

CASE STUDY

Christie Digital Systems Canada Inc.

Ontario, Canada
Visual Technologies and Solutions
PULSE LAN-XI Platform, LDS Shakers, Transducers

Christie Digital Systems Canada Inc., a privately held company that manufactures, most notably, DLP®, DLP Cinema® projectors and DLP with LED illumination display devices (Christie® MicroTiles™), is a leader in visual solutions for world-class organisations, offering diverse applications for business, entertainment, and industry. Brüel & Kjær products, including the PULSE LAN-XI platform in conjunction with an LDS V875 shaker are used as part of the stringent product testing regime to improve the design and performance of Christie's projectors.

Photos courtesy of Christie Digital Systems Canada Inc.

The Christie CP2220 digital cinema projector is just one of the products subjected to Christie's rigorous environmental tests using the V875 from Brüel & Kjær



With more than 80 years of technological firsts and a long list of product awards under its belt, Christie is no stranger to prestigious events. They have provided solutions for both the Grammy and Emmy Awards and were sponsors for numerous Shanghai World Expo 2010 multimedia pavilions, which included one of China's largest curved screen displays, a multimedia theatre and an interactive digital book. Other global organisations using Christie visual solutions include Boeing, General Motors, Microsoft®, Pixar Animation Studios, Shell, Sony Picture Studios, NASDAQ MarketSite, Weill Cornell Medical College and Starbucks.

Established in 1929, and a leader in visual solutions for world-class organisations, Christie offers diverse applications for business, entertainment, and industry.



With expertise in film projection since 1929 and professional projection systems since 1979, Christie has established a global reputation as the world's single-source provider of a variety of display technologies and solutions for cinema, large audience environments, control rooms, business presentations, training facilities, 3D and virtual reality, simulation, education, media and government. Christie has installed over 100,000 projection solutions worldwide.

With more than 1300 employees globally, Christie has an ISO 9001 and ISO 14001 certified facility in Kitchener, Ontario, Canada, as well as a manufacturing facility in Shenzhen, China. Although its core expertise is in projection technology, Christie has four strategic business units – Business Products, Entertainment Solutions, Visual Environments including Control Rooms and Advanced Visualization, and Managed Services.

Environmental Testing Laboratory

In Christie's Environmental Testing Laboratory, large digital projectors are tested to ensure robustness for transportation and operations aspects. The lab contains a variety of equipment for conducting all types of required tests. The tests range from vibration, drop, thermal, sound, pull testing as well as equipment to measure and check part accuracy.

Fig. 1
Brüel & Kjær's LDS V875 shaker with slip table and head expander is located in Christie's Environmental Testing Laboratory

LDS V875 Shaker

For this purpose, a Brüel & Kjær LDS V875 shaker with a 6 ft × 6 ft slip table and a 5 ft × 6 ft head expander is used. Senior Mechanical Engineering Manager Mark Barfoot, B.Sc. P.Eng., has been at Christie for over 10 years and previously worked for an aerospace company. He says, "This testing used to be done externally but by doing it in-house, we improve the cycle time as we don't have to wait for a slot at an external facility. I had used LDS shakers at my previous place of work, so that helped in the decision to buy the V875 three years ago". He continues, "Also, the slip tables at the external test facility were not big enough for our needs, so the 6 ft × 6 ft slip table Brüel & Kjær could provide together with the unique head expander were key in our decision making".



The shaker, used in conjunction with the 8-channel laser controller, is used every day for pre-testing prototypes and package testing. The table can create DOF (X, Y, Z) vibration and products undergo tests in and out of transport boxes and include:

- ASTM restrained cargo vibration test
- ISTA Loose Cargo Test
- Half Sine Shock Pulse Test

"Once we got the shaker set up, it has worked well" says Mark, "and we've never had to call anyone out to service it".

A number of other Brüel & Kjær products are used in the Christie Environmental Testing Lab for a range of applications. These include:

- Miniature Tear-drop IEPE Accelerometer Type 4517
- Hand-held, Battery-powered Stroboscope Type 4912

- Accelerometer Calibrator Type 4294
- Piezoelectric IEPE Accelerometer Type 4507
- Triaxial IEPE Piezoelectric Accelerometer with TEDS Type 4524-B
- Photon+™ Dynamic Signal Analyzer

Fig. 2
Sound power
measurements in the
anechoic chamber using
LAN-XI modules

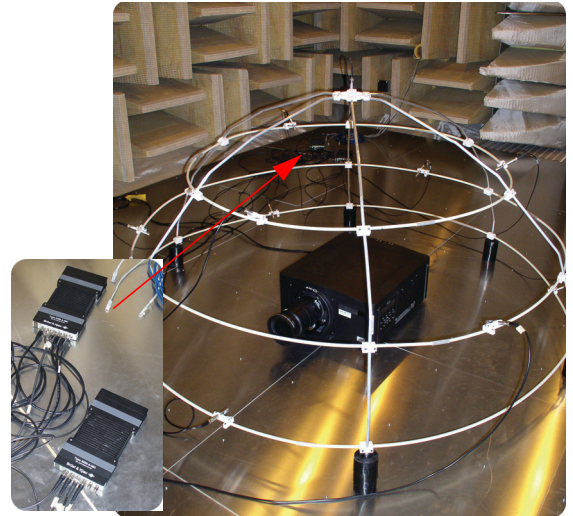
Anechoic Chamber

Last year, Christie purchased a 10-year old full anechoic chamber with a background noise of 18dB(A). Christie added a false floor to allow the chamber to be converted to a hemi-anechoic chamber when required. Here, using up to three 6-channel LAN-XI modules, PULSE Sound Quality, Sound Power and Noise Source Identification software, Christie performs sound power measurements according to ISO 3744 and sound pressure measurements according to a Japan Business Machine Makers Association Data Projector Standard.

Christie has also invested in the Sound Quality software as well as the Binaural Head to allow them to better characterise the sound quality of their products. For most products, not only the level but also the quality of the noise it makes is part of what attracts or repels the customer – the right sound can lead to increased sales. Mark Barfoot says, “Christie will be moving more towards sound quality in the future. Along with brightness and image quality, sound is one of our customers’ concerns and is, therefore, an increasingly important competitive parameter”.

A number of other Brüel & Kjær products are used in their sound testing:

- 6-channel LAN-XI modules
- Sound Intensity Calibrator Type 3541
- ½-inch Free-field Microphones Type 5189-A
- Head and Torso Simulator Type 4100
- Various PULSE software packages



A Bright Future

Fig. 3
Christie's award-winning
MicroTiles™

The future certainly looks bright for Christie and not just because its projectors are the brightest in their class – over 30,000 ANSI-lumens, which is impressive against a typical 3,000-lumen projector commonly used in a classroom or boardroom. The number of screens worldwide featuring Christie digital cinema projectors is over 16,000, and Christie has 60% market share of North American digital theatres. And the launch of Christie® MicroTiles™ in 2009 looks set to change future displays in architecture, digital-out-of-home (DOOH), command and control and event production.

The rapid growth in digital cinema projector sales around the world has led Christie to open a 60,000 ft² manufacturing facility in Shenzhen, China. This will enable Christie to invest more in the research and development of other types of digital media products at the Kitchener facility and free up capacity for future product development.

