Using PDF documents for more secure document workflows

Secure creation, editing and archiving of documents.

The management of extensive documentation sets is an inevitable fact of life for all companies. However, if documents fall into the wrong hands, either internally or externally, this can lead to serious problems that may even be terminal for the business. The PDF format provides a secure framework for the reliable management of document workflows, from creation and editing through to archiving or deletion.

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Executive Summary

A recent study carried out by the Ponemon Institute found that the loss of sensitive data costs companies an average of 3.8 million dollars (approx. 3.4 million euro). As well as the financial risk involved, the company's reputation and loss of customer loyalty are also at stake when its internal information falls into the wrong hands. And if legal requirements are breached, the consequences for the company may be serious, potentially even leading to custodial sentences for senior managers. Of course, safeguarding and keeping an eye on the many documents that a company creates, distributes, edits and stores, throughout those documents' life cycle, is an extremely difficult task. Once paper documents in particular have been circulated, it's virtually impossible to keep tabs on them. Managing documentation in digital processes based on the PDF format offers a far more successful alternative. Professional PDF solutions already feature security functions that can be combined with appropriate tools to create an end-to-end security concept. For example, PDF supports optional password-protected document security with encryption, and targeted allocation of user permissions using a separate owner's password.

This white paper explains how the PDF format and Nuance Power PDF can be used to quickly, inexpensively and efficiently create a document workflow that protects documents throughout their entire life cycle.

Documents – a security risk

It is becoming more and more difficult for companies to guarantee the security and integrity of their data, not least due to the increasing mobility of employees. Staff spend more time away from the office, accessing company documents from all over the world, often using their own devices. The "Bring your own Device" (BYOD) trend poses a major problem for company security. This was demonstrated by a study carried out by the Ponemon Institute in 2014, in which 2,300 IT and IT security specialists from 18 sectors in eight countries were surveyed. Around 58 percent of respondents consider BYOD to be a security risk. The experts claim that the use of private mobile devices restricts the effectiveness of data protection measures and impedes the implementation of security policies. Increasing mobility and the use of Cloud services to store and exchange data make it easier and faster to distribute and copy documents.

With mobility and the latest opportunities for communicating and reproducing information, the risk of data loss rises. When printed out or distributed incorrectly, lists and documents can easily fall into the wrong hands or be accidentally or deliberately deleted by employees. If development results, customer drafts, contracts or other confidential information fall into the wrong hands, it is not simply a competitive disadvantage for the company concerned. When data is lost or stolen, while the company's competitive edge or reputation may well suffer, it could also incur financial losses or be liable for heavy fines. Regulations such as HIPAA, PCI DSS and SOX stipulate substantial fines or even prison sentences in the event of non-compliance.

Not only is data becoming more mobile. It is also distributed more quickly and created in larger volumes. Around 90 percent of German companies that took part in a survey performed by the German IT industry association, Bitkom, in 2014 declared that the amount of data they were producing had increased in comparison with the previous year. On average these companies were generating 22 percent more data, or over one fifth. Companies that had managed one petabyte of storage space in the previous year now had to add another 220 terabytes. The resulting investments in storage ranged from five to six-figure sums, depending on the chosen technology (hard disk or flash). However, it's not just hardware costs that are huge; the cost of protecting such information against unauthorised access, whether from inside or outside the company, is also increasing. The consequences of data loss are becoming ever more serious and this clearly is demonstrated by the annual "Cost of Data Breach" study performed by the Ponemon Institute. The study found that, over the past two years, costs incurred by companies due to data loss have increased throughout the world by 23 percent to an average of 3.8 million dollars (approx. 3.4 million euro). Germany takes second position after the USA in terms of expenses for each lost document which amounts, on average, to 211 dollars (approx. 190 euro), and that doesn't include the damage suffered through loss of reputation. According to Ponemon, in Germany, around three percent of customers turn their backs on companies that endure a security incident involving data loss. The loss of customer loyalty is particularly high in the aftermath of a data breach in industries such as pharmaceuticals, financial services and healthcare. The Ponemon report also says that, from 2014 to 2015, the average loss of turnover caused by such incidents increased by approx. 8 percent and amounted to just under 1.6 million dollars (approx. 1.4 million euro).

The study entitled "White-collar crime in Germany" carried out by KPMG Financial Advisory Services shows that German companies are well aware of this danger. According to the study, 87 percent of those questioned consider the risk of data theft or data breach to be "high" or "very high". 34 percent had suffered damages of 300,000 euro or more, while for 35 percent, the investigation and follow-up costs had amounted to at least 75,000 euro.

Furthermore, paper documents are not necessarily more secure than electronic versions – in fact quite the opposite is true, once a paper document has left the printer, its journey from that point onward is difficult to control. It's impossible to know who might be able to read or copy it. In particular, mishaps occur time and again during transport or disposal.

However, economic loss is only one of the serious consequences of data breach. If companies are unable to prove that their data was protected according to the latest security standards, or that, in the event of loss or theft, no carelessness, negligence or even malicious intent was involved, they could face legal consequences.

If documents contain personal information, the European Data Protection Directive (95/46/EC) and the German Federal Data Protection Act (BDSG) also apply. Data protection regulations can also be found in other laws such as the German Telecommunication Act (TKG) and the German Telemedia Act (TMG). The corresponding legislation regulates data collection, processing and usage. Here too, data must be protected in accordance with IT security guidelines (article 9 of the Federal Data Protection Act). It must be possible to ensure that accessing, editing and distribution of information to third parties can be recorded and traced.

The role of PDF in secure document workflows

Even if, in principle, it is easier to keep digital documents under greater control than printed documents, digital formats still represent a potential security risk for companies. Therefore, document security is a central component of company security as the aforementioned Ponemon Institute study demonstrates. According to the study, 72 percent of IT experts surveyed believe that document security can contribute to maintaining data confidentiality, integrity, authenticity, accessibility, availability and usability.

PDF is the most popular format for exchanging and archiving documents. With a complete PDF solution, you can protect yourself by assigning security settings – another important aspect for participants of the Ponemon study. With an average score of 1.65 (1 = the most important, 4 = the least important), using technical protection options to guarantee document security ranked higher than training and raising employee awareness, secure destruction of documents and enforcement of regulations.

In particular, PDF documents can be protected at different levels:

Password protection:
Restricted viewing and editing of PDF documents

The PDF solution used should allow differentiated access authorisations to be defined for creating, editing, saving, printing and reading PDF documents. Ideally, it should be possible to set these functions both individually and for each separate document; for example, by entering passwords, via standard security profiles, or by assigning roles in global settings via systems such as Microsoft Active Directory Rights Management.

In terms of password protection, you can choose between two levels:

Permission to open a document: If a document can only be opened with a password, it is well protected against access by unauthorised persons, especially if combined with encryption.

Permission to edit a document: While PDF is initially only thought of as a way to exchange documents, this does not mean that these documents cannot be modified. Professional solutions such as Power PDF allow easy modification of texts, images and formatting in PDF. Should you wish to prevent this, you must set a separate password to protect against editing. You can, for example, determine:

- Whether or not a document may be printed, and which print resolution to use.
- Whether or not pages may be removed, rotated, created or added.
- Whether or not the recipient may fill in form fields and sign signature fields.
- Whether or not the recipient may add comments to the document.

Protecting the document against being opened is important if only a defined group of recipients is allowed to open it. For instance, if you send confidential information by e-mail without PGP or S-MIME encryption, in principle, anyone who gains access to this e-mail can also read the confidential document. However, if the document is prevented from being opened or protected by a password, only the actual intended recipient to whom you have communicated the password, for example, by telephone or text message, will be able to open it.

Permissions passwords play an important role, above all when collaborating with internal or external co-workers and also when communicating with customers. For example, if you manage a project team you might like the members of the team to view, if necessary print out and add comments to a project plan, but they should not be allowed to remove or add any pages to it. Again, it should be possible for a customer to fill in form fields on an agreement and sign the document, but not to change the text in any way.

Integration with the Document Management System (DMS) – protecting access at project or group level

Consistent document management processes avoid legal and financial risks for a company and provide a basis for proper accounting. However, these are not the only advantages. Companies that classify, file and archive documents in a well-structured and orderly fashion also have a competitive advantage. For instance, a manufacturing company can keep track of product modifications far more easily, a graphic design studio can access and refine drafts at any time, and a solicitor can call up the complete background to a case at the touch of a button. Teamwork is also greatly facilitated as every team member can see who has created or edited a given document at any time. With versioning, it allows unwanted or rejected modifications to be cancelled, and different versions of a document to be tried out.

As PDF documents play an important role in the company, it should be possible to integrate the PDF solution seamlessly into established document management systems such as HP Worksite, Microsoft SharePoint or OpenText eDocs. Integration is generally done using connectors that enable files to be opened directly from the Document Management System. During the process, it should be possible for external formats such as Microsoft Office, WordPerfect, images or Microsoft's XPS document format (XML Paper Specification) to be converted directly into PDF format, and for existing PDFs to be opened directly.

Of course, PDF solutions should also operate in the opposite direction and enable documents to be checked into the DMS. It should be possible to integrate individual documents with the DMS and create PDF files directly outside of and within a DMS. The following options are possible:

- The user can select a single non-PDF file from the DMS interface and convert it directly into PDF in the DMS. The source files stay intact. The PDF takes the same name as the source, and is normally stored in the same location as the original.
- Users can select a single non-PDF file from their local computer, convert it to PDF and save it in the current, or a defined, directory in the DMS system.

In both cases, the conversions should be done without having to configure additional settings.

Protecting Microsoft Office documents when creating PDFs

When creating a PDF, Microsoft Office users should be able to define permissions directly from the application. When saving a business letter, for example, the director's PA can specify that the recipient may print out, but not edit, the document.

The PDF solution should be able to add passwords directly to PDF files created in Microsoft Office, and prohibit or allow actions such as printing, extracting content and editing. Here too, it should be possible, as described above, to assign different passwords to prevent documents from being opened and to specify different permissions. When assigning permissions, predefined profiles can help to protect typical application scenarios, such as forwarding a document to a business partner, team member or the public.

Encryption algorithm

To ensure that protected files really cannot be read by unauthorised persons, the files must be encrypted. During the process, the PDF solution should be able to support AES (Advanced Encryption Standard) with 256 bit key length – a worldwide acknowledged algorithm, specified by the American National Institute of Standards and Technology (NIST). The file should also be encrypted according to RSA standards in compliance with FIPS (Federal Information Processing Standard).

Even if the highest level of encryption is required, problems can still occur, as the encryption may not be recognised by older PDF applications. Therefore, the solution used should also be able to support older standards which may be less secure but are nevertheless more compatible with legacy software. Ideally, the user should be able to choose between

- 40-bit RC4 – Supported in PDF version 1.1 and above (security revision 2)
- 128-bit RC4 - Supported in PDF version 1.4 and above (security revision 3)
- 128-bit AES – Supported in PDF version 1.6 and above (security revision 3) and
- 256-bit AES – Supported in PDF version 1.7 and above (security revision 3)

Permanent removal of confidential information from a PDF file

Personal data should be obliterated before the document is circulated, to protect it. This process is often referred to as redacting. It is not enough to simply put a black line across the information that you wish to conceal, as an experienced PDF user would easily be able to remove this line again. Rather, the information must actually be removed permanently. Redacting the section in question simply indicates that sensitive data has been removed from this point in the document. This is particularly relevant for authorities and other public bodies, which are required by law to comply with information requirements and must inform the public of the fact that information has been removed from a document, specifying the section of text that has been removed.

All private companies have to handle personal information, which is subject to data protection and must not be passed on to third parties. This may include social security or credit card numbers, addresses, dates of birth, religious affiliation, sexual orientation or political beliefs. Therefore, a PDF solution must be capable of permanently removing this information in a traceable way. This should be possible both manually and automatically. The program should also be able to remove potentially revealing meta data or hidden information from the PDF.

