

AS 120

Automatic Slide Maker & Stainer

Overseas Dept. | 2024.4.3

目录

CATALOGUE

01

Review of
Hematology
Analysis

02

Slide Preparation
Technology

03

Cellular Staining
Principle

AS 120

Comparison

Summary

CHAPTER

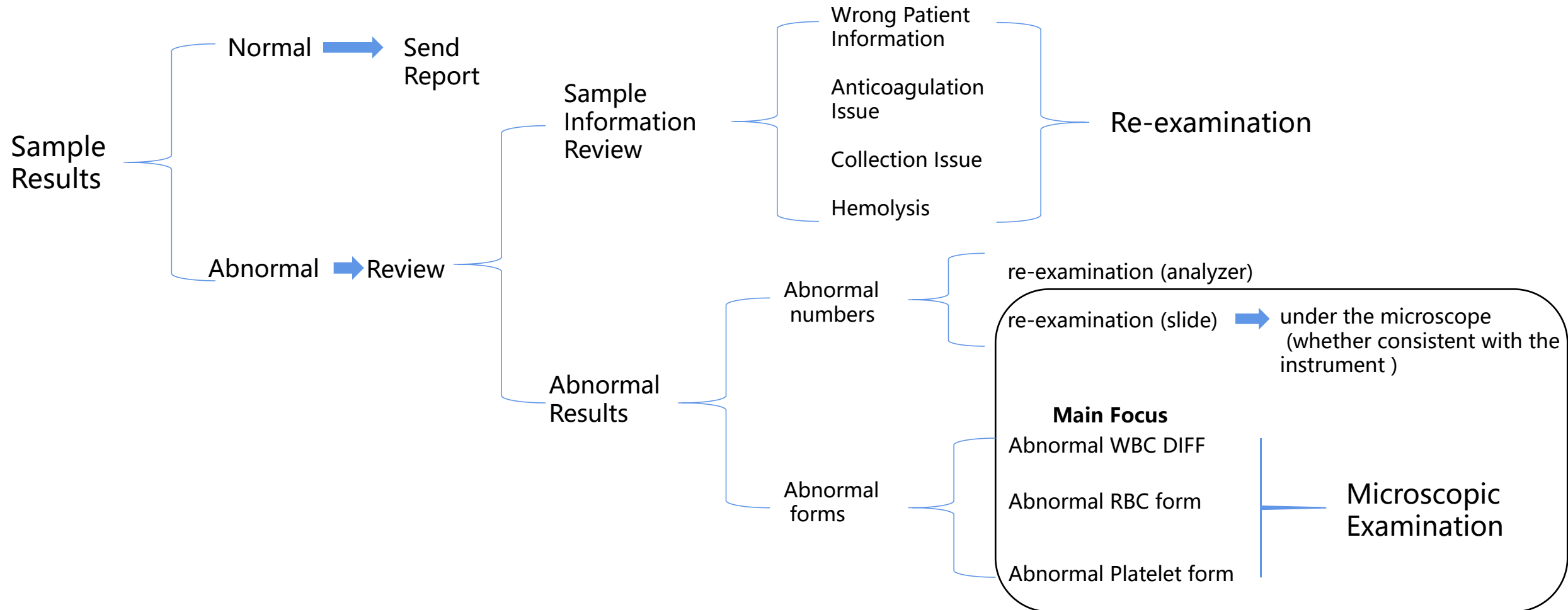
01

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Review of Hematology Analysis

