



54 YEARS AND COUNTING

Fifty-four. That's the number of years NGC Testing Services has been providing quality test services, in a unique facility that was constructed specifically for acoustical, fire and physical testing.

We have clients who have been with us that long and many more who have joined us and become regulars along the way to our current customer base of more than 1,000. We view our clients as friends, people we get to know over the years and enjoy working with; these relationships are very important to us.

Our focus is to provide quality, fast-turnaround test services and to be a trusted laboratory. We pride ourselves on responding to a test enquiry quickly, typically within hours. Our knowledgeable staff can answer your questions, help you plan your test program and provide quick quotations. Our facility includes overhead cranes, multiple test frames and test chambers, allowing us to prepare and conduct tests concurrently and provide better service to customers.

If you're one of our clients - thank you for testing with us. If you're looking for a lab for your testing needs, we hope you'll give us a chance to prove what we can do and experience firsthand why NGC Testing Services is "The Best in Test" well into our second half-century.

In this issue, we have technical articles on sound power vs. sound pressure, some numbers that are descriptive of our facility and an article about engineering feats at nearby Niagara Falls, one of the wonders of the world.

Speaking of time, it seems to go by faster and faster. I can imagine drafting a 60th anniversary newsletter before we know it, but I am pretty sure that will be by my successor.

Have a great summer and we look forward to hearing from you soon.

Bob Menchetti

Director of Laboratory Facilities & Testing Services

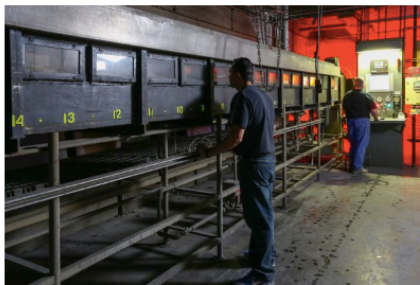
THE ORIGINS OF ASTM E84

One of the most widely accepted fire testing methods is ASTM E84 (Surface Burning Characteristics of Building Materials), also commonly referred to as the "tunnel test." It is used to evaluate the flame spread characteristics of surface materials along with the smoke produced by combustion.

E84 was introduced around 1922 to evaluate "white wash" coatings that were being heavily promoted at the time. Currently, the method is used on virtually all surface materials used in buildings and other structures that require acceptance from national code bodies.

In the tragic 1942 Boston Coconut Grove nightclub fire and the more recent Station nightclub fire in Rhode Island in 2003, which killed 100 and injured 230, it was noted that both exhibited the same type of flame spread escalation that is attempted to be re-created in the tunnel test. This demonstrates how extremely important the test is for protecting life safety.

The tunnel itself has been designated the "Steiner Tunnel" after Albert J. Steiner, an engineer who had spent much time developing this and other fire test methods. The 2-ft.-by-24-ft.-long horizontal tunnel is a closely controlled environment to ensure repeatable test results. Red oak and cement board are utilized as reference standards in its calibration. In addition to ASTM E84, corresponding test standards include NFPA 255, UL 723 and UBC 8-1.



WHEN IS A DECIBEL NOT A DECIBEL?

In the Acoustics Lab of NGC Testing Services, we are concerned primarily with the measurement of Sound Pressure Level and Sound Power Level. "Sound Power" and "Sound Pressure" are two distinct and commonly confused characteristics of sound. Both



share the same unit of measure, the decibel (dB), and the term "Sound Level" is commonly substituted for each.

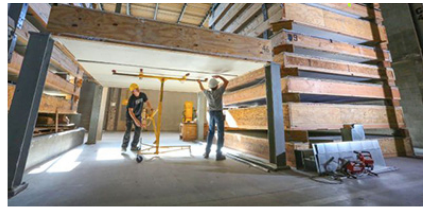
So what is the difference between a Sound Pressure Decibel and a Sound Power Decibel?

A decibel is defined as "a [unit](#) of measurement used to express the ratio of one value of a [physical property](#) to another on a logarithmic scale. It expresses the ratio of a value to a reference value." The decibel is used for a wide variety of measurements in science and [engineering](#), most prominently in [acoustics](#), [electronics](#) and [control theory](#). In electronics, the [gains](#) of amplifiers, [attenuation](#) of signals and [signal-to-noise ratios](#) are often expressed in decibels. A decibel is a unit-less quantity since it is a ratio.

Sound Power Decibel Level is the absolute measurement of the total acoustic energy or wattage that a sound source is emitting. Since it is the measure of total acoustic energy being radiated, it is not affected by the acoustic environment in which it is located. It is an absolute.

On the other hand, Sound Pressure Decibel Level is a pressure disturbance in the atmosphere whose intensity is influenced not only by the strength of the source, but also by the surroundings and the distance from the source to the receiver. It is simply the Sound Pressure Level measured of a Sound Power Source at a particular location (orientation and distance) in a particular acoustic environment.