Ideally, it should be possible to search, not just individual PFDF files, but also entire packages, portfolios and directories. A pattern search is also extremely helpful as it allows data in certain formats, such as credit card numbers or dates of birth, to be located accurately. Nevertheless, the user must always carefully check whether the document contains any searchable graphic elements that may also contain sensitive data.

Comparing two versions of a document

If there are any doubts as to whether a document has been modified or definite grounds for suspecting that it has been manipulated, the PDF solution should enable two document versions to be compared. In the process, it should be possible to clearly display any differences in the text, drawing objects and graphics. The program should be able to provide information about the following changes:

- Number of words that have been added or deleted and the number of identical words
- Number of words differing in formatting only
- Number of identical pages
- Number of differing pages
- Number of pages added or deleted

If the documents are not identical, the individual pages of both documents should be displayed side by side. The differences should be highlighted, for example, deleted words should be crossed out, added words should be underlined, corresponding words surrounded by a box, differing graphics surrounded by a cloud, etc. For comparison purposes, blank pages should be added to the shorter document to equalise the numbers of pages.

Certificate-based signatures

Documents can be signed with a digital ID. This approximately corresponds to a signature on a paper document. If unauthorised changes are made to a document after it has been signed, the digital signature becomes invalid. Documents may be signed several times and by different persons. When deciding on a PDF solution, opt for an application that not only enables documents to be signed but also allows them to be stamped with a digitally-authenticated time stamp. This indicates that the contents of any data file existed at a certain time and have not been changed since that time. A time stamp is usually requested from a third-party together with a security certificate.

Digital IDs not only allow a PDF solution to authenticate documents, but also to protect them. This process known as certifying, allows the owner of the document to apply a signature and document protection at the same time. The signee can completely lock the document, or allow certain actions to be available for other users such as form filling or commenting. Organizations use this processes to issue official documents.

For the purpose of creating the signature, you can either use an existing digital ID or you can create your own identity. Each digital ID consists of a public and a private key. In order to enable others to verify the autheticity of your signature and your document, you need to share your public key with them, that they can then save their trusted identities store.

Six good reasons to use Nuance Power PDF

Nuance Power PDF offers all security functions for creating, circulating and editing PDFs on a user-friendly operator interface. The main benefits of Power PDF in a secure digital workflow are:

1. Easy configuration of read, edit, copy and print authorisations. Restrictions can be defined on a file-by-file basis, for standard security profiles or by assigning personal access rights via a Document Rights Management System such as Microsoft Active Directory Rights Management. Power PDF Advanced also takes account of all security settings that can be assigned in the FileOpen DRM system. **Only available in Power PDF Advanced:** Microsoft's Active Directory Rights Management Service (AD RMS) is supported. This function enables administrators to define access rights via the Rights Management interface and to apply them to PDF files. This works both directly using Power PDF and also in SharePoint workflows. It is an effective method of protecting your PDF documents against unauthorised access.

2. Strong encryption. Power PDF uses industry standard AES encryption, with a 128 or 256 bit key length, and also supports the Public Key Cryptography Standard (PKCS) #12, while retaining backwards-compatibility as far as version 1.1 of the PDF standard. Word documents can also be protected directly when being saved as PDFs.

3. Automatic or manual removal of sensitive data. With Power PDF, sensitive data such as dates of birth, addresses, social security and credit card numbers can be detected automatically when scanning paper documents, and be redacted or removed. Hidden information can also be removed automatically before sending a document.

4. Digital signatures and certificates. Documents can be signed and authenticated to guarantee their authenticity and integrity. Power PDF supports PKCS#7 and CAdES cryptography standards for signing and certifying documents.

5. Rapid implementation and integration with existing systems. Power PDF not only enables the generation of secure documents from office software such as Microsoft Office, but it can also be integrated seamlessly into workflows in the latest Document Management Systems such as HP Worksite, Microsoft SharePoint or OpenText eDOCS.

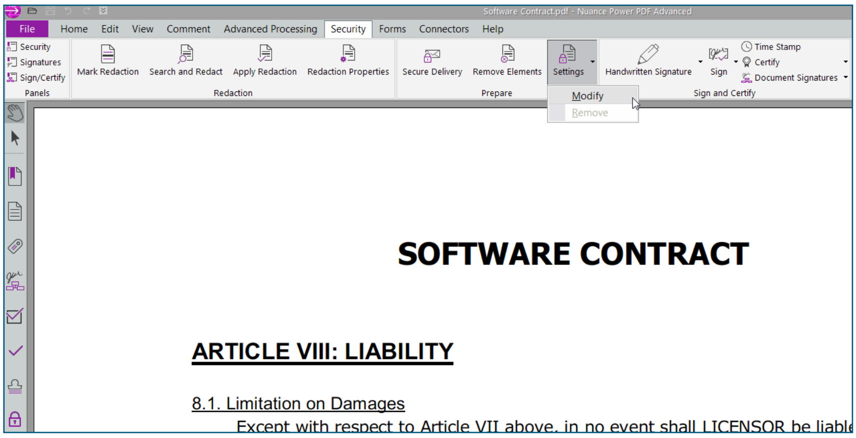
6. Compare two versions of a document. Power PDF allows the user to view a comparison of different file versions, clearly displaying any differences between the versions.

Practical application

Document security

How to protect a document against unauthorised access.

Open the document in Power PDF and go to the Security ribbon toolbar. Click on Document Security and select Security Properties



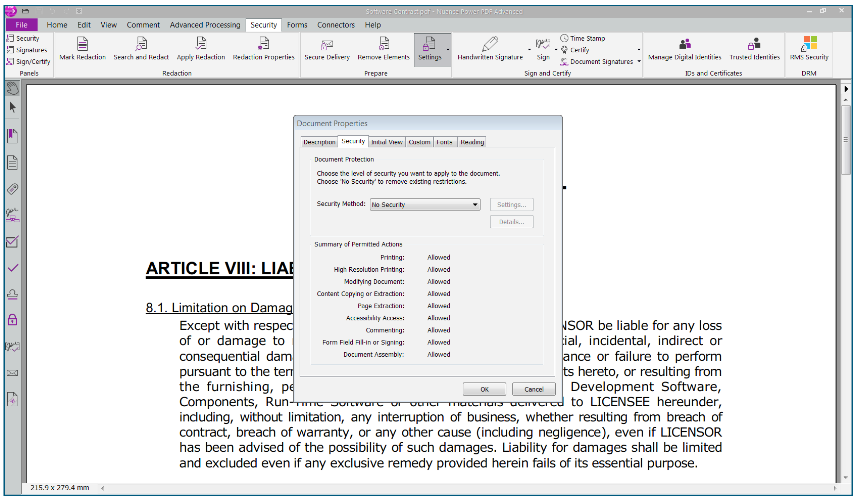
SOFTWARE CONTRACT

ARTICLE VIII: LIABILITY

8.1. Limitation on Damages

Except with respect to Article VII above, in no event shall LICENSOR be liable

The Document Properties window opens.



Document Protection

Choose the level of security you want to apply to the document.
Choose 'No Security' to remove existing restrictions.

Security Method: No Security

Summary of Permitted Actions

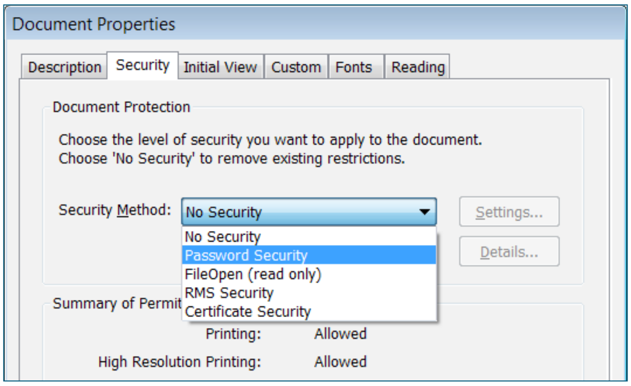
Printing:	Allowed
High Resolution Printing:	Allowed
Modifying Document:	Allowed
Content Copying or Extraction:	Allowed
Page Extraction:	Allowed
Accessibility Access:	Allowed
Commenting:	Allowed
Form Field Fill-in or Signing:	Allowed
Document Assembly:	Allowed

ARTICLE VIII: LIAB

8.1. Limitation on Damag

Except with respec … NSOR be liable for any loss of or damage to … ial, incidental, indirect or consequential dam… ance or failure to perform pursuant to the ter… ts hereto, or resulting from the furnishing, pe… Development Software, Components, Run-time Software or other materials delivered to LICENSEE hereunder, including, without limitation, any interruption of business, whether resulting from breach of contract, breach of warranty, or any other cause (including negligence), even if LICENSOR has been advised of the possibility of such damages. Liability for damages shall be limited and excluded even if any exclusive remedy provided herein fails of its essential purpose.

A summary of the permitted actions is displayed here.



Document Protection

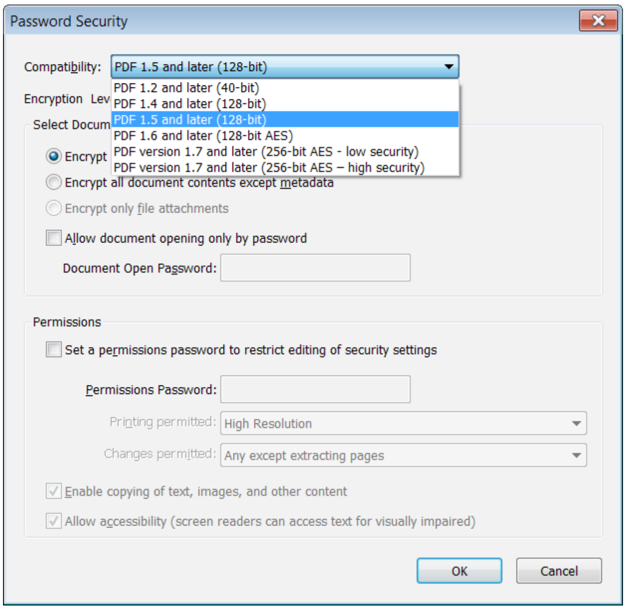
Choose the level of security you want to apply to the document.
Choose 'No Security' to remove existing restrictions.

Security Method: No Security

Summary of Permit

Printing:	Allowed
High Resolution Printing:	Allowed

You can select one of the various levels of security from the Security Method drop-down list. You can, of course, create a PDF with no security features enabled, or you can opt for password protection.



Password Security

Compatibility: PDF 1.5 and later (128-bit)

- PDF 1.2 and later (40-bit)
- PDF 1.4 and later (128-bit)
- PDF 1.5 and later (128-bit)
- PDF 1.6 and later (128-bit AES)
- PDF version 1.7 and later (256-bit AES - low security)
- PDF version 1.7 and later (256-bit AES – high security)

Encryption Lev

Select Docum

● Encrypt

○ Encrypt all document contents except metadata

○ Encrypt only file attachments

□ Allow document opening only by password

Document Open Password:

Permissions

□ Set a permissions password to restrict editing of security settings

Permissions Password:

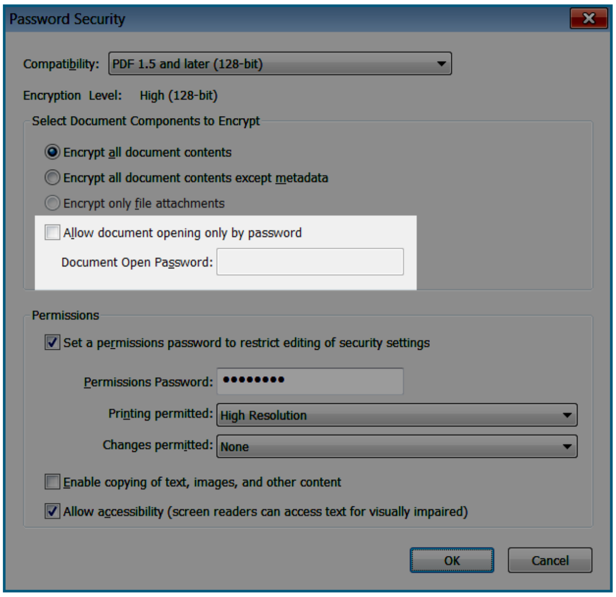
Printing permitted: High Resolution

Changes permitted: Any except extracting pages

☑ Enable copying of text, images, and other content

☑ Allow accessibility (screen readers can access text for visually impaired)

Power PDF supports all current levels of PDF security up to PDF 1.7 with 256 bit AES encryption.