请根据实际情况进行调整

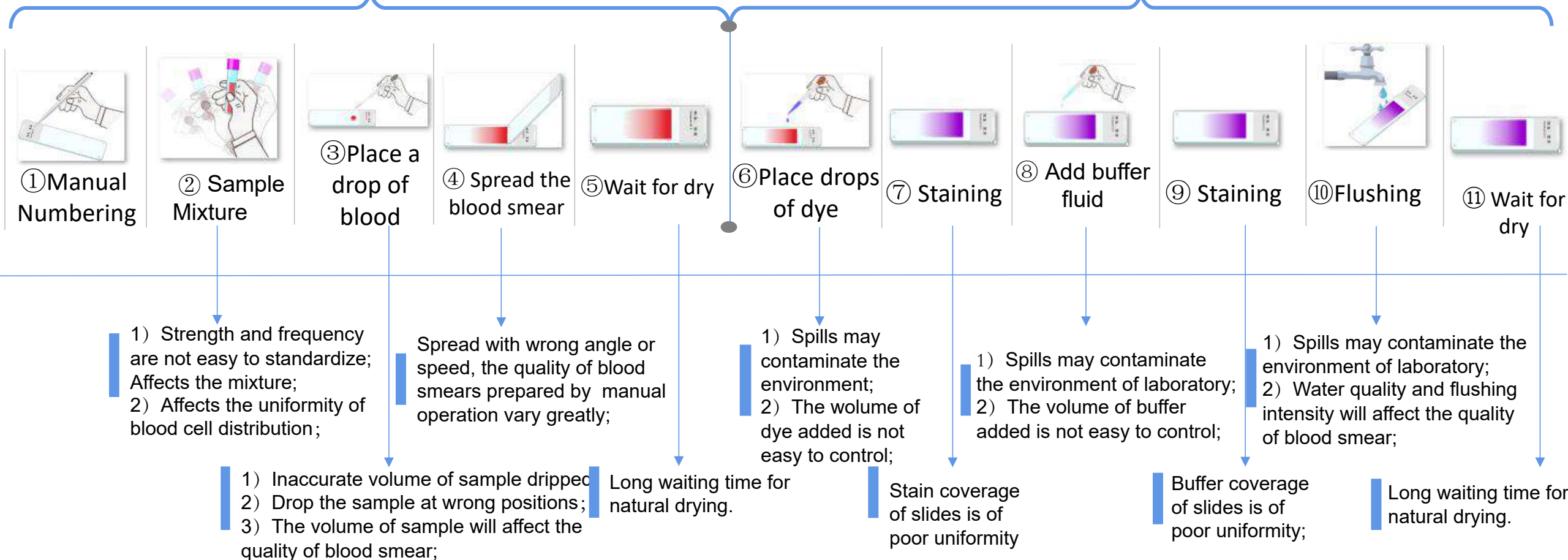
Hematology Analysis Routine



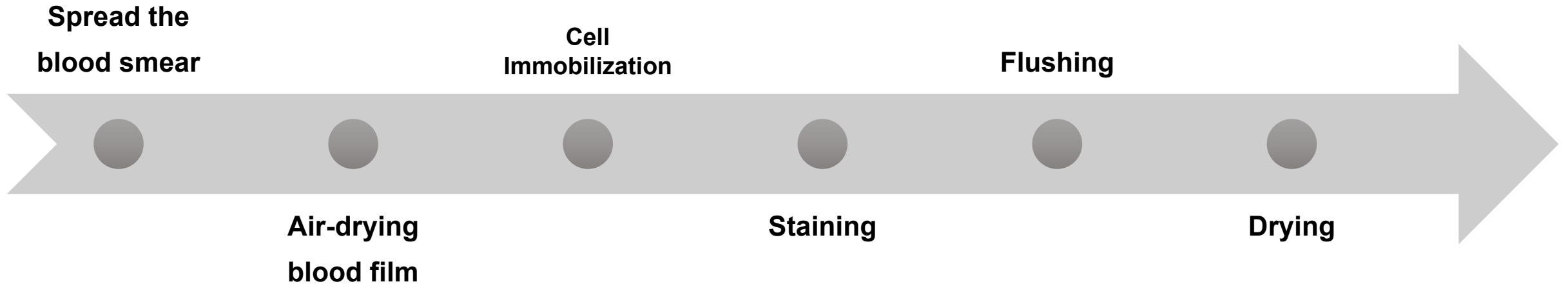
Conventional Manual Slide Preparation Process

Spread the blood smear

Stain the slide



Slide Preparation Process of Instrument



CHAPTER

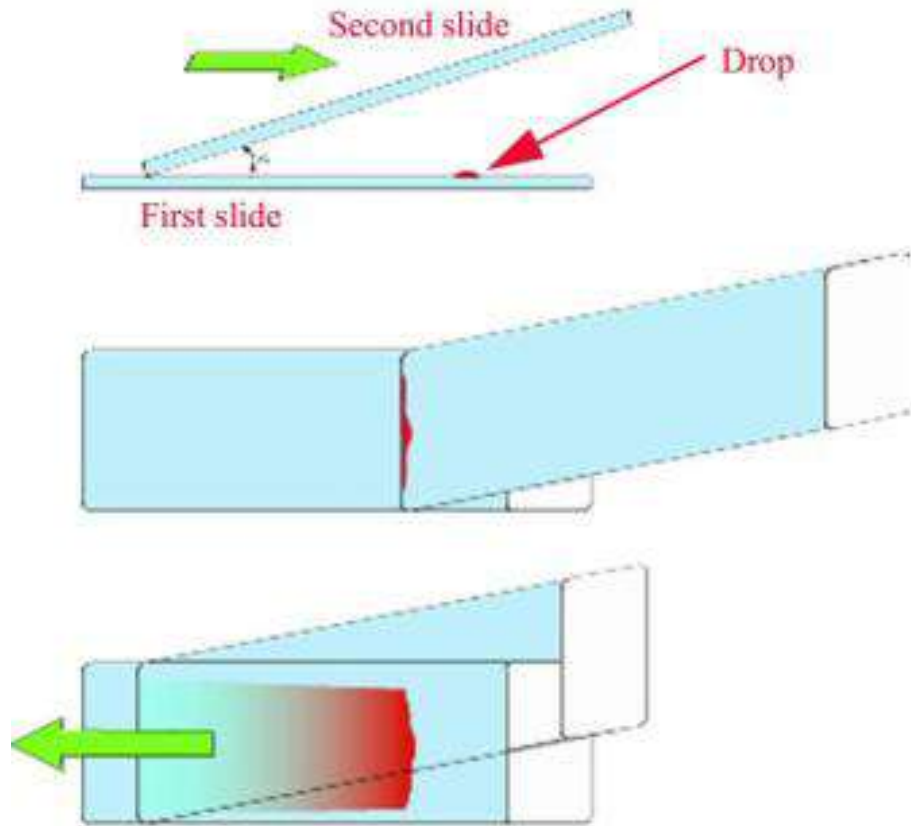
02

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Slide Preparation Technology

请根据实际情况进行调整

Slide Preparation Technology



Bedew → Spread → Push

Appropriate
Tension

State of slide surface

State of push tool:
ultrasonic cleaning

State of sample: viscosity

Parameters of Slides

Definitions of Head, Body, and Tail

In a narrow sense

The blood film is divided into three sections, which are divided into head, body and tail according to their thickness starting from the dot and line.

