	<b>Catatan Hasil Kalibrasi Internal</b>	No. : F-PM-01-38
	<i>Internal Calibration Record</i>	Rev. : 00
	<b>Sprit / Syringe</b>	Date : 3 September 2014

<b>Merek</b> :	<b>Bidang/Lokasi</b> :
<i>Brand</i>	<i>Department/Location</i>
<b>Type</b> :	<b>Suhu ruang</b> : °C
<i>Type</i>	<i>Room temperature</i>
<b>Kode kalibrasi</b> :	<b>Kelembaban</b> : % RH
<i>Calibration code</i>	<i>Humidity</i>
<b>Kapasitas</b> : ml	<b>No. Protap</b> : PKVK054
<i>Capacity</i>	<i>SOP No.</i>
<b>Resolusi</b> : ml	<b>Petugas</b> :
<i>Subdivision (Resolution)</i>	<i>Operator</i>
<b>Syarat</b> : ml	<b>Tanggal kalibrasi</b> :
<i>Requirement</i>	<i>Calibration date</i>

Kalibrator yang digunakan <i>Calibrator used</i>	Kode Kalibrasi <i>Calibration Code</i>	Tanggal kalibrasi Kalibrator <i>Cal. date of Calibrator</i>
1. Neraca Analitik 2. Termometer		

**Catatan/Note :**

$T_{Air} = 24.0$ °C	$\rho_{Air} = 0.99729$ g/ml	$\rho_{air\ 20^{\circ}C} = 998.202$ kg/m <sup>3</sup>	$\rho_{AT} = 8$ g/ml
$\rho_{Udara} = 0.0012$ g/ml	$V_{plastik} = 2.5.E-04$ /°C	$V_{glass\ soda\ lime} = 2.5.E-05$ /°C	$LOP_{Neraca} = 0.0026$ gram
	$U_{Sert\ Termometer} = 0.7$ °C	$\Delta\rho/\Delta T = -0,00026$ g/ml°C	$\Delta\ Suhu = 24.0$ °C

**A. Data**1.  $V_{nominal} =$  ml

Ulangan Rep.	$W_{kosong}$ $W_{Empty}$ (g)	$W_{isi(air)}$ $W_{Water}$ (g)	$\Delta R$ $\Delta R$ (g)
1	0.0000		0.0000
2	0.0000		0.0000
3	0.0000		0.0000
4	0.0000		0.0000
5	0.0000		0.0000
$\Delta R$ rata-rata/average		0.0000 g	
SD ( $\sigma_{n-1}$ )		0.0000 g	
Isi / Volume, $V_{T20^{\circ}C}$		0.0000 ml	

2.  $V_{nominal} =$  ml


Ulangan Rep.	$W_{kosong}$ $W_{Empty}$ (g)	$W_{isi(air)}$ $W_{Water}$ (g)	$\Delta R$ $\Delta R$ (g)
1	0.0000		0.0000
2	0.0000		0.0000
3	0.0000		0.0000
4	0.0000		0.0000
5	0.0000		0.0000
$\Delta R$ rata-rata/average		0.0000 g	
SD ( $\sigma_{n-1}$ )		0.0000 g	
Isi / Volume, $V_{T20^{\circ}C}$		0.0000 ml	

3.  $V_{nominal} =$  ml

Ulangan Rep.	$W_{kosong}$ $W_{Empty}$ (g)	$W_{isi(air)}$ $W_{Water}$ (g)	$\Delta R$ $\Delta R$ (g)
1	0.0000		0.0000
2	0.0000		0.0000
3	0.0000		0.0000
4	0.0000		0.0000
5	0.0000		0.0000
$\Delta R$ rata-rata/average		0.0000 g	
SD ( $\sigma_{n-1}$ )		0.0000 g	
Isi / Volume, $V_{T20^{\circ}C}$		0.0000 ml	

