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# **The NEW**

# **ISO IWA 15 for Liquid Handling**

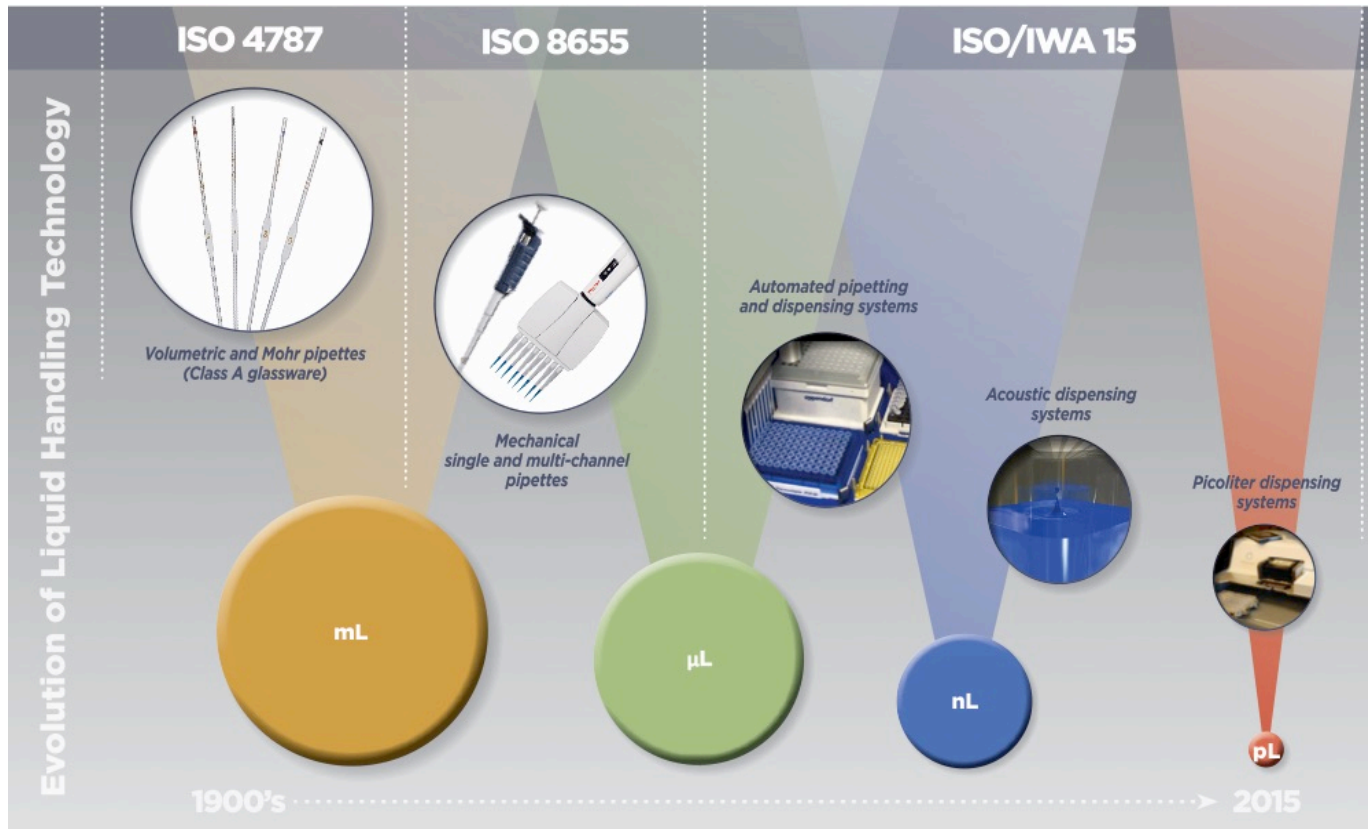
## ***How it will help you***

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# Volumetric Performance - Why care?



# What's the need?



# The Document

## ISO IWA 15 Specification and Method for the Determination of Volumetric Performance of Automated Liquid Handling Systems (ALHS)

# Outline of ISO IWA 15

- **Terms and Definitions**
- **Operation of ALHS**
- **Volumetric Performance Determination**
  - Indexing to track data
    - From channel perspective
    - From microplate perspective
- **Test Methods**
- **Specification of ALHS performance**
- **Reporting**
- **Bibliography**
- **Annexes**

# Benefits - Quality, Productivity and Compliance

- Example - System Suitability Testing
  - 8 channel liquid handling device
  - 96 well plates
  - 1 plate
  - 12 deliveries per channel per plate
  - 96 data points
  - Requirement: 3% Accuracy
  - Requirement: 2% CV

# Example Data & Calculations

## Example 1

8 channel device,  $L = 8$   
 one single run,  $M = 1$   
 12 replicates per channel,  $N = 12$   
 measured in one 96 well plate

Channel		1	2	3	4	5	6	7	8	9	10	11	12
$l = 1$	A	102.89	102.57	100.41	98.02	100.83	99.76	103.73	99.59	101.46	102.12	102.66	102.62
$l = 2$	B	102.04	104.82	104.11	106.26	104.97	107.33	103.31	107.14	105.59	104.21	104.35	107.94
$l = 3$	C	101.27	104.83	102.64	106.48	104.41	103.92	104.42	102.15	103.84	104.38	103.32	103.08
$l = 4$	D	101.46	101.42	102.50	101.07	101.73	105.51	100.76	102.31	105.96	102.07	103.70	101.39
$l = 5$	E	96.66	98.35	96.21	96.91	93.53	96.89	97.21	97.61	96.47	99.21	97.40	99.15
$l = 6$	F	99.62	97.14	99.46	101.46	99.58	98.25	97.32	101.15	101.35	100.63	103.42	102.05
$l = 7$	G	99.45	98.97	100.57	98.97	98.90	101.85	101.57	104.14	103.51	101.97	101.08	103.31
$l = 8$	H	99.98	99.64	98.26	98.32	101.29	96.19	96.67	102.06	98.19	100.71	100.94	98.91

## Run Order Statistics

$n \rightarrow$		1	2	3	4	5	6	7	8	9	10	11	12
Form. 9	$V(n)$	100.42	100.97	100.52	100.94	100.65	101.21	100.62	102.02	102.05	101.91	102.11	102.31
Form. 3	$e_S(n)$	0.42%	0.97%	0.52%	0.94%	0.65%	1.21%	0.62%	2.02%	2.05%	1.91%	2.11%	2.31%
Form. 11	$CV(n)$	1.94%	2.89%	2.55%	3.65%	3.55%	4.06%	3.15%	2.79%	3.31%	1.73%	2.21%	2.76%

Overall Statistics	
Grand Avg	Form. 12
$V_{GA}$	101.31
$e_{S GA}$	1.31%

Overall CV	
$CV_{OA}$	Form. 13
	2.86%

Channel Statistics		
Form. 1	Form. 3	Form. 7
$V(l)$	$e_S(l)$	$CV(l)$
101.39	1.39%	1.66%
105.17	5.17%	1.66%
103.73	3.73%	1.32%
102.49	2.49%	1.66%
97.13	-2.87%	1.55%
100.12	0.12%	1.91%
101.19	1.19%	1.84%
99.26	-0.74%	1.84%
max $e_S(l)$	5.17%	
min $e_S(l)$	-2.87%	
max $CV(l)$	1.91%	

Form. 14
$CV_{C2C}$
2.51%



# Developers of ISO IWA 15



Hinsdale  
Pathology  
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