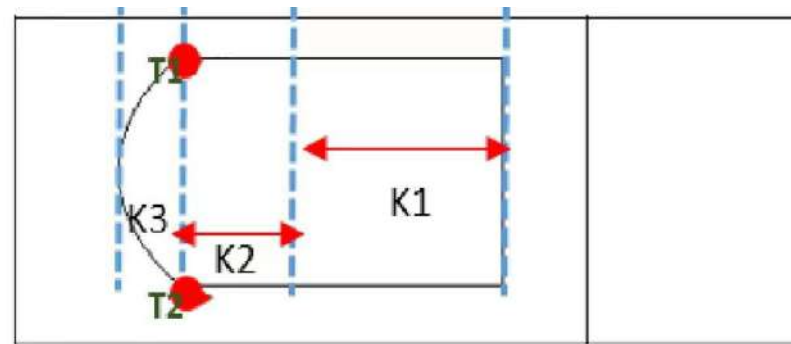


Vague and unclear concepts;
There is no principle of division.

Maccura's definition

The blood film formed from the beginning to the end of the slide is divided into three sections of different thickness and appearance, which were successively defined as: head, body and tail.

K1 represents the head; K2 represents the body; K3 represents the tail.
T1 represents the connection of the body and tail; T2 represents the other side of the connection of body and tail.



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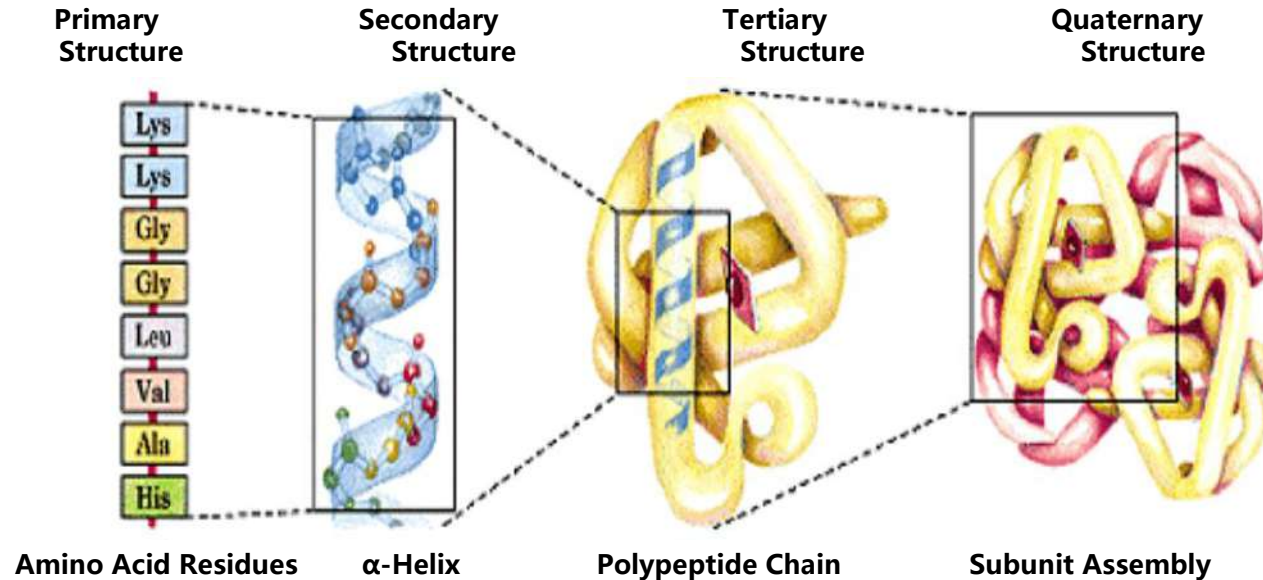
03

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Cellular Staining Principle

请根据实际情况进行调整

Cell Immobilization



Methanol has a strong dehydrating power, through dehydration to destroy the hydrogen bonds in protein molecules, so as to denature proteins.

**Wright-Geimsa Stain:
Pure Methanol!**

Tips:

1. Use methanol to immobilize cells, use ethanol for cleaning and maintenance only;
2. Purpose of cell immobilization: maintain cell form to meet the standard of microscopic examination;
3. Dehydrate cells; (Different from the process of airdrying blood film)
4. Expose chemical functional groups in the cells, allowing stain to bind easily to their ions.

Staining Principle



Acidic or anionic stains
eosin Y/B



Staining: alkaline substances (cations)



Light red

Alkaline or cationic dyes

Azur: B
(Oxidation product of methylene blue)



Staining: acidic substances (anions)



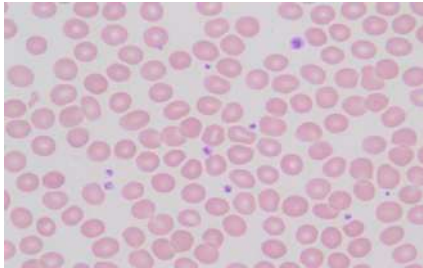
Violet blue



Staining and Morphology of Normal Cells

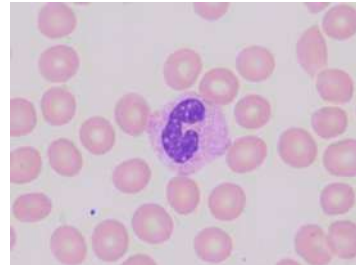
Mature Red Blood Cells:

No nucleus, **pink or amber** after staining, due to both sides of cells are slightly concave, so the color of 1/3 of central area is lighter than other central areas.



