

# UV DETECTOR LINEARITY & SENSITIVITY REPORT

## ACQUISITION INFORMATION

System Name: Column Manager  
Project Name: SQT\_ACQUITY\_TUV\_12  
Sample Set Method: 04b Detector Lin Sens  
Processing Method Detector Area PM, Detector Height  
Report Method Name: Det Lin Sens Report  
User Name: Tester Account (Tester)  
Sample Set Name: Detector Lin Sens

Acquired By: Tester  
Column serial Number: 03833034215140  
Sample Kit 1 Expiration date: 10/6/2022 12:00:00 AM  
Sample Kit 1 Lot Number: W06102013  
Build Version: Empower 2 Software Build 2154 SPs  
Sample Set Id: 14505 Result Set Id 14528  
Sample Set Start Date: 4/12/2021 4:51:09 PM

The Detector Linearity & Sensitivity qualification injects several amounts of Caffeine and plots the Response vs. Caffeine Amount.

It also computes the Sensitivity (Peak Area/Amount) and (Peak Height/Amount) for each injection.

The qualification passes if the Linearity  $R^2$  value for Area is  $\geq 0.9990$  and the  $R^2$  value for Height is  $\geq 0.990$ . The % RSD of the Sensitivity must be  $\leq 3.5\%$  for Area and  $\leq 4.5\%$  for Height.

### Detector Area Linearity

|   | Area Linearity<br>Curve R2<br>Specification | Area Linearity<br>Curve R2 | Area Linearity<br>Curve R2<br>Pass Fail |
|---|---------------------------------------------|----------------------------|-----------------------------------------|
| 1 | $R^2 \geq 0.9990$                           | 0.9999                     | PASS                                    |

### Detector Height Linearity

|   | Height Linearity<br>Curve R2<br>Specification | Height Linearity<br>Curve R2 | Height Linearity<br>Curve R2<br>Pass Fail |
|---|-----------------------------------------------|------------------------------|-------------------------------------------|
| 1 | $R^2 \geq 0.990$                              | 1.000                        | PASS                                      |

### Detector Area Sensitivity

|   | Area<br>Sensitivity %RSD<br>Specification | Area<br>Sensitivity %RSD | Area<br>Sensitivity %RSD<br>Pass Fail |
|---|-------------------------------------------|--------------------------|---------------------------------------|
| 1 | %RSD $\leq 3.5$                           | 0.8                      | PASS                                  |

### Detector Height Sensitivity

|   | Height<br>Sensitivity %RSD<br>Specification | Height<br>Sensitivity %RSD | Height<br>Sensitivity %RSD<br>Pass Fail |
|---|---------------------------------------------|----------------------------|-----------------------------------------|
| 1 | %RSD $\leq 4.5$                             | 1.3                        | PASS                                    |

### Certification

Comments

NO comments.

The undersigned performer attests that the values recorded and calculated above are accurate and complete.

Performer

Signature

Date

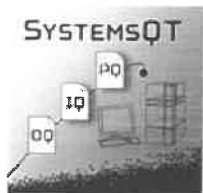
13 Apr 2021

The undersigned reviewer accepts that the values recorded and calculated above are accurate and complete.

Reviewer

Signature

Date



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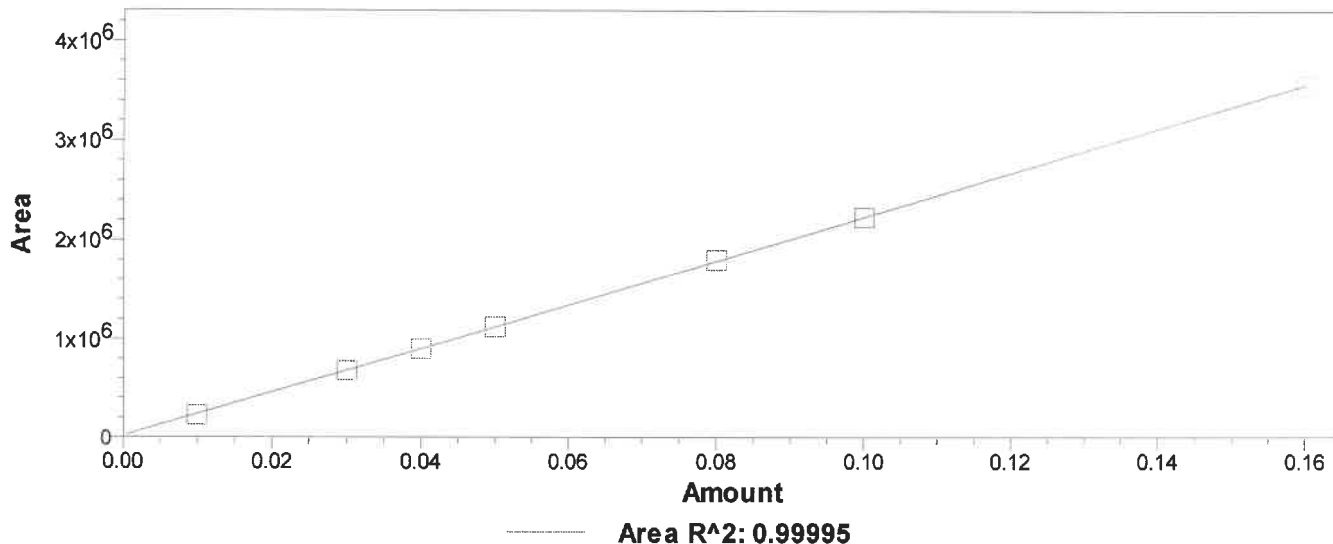
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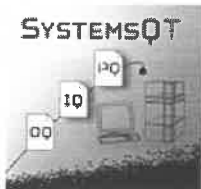
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## Detector Area Linearity Results