Password Security

Compatibility: PDF 1.5 and later (128-bit)

Encryption Level: High (128-bit)

Select Document Components to Encrypt

● Encrypt all document contents

○ Encrypt all document contents except metadata

○ Encrypt only file attachments

□ Allow document opening only by password

Document Open Password:

Permissions

☑ Set a permissions password to restrict editing of security settings

Permissions Password: ••••••••

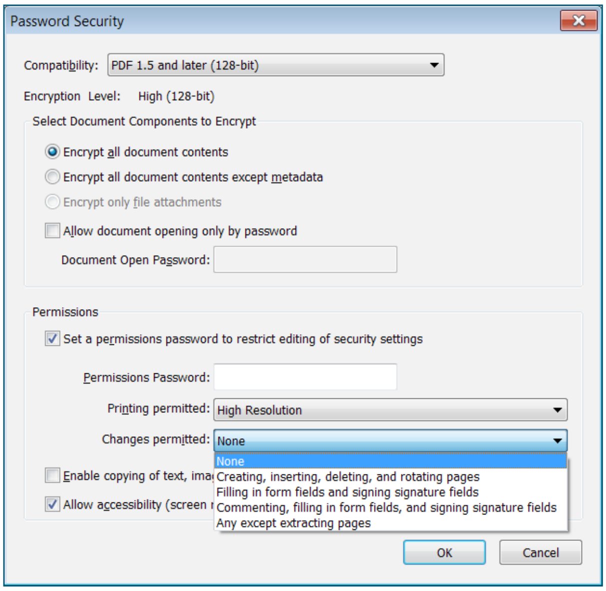
Printing permitted: High Resolution

Changes permitted: None

□ Enable copying of text, images, and other content

☑ Allow accessibility (screen readers can access text for visually impaired)

You can set a password that must be entered in order to open the document. But be careful, if you lose the password, you will also lose access to the document.



Password Security

Compatibility: PDF 1.5 and later (128-bit)

Encryption Level: High (128-bit)

Select Document Components to Encrypt

● Encrypt all document contents

○ Encrypt all document contents except metadata

○ Encrypt only file attachments

□ Allow document opening only by password

Document Open Password:

Permissions

☑ Set a permissions password to restrict editing of security settings

Permissions Password:

Printing permitted: High Resolution

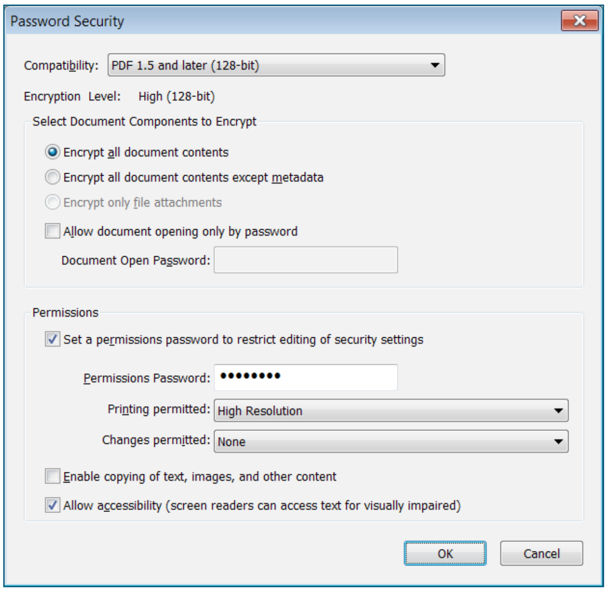
Changes permitted: None

- None
- Creating, inserting, deleting, and rotating pages
- Filling in form fields and signing signature fields
- Commenting, filling in form fields, and signing signature fields
- Any except extracting pages

□ Enable copying of text, ima

☑ Allow accessibility (screen r

A permission level applies to the password protection. In our example, we'll select None to indicate that no changes are permitted unless the permissions password is entered.



Password Security

Compatibility: PDF 1.5 and later (128-bit)

Encryption Level: High (128-bit)

Select Document Components to Encrypt

● Encrypt all document contents

○ Encrypt all document contents except metadata

○ Encrypt only file attachments

□ Allow document opening only by password

Document Open Password:

Permissions

☑ Set a permissions password to restrict editing of security settings

Permissions Password: ••••••••

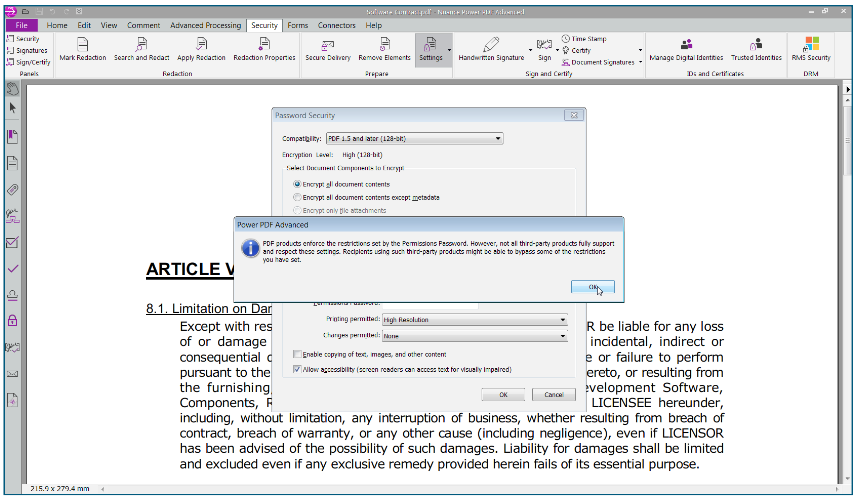
Printing permitted: High Resolution

Changes permitted: None

□ Enable copying of text, images, and other content

☑ Allow accessibility (screen readers can access text for visually impaired)

In this example, we will enter a permissions password that will authorise other users to make changes to the document provided that they enter the correct password.



Password Security

Compatibility: PDF 1.5 and later (128-bit)

Encryption Level: High (128-bit)

Select Document Components to Encrypt

● Encrypt all document contents
○ Encrypt all document contents except metadata
○ Encrypt only file attachments

Printing permitted: High Resolution

Changes permitted: None

□ Enable copying of text, images, and other content
☑ Allow accessibility (screen readers can access text for visually impaired)

OK Cancel

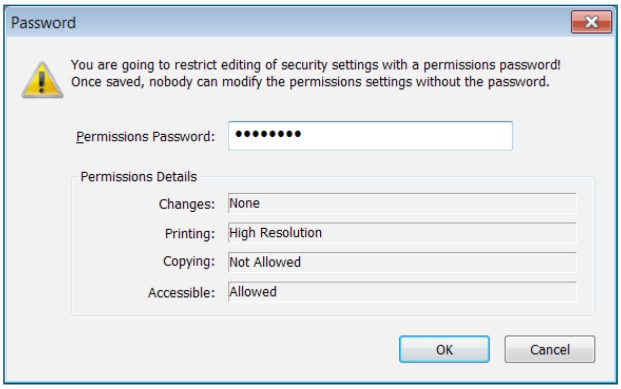
Power PDF Advanced

PDF products enforce the restrictions set by the Permissions Password. However, not all third-party products fully support and respect these settings. Recipients using such third-party products might be able to bypass some of the restrictions you have set.

OK

To secure the document with a permissions password, click OK.

A password window appears so that you can confirm the password you previously set. Type your chosen password and click OK.



Password

You are going to restrict editing of security settings with a permissions password!
Once saved, nobody can modify the permissions settings without the password.

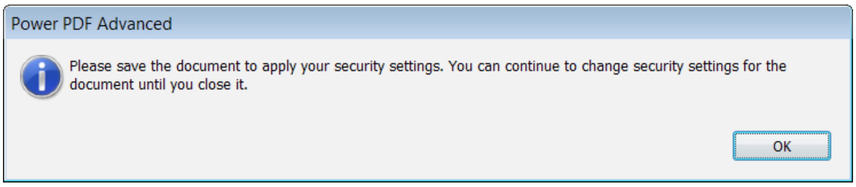
Permissions Password: ••••••••

Permissions Details

Changes:	None
Printing:	High Resolution
Copying:	Not Allowed
Accessible:	Allowed

OK Cancel

A message window asks you to save the document in order to apply your security settings. Click OK.

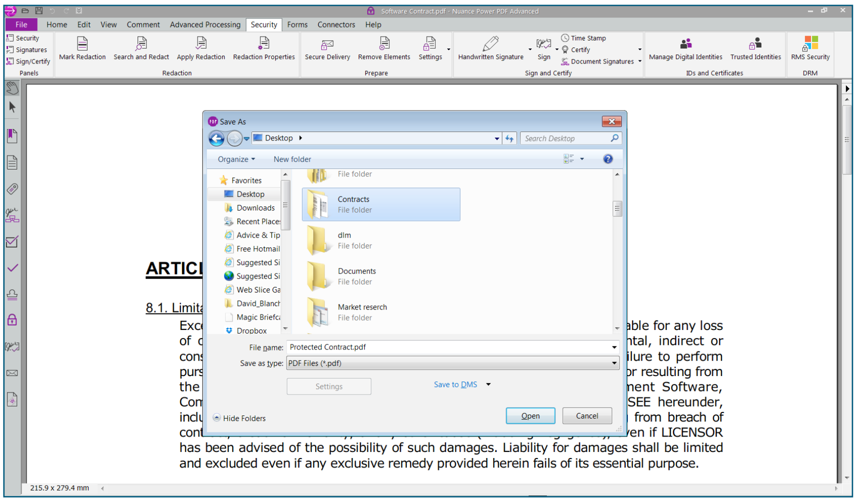


Power PDF Advanced

Please save the document to apply your security settings. You can continue to change security settings for the document until you close it.

OK

Save the document with a name indicating that this is the secure version, for example “Protected contract.pdf”.



File name: Protected Contract.pdf

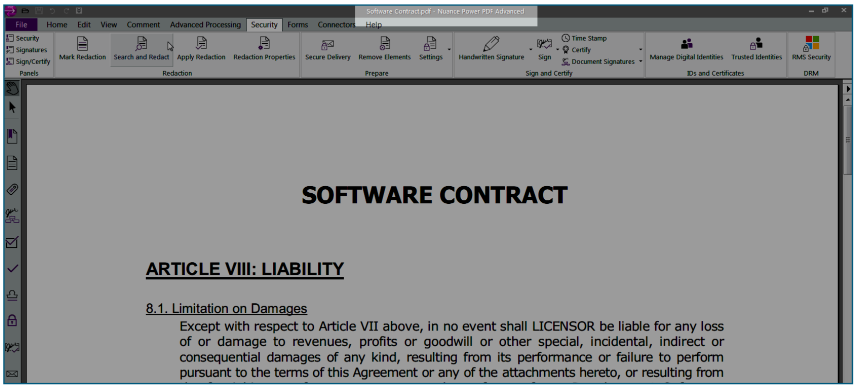
Save as type: PDF Files (*.pdf)

ARTICL

8.1. Limita

Exc... able for any loss of ... ntal, indirect or cons... ilure to perform purs... or resulting from the ... ment Software, Com... SEE hereunder, incl... from breach of cont... en if LICENSOR has been advised of the possibility of such damages. Liability for damages shall be limited and excluded even if any exclusive remedy provided herein fails of its essential purpose.

