the same features supported when viewing a PDF file which does support a large number of features. However, we are unable to view XPS documents from version Acrobat version 9.

Microsoft and Pagemark are the only viewers that practically support text select/copy and search features.

Conclusion: Pagemark offers the greatest flexibility for viewing and zooming modes, text search, select and copy.

Rendering Quality

Both the Pagemark XPS Viewer and the Software Imaging XPS Viewer render all documents tested correctly and consistent with the Microsoft viewer.

All other viewers displayed substantial rendering errors in various areas.

Conclusion: Only Pagemark XPS Viewer and Software Imaging Viewer Render all XPS documents tested correctly.

Performance

Our performance comparison was made between the Pagemark XPS Viewer, Software Imaging Viewer and Global Graphics gDoc Fusion. XPS Associates has done a comparison between the Software Imaging XPS Viewer, Brava Viewer and the Microsoft Viewer. This comparison can be reviewed at http://www.xpsreview.com. The reason for limiting our performance testing to the Software Imaging XPS Viewer and the gDoc Fusion viewer was because previous testing by XPS Associates has demonstrated that the Software Imaging Viewer was superior to the Microsoft Viewer and Brava Viewer. Therefore the focus of our performance testing was how the Pagemark XPS Viewer compared to the Software Imaging XPS Viewer and gDoc Fusion.

Conclusion: The XPS Pagemark Viewer performed faster than both the Software Imaging XPS Viewer and Global Graphics gDoc Fusion when rendering *ALL* XPS documents tested. In all cases except for rendering text the Pagemark XPS Viewer is significantly faster than the Software Imaging XPS Renderer.

For Additional Information about Pagemark Technology, Inc including, XPS Viewers for Windows, Macintosh, and Linux, our XPS Rendering SDK, XPS Digital Signatures api.

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