



# Digital Pathology Slide Preparation Best Practice

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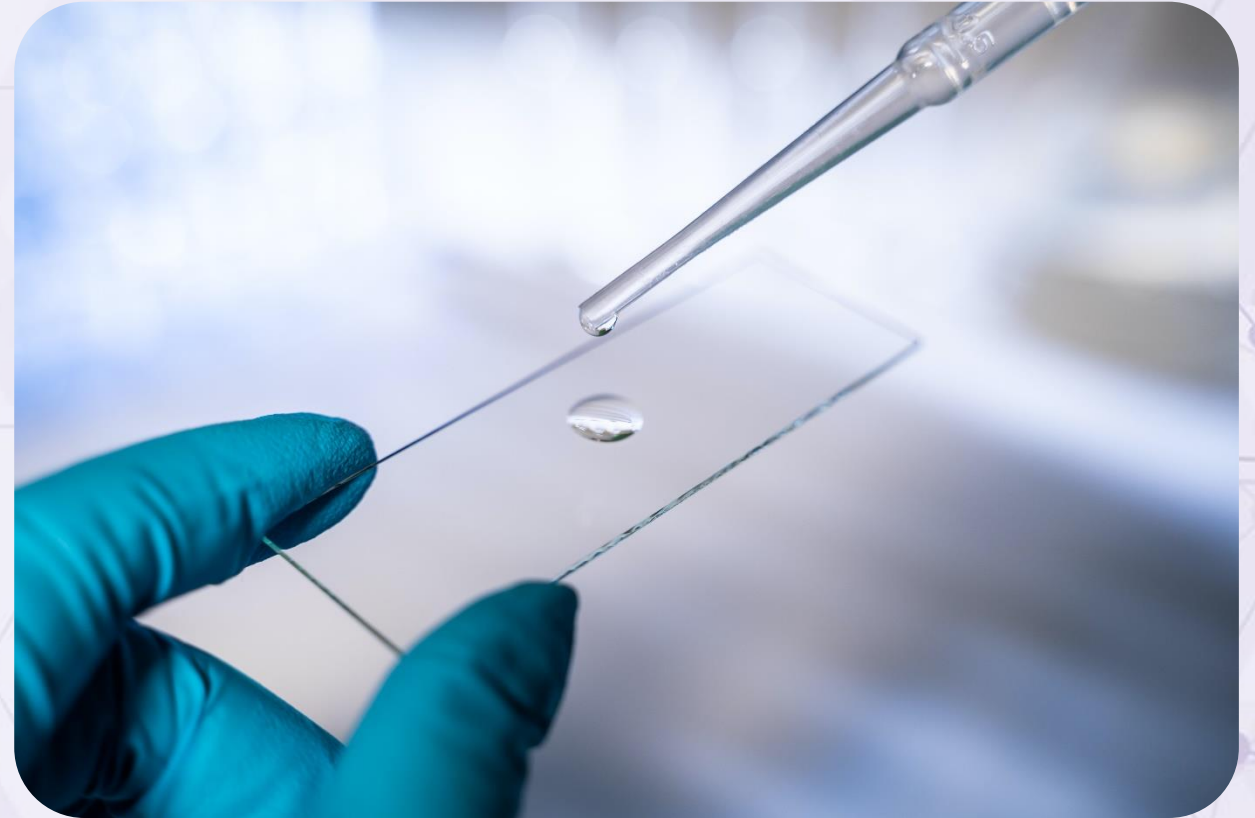
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**This document outlines digital pathology best practices only and is not a substitute for the 'Instructions for Use', which you must read and understand before using your whole slide scanner.**

# Slide Preparation

**Slide preparation is the key to achieving high-quality digital images.**

Since poor quality slide preparation could lead to non-diagnosable images, the following information outlines the optimum slide preparation that will help attain the highest possible image quality.



# Slide dimensions and requirements

In addition to slide preparation, it is also important to make sure that the slides match the scanner specifications, for example:

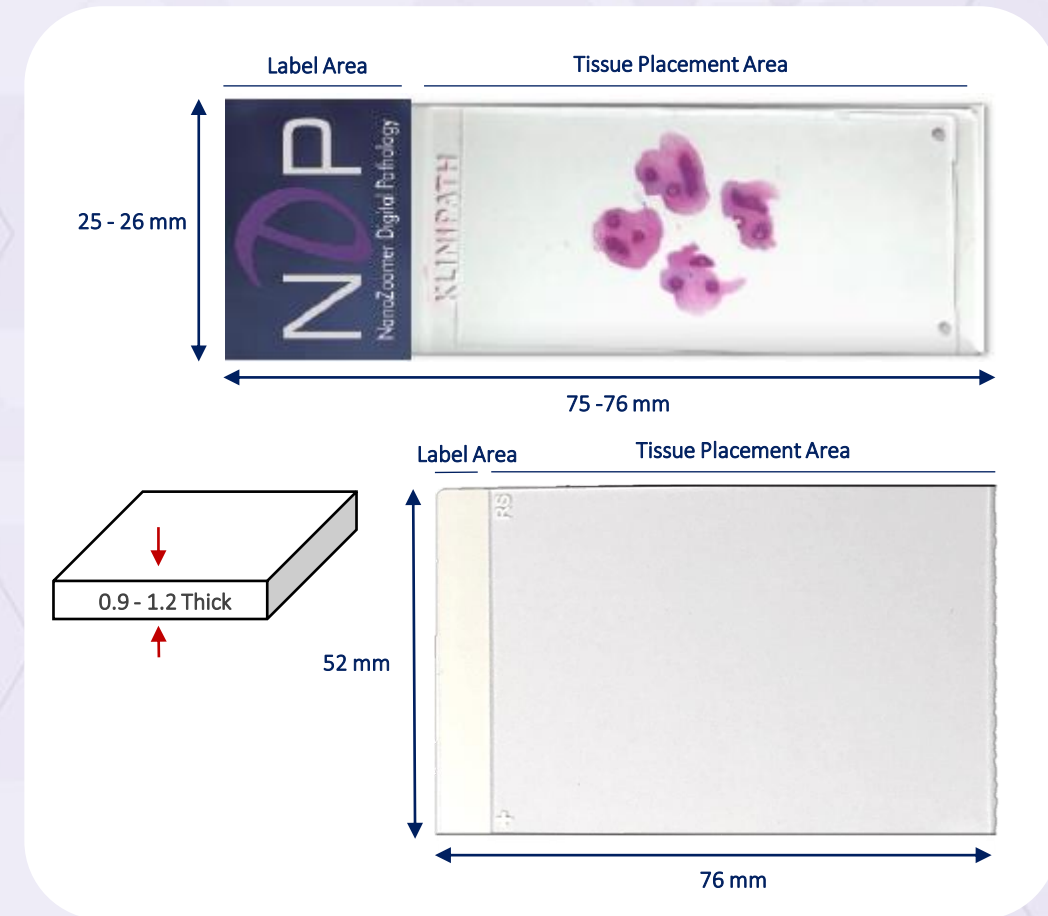
- Slides should not be chipped, cracked or scratched.
- Corner may be clipped.

## Slide dimensions

**Glass Slide:** 75 mm to 76 mm × 24.7 mm to 26.5 mm

**Mega Slide:** 52 mm x 76 mm

0.9 mm to 1.2 mm thickness



# Histology artefacts to avoid

During slide preparation, slides should not contain the following:

- Dirt
- Tissue folds
- Tissue overhanging
- Scratches
- Excessive mounting media
- Marker on slide
- Air bubbles
- Damaged microtome blade

*We will now cover each of these artefacts in more detail.*

# Dirt

If dirt appears on the surface of the slide, there is a risk that the scanner may focus on this rather than the tissue, causing unfocused areas.