Double-click on the document that you have just saved, in order to open it. As the document has been assigned security features, it can now only be edited by entering a password.



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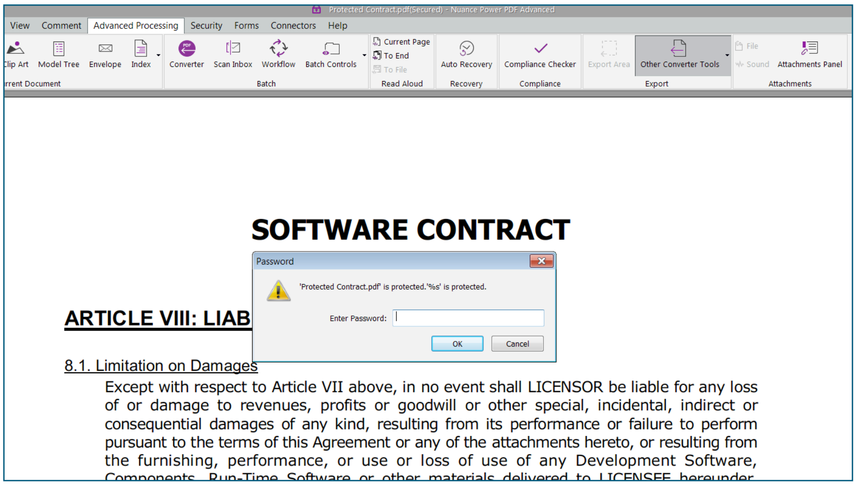
ARTICLE VIII: LIABILITY

8.1. Limitation on Damages

Except with respect to Article VII above, in no event shall LICENSOR be liable for any loss of or damage to revenues, profits or goodwill or other special, incidental, indirect or consequential damages of any kind, resulting from its performance or failure to perform pursuant to the terms of this Agreement or any of the attachments hereto, or resulting from

If you try to edit the document, for example by converting it into a Word document, the password window will be displayed.



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'Protected Contract.pdf' is protected.'%s' is protected.

Enter Password:

ARTICLE VIII: LIAB

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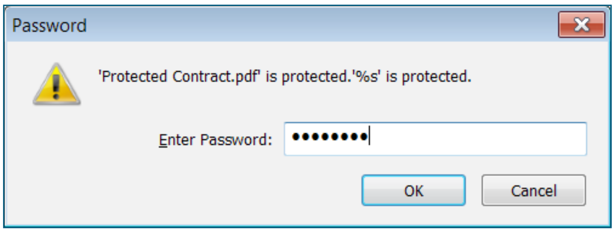
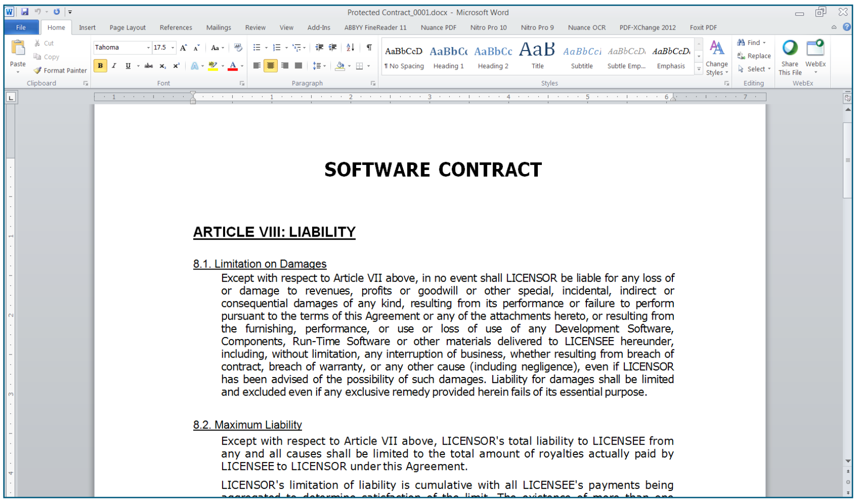
Except with respect to Article VII above, in no event shall LICENSOR be liable for any loss of or damage to revenues, profits or goodwill or other special, incidental, indirect or consequential damages of any kind, resulting from its performance or failure to perform pursuant to the terms of this Agreement or any of the attachments hereto, or resulting from the furnishing, performance, or use or loss of use of any Development Software, Components, Run-Time Software or other materials delivered to LICENSEE hereunder, Enter the password and click OK to be able to work with the document.



'Protected Contract.pdf' is protected.'%s' is protected.

Enter Password: ••••••••

The document will open in Word. You can now read and edit it as required.



SOFTWARE CONTRACT

ARTICLE VIII: LIABILITY

8.1. Limitation on Damages

Except with respect to Article VII above, in no event shall LICENSOR be liable for any loss of or damage to revenues, profits or goodwill or other special, incidental, indirect or consequential damages of any kind, resulting from its performance or failure to perform pursuant to the terms of this Agreement or any of the attachments hereto, or resulting from the furnishing, performance, or use or loss of use of any Development Software, Components, Run-Time Software or other materials delivered to LICENSEE hereunder, including, without limitation, any interruption of business, whether resulting from breach of contract, breach of warranty, or any other cause (including negligence), even if LICENSOR has been advised of the possibility of such damages. Liability for damages shall be limited and excluded even if any exclusive remedy provided herein fails of its essential purpose.

8.2. Maximum Liability

Except with respect to Article VII above, LICENSOR's total liability to LICENSEE from any and all causes shall be limited to the total amount of royalties actually paid by LICENSEE to LICENSOR under this Agreement.

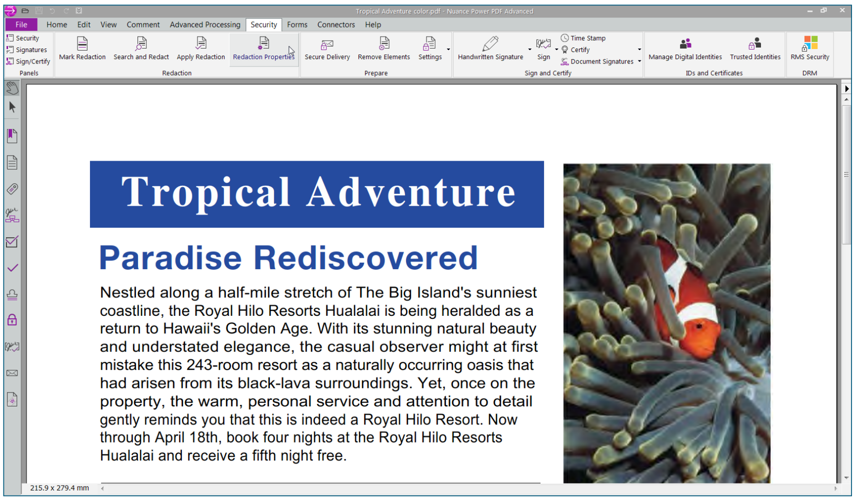
LICENSOR's limitation of liability is cumulative with all LICENSEE's payments being aggregated to determine satisfaction of the limit. The existence of more than one

Redacting

Power PDF offers various methods to obliterate confidential information in a way that cannot be recovered. You can mark areas manually or use the search function to find any phrases that you would like to redact.

Caution: When using the redact function by selecting or searching for text, remember that this only works in “normal” or “searchable” PDF documents. If you have a pure image file, you can use the area selection tool.

To mark content in a document and obliterate it permanently, go to the Security ribbon toolbar and click Redaction Properties in the Redaction section.



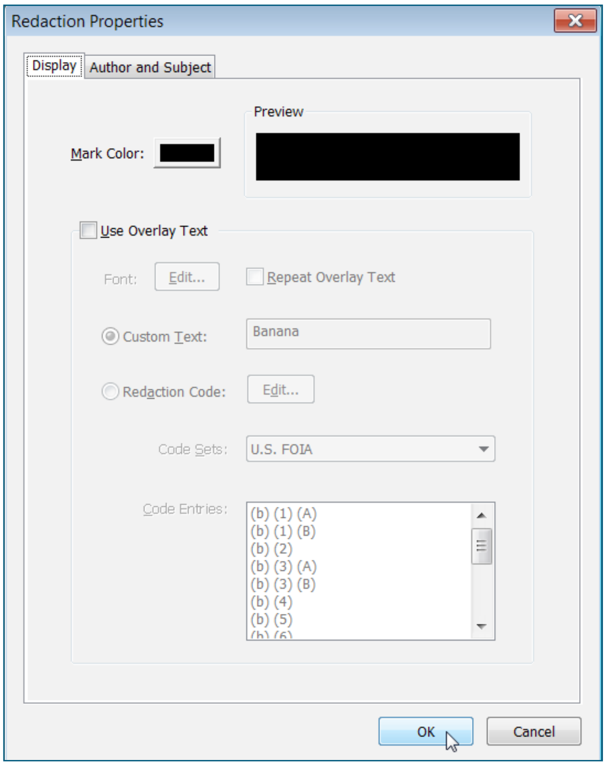
Tropical Adventure

Paradise Rediscovered

Nestled along a half-mile stretch of The Big Island's sunniest coastline, the Royal Hilo Resorts Hualalai is being heralded as a return to Hawaii's Golden Age. With its stunning natural beauty and understated elegance, the casual observer might at first mistake this 243-room resort as a naturally occurring oasis that had arisen from its black-lava surroundings. Yet, once on the property, the warm, personal service and attention to detail gently reminds you that this is indeed a Royal Hilo Resort. Now through April 18th, book four nights at the Royal Hilo Resorts Hualalai and receive a fifth night free.

The Redaction Properties dialog box will appear.

Here you can define the colours to be used to mark the text. In the example we have used the standard colour, black. Click OK.



Mark Color: ■

□ Use Overlay Text

Font: Edit...

□ Repeat Overlay Text

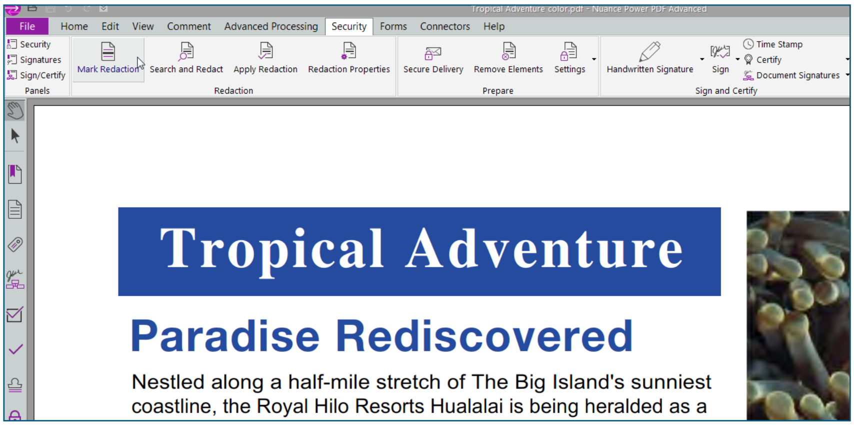
● Custom Text: Banana

○ Redaction Code: Edit...

Code Sets: U.S. FOIA

Code Entries:
(b) (1) (A)
(b) (1) (B)
(b) (2)
(b) (3) (A)
(b) (3) (B)
(b) (4)
(b) (5)
(b) (6)

Now select the Mark Redaction tool. This lets you select any content that you wish to remove.