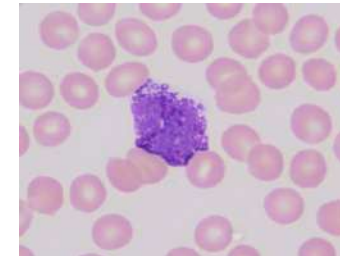
Neutrophils:

The nucleus is **dark purplish red**, the chromatin is rough uneven, and abundant in lumps. The cytoplasm is pale pink, full of purplish and red neutral granules, generally no or a few nonspecific granules.



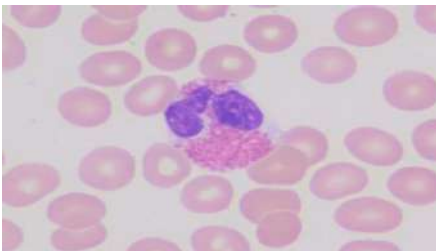
Basophils:

The nucleus is visibly lobed or vague, and the cytoplasm and nucleus are covered with basophilic particles.



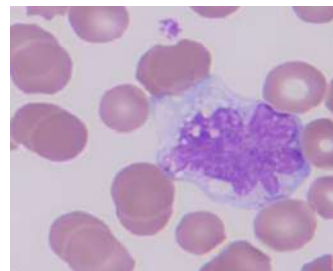
Eosinophils:

Generally round in appearance, with purplish red nucleus, relatively phasic chromatin. Ribbon-shaped or U-shaped cytoplasm filled with large orange eosinophilic granules.



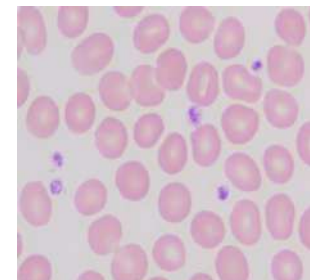
Monocytes:

large cell mass, gray blue or gray pink, easy to see dust-like azure particles.



Platelets:

No nucleus, pale blue cytoplasm, central part of the small evenly distributed lavender particles.



CHAPTER

04

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AS120

请根据实际情况进行调整

Product Specification

Product Name: Automatic Slide Preparation Instrument

Model: AS 120

Modules: 1、 Main Instrument

2、 Track Module

3、 Compressor

Sample: EDTA anticoagulated blood

Detection Items: Slide Preparation, Staining

Method of Slide Preparation: Standalone or on track
(LABAS F 9000 or F 9000 X)

Reading module: Reserved instrument interface to access
slide reader



AS 120 Functions

- **Throughput (Printing)** : 120 slides/hour
- **Throughput (Preparation):**
Standard Mode: 30T/H; Fast Mode: 60T/H
- **Anti-volatilization:** The stain tank has the function to cover the tank automatically, thus can reduce the volatilization of stain solution.
- **Viscosity detection:** parameters can be set automatically according to the viscosity
- **Sample Volume:** Auto-loader: $\leq 40\mu\text{l}$
- **Blood spreader(or pusher):** made of highly durable sapphire glass. No replacement and maintenance is required.
- **Slide Storage:** Slide basket, 6 slides/basket, 12 slides/basket(optional);
- **Staining Box:** Multiple slides per box; Automatic cleaning and maintenance



Reagents



Name of Reagent	Specification	Function	Notes
Automatic Hematology Analyzer Diluent	F-DK	1、 Clean sapphire spreader 2、 Fill pipelines (sample transfer)	Adapted to F 8 series
Automatic Hematology Analyzer Cell Clean	F-CC	Maintenance solution when shutdown instrument	Adapted to F 8 series
Methanol or Ethanol	AR level	Methanol: pre-immobilization of cells, clean stain tank and pipelines Ethanol: clean stain tank and pipelines	Prepared by laboratory
Wright-Geimsa Stain A	/	Stain blood cells	1、 BASO Stain 2、 Prepared by laboratory
Wright-Geimsa Stain	/	Stain blood cells	1、 BASO Stain 2、 Prepared by laboratory
Carbon Ribbon		/	Prepared by laboratory
Pure Water	From regular water purifier	Clean excess dye and residue on blood smears	Prepared by laboratory
Slides	/	/	Matching slides

Preparation Mode

Four Types of Preparation Mode

【Spreading】、【Staining】、【Printing】、【Spreading+Staining】

Preparation Mode	Automatic Preparation	Manual Preparation	Notes
【Spreading + Staining】	✓	✓	- The default mode, includes printing, spreading, staining - Printing function can be turned off
【Spreading】	✓	✓	- Includes printing, spreading, pre-immobilization by methanol - Without staining function - Pre-immobilization function can be turned off
【Staining】	×	✓	- Only includes staining function
【Printing】	×	✓	- Only includes printing function

- 1) Manual Preparation:** Load the sample through the emergency channel of the auto-loader
- 2) Automatic Preparation:** Load the sample through the analysis module of the sample loader.
- 3) Mode switching condition:** After finish current preparation or not when no preparation is performing.

Application Scenarios

- ✓ **Leading competitor instruments all support these 4 preparation modes;**
- ✓ **【Spreading Mode】** : There are very few application scenarios; it is used by engineers or for training.
- ✓ **【Staining mode】** : There are very few application scenarios; very few users use this mode to stain samples.
- ✓ **【Printing Mode】** : There are very few application scenarios. The printing content can be customized by settings.
- ✓ **【Spreading +Staining】** :Default mode.