4.  $V_{nominal} =$  ml

Ulangan Rep.	$W_{kosong}$ $W_{Empty}$ (g)	$W_{isi(air)}$ $W_{Water}$ (g)	$\Delta R$ $\Delta R$ (g)
1	0.0000		0.0000
2	0.0000		0.0000
3	0.0000		0.0000
4	0.0000		0.0000
5	0.0000		0.0000
$\Delta R$ rata-rata/average		0.0000 g	
SD ( $\sigma_{n-1}$ )		0.0000 g	
Isi / Volume, $V_{T20^{\circ}C}$		0.0000 ml	

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5.  $V_{nominal} =$  ml

Ulangan Rep.	$W_{kosong}$ $W_{Empty}$ (g)	$W_{Isi(air)}$ $W_{Water}$ (g)	$\Delta R$ $\Delta R$ (g)
1	0.0000		0.0000
2	0.0000		0.0000
3	0.0000		0.0000
4	0.0000		0.0000
5	0.0000		0.0000
$\Delta R$ rata-rata/average		0.0000 g	
SD ( $\sigma_{n-1}$ )		0.0000 g	
Isi / Volume, $V_{T20\text{ }^\circ\text{C}}$		0.0000 ml	

**B. Perhitungan Ketidakpastian**

Calculation of uncertainty

1. Perhitungan ketidakpastian volume nominal = 0 ml


Uncertainty calculation of nominal volume

No. No.	Sumber Ketidakpastian Source of Uncertainty	Satuan Unit	Distribusi Distribution	Nilai $U_i$ $U_i$ value	Pembagi Divisor	$u_i$	Coeff. Ci		ui Ci $u_i C_i$	V V
							Coeff.	Ci		
1	Reproducibility, $U_{Rep.} = \sigma_{n-1}$	gram	Normal	0.0000	$\sqrt{5}$	0.0000	1.003	1.003	0.00000	4
2	LOP of Balance, $U_{Serf.} = LOP$	gram	Normal	0.0026	2.0	0.0013	1.003	1.003	0.00130	$\infty$
3	Density of Air ( $\rho_{Air}$ ) = 10% x 0,0012	g/ml	Rectangular	0.00012	$\sqrt{3}$	0.00007	1,003 $\Delta R$	0.00.E+00	0.00000	$\infty$
4	Density of Water, $U(\rho_{H2O}) = T_{serf.} \times \Delta\rho / \Delta T$	g/ml	Normal	-0.00018	1.0	-0.00018	-1,003 $\Delta R$	0.00.E+00	0.000000	$\infty$
5	Density of Weights, $U_{Weights} = 10\% \times \rho_{Weights}$	g/ml	Rectangular	0.8	$\sqrt{3}$	0.46	1,88E-5 $\Delta R$	0.00E+00	0.0.E+00	$\infty$
6	Temp. of water, $U_{(TH2O)} = U_{\Delta T room}$	°C	Normal	24.00	$\sqrt{3}$	13.8564	1,003E-6 $\Delta R$	0.00E+00	0.000000	$\infty$
7	Coef. thermal, $(U_\gamma) = 10\% \times \gamma$	°C	Rectangular	2.5.E-05	$\sqrt{3}$	1.E-05	-5,015 $\Delta R$	0.00E+00	0.00000	$\infty$
8	Resolution, $U_{Res} = 1/2 \times Resolution$	ml	Rectangular	0.000	$\sqrt{3}$	0.0000	1.00	1.00	0.0000	$\infty$
9	Drift of Balance, $U_{Drift} = 10\% \times LOP$	gram	Rectangular	0.00026	$\sqrt{3}$	1.50E-04	1.003	1.003	0.00015	$\infty$
Ketidakpastian baku gabungan / Combined Uncertainty, $u(D) = \text{SQRT}(\sum (u_i C_i)^2)$									0.00131	
Derajat kebebasan efektif / Effective degree of freedom, $V_{eff}$									#DIV/0!	
Faktor cakupan pada tingkat kepercayaan 95 % / Coverage Factor on uncertainty 95%, $K_{95\%}$									2	
Ketidakpastian gabungan perluasan / Expanded Uncertainty, $U(D) = u(D) \times K_{95\%}$ , dalam l in ml									0.003	