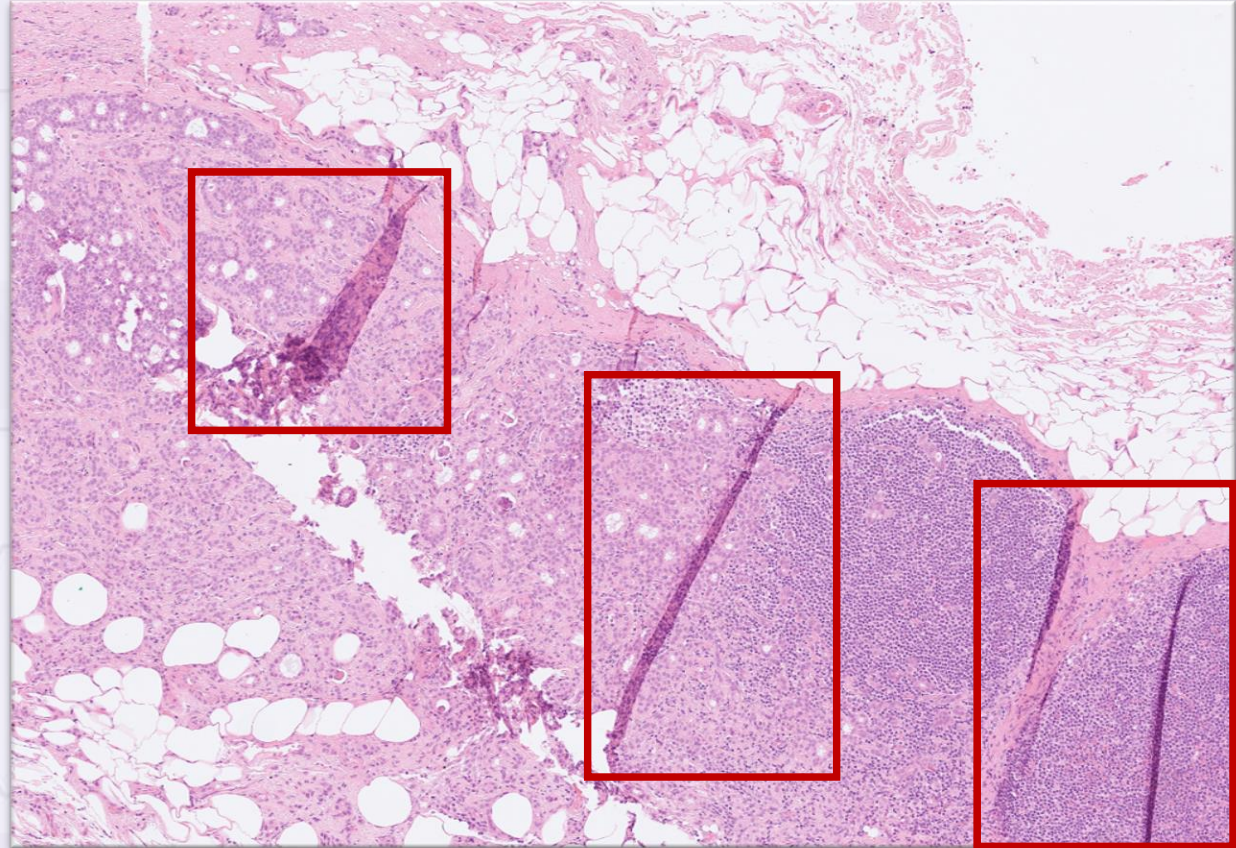


# Tissue folds

Tissue folds can compromise image quality. It is therefore important to minimize the occurrence of these folds during slide preparation.

Cutting angle, water bath temperature, and tissue type can affect the number of folds.

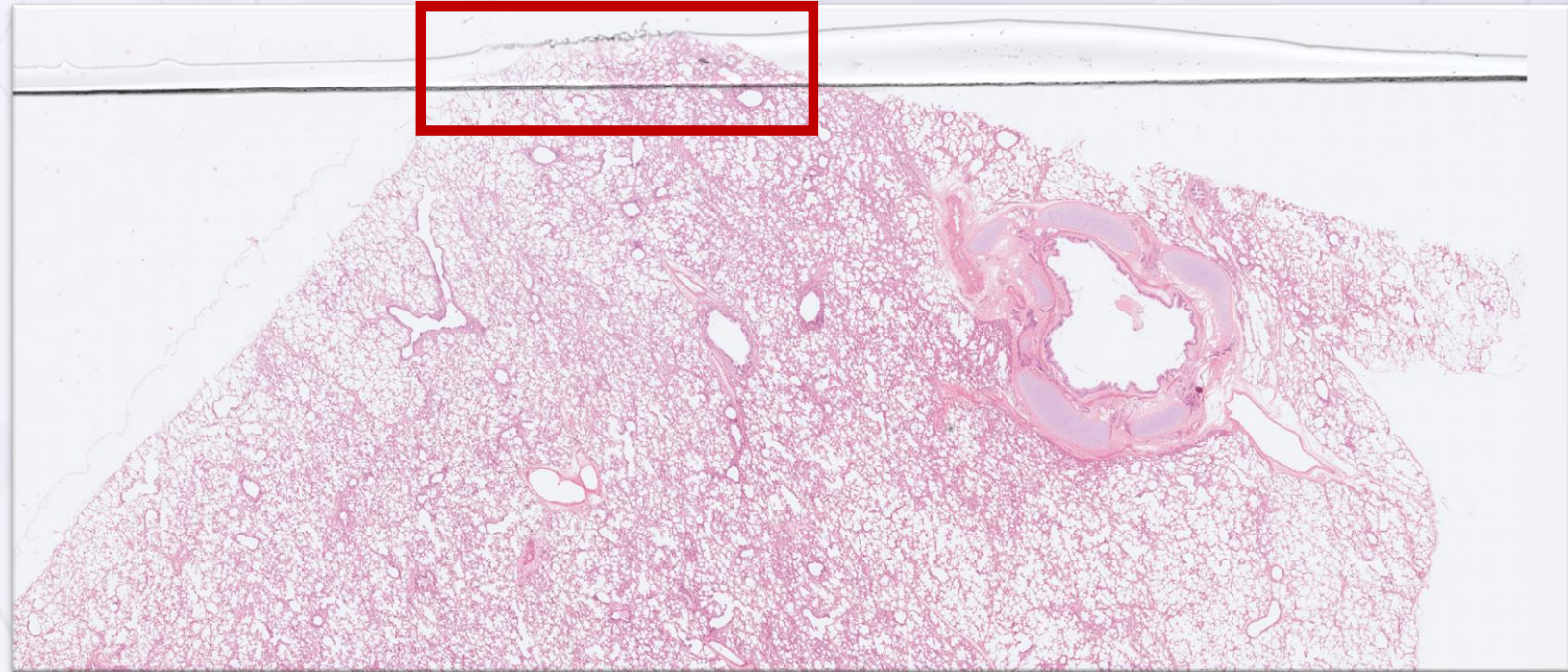
The scanner is optimised for placing focus points on sections of tissue that do not contain folds.



