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**化工测试中心**

TEST CENTER OF CHEMICAL ENGINEERING

**Test Report No.:TCCE181020012**

**Report Date: 20<sup>th</sup> OCTOBER. 2018**

<p>Test Condition:</p>	<p><b>LOCATION:</b> Shibei, Qingdao, China. <b>DATE:</b> Oct. 2018 <b>CLIMATE:</b> Temperature:15℃---20℃ , Humidity: 30%---50% <b>SOIL TYPE:</b> sandy soil <b>CONTAINER:</b> Transparent plastic container with holes in the bottom. <b>WATER RETAINER AGENT:</b> SAP from SOCO(SHK series Potassium Polyacrylate)</p>	
<p>Sample information</p>		
<p>Item</p>	<p>Batch no Description</p>	<p>None Clear Crystalline powder</p>
<p>Physical tests done at 17℃±3℃</p>		
<p>SC-W1-05-061</p> <p><b>Rainfall Test Description:</b></p> <p>Agriculture grade SAP can absorbent the water from rainfall and release when dry, if the rainfall intensity is low, or the soil water retention is big, SAP have enough time to absorbent the water, in order to know the SOCO agriculture SAP performance in worse condition, this test is to use sandy soil(Low water retention) and moderate rain quantity but with a extraordinary rainstorm intensity.</p>	<div data-bbox="810 1272 1469 1525" data-label="Image"> </div> <p style="text-align: center;"><b>Rainfall Test</b></p> <p><b>Method:</b> SOCO-Test center In-house methods: SC-W1-05-061(GB/T9001-2008Technique) 1% SAP with sandy soil (5g SAP in 500g Soil) 10mm/min rainfall intensity for 2min. Extraordinary rainstorm average rainfall intensity to make moderate rain total quantity. total 300ml rainfall.</p> <p><b>Test device:</b></p>	

### Analysis for rainfall test:



The seepage water:

1. The seepage water color of SAP mixed soil is pure and transparent, the water quantity is less due to SAP absorbing.
2. The seepage water color of pure soil is yellow, the water quantity is more.

The soil:

1. The expanded SAP makes soil volume become big
2. The Pure sandy soil becomes a little bit bigger because of wet.

### Result for rainfall test:

- 1、SAP can reduce the soil erosion from seepage.
- 2、SAP can absorbent the water from rainfall.
- 3、SHK220X can absorbent more water than SHK205X in this worse condition. (2 min rainfall)
- 4、After rainfall 10min:  
1# Soil: 762g (500g soil + 1g SAP + 262g water)  
2# Soil: 643g (500g soil + 1g SAP + 143g water)  
3# Soil: 580g (500g soil + 1g SAP + 80g water)

### Soil Water Content Comparing:

1% of SHK205X in Sandy soil  
1% of SHK220X in Sandy soil  
Pure Sandy Soil

Weight the sandy soil after rainfall testing 4 hours to find the difference.

### Soil Water Content Test

**Method:** SOCO-Test center In-house methods:

SC-W1-05-061(GB/T9001-2008Technique)

After rainfall 4 hours, making record for the weight of total soil until the pure sandy soil revert the original weight.

### Analysis for rainfall test:

**After rainfall 10min:**

1# Soil: 762g  
2# Soil: 643g  
3# Soil: 580g



**After rainfall 4hours:**

1# Soil: 762g  
2# Soil: 643g  
3# Soil: 579g

**After rainfall 7 days:**

1# Soil: 728g  
2# Soil: 613g  
3# Soil: 500g



### Result:

- 1、 Pure Sandy soil will loss all rainfall moisture (80ml) after 7 days from 16% to 0%.
- 2、 After Pure sandy soil loss all rainfall moisture, the sandy soil becomes hard, the gaseous phase of soil becomes worse.
- 3、 1% of SHK220X SAP can help soil to keep more moisture in 7 days from 52.4% to 45.6%.
- 4、 1% of SHK205X SAP can help soil to keep more moisture in 7 days from 28.6% to 22.6%.

For and on behalf of  
QINGDAO SOCO NEW MATERIAL CO., LTD  
青島首科新材料有限公司

**DR. Wang**

*Authorized Signature(s)*

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**DR. Technical Manager**

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