2. Perhitungan ketidakpastian volume nominal = 0 ml

Uncertainty calculation of nominal volume

No. No.	Sumber Ketidakpastian Source of Uncertainty	Satuan Unit	Distribusi Distribution	Nilai $U_i$ $U_i$ value	Pembagi Divisor	$u_i$	Coeff. Ci		ui Ci $u_i C_i$	V V
							Coeff.	Ci		
1	Reproducibility, $U_{Rep.} = \sigma_{n-1}$	gram	Normal	0.0000	$\sqrt{5}$	0.0000	1.003	1.003	0.00000	4
2	LOP of Balance, $U_{Serf.} = LOP$	gram	Normal	0.0026	2.0	0.0013	1.003	1.003	0.00130	$\infty$
3	Density of Air ( $\rho_{Air}$ ) = 10% x 0,0012	g/ml	Rectangular	0.00012	$\sqrt{3}$	0.00007	1,003 $\Delta R$	0.00.E+00	0.00000	$\infty$
4	Density of Water, $U(\rho_{H2O}) = T_{serf.} \times \Delta\rho / \Delta T$	g/ml	Normal	-0.00018	1.0	-0.00018	-1,003 $\Delta R$	0.00.E+00	0.000000	$\infty$
5	Density of Weights, $U_{Weights} = 10\% \times \rho_{Weights}$	g/ml	Rectangular	0.8	$\sqrt{3}$	0.46	1,88E-5 $\Delta R$	0.00E+00	0.0.E+00	$\infty$
6	Temp. of water, $U_{(TH2O)} = U_{\Delta T room}$	°C	Normal	24.00	$\sqrt{3}$	13.8564	1,003E-6 $\Delta R$	0.00E+00	0.000000	$\infty$
7	Coef. thermal, $(U_\gamma) = 10\% \times \gamma$	°C	Rectangular	2.5.E-05	$\sqrt{3}$	1.E-05	-5,015 $\Delta R$	0.00E+00	0.00000	$\infty$
8	Resolution, $U_{Res} = 1/2 \times Resolution$	ml	Rectangular	0.000	$\sqrt{3}$	0.0000	1.00	1.00	0.0000	$\infty$
9	Drift of Balance, $U_{Drift} = 10\% \times LOP$	gram	Rectangular	0.00026	$\sqrt{3}$	1.50E-04	1.003	1.003	0.00015	$\infty$
Ketidakpastian baku gabungan / Combined Uncertainty, $u(D) = \text{SQRT}(\sum (u_i C_i)^2)$									0.00131	
Derajat kebebasan efektif / Effective degree of freedom, $V_{eff}$									#DIV/0!	
Faktor cakupan pada tingkat kepercayaan 95 % / Coverage Factor on uncertainty 95%, $K_{95\%}$									2	

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Ketidakpastian gabungan perluasan / Expanded Uncertainty, $U(D) = u(D) \times K_{95\%}$ , dalam / in ml	0.003
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3. Perhitungan ketidakpastian volume nominal = 0 ml


