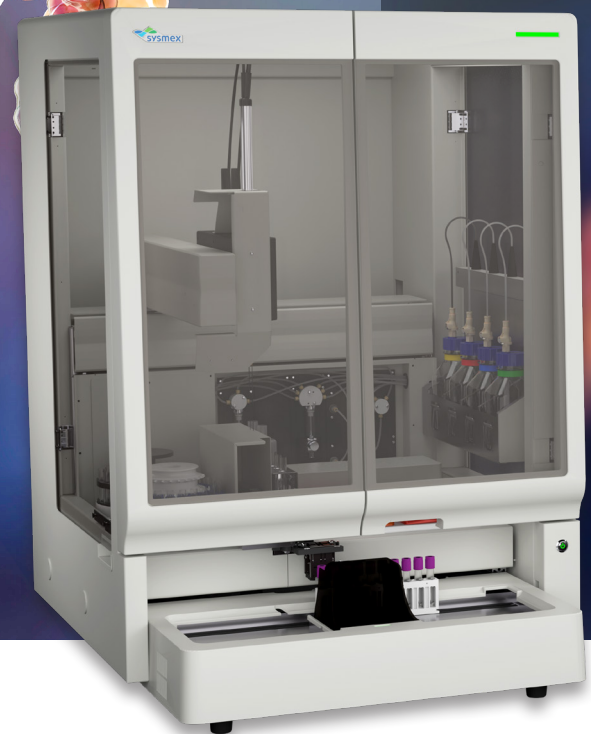
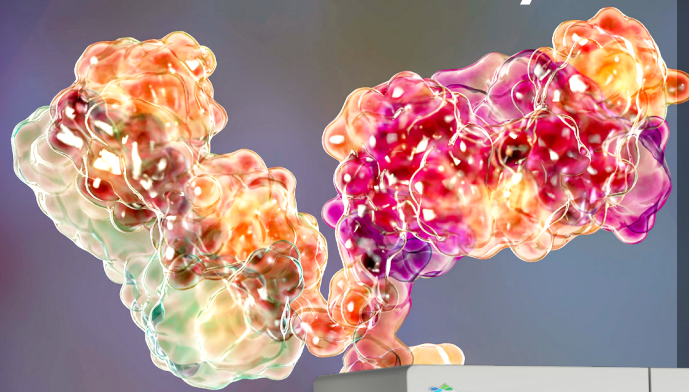


WHITE PAPER

# Time Savings with the Sysmex PS-10™ Sample Preparation System

Smart automation for a new  
level of workflow efficiency



# Introduction

Sysmex's PS-10 Sample Preparation System is designed to automate and streamline time-consuming manual tasks in today's busy clinical flow cytometry laboratories. Laboratories can significantly improve efficiency and productivity by reducing the hands-on time spent on repetitive, labor-intensive processes.

Additionally, PS-10 helps laboratories improve accuracy by reducing the chance of operator error due to the multiple integrated barcode readers.

The following PS-10 automated sample preparation workflows are included to illustrate potential time savings compared to traditional manual sample preparation.

## Time Savings in Action

To illustrate the potential time savings, one can consider a typical sample preparation workflow. Each of the workflows are built in the PS-10 with the following steps in various orders: "Antibody/Cocktail", "Incubation", "Lyse/Buffer", "Cell Wash" and "Mix".

Please note: the Helmer UltraCW® II Automatic Cell Washing System is used in the workflows listed below for wash procedures. The PS-10's swingout rotors are directly compatible with the Helmer and can be easily transferred on and off the system for required wash steps. This eliminates daughter tube handling and human errors when transferring tubes to and from a centrifuge for washing.



# Simple Sample Preparation Workflow Examples

## Example #1: Stain, Lyse, No-Wash

Hands-on-time saved by using PS-10: 63.75 minutes

Number of primary sample tubes: 48

Number of daughter tubes: 48

This workflow requires only six minutes of hands-on-time when loading reagents and sample tubes. The PS-10 will then perform steps 3-24 automatically, saving the laboratorian more than an hour of time that can be spent on other tasks.

Stain, Lyse, No-Wash			
Step	Description	Time on PS-10 (minutes)	Hands-on-Time (minutes)
1	Load Reagent Block and Reagent Vial on PS-10		1.0
2	Select Panel and Load Sample Tubes on PS-10		5.0
3	Initial Rotor 1 Scan	0.5	
4	Add Primary Sample 100 $\mu$ L (24) Rotor 1	12.0	
5	Wash Probes	0.5	
6	Add Antibody (50 $\mu$ L per secondary tube) Rotor 1	1.5	
7	Wash Probes	0.5	
8	Mix 1x (~10 seconds each) Rotor 1	0.25	
9	Incubation (15-20 minutes) Rotor 1	16.0	
10	Initial Rotor 2 Scan	-	
11	Add Primary Sample 100 $\mu$ L (24) Rotor 2	-	
12	Wash Probes	-	
13	Add Antibody (50 $\mu$ L per secondary tube) Rotor 2	-	
14	Mix 1x (~10 seconds each) Rotor 2	-	
15	Wash Probes	-	
16	Incubation (15-20 minutes) Rotor 2	-	
17	Add Lyse (2000 $\mu$ L) Rotor 1	4.5	
18	Wash Probes	0.5	
19	Mix 1x (10 seconds each) Rotor 1	0.25	
20	Incubation (10-15 minutes) Rotor 1	12.0	
21	Add Lyse (2000 $\mu$ L) Rotor 2	4.5	
22	Wash Probes	0.5	
23	Mix 1x (10 seconds each) Rotor 2	0.25	
24	Incubation (10-15 minutes) Rotor 2	10.0	
<b>Total Time (minutes):</b>		63.75	6.00