Combinations



AS 120



F 9000X



F 9000

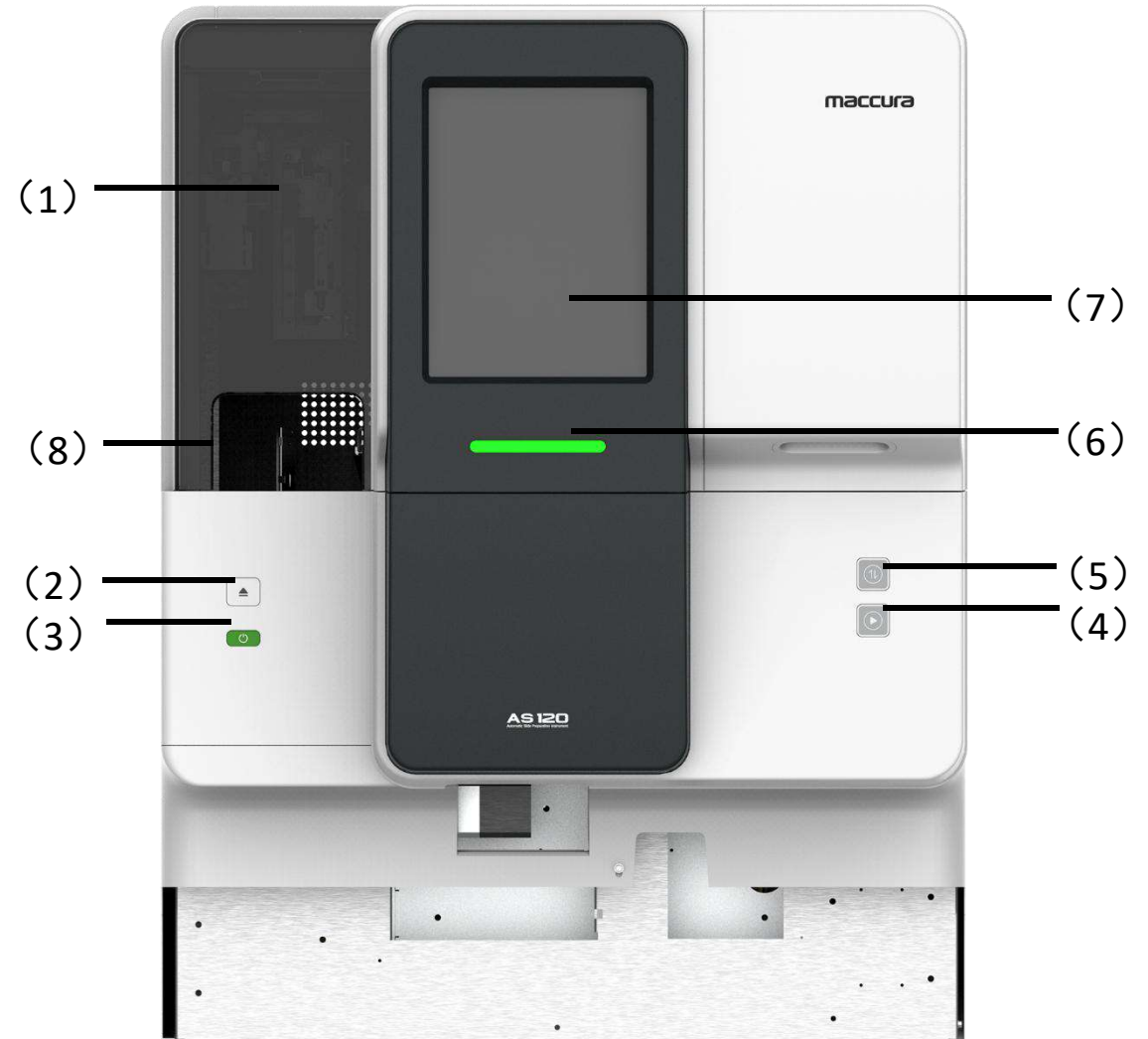
Work Flow Version



Name	Module	Notes
Instrument	AS 120	Includes spreading system, staining system and slide basket track
Track Module	TM 04	Includes sample loader, belt track and Cabinet
Compressor of automatic hematology analyzer	CP-10/CP-11	CP-10: Support 220V CP-11: Support 110V
Hand-held barcode scanner	NLS-HR32-SR(U)	Optional
Keyboard and Mouse	/	Prepared by laboratory
Waste Liquid Tank	20L	Optional

System components

- (1) Slide cassette viewing window
- (2) Quick cassette exiting button
- (3) Power start button
- (4) Start button
- (5) Mode switching button
- (6) Instrument status light
- (7) LED Screen
- (8) Slide basket operating port