# Tissue overhanging

For the scanner to focus on the tissue, it requires the coverslip to be positioned correctly on all slides.

Areas outside the coverslip may not be in focus.





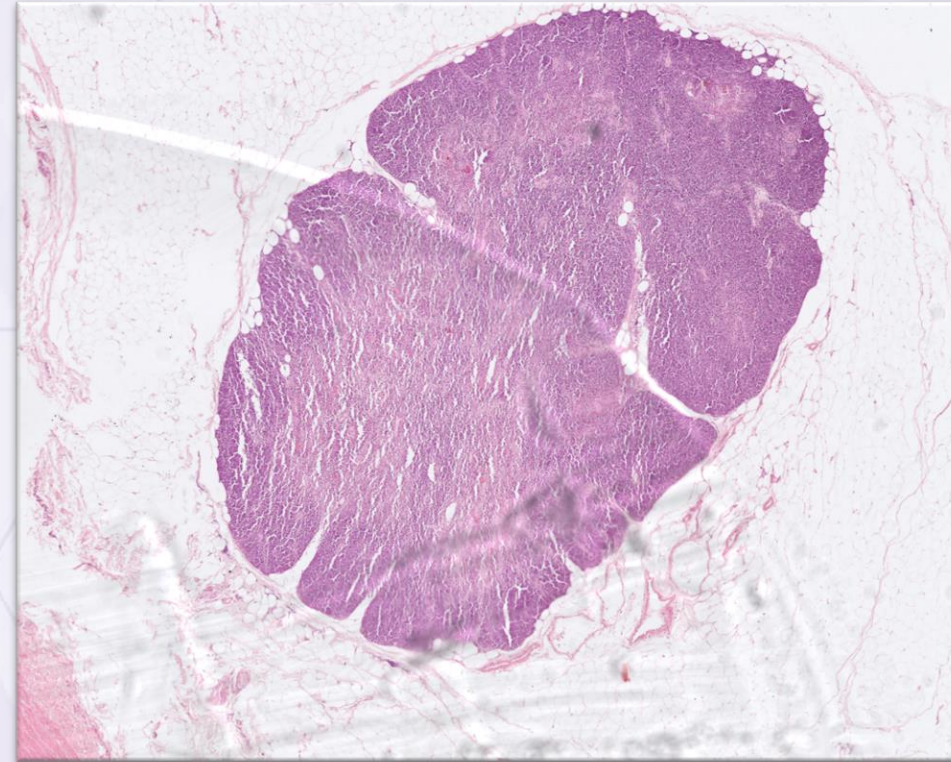
# Scratches

Please ensure there are no visible scratches on the surface of the slide.



# Excessive mounting media

Excessive mounting media can result in reduced image quality. Avoid applying too much mounting media during preparation.

