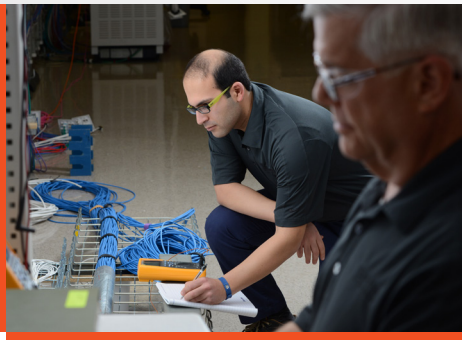
# Converged Application Score

September 2015

- Traditional testing methods do not reflect real-world conditions.
- Testing must incorporate converged applications.
- Increasing bandwidth, high power PoE, and evolving wireless technology are stressing network infrastructure.
- The Converged Application Score is a more accurate measure of how cabling will perform under the strain of future demand.



Berk-Tek's Converged Application (CA) Score is calculated using a proprietary algorithm that combines the results of the following tests over a specially designed 100 meter, four connector channel (see side 2 for details):

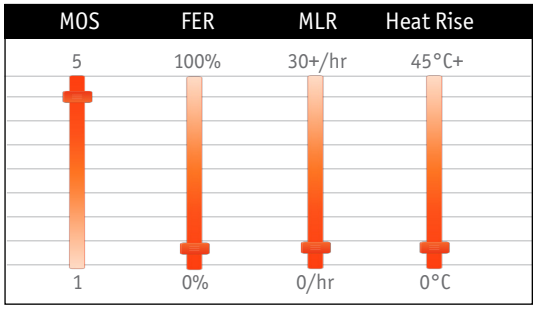
**Mean Opinion Score (MOS)** – A quality of service metric used mainly to measure VoIP.
**Frame Error Rate (FER)** – A very rigorous test for IP data applications.
**Media Loss Rate (MLR)** –A quality of service metric used to measure IP video (IPTV).
**Heat Rise from PoE** – A measurement of how efficiently cabling can dissipate heat.

A cable's CA Score is in an indicator of how well IP traffic is protected, as well as how much heat rise there is when the cable undergoes PoE testing. The score is represented by a numeric value between 1 and 10, with 1 being the lowest and 10 being the highest. In reality, a score of 1 is not possible because it would represent no connection and catastrophic heat rise. Likewise, a score of 10 is unattainable because it would mean perfect performance and zero heat rise with high power PoE. Consequently, CA Scores range between 2 and 9, as illustrated in this table:

| CA score | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Score | < 3.6 | 3.6 - 5.5 | 5.6 - 6.5 | 6.6 - 7.5 | 7.6 - 8.5 | 8.6 + |
| | Performance | Unacceptable | Poor | Limited | Good | Better | Best |
| | Heat Rise | Severe | Significant | Moderate | Moderate | Moderate | Low |

*Before CA Score testing was performed, all channels were tested with Fluke and passed with margin.*

**What does the CA Score tell you?** A performance rating of "Unacceptable" (less than 3.6) means that there are consistent noticeable flaws (dropped frames, media loss, etc) in the applications tested. As you move towards higher scores, you notice fewer flaws until you reach a score of 9, which is almost flawless. PoE testing is also an important factor; cables that experience less temperature rise can achieve higher CA Scores. Because the CA Score algorithm assigns weights to MOS, FER, MLS and PoE heat rise test results, there are multiple ways to achieve a specific CA Score. For example, the CA Score algorithm weights the results of MOS and MLR higher than FER due to the time-senstive protocols used within VoIP and video applications, such as RTP and UDP, where lost frames are not retransmitted.




*An example of what the MOS, FER, MLR and PoE Heat Rise scores can look like for a cable with a CA Score of 8.6.*

**Application:**

Measuring Infrastructure Performance

**Challenge:**

Traditional testing methods do not accurately measure the performance of cabling under the strain of increasing bandwidth demand, high power PoE, and evolving wireless technology.