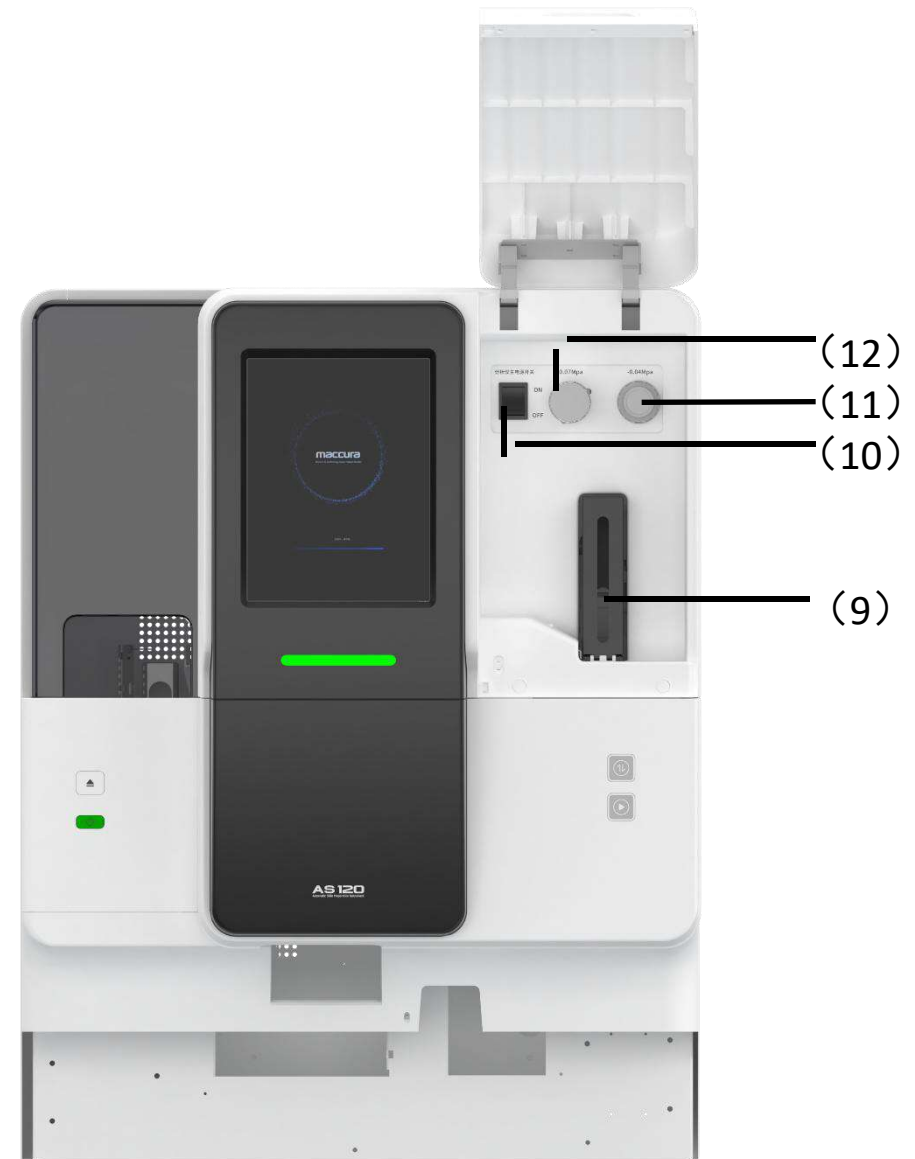


(9) Slide box

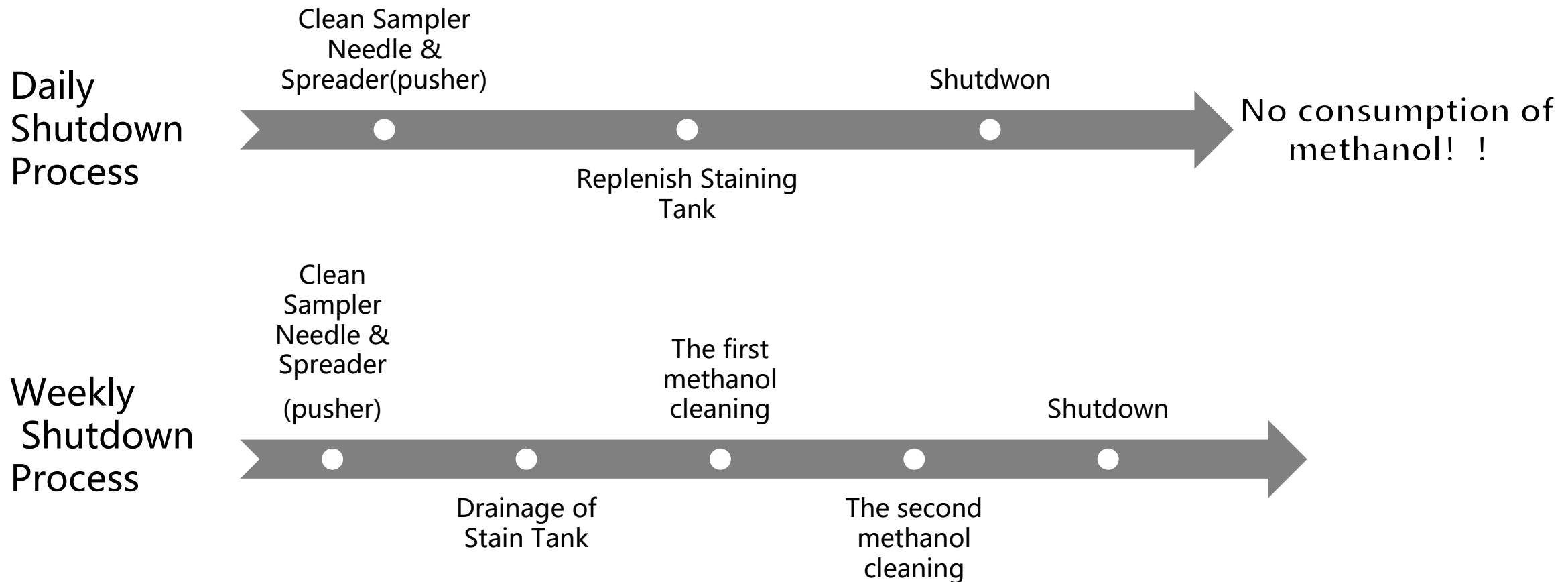
(10) Main power switch

(11) 0.07 Mpa adjustment knob

(12) -0.04 Mpa adjustment knob



Reagent Dosage- Shutdown



Sample Tubes / Sample Rack



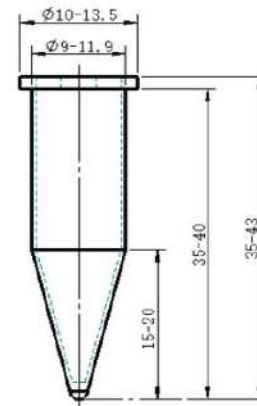
Rubber Pad

Sample Rack

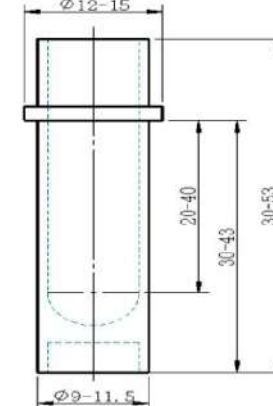
Adapter Ring

The fitting sample tube holder is the same as F 8 series hematology analyzer.

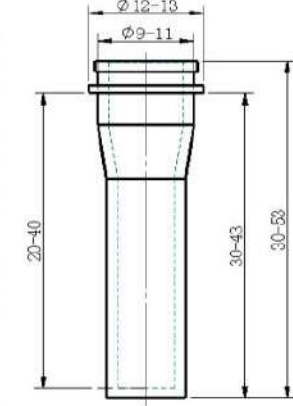
microcentrifuge tube



micro blood collection tube 1



micro blood collection tube 2



Slides / Slide Cassette

Size: Length(c) x Width:(a) = 75 x 20mm

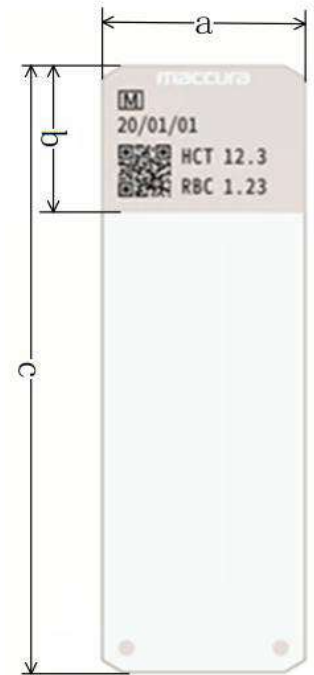
Thickness: 1.0-1.2mm

Storage of slide box: No less than 120 slides

Lodaing capacity of the slide cassette: 6 slides

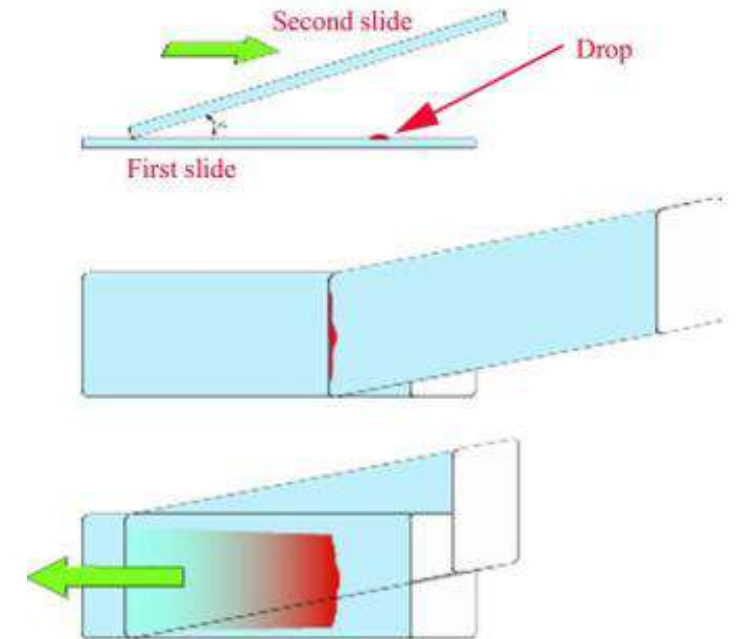


When (b) is greater than 18 mm, the staining solution may spread to the printing area!!



Function - Spreading

Spreading Method	Slide movement (spreader does not move) to push the piece, Length of spreading: 42.7mm
Spreader	Highly durable Sapphire
Cleaving Method	Ultrasonic, compressed air drying Ultrasonic cleaning time :5 seconds
Push-piece Protocol	11 sets of defaults: can adjust the spreading parameters and HCT range, can not change the name; 5 sets of customization: can adjust the spreading parameters, change the name, can not adjust the HCT range
Regulation	The larger the blood droplet, the greater the angle of spreading, the faster the speed, and the thicker the blood membrane; On the contrary, it is thin; The shorter the time of scraping, the less blood is scraped, and the more pointed the tail
Spreading Mode	A suction with a spread; A suction with 2 spreads
Viscosity Detection Method	Measure suction pressure