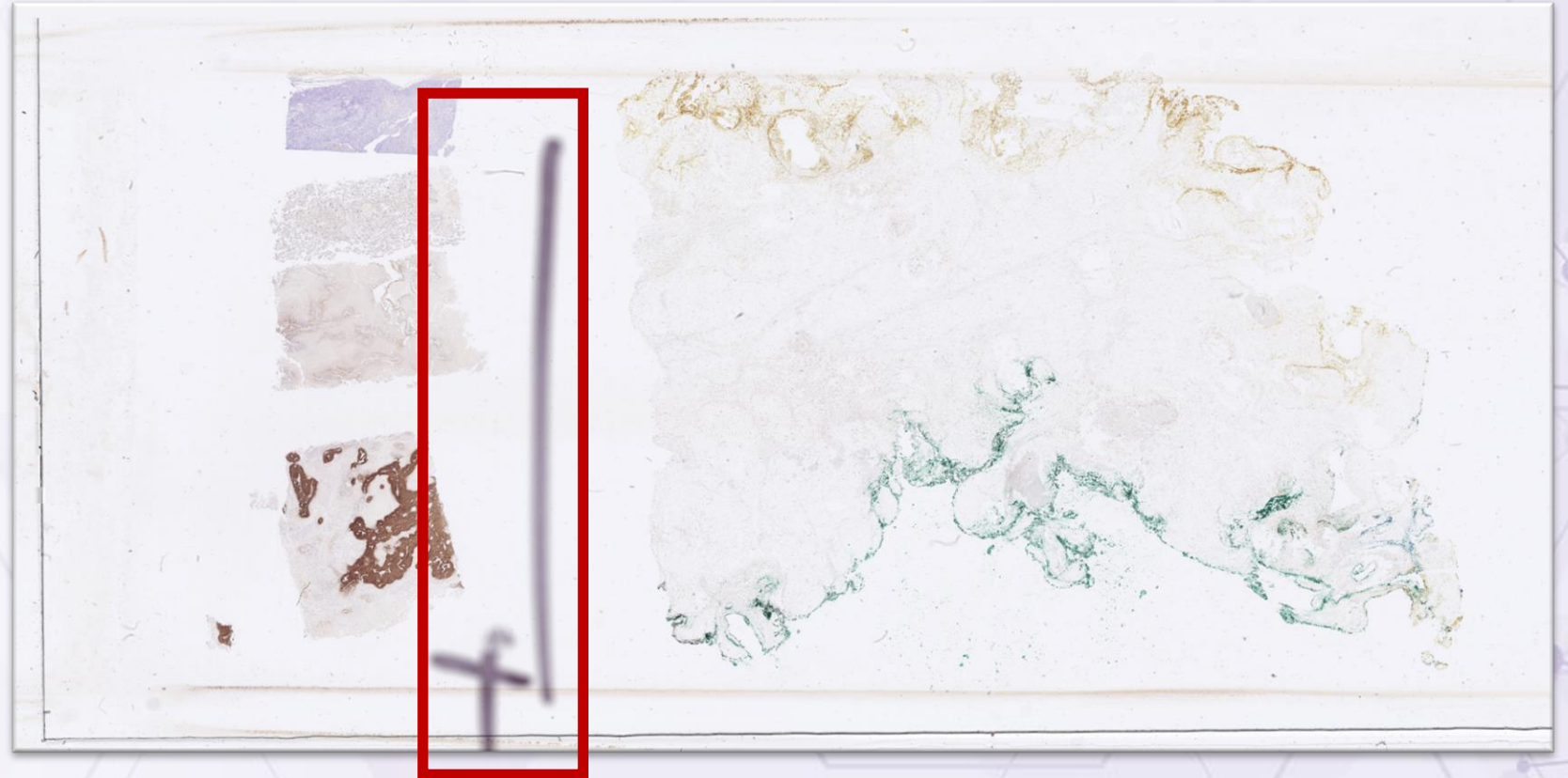


# Pen marks

Avoid using a pen to mark the slide.

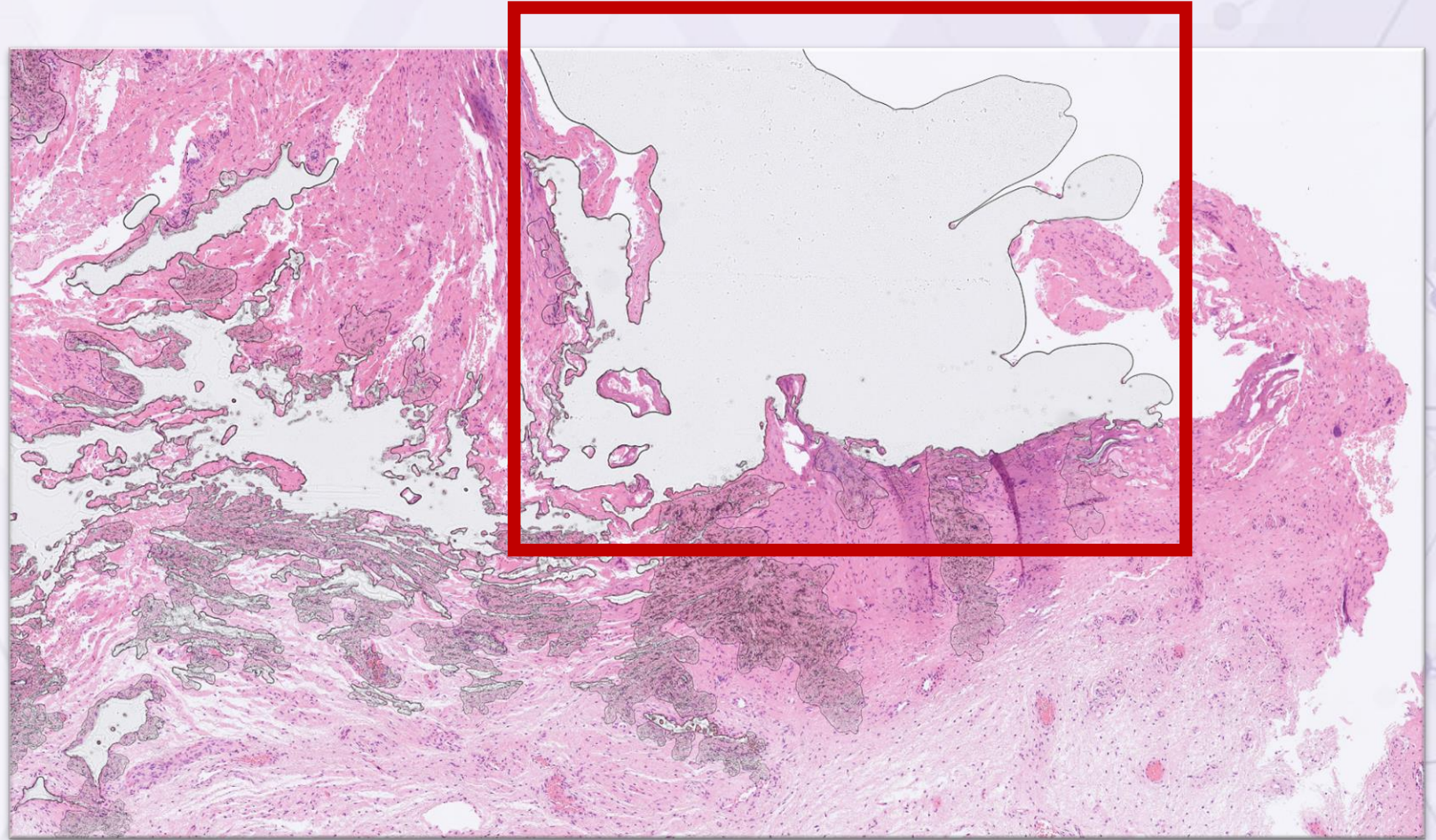
This may cause the scanner to focus on the markings rather than the tissue sample.