|                 |                          |                |                 |
|-----------------|--------------------------|----------------|-----------------|
| Calibration Id  | 14577                    | Y Intercept    | 16609.857251    |
| Date Calibrated | 4/12/2021 5:13:28 PM SGT | Slope          | 22196968.426981 |
| Fit Type        | Linear (1st Order)       | R <sup>2</sup> | 0.99995         |

Calibration Plot  
Area vs. Amount





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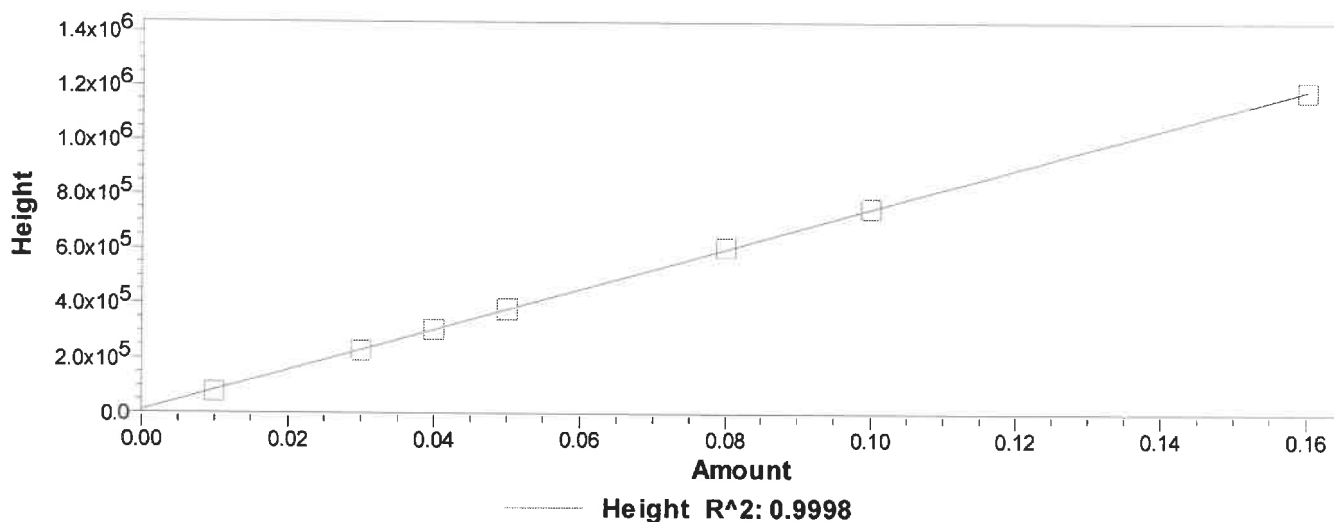
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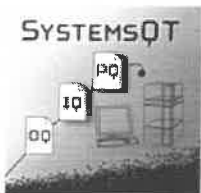
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## Detector Height Linearity Results

|                 |                          |                |                |
|-----------------|--------------------------|----------------|----------------|
| Calibration Id  | 14587                    | Y Intercept    | 9590.592957    |
| Date Calibrated | 4/12/2021 5:13:32 PM SGT | Slope          | 7374731.974287 |
| Fit Type        | Linear (1st Order)       | R <sup>2</sup> | 0.9998         |