## Example #2: Lyse, Wash, Stain, Wash

Hands-on-time saved by using PS-10 and Helmer: 81 minutes

Number of primary sample tubes: 12

Number of daughter tubes: 48

The laboratorian will spend seven minutes of hands-on time in this workflow while the PS-10 automates 73 minutes and the Helmer automates eight minutes of the process.

Lyse, Wash, Stain, Wash				
Step	Description	Time on PS-10 (minutes)	Hands-on-Time (minutes)	Helmer Cell Washer
1	Load Reagent Block and Reagent Vial on PS-10		1.00	
2	Select Panel and Load Sample Tubes on PS-10		3.00	
3	Initial Rotor Scan Rotor 1	0.50		
4	Add Primary Sample (6) Rotor 1	6.00		
5	Wash Probes	1.50		
6	Add Lyse (2000 µL) Rotor 1	4.50		
7	Wash Probes	1.00		
8	Mix Rotor 1	0.25		
9	Incubation (10-15 minutes) Rotor 1	10.00		
10	Transfer Rotor 1 to Cell Washer	0.75		
11	Wash Samples (Post-Lyse Wash) Rotor 1		0.75	3.25
12	Transfer Rotor 1 to PS-10	0.75		
13	Add Cocktail (1 per secondary tube) Rotor 1	3.25		
14	Wash Probes	0.50		
15	Mix Rotor 1	0.25		
16	Incubation (15-20 minutes) Rotor 1	15.00		
17	Initial Rotor Scan Rotor 2	-		
18	Add Primary Sample (6) Rotor 2	-		
19	Wash Probes	-		
20	Add Lyse (2000 µL) Rotor 2	-		
21	Wash Probes	-		
22	Mix Rotor 2	-		
23	Incubation (10-15 minutes) Rotor 2	7.00		
24	Transfer Rotor 1 to Cell Washer	0.75		
25	Wash Samples (Post-Stain Wash) Rotor 1		0.75	0.75
26	Transfer Rotor 2 to Cell Washer	0.75		
27	Wash Samples (Post-Lyse Wash) Rotor 2		0.75	3.25
28	Transfer Rotor 2 to PS-10	0.75		
29	Add Cocktail (1 per secondary tube) Rotor 2	3.00		
30	Wash Probes	0.50		
31	Mix Rotor 2	0.25		
32	Incubation (15-20 minutes) Rotor 2	15.00		
33	Transfer Rotor 2 to Cell Washer	0.75		
34	Wash Samples (Post-Stain Wash) Rotor 2		0.75	0.75
<b>Total Time (minutes):</b>		73.00	7.00	8.00

### Example #3: Wash, Stain, Lyse, Wash (Prewash)

Hands-on-time saved by using PS-10 and Helmer: 84.25 minutes

Number of primary sample tubes: 12

Number of daughter tubes: 24

The laboratorian will spend seven minutes of hands-on time in this workflow while the PS-10 automates 65.75 minutes and the Helmer automates 18.5 minutes of the process.

Wash, Stain, Lyse, Wash, (Prewash)				
Step	Description	Time on PS-10 (minutes)	Hands-on-Time (minutes)	Helmer Cell Washer
1	Load Reagent Block and Reagent Vial on PS-10		1.00	
2	Select Panel and Load Sample Tubes on PS-10		3.00	
3	Initial Rotor 1 Scan	0.50		
4	Add Primary Sample (6) Rotor 1	6.00		
5	Wash Probes	0.50		
6	Transfer Rotor 1 to Cell Washer	0.75		
7	Wash Samples (Pre-Wash x3)		0.75	5.75
8	Transfer Rotor 1 to PS-10	0.75		
9	Add Cocktail (1 per secondary tube) Rotor 1	3.25		
10	Wash Probes	0.50		
11	Mix Rotor 1	0.25		
12	Incubation (15-20 minutes) Rotor 1	19.50		
13	Initial Rotor 2 Scan	-		
14	Add Primary Sample (6) Rotor 2	-		
15	Wash Probes	-		
16	Transfer Rotor 2 to Cell Washer	-		
17	Wash Samples (Pre-Wash x3)		0.75	5.75
18	Transfer Rotor 2 to PS-10	-		
19	Add Cocktail (1 per secondary tube) Rotor 2	-		
20	Wash Probes	-		
21	Mix Rotor 2	-		
22	Incubation (15-20 minutes) Rotor 2	-		
23	Add Lyse (2000 µL) Rotor 1	4.50		
24	Wash Probes	1.00		
25	Mix Rotor 1	0.25		
26	Incubation (10-15 minutes) Rotor 1	10.75		
27	Add Lyse (2000 µL) Rotor 2	4.50		
28	Wash Probes	1.00		
29	Transfer Rotor 1 to Cell Washer	0.75		
30	Wash Sample (Final Wash)		0.75	3.50
31	Mix Rotor 2	0.25		
32	Incubation (10-15 minutes) Rotor 2	10.00		
33	Transfer Rotor 2 to Cell Washer	0.75		
34	Wash Sample (Final Wash)		0.75	3.50
<b>Total Time (minutes):</b>		65.75	7.0	18.50