Hamamatsu recommends using digital marking tools to prevent this.



# Air bubbles

Please be aware, if air bubbles occur during slide preparation there is a risk that the scanner will focus on these bubbles rather than the tissue sample.



# Microtome

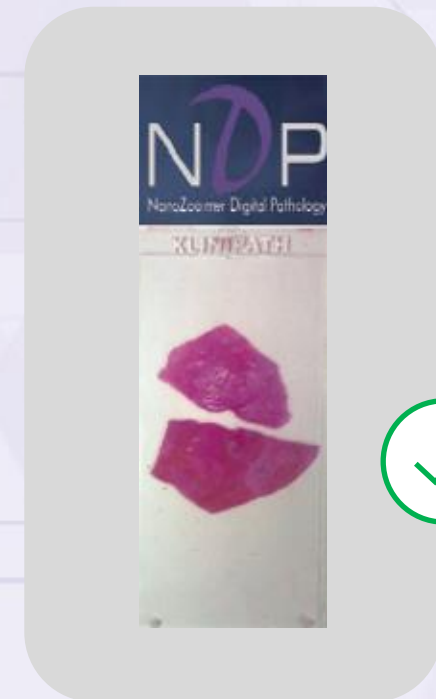
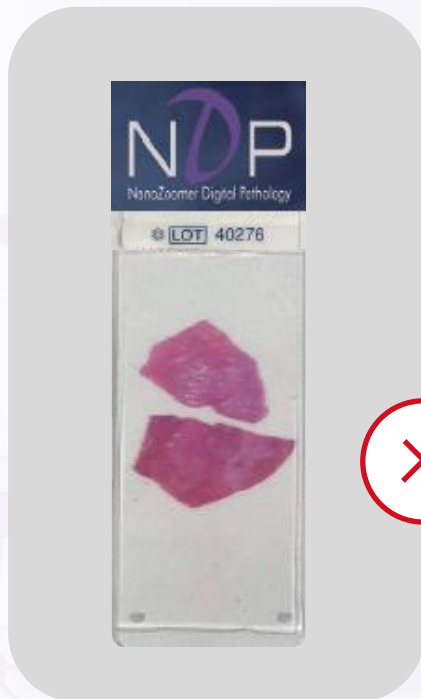
When cutting tissue samples, please make sure that the following steps are carried out:

- Microtome should be placed on a steady bench to prevent any movement while cutting the tissue. Any movement may cause vibration during tissue sectioning.
- There should be an optimal blade tilt.
- Blades should be changed as soon as any chipped areas are observed as this can cause tears on tissue sections.
- Water bath should be regularly cleaned.