**Solution:**

The CA Score goes beyond standard decibel-based testing to real-world scenarios that are designed to measure how well cables perform under the stress of converging applications. The testing shows that cables with higher CA Scores perform better by protecting your IP traffic from the effects of heat and noise.

*continued on side 2*

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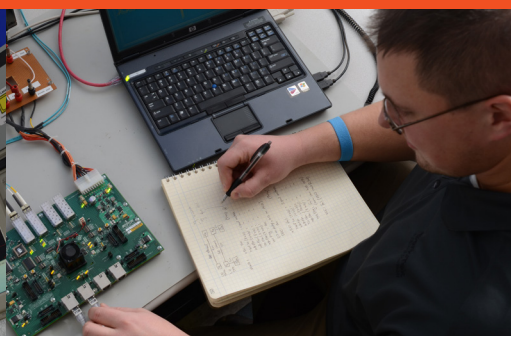
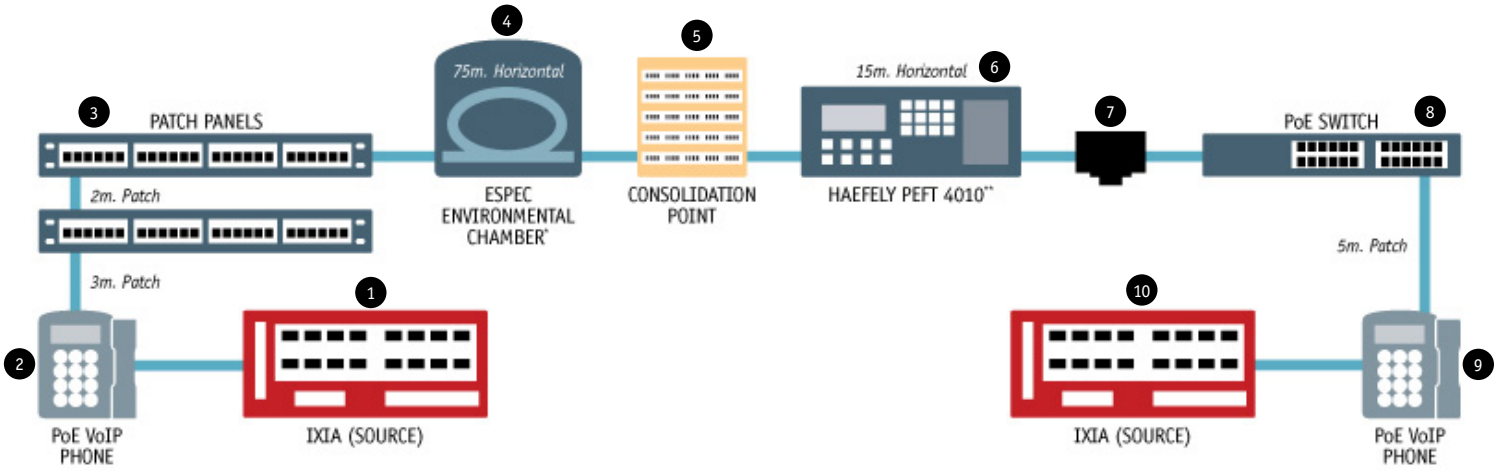


## About the Converged Application Score Test:

The four (4) connector, 100 meter channel used for CA Scoring is not the same as what the industry has used for last 20 years. The CA Score test looks like this:




1. IXIA – IP Traffic Generator used to transmit real VoIP, Data, and IP Video traffic
2. VoIP phone
3. Two Patch Panels (1st two connectors)
4. Environmental Chamber heated to 75C with 75 meters of the channel in loose coil
5. Consolidation Point (3rd connector)
6. EFT Generator – 15 meters of channel exposed to 250V spikes to simulate outside noise
7. Outlet (4th connector)
8. PoE Switch – Transmit PoE to power VoIP phones
9. VoIP phone
10. Return to IXIA

TEK Center CERTIFIED

This stamp certifies that all testing was performed, reviewed, and approved by highly trained, experienced engineers dedicated to studying and developing solutions for future network infrastructures.

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