If you know the sound power that is emitted by a sound source, it is possible to estimate the Sound Pressure Level that would be measured at a certain distance from that source in a certain acoustic environment (room size, room dimensions and room absorption). This is an important tool for prediction of noise levels when a sound source is introduced to an already noisy environment.



NIAGARA FALLS ENGINEERING FEATS

NGC Testing Services provides tests to prove out technology for our customers. And just 20 minutes away from our facility sits one of the world's wonders, Niagara Falls, where key technology firsts and advancements have taken place that may not be known to the millions of tourists that visit each year.

Over the years, people have harnessed the power of the falls and the nearly 200 feet in elevation drop. First with the construction of many mills along the gorge starting in the 1800s. Then the world's first large-scale hydroelectric generating station opened in Niagara Falls in 1895. The plant used a direct current (DC) system; however, it could only transmit electricity 100 yards. In 1896, the famous electrical engineer Nikola Tesla proved that he could transmit electricity from Niagara Falls to Buffalo, about 20 miles, using his new alternating current (AC) induction motor. That marked the first long distance commercial use of the AC system that is still used around the world today.



Successive generating plants led to the Robert Moses Niagara Power Plant, completed in 1961. It has a capacity of 2.4 MKW, enough to power nearly 2 million households. Water is drawn from the Niagara River above the falls using two water intakes measuring 46 feet by 66 feet. These conduits carry the water four miles under the city of Niagara Falls to the power plant at the lower Niagara River Gorge.

John Roebling built the world's first railway suspension bridge over the Niagara River at Niagara Falls between Canada and the United States. Completed in 1855, the new bridge accommodated trains, carriages and pedestrians, and remnants can still be seen on the banks of the Niagara. From 1848 until today, 13 bridges were built across the lower Niagara River, and four are present today. Some were destroyed by gale winds or by ice jams in the river, one was dismantled for the scrap metal and another was carefully dismantled and re-assembled downstream.



The original Maid of the Mist boat was christened in 1846 as a border-crossing ferry. The ferry did well until 1848, when the opening of the first bridge between the United States and Canada cut significantly into the ferry traffic. It was then that the owners decided to repurpose the Maid of the Mist as a sightseeing trip by plotting a journey closer to the falls, and it remains a famous tourist attraction to this day.

Bell Aero systems was established in Niagara Falls in 1935. This aerospace company developed the X-1 aircraft (first supersonic aircraft), the first commercially available helicopter, the Bell X-22 (world's first vertical-thrust aircraft), the Bell Rocket Belt and the Apollo LEM [Ascent Propulsion System](#) (thrust package to lift astronauts from the moon).

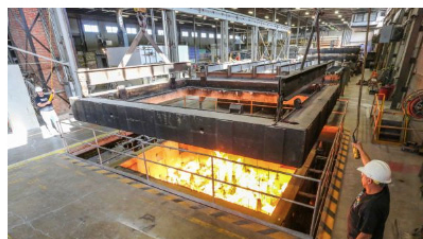
There has been a long history of observation towers built at Niagara Falls. In 1829, on several large exposed rocks near the end of a walkway, Terrapin Tower was the first to be built by General Parkhurst Whitney, a prominent American innkeeper. The walkway, built of heavy timbers, extended approximately 10 feet beyond the crest line of the falls.

For several months in 1969, the torrent of water rushing over American Fall, was reduced to little more than a trickle. This was done to study the geological composition of the falls and forestall their potential destruction due to erosion. Over three days in June 1969, more than 1,200 trucks dumped nearly 28,000 tons of rocky fill into a cofferdam upstream of the falls, diverting the flow of the Niagara River away from American Falls and toward the much larger Horseshoe Falls.

BY THE NUMBERS

What makes NGC Testing Services special? Here are a few numbers that tell the story of our testing facility:

- 150,000 lb. floor-ceiling furnace combined live load capacity
- 110,000 lb. axial load capacity in wall furnace
- 53,000-plus square feet
- 10,000-plus acoustical tests conducted
- 9,000-plus flame spread tests conducted
- 3,500-plus endurance fire tests conducted



- 1,000 approximate number of our worldwide clients
- 295 combined thermocouple capacity for fire tests
- 180-plus years of combined direct testing experience of key technical staff
- 54-plus years of testing
- 50-plus prebuilt movable acoustical floor-ceiling IIC, STC test assemblies
- 30-ton overhead crane
- 28 clear interior height (ft.)
- 12-ton overhead crane
- 12-ton overhead trolley system
- 9 acoustical test chambers
- 8 fire test furnaces and apparatuses
- 7 structural / physical test apparatuses
- 5 large shipping / receiving overhead door entries
- 4 fire floor-ceiling test frames
- 3 fire-wall test frames
- 2 visitor office work areas
- 1 single testing facility providing all your fire, acoustical, structural / physical testing needs



TAKE A CLOSER LOOK!

Check out our new [brochure](#) and watch our [video](#) for the latest updates about NGC Testing Services' capabilities. We're ready to put your products to the test, and this is a great way to see all that we can do for you. Take a look and give us a call — let us know how we can help.




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