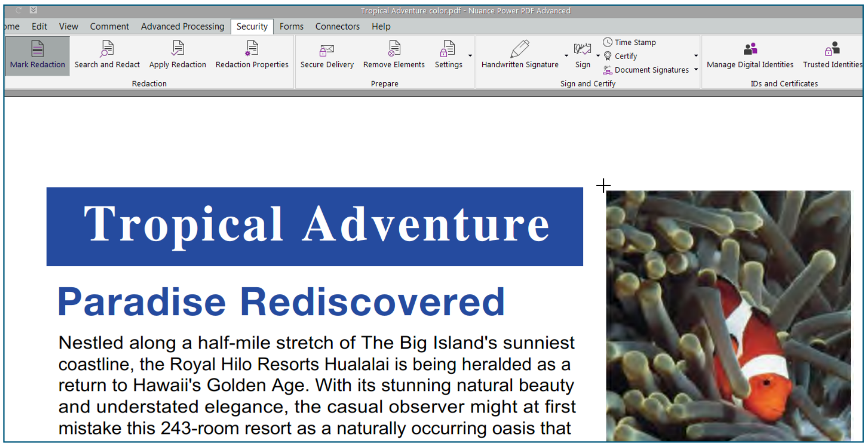


Tropical Adventure

Paradise Rediscovered

Nestled along a half-mile stretch of The Big Island's sunniest coastline, the Royal Hilo Resorts Hualalai is being heralded as a

You can now remove any text that you have selected with the mouse. You can also remove other elements. In our example, we have marked a picture by moving the cursor over it. As soon as the cursor changes to "+", drag it to draw a rectangle to cover the desired selection area.

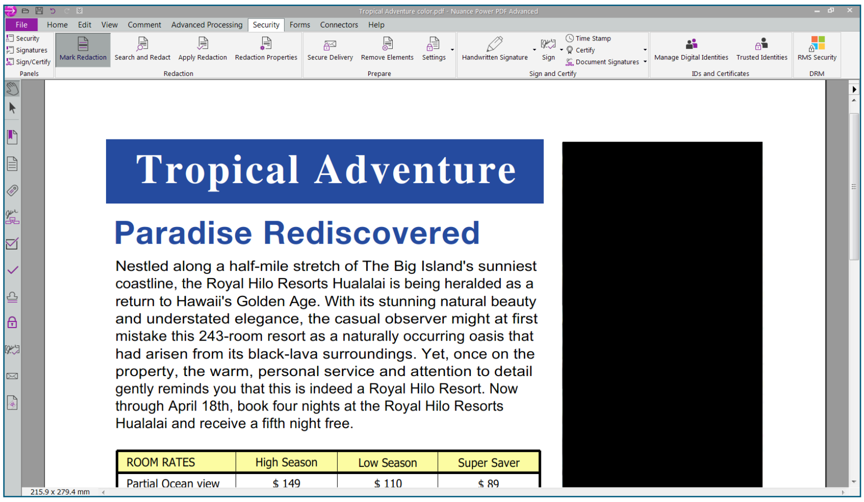


Tropical Adventure

Paradise Rediscovered

Nestled along a half-mile stretch of The Big Island's sunniest coastline, the Royal Hilo Resorts Hualalai is being heralded as a return to Hawaii's Golden Age. With its stunning natural beauty and understated elegance, the casual observer might at first mistake this 243-room resort as a naturally occurring oasis that

Move the cursor over a marked area for a preview of how the redaction marking will appear when applied.



Tropical Adventure

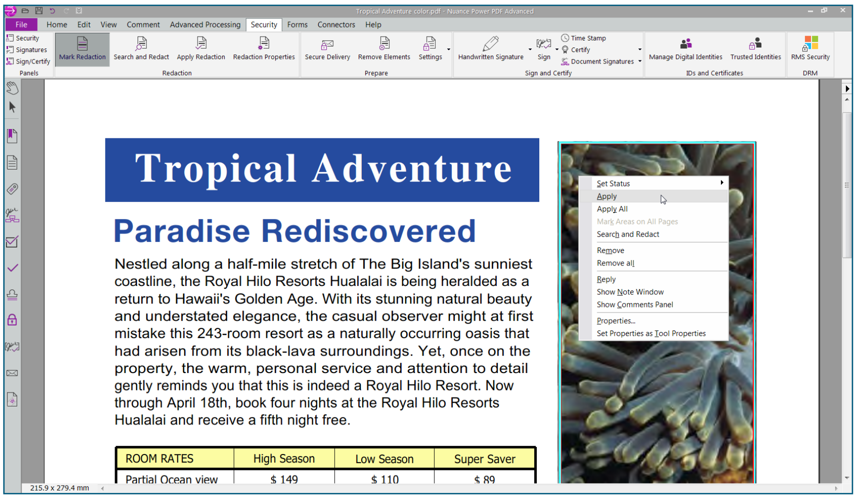
Paradise Rediscovered

Nestled along a half-mile stretch of The Big Island's sunniest coastline, the Royal Hilo Resorts Hualalai is being heralded as a return to Hawaii's Golden Age. With its stunning natural beauty and understated elegance, the casual observer might at first mistake this 243-room resort as a naturally occurring oasis that had arisen from its black-lava surroundings. Yet, once on the property, the warm, personal service and attention to detail gently reminds you that this is indeed a Royal Hilo Resort. Now through April 18th, book four nights at the Royal Hilo Resorts Hualalai and receive a fifth night free.

[redacted]

ROOM RATES	High Season	Low Season	Super Saver
Partial Ocean view	$ 149	$ 110	$ 89

Right-click in a marked area and select Apply from the context menu. If you wish to permanently obliterate all of the marked content, select Apply All.



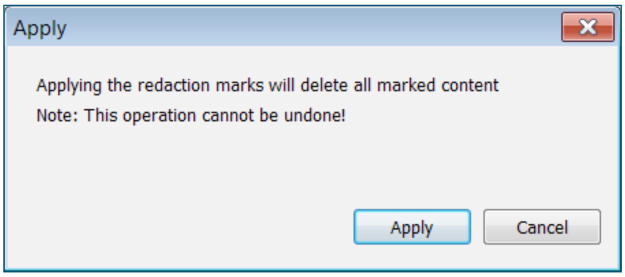
Tropical Adventure

Paradise Rediscovered

Nestled along a half-mile stretch of The Big Island's sunniest coastline, the Royal Hilo Resorts Hualalai is being heralded as a return to Hawaii's Golden Age. With its stunning natural beauty and understated elegance, the casual observer might at first mistake this 243-room resort as a naturally occurring oasis that had arisen from its black-lava surroundings. Yet, once on the property, the warm, personal service and attention to detail gently reminds you that this is indeed a Royal Hilo Resort. Now through April 18th, book four nights at the Royal Hilo Resorts Hualalai and receive a fifth night free.

ROOM RATES	High Season	Low Season	Super Saver
Partial Ocean view	$ 149	$ 110	$ 89

Answer the confirmation request by clicking Yes to permanently delete the marked content.

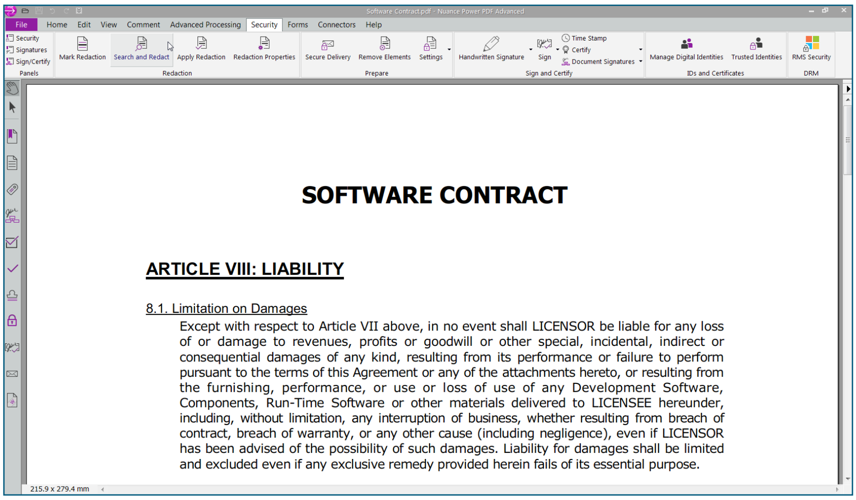


Apply

Applying the redaction marks will delete all marked content

Note: This operation cannot be undone!

Create a copy of the file before redacting it, or save the redacted file with a different name or in a different location.



SOFTWARE CONTRACT

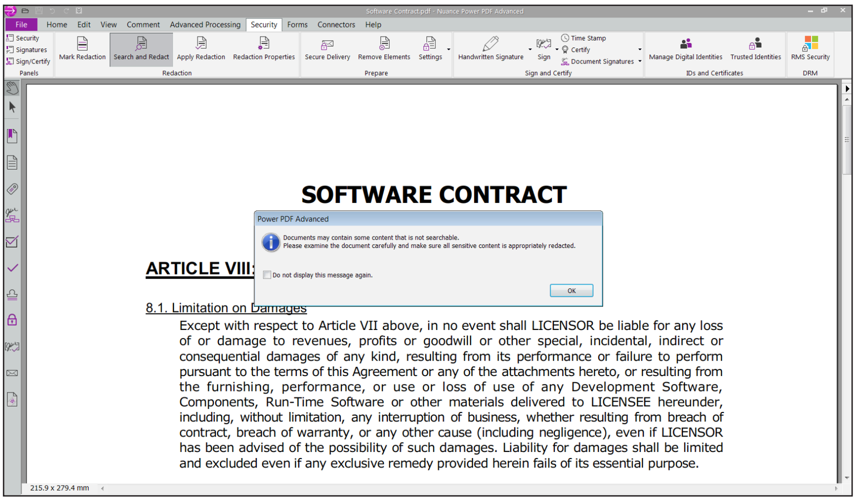
ARTICLE VIII: LIABILITY

8.1. Limitation on Damages

Except with respect to Article VII above, in no event shall LICENSOR be liable for any loss of or damage to revenues, profits or goodwill or other special, incidental, indirect or consequential damages of any kind, resulting from its performance or failure to perform pursuant to the terms of this Agreement or any of the attachments hereto, or resulting from the furnishing, performance, or use or loss of use of any Development Software, Components, Run-Time Software or other materials delivered to LICENSEE hereunder, including, without limitation, any interruption of business, whether resulting from breach of contract, breach of warranty, or any other cause (including negligence), even if LICENSOR has been advised of the possibility of such damages. Liability for damages shall be limited and excluded even if any exclusive remedy provided herein fails of its essential purpose.

Power PDF allows you to mark information to be redacted manually, but you can also search for text to be redacted automatically using the search function.

Open the document containing the content that you wish to redact. In our example, we wish to remove information concerning social security numbers from a contract.



SOFTWARE CONTRACT

ARTICLE VIII:

8.1. Limitation on Damages

Except with respect to Article VII above, in no event shall LICENSOR be liable for any loss of or damage to revenues, profits or goodwill or other special, incidental, indirect or consequential damages of any kind, resulting from its performance or failure to perform pursuant to the terms of this Agreement or any of the attachments hereto, or resulting from the furnishing, performance, or use or loss of use of any Development Software, Components, Run-Time Software or other materials delivered to LICENSEE hereunder, including, without limitation, any interruption of business, whether resulting from breach of contract, breach of warranty, or any other cause (including negligence), even if LICENSOR has been advised of the possibility of such damages. Liability for damages shall be limited and excluded even if any exclusive remedy provided herein fails of its essential purpose.