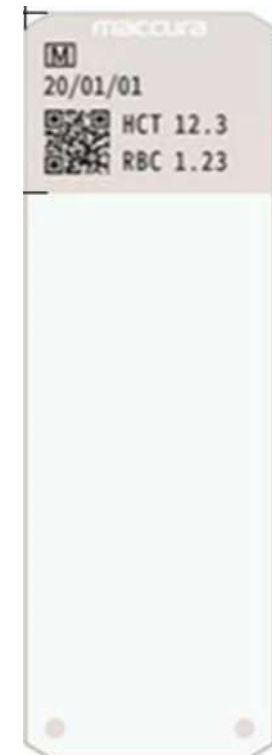
Function - Staining



Staining Process	Immersion: vertical immersion in stain solution, depth of immersion H =50-51.5mm; The instrument controls the lowest liquid level, which will rise by about 2.5mm when 8 slides are placed in a staining tank
Channels	Tank group 2: methanol pre-immobilization Tank group 3: methanol drying Tank group 4: stain solution fixation tank (primary staining) Tank group 5: diluent staining tank 1(counter-staining) Tank group 6: diluent staining tank 2(counte-staining) Tank group 7: cleaning tank Tank group 8: transfer tank
Regulation	Undiluted stain solution 1: the longer the time, the bluer the color, the darker; Dilution stain 1: The longer the time, the redder the background; The larger the proportions, the redder and darker the color ; Cleaning: The more times, the less residue is stained and the lighter the color ; Drying: The longer you dry, the less residual there is.
Standby closed cover function	According to the current state of the instrument, when the instrument is standby, the lid of the staining tank will automatically close to prevent the volatilization of staining solution and methanol.
Anti-hanging liquid design	In the process of handling the slides, a large amount of stain will remain on slides. In order to prevent the contamination, the gripper picks up the slides during the rising process. When the bottom of the slides is close to the liquid surface, it will pause briefly and pull the stain on the slides back to the dyeing pool by using the tension and gravity.
Slide transfer path	The path is designed to be linear or L-shaped to avoid cross-slide handling during the handling process and prevent the stain solution from falling in the blood smear printing area.

Function - Printing

Printing templates	3 templates: three lines of text; One line of text + one-dimensional code; Three lines of text + QR code
Printing principle	Thermal transfer
Resolution	300dpi
Labeling manual prepared slides	Mark "M" at the upper left corner of the slide
Modes	Support single-slide printing, multi-slide continuous printing, smear mode printing
Character types	characters, numeric characters, special symbols



Function - Recycling Slide Cassette

Transfer Method	Flexible transport: belt track
Cache capacity	Input cache (empty cassettes): 7 cassettes Output cache (with blood smears stored): 9 cassettes
Empty cassette recycling	Instrument with automatic recycling of empty cassettes (can be turned on or off)
Drying function	Slide cassette track integrated blood smear drying module (can be turned on or off) Drying method: single cassette drying Drying temperature: about 40 Thermode: PCT ceramic generator



Function - Shutdown maintenance

- **Daily shutdown:** Automatic maintenance. Increase the stain liquid level during daily shutdown; Reduce the stain liquid level during daily startup.
- **Weekly shutdown:** uses methanol / ethanol to clean all stain pipelines, staining tanks and storage tanks. Soak liquid mixing tank for cleaning, the instrument performs two consecutive cleaning process to ensure hygiene.



CHAPTER






05

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Comparison

请根据实际情况进行调整

Leading Competitors

Brand	Mindray	Sysmex	Horiba	Abbott	Beckman
Model	SC 120	SP 1/100/1000/10/50	SPS	CELL-DYN SMS Alinity hs	DxH SMS
Image					
Features	Took SPS, SP10, SP50, hs, as references for comprehensive optimization of design;	<ol style="list-style-type: none"> 1. After two generations of change, the user software is relatively comprehensive; 2. SP50 aims to reduce the footprint; 3. Customized pusher. 	<ol style="list-style-type: none"> 1. No sampling system, resistant to Pentra DX hematology analyzer for sample loading; 2. Spreading Track; 3. Stain one slide at a time. 	<ol style="list-style-type: none"> 1. Integrated slide reader 2. Spreading Track; 3. Cabinet Type; 4. Stain multiple slides at a time. 	<ol style="list-style-type: none"> 1. PC instrument 2. Cabinet Type; 3. Stain multiple slides at a time.

Comparison Table

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Brand Function	Maccura (AS 120)	Sysmex (SP 10)	Sysmex (SP 50)	Mindray (SC-120)
Printing	120 slides/hour			
Slide Preparation	1. Standard Mode: 30T/H; 2. Fast Mode: 60T/H (Modes can be switching by software)	120T/H	1. Standard Mode: 30T/H; 2. Fast Mode: 70T/H (Fixed a throughput when installed)	120T/H
Staining Tank (Anti-volatilization)	✓	✗	✗	✗
Viscosity Detection	✓	✗	✗	✓
HCT	✓	✓	✓	✓
Staining Tank Maintenance	Automatic	Manual	Manual	Manual
Staining Box	Multiple slides	1 slide / box	Multiple slides	1 slide / box

CHAPTER

06

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Summary

请根据实际情况进行调整

AS 120 Summary

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- **Throughput (Preparation):**
Standard Mode: 30T/H; Fast Mode: 60T/H
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- **Viscosity detection:** parameters can be set automatically according to the viscosity
- **Sample Volume:** Auto-loader: $\leq 40\mu\text{l}$
- **Blood spreader(or pusher):** made of highly durable sapphire glass.
No replacement and maintenance is required.
- **Slide Storage:** Slide cassette, 6 cassettes/basket, 12 cassettes/basket(optional);
- **Staining Box:** Multiple slides per box; Automatic cleaning and maintenance



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I'M ACCURATE

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