



TEXAS-LEHIGH CEMENT COMPANY



Evaluation tests for:

TLC API 10A Class H Well Cement - Buda, Texas Plant

Typical Performance Data: Grind # 200601 Prod date: 1 - 30 June, 2020 Silo No. 2,6,8,15

Chemical Analysis%(ASTM C114)

| SiO2 | Al2O3 | Fe2O3 | CaO | MgO | SO3 | LOI | Na2O | K2O | Na2O Equiv. | Insol. Residue |
|--------------------|-------|-------|------|-----|-----|-----|------|-----|-------------|----------------|
| 21.5 | 3.5 | 5.8 | 62.7 | 1.0 | 3.0 | 1.3 | 0.1 | 0.6 | 0.52 | 0.10 |
| API Spec., max., % | | | | 6.0 | 3.0 | 3.0 | | | 0.75 | 0.75 |

Calculated Compounds%(API Spec. 10A, Table 1)

| | C ₃ S | C ₂ S | C ₃ A | [C ₄ AF+ 2(C ₃ A)] |
|-------------------|------------------|------------------|------------------|---|
| API 10A Spec. (%) | 51 | 23 | 0 | 18 |
| | 48 - 65 | | 3 Max. | 24 Max. |

Physical Parameters

| | | | | |
|--------------------------------------|-------------|--|-------------------------------------|----------------------|
| Fineness | | | | API Spec. |
| Blaine-m ² /kg(ASTM C204) | <u>261</u> | | % Free Fluid @ 38% H ₂ O | <u>3.9</u> 5.9% Max. |
| -325%(ASTM C430) | <u>77.8</u> | | % Free Lime | <u>0.28</u> |

Thickening Time and Compressive Strength (38% H₂O - neat slurry)

| | | | |
|--------------|-----------|------------------------------|------------------|
| API Schedule | Depth ft. | Bottom Hole Circulation Temp | H ₂ O |
| 5-Csg | 8000 | 125 Deg F | 4.29 gal/sk |

| Consistency (Bc) | | | | Thickening Time (Minutes) | | Compressive Strength (PSI) | |
|------------------|---------|---------|---------|--|-----------------------------------|----------------------------|--------|
| Initial | 15 min. | 30 min. | 60 min. | 70 Bc. | 100 Bc. | 100° F | 140° F |
| 18 | 19 | 22 | 26 | 88 | 100 | 870 | 2000 |
| API 10A Spe | | | | 30 Bc max. in 15-30 min. stirring period | 90 minute min. 120 minute max. | 300 PSI min. 1500 PSI min. | |

The above Class H cement meets all current API 10A specifications for Class H (HSR) Cement

All well cement tests are performed according to current API 10A Spec.

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