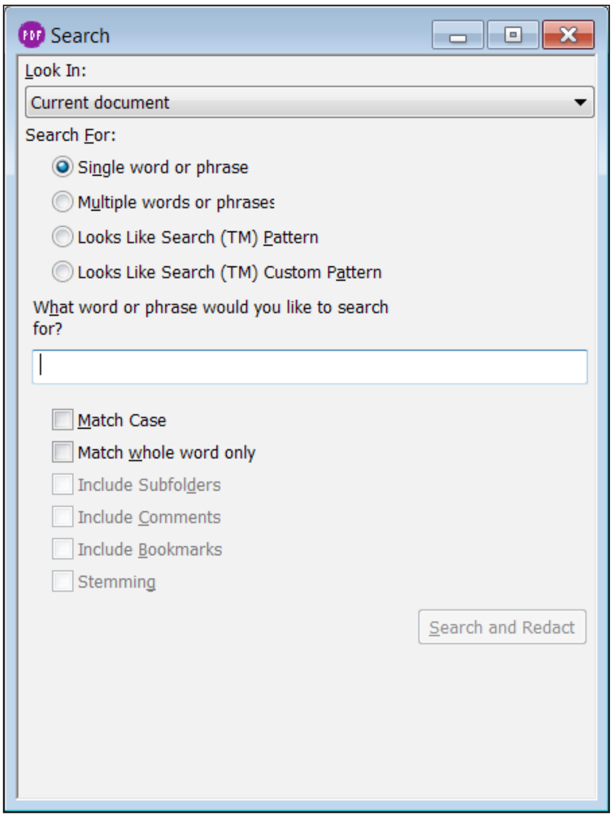
Power PDF Advanced

Documents may contain some content that is not searchable.
Please examine the document carefully and make sure all sensitive content is appropriately redacted.

□ Do not display this message again.

OK

To find the information to be redacted, click on Search and Redact in the Redaction section of the Security ribbon toolbar.



Look In:

Current document

Search For:

● Single word or phrase

○ Multiple words or phrases

○ Looks Like Search (TM) Pattern

○ Looks Like Search (TM) Custom Pattern

What word or phrase would you like to search for?

□ Match Case

□ Match whole word only

□ Include Subfolders

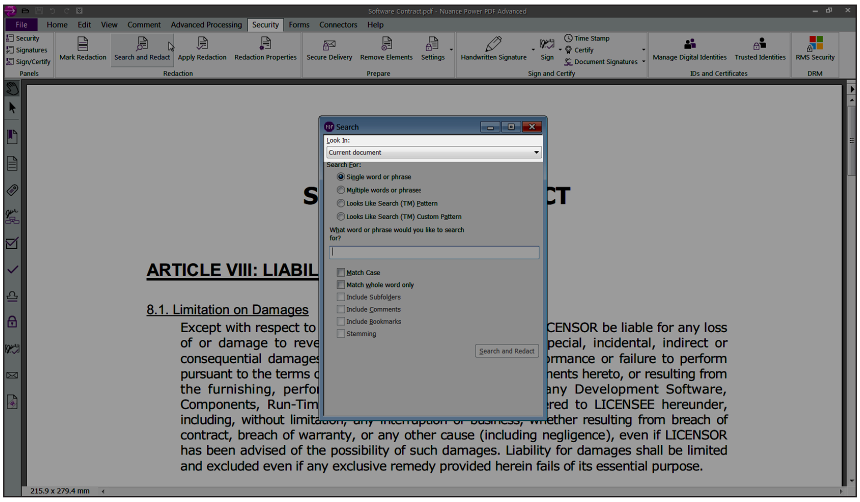
□ Include Comments

□ Include Bookmarks

□ Stemming

Search and Redact

Power PDF reminds you that certain documents may contain content that is not searchable. Therefore, you should always examine the document carefully to make sure that all sensitive content has been properly redacted. Click OK.



Look In: Current document

Search For:

- ● Single word or phrase
- ○ Multiple words or phrases
- ○ Looks Like Search (TM) Pattern
- ○ Looks Like Search (TM) Custom Pattern

What word or phrase would you like to search for?

- □ Match Case
- □ Match whole word only
- □ Include Subfolders
- □ Include Comments
- □ Include Bookmarks
- □ Stemming

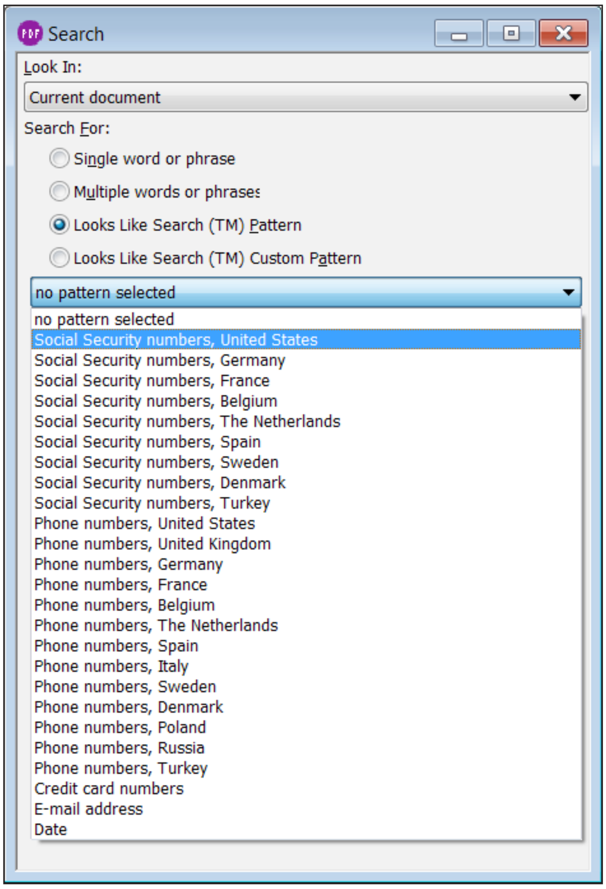
S CT

ARTICLE VIII: LIABIL

8.1. Limitation on Damages

Except with respect to CENSOR be liable for any loss of or damage to reve pecial, incidental, indirect or consequential damages rmance or failure to perform pursuant to the terms c nents hereto, or resulting from the furnishing, perfo any Development Software, Components, Run-Tim red to LICENSEE hereunder, including, without limitation, any interruption of business, whether resulting from breach of contract, breach of warranty, or any other cause (including negligence), even if LICENSOR has been advised of the possibility of such damages. Liability for damages shall be limited and excluded even if any exclusive remedy provided herein fails of its essential purpose.

A dialog box opens asking you to select the document, portfolio or even the folder that you wish to search.



Look In: Current document

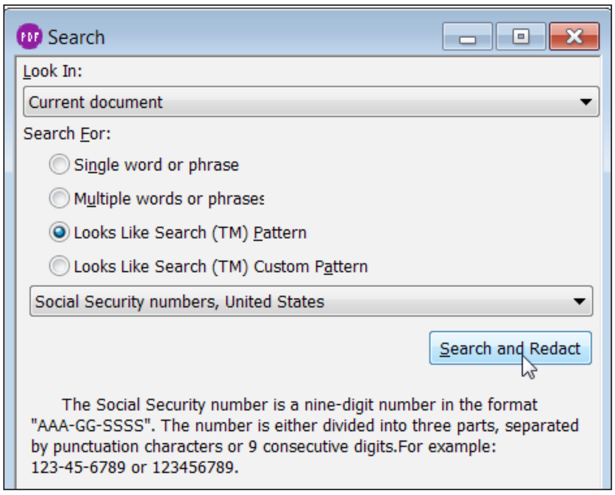
Search For:

- ○ Single word or phrase
- ○ Multiple words or phrases
- ● Looks Like Search (TM) Pattern
- ○ Looks Like Search (TM) Custom Pattern

no pattern selected

- no pattern selected
- Social Security numbers, United States
- Social Security numbers, Germany
- Social Security numbers, France
- Social Security numbers, Belgium
- Social Security numbers, The Netherlands
- Social Security numbers, Spain
- Social Security numbers, Sweden
- Social Security numbers, Denmark
- Social Security numbers, Turkey
- Phone numbers, United States
- Phone numbers, United Kingdom
- Phone numbers, Germany
- Phone numbers, France
- Phone numbers, Belgium
- Phone numbers, The Netherlands
- Phone numbers, Spain
- Phone numbers, Italy
- Phone numbers, Sweden
- Phone numbers, Denmark
- Phone numbers, Poland
- Phone numbers, Russia
- Phone numbers, Turkey
- Credit card numbers
- E-mail address
- Date

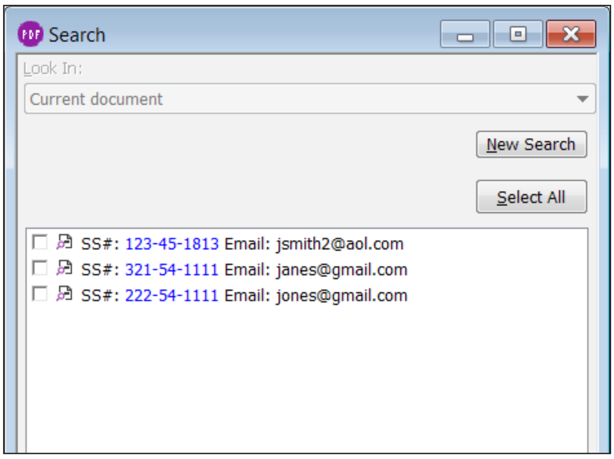
Select Social Security numbers, United States.



Search
Look In:
Current document
Search For:
○ Single word or phrase
○ Multiple words or phrases
● Looks Like Search (TM) Pattern
○ Looks Like Search (TM) Custom Pattern
Social Security numbers, United States
Search and Redact

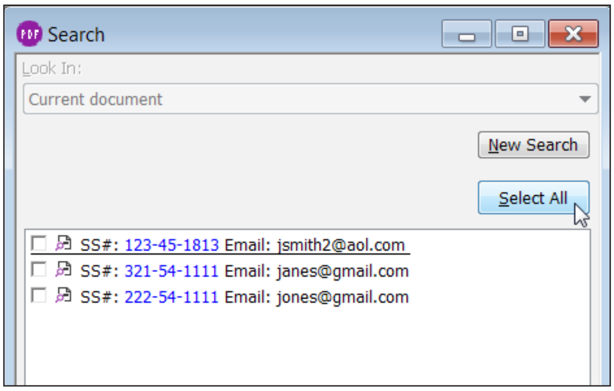
The Social Security number is a nine-digit number in the format "AAA-GG-SSSS". The number is either divided into three parts, separated by punctuation characters or 9 consecutive digits.For example: 123-45-6789 or 123456789.

Click Search and Redact. The Advanced Search dialog box is displayed.



□ SS#: 123-45-1813 Email: jsmith2@aol.com
□ SS#: 321-54-1111 Email: janes@gmail.com
□ SS#: 222-54-1111 Email: jones@gmail.com

Click Select All. All areas that match the search are marked.

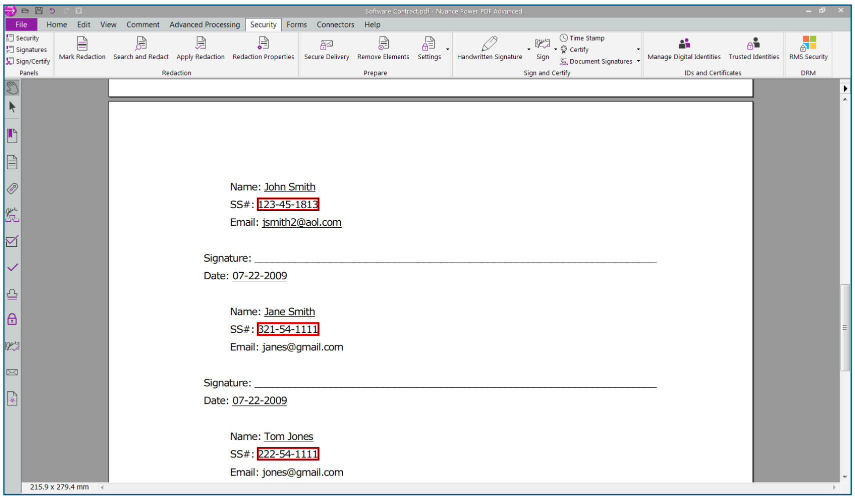


□ SS#: 123-45-1813 Email: jsmith2@aol.com

□ SS#: 321-54-1111 Email: janes@gmail.com

□ SS#: 222-54-1111 Email: jones@gmail.com

Click Mark selected results for redaction. The text passages to be redacted are marked.