Uncertainty calculation of nominal volume

No. No.	Sumber Ketidakpastian Source of Uncertainty	Satuan Unit	Distribusi Distribution	Nilai $U_i$ $U_i$ value	Pembagi Divisor	$u_i$	Coeff. Ci		ui Ci $u_i C_i$	V
							Coeff.	Ci		
1	Reproducibility, $U_{Rep.} = \sigma_{n-1}$	gram	Normal	0.0000	$\sqrt{5}$	0.0000	1.003	1.003	0.00000	4
2	LOP of Balance, $U_{Sert.} = LOP$	gram	Normal	0.0026	2.0	0.0013	1.003	1.003	0.00130	$\infty$
3	Density of Air ( $\rho_{Air}$ ) = 10% x 0,0012	g/ml	Rectangular	0.00012	$\sqrt{3}$	0.00007	1,003 $\Delta R$	0.00.E+00	0.00000	$\infty$
4	Density of Water, $U(\rho_{H2O}) = T_{sert} \times \Delta\rho/\Delta T$	g/ml	Normal	-0.00018	1.0	-0.00018	-1,003 $\Delta R$	0.00.E+00	0.000000	$\infty$
5	Density of Weights, $U_{Weights} = 10\% \times \rho_{Weights}$	g/ml	Rectangular	0.8	$\sqrt{3}$	0.46	1,88E-5 $\Delta R$	0.00E+00	0.0.E+00	$\infty$
6	Temp. of water, $u_{(TH2O)} = U_{\Delta T room}$	°C	Normal	24.00	$\sqrt{3}$	13.8564	1,003E-6 $\Delta R$	0.00E+00	0.000000	$\infty$
7	Coef. thermal, $(U\gamma) = 10\% \times \gamma$	°C	Rectangular	2.5.E-05	$\sqrt{3}$	1.E-05	-5,015 $\Delta R$	0.00E+00	0.00000	$\infty$
8	Resolution, $U_{Res} = 1/2 \times Resolution$	ml	Rectangular	0.000	$\sqrt{3}$	0.0000	1.00	1.00	0.0000	$\infty$
9	Drift of Balance, $U_{Drift} = 10\% \times LOP$	gram	Rectangular	0.00026	$\sqrt{3}$	1.50E-04	1.003	1.003	0.00015	$\infty$
Ketidakpastian baku gabungan / Combined Uncertainty, $u(D) = \text{SQRT}(\sum (u_i C_i)^2)$									0.00131	
Derajat kebebasan efektif / Effective degree of freedom, $V_{eff}$									#DIV/0!	
Faktor cakupan pada tingkat kepercayaan 95 % / Coverage Factor on uncertainty 95%, $K_{95\%}$									2	
Ketidakpastian gabungan perluasan / Expanded Uncertainty, $U(D) = u(D) \times K_{95\%}$ , dalam / in ml									0.003	

4. Perhitungan ketidakpastian volume nominal = 0 ml

Uncertainty calculation of nominal volume

No. No.	Sumber Ketidakpastian Source of Uncertainty	Satuan Unit	Distribusi Distribution	Nilai $U_i$ $U_i$ value	Pembagi Divisor	$u_i$	Coeff. Ci		ui Ci $u_i C_i$	V
							Coeff.	Ci		
1	Reproducibility, $U_{Rep.} = \sigma_{n-1}$	gram	Normal	0.0000	$\sqrt{5}$	0.0000	1.003	1.003	0.00000	4
2	LOP of Balance, $U_{Sert.} = LOP$	gram	Normal	0.0026	2.0	0.0013	1.003	1.003	0.00130	$\infty$
3	Density of Air ( $\rho_{Air}$ ) = 10% x 0,0012	g/ml	Rectangular	0.00012	$\sqrt{3}$	0.00007	1,003 $\Delta R$	0.00.E+00	0.00000	$\infty$
4	Density of Water, $U(\rho_{H2O}) = T_{sert} \times \Delta\rho/\Delta T$	g/ml	Normal	-0.00018	1.0	-0.00018	-1,003 $\Delta R$	0.00.E+00	0.000000	$\infty$
5	Density of Weights, $U_{Weights} = 10\% \times \rho_{Weights}$	g/ml	Rectangular	0.8	$\sqrt{3}$	0.46	1,88E-5 $\Delta R$	0.00E+00	0.0.E+00	$\infty$
6	Temp. of water, $u_{(TH2O)} = U_{\Delta T room}$	°C	Normal	24.00	$\sqrt{3}$	13.8564	1,003E-6 $\Delta R$	0.00E+00	0.000000	$\infty$
7	Coef. thermal, $(U\gamma) = 10\% \times \gamma$	°C	Rectangular	2.5.E-05	$\sqrt{3}$	1.E-05	-5,015 $\Delta R$	0.00E+00	0.00000	$\infty$
8	Resolution, $U_{Res} = 1/2 \times Resolution$	ml	Rectangular	0.000	$\sqrt{3}$	0.0000	1.00	1.00	0.0000	$\infty$
9	Drift of Balance, $U_{Drift} = 10\% \times LOP$	gram	Rectangular	0.00026	$\sqrt{3}$	1.50E-04	1.003	1.003	0.00015	$\infty$
Ketidakpastian baku gabungan / Combined Uncertainty, $u(D) = \text{SQRT}(\sum (u_i C_i)^2)$									0.00131	
Derajat kebebasan efektif / Effective degree of freedom, $V_{eff}$									#DIV/0!	
Faktor cakupan pada tingkat kepercayaan 95 % / Coverage Factor on uncertainty 95%, $K_{95\%}$									2	
Ketidakpastian gabungan perluasan / Expanded Uncertainty, $U(D) = u(D) \times K_{95\%}$ , dalam / in ml									0.003	