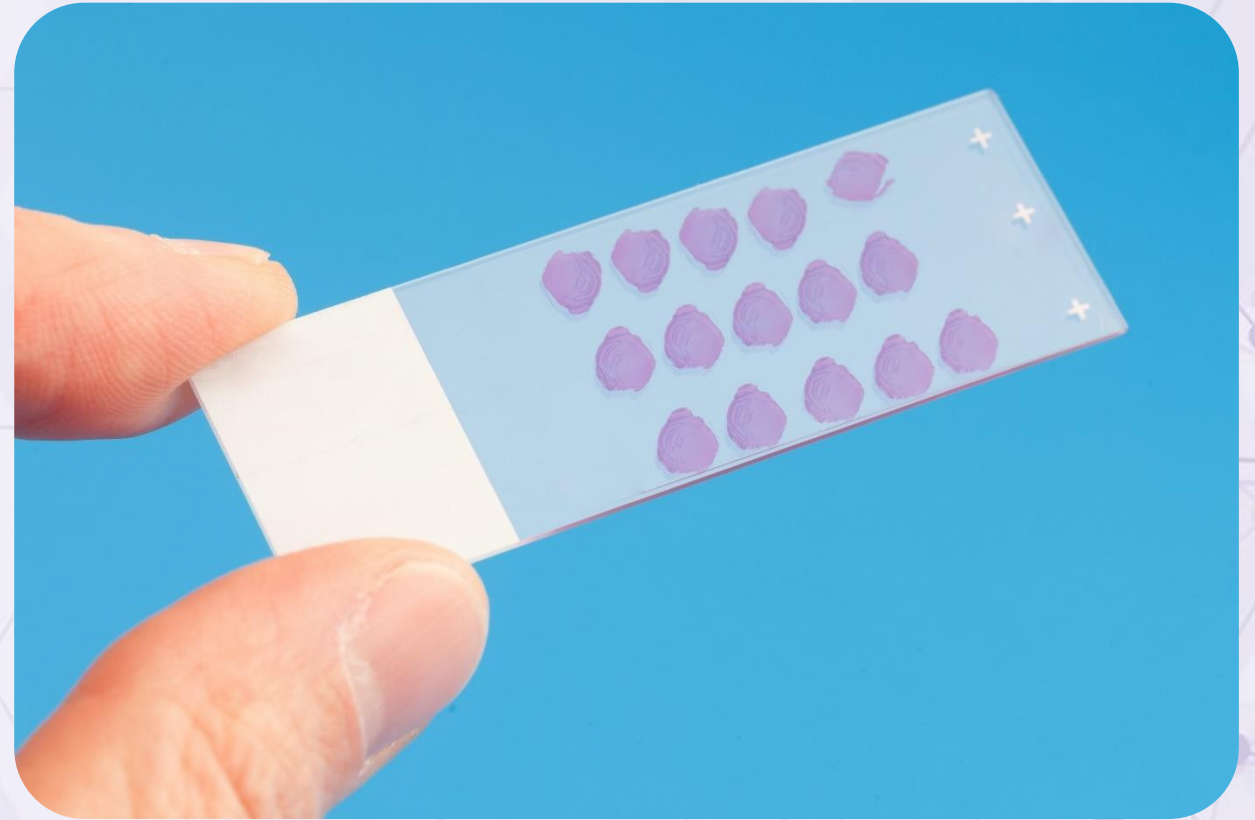
# Slide labels

Slide labels must be positioned correctly on the label area, without any overhanging sections, to ensure the scanner can work optimally.



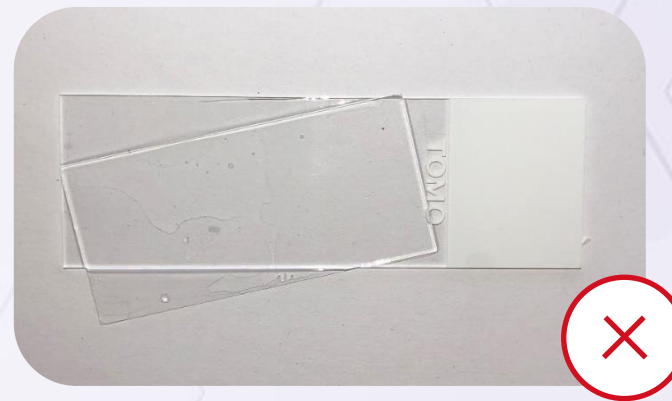
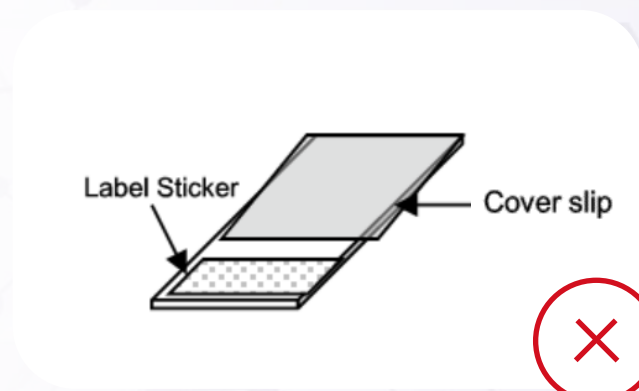
# Slide labels

- Do not stack labels.
- Make sure the label is not peeling.
- No excess adhesive residue.
- Place the label on the designated area.
- The label must be placed at the top of the slide.