Name: John Smith
SS#: 123-45-1813
Email: jsmith2@aol.com

Signature: ___________

Date: 07-22-2009

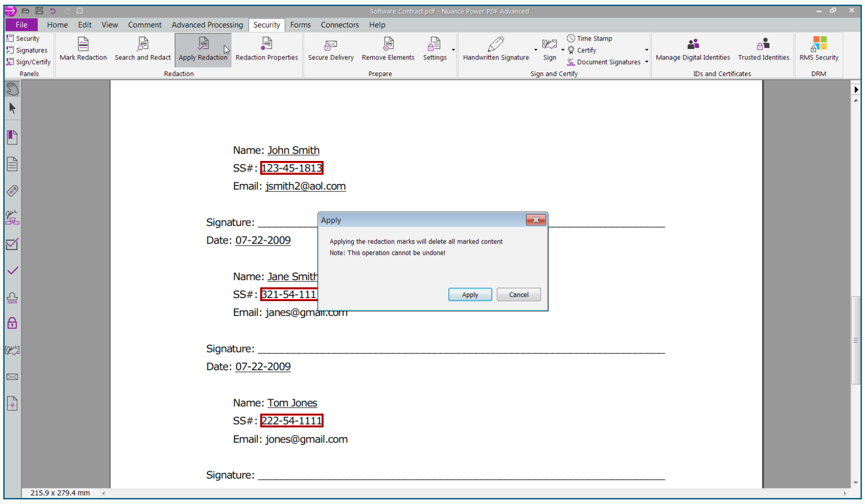
Name: Jane Smith
SS#: 321-54-1111
Email: janes@gmail.com

Signature: ___________

Date: 07-22-2009

Name: Tom Jones
SS#: 222-54-1111
Email: jones@gmail.com

A message pops up noting that once applied, the redactions cannot be undone.



Name: John Smith
SS#: 123-45-1813
Email: jsmith2@aol.com

Signature: ______
Date: 07-22-2009

Name: Jane Smith
SS#: 321-54-111
Email: janes@gmail.com

Signature: ______
Date: 07-22-2009

Name: Tom Jones
SS#: 222-54-1111
Email: jones@gmail.com

Signature: ______

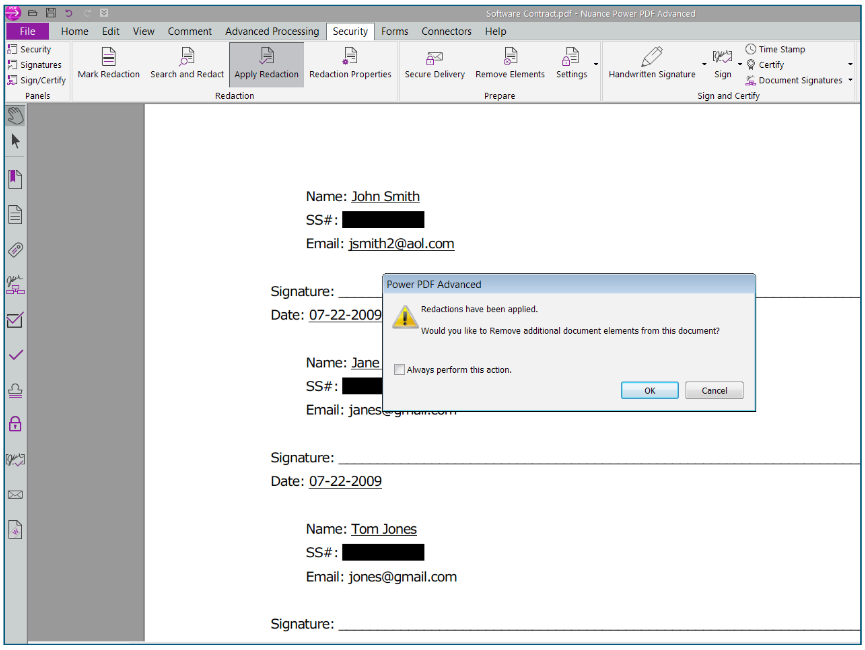
Apply

Applying the redaction marks will delete all marked content
Note: This operation cannot be undone!

Apply | Cancel

After redaction has been completed, Power PDF will ask whether you wish to remove other elements from the document.

This process also removes all other elements that are still connected in the background to Social Security numbers and that must also be protected against access. Click OK. Now, all of the information related to Social Security numbers has been removed.



Name: John Smith
SS#: [redacted]
Email: jsmith2@aol.com

Signature: ______
Date: 07-22-2009

Name: Jane
SS#: [redacted]
Email: janes

Signature: ______
Date: 07-22-2009

Name: Tom Jones
SS#: [redacted]
Email: jones@gmail.com

Signature: ______

Power PDF Advanced

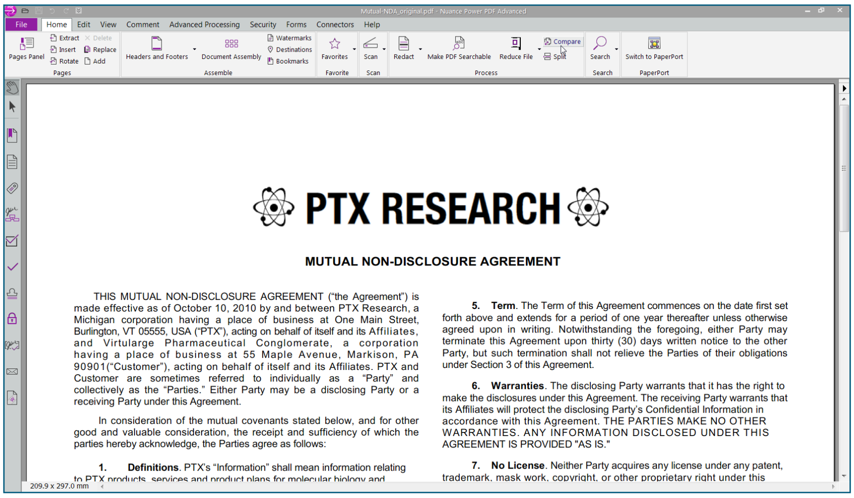
Redactions have been applied.
Would you like to Remove additional document elements from this document?

□ Always perform this action.

OK | Cancel

Document comparison

In order to compare two documents, with the document open in Power PDF, click on the Compare button in the ribbon toolbar.



PTX RESEARCH

MUTUAL NON-DISCLOSURE AGREEMENT

THIS MUTUAL NON-DISCLOSURE AGREEMENT ("the Agreement") is made effective as of October 10, 2010 by and between PTX Research, a Michigan corporation having a place of business at One Main Street, Burlington, VT 05555, USA ("PTX"), acting on behalf of itself and its Affiliates, and Virtularge Pharmaceutical Conglomerate, a corporation having a place of business at 55 Maple Avenue, Markison, PA 90901("Customer"), acting on behalf of itself and its Affiliates. PTX and Customer are sometimes referred to individually as a "Party" and collectively as the "Parties." Either Party may be a disclosing Party or a receiving Party under this Agreement.

In consideration of the mutual covenants stated below, and for other good and valuable consideration, the receipt and sufficiency of which the parties hereby acknowledge, the Parties agree as follows:

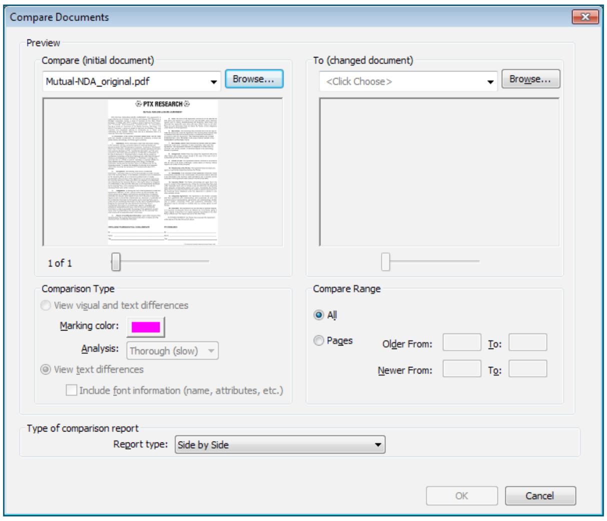
1. **Definitions**. PTX's "Information" shall mean information relating to PTX products, services and product plans for molecular biology and

5. **Term**. The Term of this Agreement commences on the date first set forth above and extends for a period of one year thereafter unless otherwise agreed upon in writing. Notwithstanding the foregoing, either Party may terminate this Agreement upon thirty (30) days written notice to the other Party, but such termination shall not relieve the Parties of their obligations under Section 3 of this Agreement.

6. **Warranties**. The disclosing Party warrants that it has the right to make the disclosures under this Agreement. The receiving Party warrants that its Affiliates will protect the disclosing Party's Confidential Information in accordance with this Agreement. THE PARTIES MAKE NO OTHER WARRANTIES. ANY INFORMATION DISCLOSED UNDER THIS AGREEMENT IS PROVIDED "AS IS."

7. **No License**. Neither Party acquires any license under any patent, trademark, mask work, copyright, or other proprietary right under this

This opens the Compare Documents window.



Compare (initial document): Mutual-NDA_original.pdf

To (changed document): <Click Choose>

1 of 1

○ View visual and text differences

Marking color: 🟪

Analysis: Thorough (slow)

● View text differences

□ Include font information (name, attributes, etc.)

● All

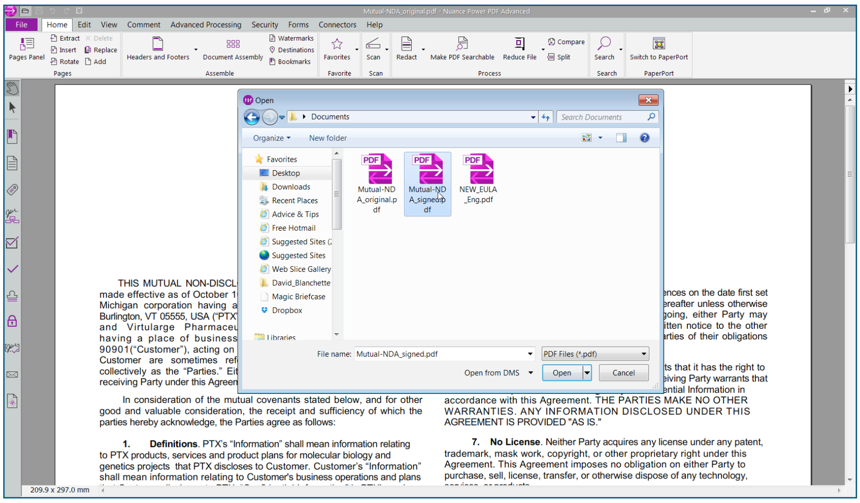
○ Pages

Older From: ___ To: ___

Newer From: ___ To: ___

Report type: Side by Side

Now specify the document that you wish to compare with the original. To do this, click Browse in the right-hand column under With (changed document). The Open document window displays.