**Calibration Plot  
Height vs. Amount**





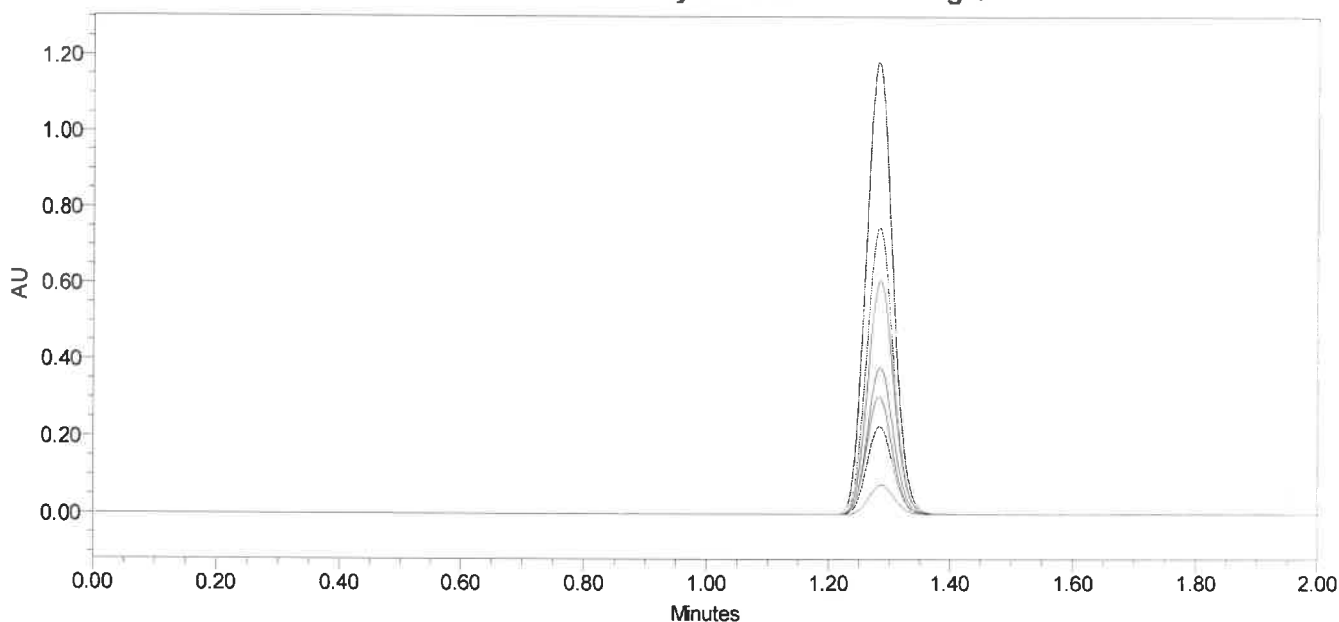
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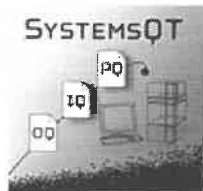
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**Caffeine Detector Linearity Overlaid Chromatogram**





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### Detector Area Sensitivity Results

#### Peak: Caffeine

|           | Vial  | SampleName | Level | Area<br>( $\mu\text{V}\cdot\text{sec}$ ) | Amount | Area_Sensitivity | Result Id |
|-----------|-------|------------|-------|------------------------------------------|--------|------------------|-----------|
| 1         | 2:F,1 | DetLin_1   | 1     | 226907                                   | 0.01   | 22690672.93      | 14580     |
| 2         | 2:F,2 | DetLin_2   | 2     | 681456                                   | 0.03   | 22715184.75      | 14581     |
| 3         | 2:F,3 | DetLin_3   | 3     | 905668                                   | 0.04   | 22641694.30      | 14582     |
| 4         | 2:F,4 | DetLin_4   | 4     | 1132872                                  | 0.05   | 22657431.90      | 14583     |
| 5         | 2:F,5 | DetLin_5   | 5     | 1805640                                  | 0.08   | 22570506.09      | 14584     |
| 6         | 2:F,6 | DetLin_6   | 6     | 2235979                                  | 0.10   | 22359790.50      | 14585     |
| 7         | 2:F,7 | DetLin_7   | 7     | 3560323                                  | 0.16   | 22252018.66      | 14586     |
| Mean      |       |            |       |                                          |        | 22555328.45      |           |
| Std. Dev. |       |            |       |                                          |        | 178987.25        |           |
| % RSD     |       |            |       |                                          |        | 0.79             |           |

### Detector Height Sensitivity Results

#### Peak: Caffeine

|           | Vial  | SampleName | Level | Height<br>( $\mu\text{V}$ ) | Amount | Height_Sensitivity | Result Id |
|-----------|-------|------------|-------|-----------------------------|--------|--------------------|-----------|
| 1         | 2:F,1 | DetLin_1   | 1     | 76654                       | 0.010  | 7665375.57         | 14589     |
| 2         | 2:F,2 | DetLin_2   | 2     | 229854                      | 0.030  | 7661785.77         | 14590     |
| 3         | 2:F,3 | DetLin_3   | 3     | 305537                      | 0.040  | 7638423.81         | 14591     |
| 4         | 2:F,4 | DetLin_4   | 4     | 381377                      | 0.050  | 7627534.95         | 14592     |
| 5         | 2:F,5 | DetLin_5   | 5     | 606012                      | 0.080  | 7575150.25         | 14593     |
| 6         | 2:F,6 | DetLin_6   | 6     | 749800                      | 0.100  | 7497997.98         | 14594     |
| 7         | 2:F,7 | DetLin_7   | 7     | 1184025                     | 0.160  | 7400158.32         | 14595     |
| Mean      |       |            |       |                             |        | 7580918.09         |           |
| Std. Dev. |       |            |       |                             |        | 98940.89           |           |
| % RSD     |       |            |       |                             |        | 1.31               |           |