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5. Perhitungan ketidakpastian volume nominal = 0 ml

*Uncertainty calculation of nominal volume*

No. No.	Sumber Ketidakpastian Source of Uncertainty	Satuan Unit	Distribusi Distribution	Nilai $U_i$ $U_i$ value	Pembagi Divisor	$u_i$	Coeff. $C_i$		$u_i C_i$ $u_i C_i$	$V$ $V$
							Coeff.	$C_i$		
1	Reproducibility, $U_{Rep.} = \sigma_{n-1}$	gram	Normal	0.0000	$\sqrt{5}$	0.0000	1.003	1.003	0.00000	4
2	LOP of Balance, $U_{Sert.} = LOP$	gram	Normal	0.0026	2.0	0.0013	1.003	1.003	0.00130	$\infty$
3	Density of Air ( $\rho_{Air}$ ) = 10% x 0,0012	g/ml	Rectangular	0.00012	$\sqrt{3}$	0.00007	1,003 $\Delta R$	0.00.E+00	0.00000	$\infty$
4	Density of Water, $U(\rho_{H2O}) = T_{sert} \times \Delta\rho/\Delta T$	g/ml	Normal	-0.00018	1.0	-0.00018	-1,003 $\Delta R$	0.00.E+00	0.000000	$\infty$
5	Density of Weights, $U_{Weights} = 10\% \times \rho_{Weights}$	g/ml	Rectangular	0.8	$\sqrt{3}$	0.46	1,88E-5 $\Delta R$	0.00E+00	0.0.E+00	$\infty$
6	Temp. of water, $u_{(TH2O)} = U_{\Delta T room}$	°C	Normal	24.00	$\sqrt{3}$	13.8564	1,003E-6 $\Delta R$	0.00E+00	0.000000	$\infty$
7	Coef. thermal, $(U\gamma) = 10\% \times \gamma$	°C	Rectangular	2.5.E-05	$\sqrt{3}$	1.E-05	-5,015 $\Delta R$	0.00E+00	0.00000	$\infty$
8	Resolution, $U_{Res} = 1/2 \times Resolution$	ml	Rectangular	0.000	$\sqrt{3}$	0.0000	1.00	1.00	0.0000	$\infty$
9	Drift of Balance, $U_{Drift} = 10\% \times LOP$	gram	Rectangular	0.00026	$\sqrt{3}$	1.50E-04	1.003	1.003	0.00015	$\infty$
Ketidakpastian baku gabungan / Combined Uncertainty, $u(D) = \text{SQRT}(\sum (u_i C_i)^2)$									0.00131	
Derajat kebebasan efektif / Effective degree of freedom, $V_{eff}$									#DIV/0!	
Faktor cakupan pada tingkat kepercayaan 95 % / Coverage Factor on uncertainty 95%, $K_{95\%}$									2	
Ketidakpastian gabungan perluasan / Expanded Uncertainty, $U(D) = u(D) \times K_{95\%}$ , dalam / in ml									0.003	

C. Hasil Kalibrasi  
*Calibration Results*

No.	$V_{Nominal}$ $V_{Nominal}$ (°C)	$V_{Kalibrasi}$ $V_{Calibration}$ (°C)	Koreksi Correction (°C)	Ketidakpastian, $U_{95\%}$ Uncertainty, $U_{95\%}$ (°C)
1	0.0	0.00	0.00	0.00
2	0.0	0.00	0.00	0.00
3	0.0	0.00	0.00	0.00
4	0.0	0.00	0.00	0.00
5	0.0	0.00	0.00	0.00

Dihitung Oleh Calculated by	Tanggal Date	Diperiksa oleh Checked by	Tanggal Date	Catatan / Kesimpulan Note / Conclusion