File name: Mutual-NDA_signed.pdf

PDF Files (*.pdf)

THIS MUTUAL NON-DISCL
made effective as of October 1
Michigan corporation having a
Burlington, VT 05555, USA ("PTX
and Virtularge Pharmaceu
having a place of business
90901("Customer"), acting on
Customer are sometimes ref
collectively as the "Parties." Eit
receiving Party under this Agreem

In consideration of the mutual covenants stated below, and for other good and valuable consideration, the receipt and sufficiency of which the parties hereby acknowledge, the Parties agree as follows:

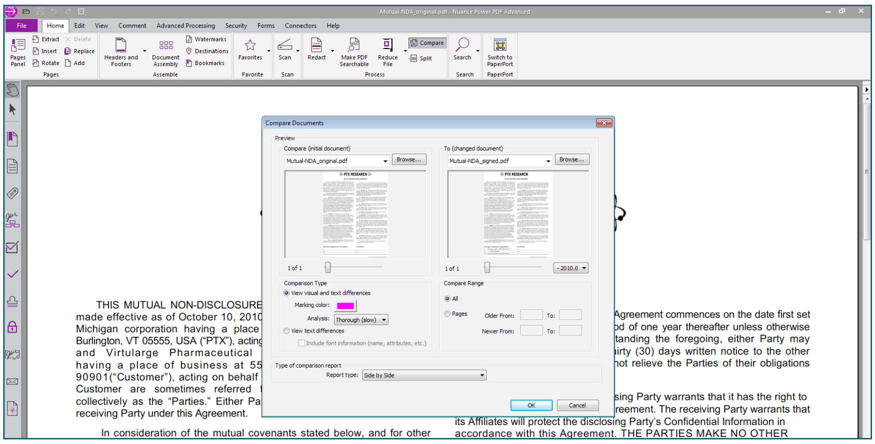
1. **Definitions**. PTX's "Information" shall mean information relating to PTX products, services and product plans for molecular biology and genetics projects that PTX discloses to Customer. Customer's "Information" shall mean information relating to Customer's business operations and plans

ences on the date first set
ereafter unless otherwise
going, either Party may
itten notice to the other
rties of their obligations

ts that it has the right to
eiving Party warrants that
ential Information in
accordance with this Agreement. THE PARTIES MAKE NO OTHER WARRANTIES. ANY INFORMATION DISCLOSED UNDER THIS AGREEMENT IS PROVIDED "AS IS."

7. **No License**. Neither Party acquires any license under any patent, trademark, mask work, copyright, or other proprietary right under this Agreement. This Agreement imposes no obligation on either Party to purchase, sell, license, transfer, or otherwise dispose of any technology,

Browse for the document that you wish to compare and click Open. The two documents are now displayed side-by-side with the initial version on the left and the new version on the right.



Compare (initial document): Mutual-NDA_original.pdf

To (changed document): Mutual-NDA_signed.pdf

- 2010.0

Comparison Type

● View visual and text differences

Marking color: 🟪

Analysis: Thorough (slow)

○ View text differences

□ Include font information (name, attributes, etc.)

Compare Range

● All

○ Pages Older From: To:

Newer From: To:

Type of comparison report

Report type: Side by Side

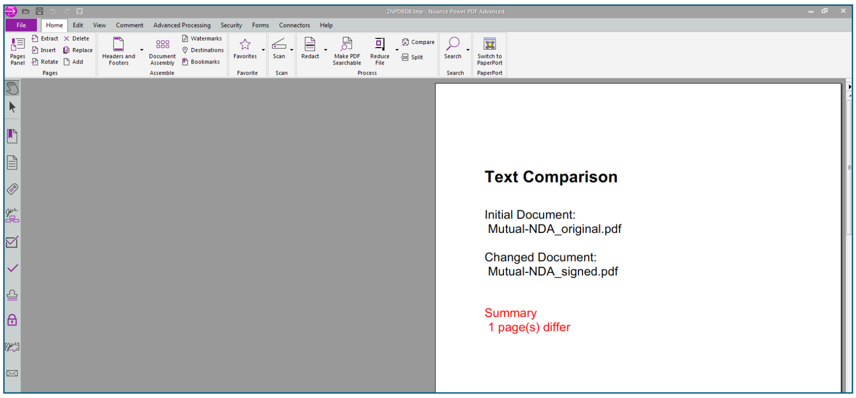
THIS MUTUAL NON-DISCLOSURE
made effective as of October 10, 2010
Michigan corporation having a place
Burlington, VT 05555, USA ("PTX"), acting
and Virtularge Pharmaceutical
having a place of business at 55
90901("Customer"), acting on behalf
Customer are sometimes referred t
collectively as the "Parties." Either Pa
receiving Party under this Agreement.

In consideration of the mutual covenants stated below, and for other

Agreement commences on the date first set
od of one year thereafter unless otherwise
tanding the foregoing, either Party may
irty (30) days written notice to the other
not relieve the Parties of their obligations

sing Party warrants that it has the right to
reement. The receiving Party warrants that
its Affiliates will protect the disclosing Party's Confidential Information in
accordance with this Agreement. THE PARTIES MAKE NO OTHER

The documents can be displayed in the side-by-side layout for comparison or in a summarised form. Leave the default Report Type setting Side by Side Report and click OK. Power PDF will first display a summary of the comparison results.



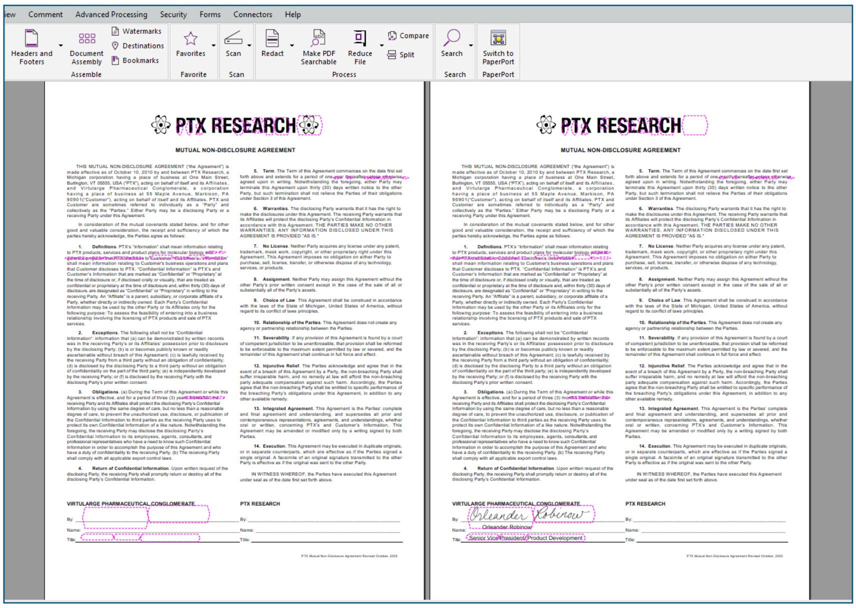
Text Comparison

Initial Document:
Mutual-NDA_original.pdf

Changed Document:
Mutual-NDA_signed.pdf

Summary
1 page(s) differ

Go to the next page. You can now view a side-by-side comparison of the two document versions. The changed sections are highlighted.



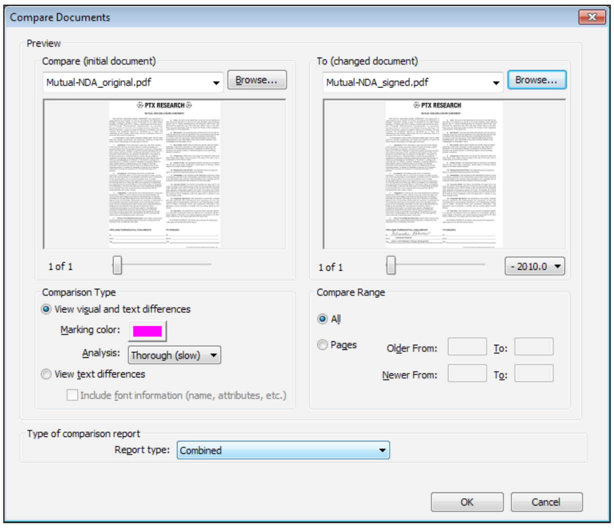
PTX RESEARCH

MUTUAL NON-DISCLOSURE AGREEMENT

PTX RESEARCH

MUTUAL NON-DISCLOSURE AGREEMENT

If you would prefer to view the differences in the Summary view rather than in the Side-by-Side view, select the Combined option for Report Type.



Compare (initial document): Mutual-NDA_original.pdf

To (changed document): Mutual-NDA_signed.pdf

1 of 1

1 of 1 - 2010.0

Comparison Type

● View visual and text differences

Marking color:

Analysis: Thorough (slow)

○ View text differences

□ Include font information (name, attributes, etc.)

Compare Range

● All

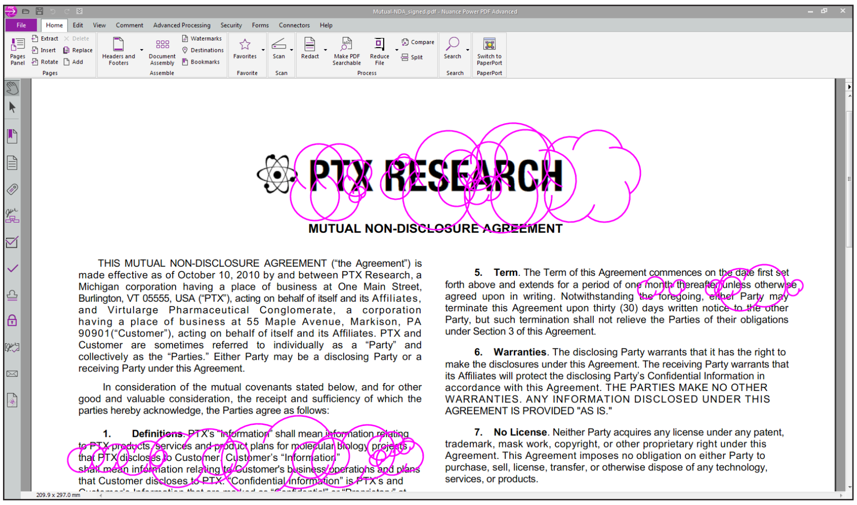
○ Pages Older From: To:

Newer From: To:

Type of comparison report

Report type: Combined

Click OK. The changes are now displayed in a single document, rather than side by side.



PTX RESEARCH

MUTUAL NON-DISCLOSURE AGREEMENT

THIS MUTUAL NON-DISCLOSURE AGREEMENT ("the Agreement") is made effective as of October 10, 2010 by and between PTX Research, a Michigan corporation having a place of business at One Main Street, Burlington, VT 05555, USA ("PTX"), acting on behalf of itself and its Affiliates, and Virtularge Pharmaceutical Conglomerate, a corporation having a place of business at 55 Maple Avenue, Markison, PA 90901("Customer"), acting on behalf of itself and its Affiliates. PTX and Customer are sometimes referred to individually as a "Party" and collectively as the "Parties." Either Party may be a disclosing Party or a receiving Party under this Agreement.

In consideration of the mutual covenants stated below, and for other good and valuable consideration, the receipt and sufficiency of which the parties hereby acknowledge, the Parties agree as follows:

1. **Definitions**. PTX's "Information" shall mean information relating to PTX products, services and product plans for molecular biology projects that PTX discloses to Customer. Customer's "Information" shall mean information relating to Customer's business operations and plans that Customer discloses to PTX. "Confidential Information" is PTX's and

5. **Term**. The Term of this Agreement commences on the date first set forth above and extends for a period of one month thereafter unless otherwise agreed upon in writing. Notwithstanding the foregoing, either Party may terminate this Agreement upon thirty (30) days written notice to the other Party, but such termination shall not relieve the Parties of their obligations under Section 3 of this Agreement.

6. **Warranties**. The disclosing Party warrants that it has the right to make the disclosures under this Agreement. The receiving Party warrants that its Affiliates will protect the disclosing Party's Confidential Information in accordance with this Agreement. THE PARTIES MAKE NO OTHER WARRANTIES. ANY INFORMATION DISCLOSED UNDER THIS AGREEMENT IS PROVIDED "AS IS."

7. **No License**. Neither Party acquires any license under any patent, trademark, mask work, copyright, or other proprietary right under this Agreement. This Agreement imposes no obligation on either Party to purchase, sell, license, transfer, or otherwise dispose of any technology, services, or products.

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