## Example #4: Fix and Perm (Intracellular)

Hands-on-time saved by using the PS-10 and Helmer: 90 minutes

Number of primary sample tubes: 12

Number of daughter tubes: 24

Five and a half minutes of hands-on-time are required in this workflow, while the PS-10 automates 80.5 minutes and the Helmer automates 9.5 minutes.

Fix and Perm (Intracellular)				
Step	Description	Time on PS-10 (minutes)	Hands-on-Time (minutes)	Helmer Cell Washer
1	Load Reagent Block and Reagent Vial on PS-10		1.0	
2	Select Panel and Load Sample Tubes on PS-10		3.0	
3	Initial Rotor Scan	0.5		
4	Add Primary Sample (12)	7.25		
5	Wash Probes	0.5		
6	Add Cocktail/Antibody (1 per secondary tube)	1.5		
7	Wash Probes	0.5		
8	Mix	0.25		
9	Incubation (15-20 minutes)	15.0		
10	Add Fixation Buffer (250 µL)	1.5		
11	Wash Probes	1.0		
12	Mix	0.25		
13	Incubation (10-15 minutes)	10.75		
14	Add Deionized Water (1500 µL)	3.5		
15	Wash Probes	1.5		
16	Add Deionized Water (1500 µL)	3.5		
17	Wash Probes	1.0		
18	Mix	0.25		
19	Incubation (10-15 minutes)	10.0		
20	Transfer to Cell Washer	0.75		
21	Centrifuge Samples (Post-Fix Spin)		0.75	4.50
22	Transfer to PS-10	0.75		
23	Add Permeabilization Buffer (250 µL)	1.5		
24	Wash Probes	1.0		
25	Add Cocktail/Antibody (1 per secondary tube)	1.5		
26	Wash Probes	0.5		
27	Mix	0.25		
28	Incubation (15-20 minutes)	15.0		
29	Transfer to Cell Washer	0.5		
30	Wash Samples (Post-Perm Wash)		0.75	5.00
<b>Total Time (minutes):</b>		<b>80.5</b>	<b>5.5</b>	<b>9.5</b>

# PS-10 Key Time-Saving Features

1. **Dual Cap-Piercing:** The PS-10 eliminates preparation steps and minimizes operator exposure to potentially hazardous biological specimens by acquiring and dispensing two samples simultaneously.
2. **Automated Aliquoting:** The system can automatically aliquot samples into multiple daughter tubes, saving time and reducing the risk of contamination.
3. **Barcode Scanning:** The PS-10 incorporates barcode scanning technology to ensure accurate sample tracking and reduce the risk of errors.
4. **Compatible Centrifugation Rotors:** The PS-10's rotors are directly compatible with the Helmer UltraCW II Automatic Cell Washing System for wash procedures. Rotors can be easily transferred on and off the system for required wash steps, virtually eliminating daughter tube handling and human errors when transferring tubes to and from a centrifuge for washing. The same rotor can be transferred between the centrifuge, PS-10 and XF-1600™ Flow Cytometer.
5. **Intuitive Software:** The PS-10's user-friendly software interface simplifies operation and minimizes training time.



## Benefits of Time Savings and Reduced Errors

- **Increased Throughput:** By reducing the time spent on sample preparation, laboratories can process more samples per hour, increasing overall throughput and minimizing the time taken to return results to the requesting clinician.
- **Improved Efficiency:** Automation can help to reduce errors and improve the overall efficiency of the laboratory by standardizing the workflow.
- **Enhanced Productivity:** The time saved can be reallocated to other tasks, such as performing additional tests, improving quality control procedures or sample analysis.
- **Elimination of Operator Errors and Improved Safety:** The PS-10's automated processes minimize the risk of human error, such as accidental sample spills and incorrect pipetting of reagents and improve safety through minimal interaction with samples and reduced manual pipetting.
- **Standardization of Results:** By automating repetitive tasks, the PS-10 helps to ensure consistent results across different operators and shifts, improving data reliability.

## Conclusion

The Sysmex PS-10 Sample Preparation System offers significant time savings and increased efficiency for clinical laboratories. By automating routine tasks and reducing the risk of human error, the system helps to improve laboratory performance, data quality and patient results.

Disclaimer: Results shown in this document are real examples of time savings with the PS-10 Sample Preparation System. Your individual results may vary.

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