# Coverslip

- All slides must be cover-slipped.
- **No oil** should be used – this may damage the system.
- **No coverslips** should be overhanging.
- Mounting media should be completely dry.





# Barcodes

For a fully automatic workflow, we recommend the use of barcodes as they can be linked directly to patient data.

Barcodes can reduce transcription errors and reduce the time taken to prepare slides.

## Supported Barcode Formats\*

Barcode name	Type	Default	Note
CODE-39	1D	Enable	
CODE-128	1D	Enable	
CODE-2-of-5 Interleaved	1D	Enable	
Coda bar	1D	Enable	
EAN-8	1D	Enable	
EAN-13	1D	Disable	
Patch Codes	1D	Disable	
UPC-A	1D	Disable	
UPC-E	1D	Enable	
Datamatrix	2D	Disable	Barcode Option
			U14593 Data matrix for NZAcquire
QR Code	2D	Disable	Barcode Option
Micro QR Code	2D	Disable	U14594 QR-Code for NZAcquire

\* This information is cited from the NanoZoomer instructions for use.

# Barcodes

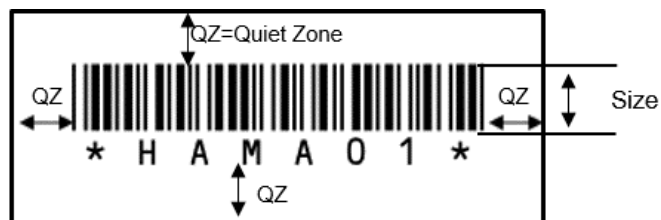
## Important Information

If a barcode contains a character that cannot be used as a file name, that character is automatically replaced with the following character and becomes the file name.

Character	¥	/	<	>	“	?	:	*	
After replace	Blank space	Blank space	(	)	,	.	-	Blank space	Blank space

Available barcode for NanoZoomer must meet the following conditions.

Pitch	At least 0.191 mm (the width of the barcode line and space between barcodes lines)
Size	At least 5 mm
Quiet Zone (QZ)	At least 2 mm



\* This information is cited from the NanoZoomer instructions for use.

Example of Barcode Option Datamatrix supported by NanoZoomer\*  
 Readable barcodes must satisfy the following conditions

Version	ECC200
Barcode pitch	1 cell is 0.28 mm or more
Quiet Zone (QZ)	More than 2 cells

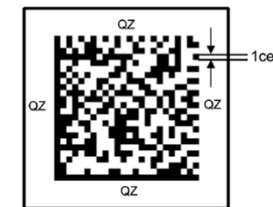


Figure 1

Example of Barcode Option QR Code supported by NanoZoomer\*  
 Readable barcodes must satisfy the following conditions

Format	QR Code Model-1
	QR Code Model-2
	MicroQR
Barcode pitch	1 cell is 0.28 mm or more
Quiet Zone (QZ)	More than 2 cells

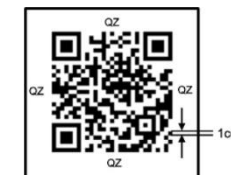


Figure 2

# References

1. J. Evans, MD,PhD; Mohamed E. Salama, MD; Walter H Henrich, MD; Liron Pantanowitz, MD. Implementation of Whole Slide Imaging for Clinical Purposes. Arch Pathol LabMed Vol 141, July 2017
2. Noriaki Hashimoto. Practical Application of Digital Images in Pathology: Toward Standardization. IEICF Fundamentals Vol.9 No.3
3. Yukako Yagi and John R Gilbertson from Department of Pathology, Harvard Medical School, Boston, USA. A relationship between slide quality and image quality in whole slide imaging (WSI) Diagnostic Pathology 2008, 3(Suppl I ):S12

# Important Notice

- In Europe, the following products are regulatory compliant for IVDR (EU), (UK) MDR2002 (UK) and IvDO (CH) for in vitro diagnostic use:
  - C13220-21MDEU NanoZoomer® S360MD Slide scanner system
  - C16600-21MDEU NanoZoomer® S60v2MD Slide scanner system
  - C16300-21MDEU NanoZoomer® S20MD Slide scanner system
- In the USA, C13220-01MD NanoZoomer® S360MD Slide scanner system is intended for in vitro diagnostic use.

# THANK YOU

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