Case Study Application Book

4

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# Colleges & Universities

Titus

As has been our legacy, we continue to advance every aspect of our business to meet the changing needs of our customers and HVAC professionals world wide. At Titus our goal is very clear - to help the people who depend upon us by continuing to innovate and advance the science of air distribution. We are guided in this work by our commitment to building on opportunities that significantly improve the health, efficiency, comfort and aesthetics of the environments in which our products are used. We have a knowledgeable and experienced staff of industry professionals ready and available to assist you and your consumers with any aspect of an HVAC problem.

Intelligent innovations doesn't stop with the products we create, it extends itself into all realms of the creative process which includes literature. Colleges & Universities have always played an instrumental piece in our society. Now with the world focusing more on Green Building design, many of these instituitions of higher learning are building new facilities that are not only breathtaking, but eco-friendly as well. The projects listed in this brochure presented many different and unique challenges that Titus had a solution for. Whether you have a ceiling application or an underfloor installation, Titus has the products and staff to meet and exceed your HVAC needs.

# contents


## PROJECT - ASU WALTER CRONKITE SCHOOL OF JOURNALISM & MASS COMMUNICATIONS

ARCHITECTS - EHRLICH ARCHITECTS / HDR ARCHITECTS
LOCATION - PHOENIX, ARIZONA
LEED CERTIFICATION - LEED SILVER CERTIFICATION

ASU School of Journalism & Mass Communications

## ABOUT THE PROJECT

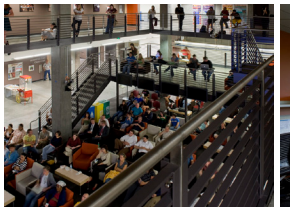
Back in 1984, the School of Journalism at Arizona State University was in dire need of a jolt. Legendary journalist Walter Cronkite partnered with the university to bolter their efforts to improve this area and its building has used his name ever since. The next chapter for ASU journalism was completed in 2008 as the new ASU Walter Cronkite School of Journalism and Mass Communication opened in the Fall.

The new building is a state-of-the-art six-story, 225,000 square-foot facility that houses classrooms, office space and production and broadcast facilities for PBS station KAET/Channel 8 to utilize. The design team focused on creating an open environment for students, faculty and industry leaders to exchange ideas about today's current events. This forum extends two stories and allows open discussions to take place at all times of the day. The architects at Ehrlich Architects & HDR designed a building that not only met the growing needs for a university, but created an environmentally friendly facility that earned LEED Silver Certification.

## THE TITUS SOLUTION

It was a privledge and honor for Titus to be selected as the HVAC provider for this project. The products selected for this new building were the DESV terminal unit, an assortment of 300/350R grilles, the OMNI diffuser, and a combination of TMS/TMSA diffusers.

The DESV is a Single Duct Terminal Unit. The Titus ESV is unique as it incorporates many design features that increase performance, decrease service and installation costs, and offer increased value. Titus' 300/350 series grilles define the standard for the HVAC industry. With high quality and competitive pricing these grilles form the back bone of a standard offering that will meet any application requirements.




For architectural ceilings, Titus has several options to choose from. The OMNI diffuser is an architectural ceiling diffuser with a steel plaque face. Its strong, clean, unobtrusive lines harmonize with the ceiling system without sacrificing performance. The curvature of the OMNI backpan works with the formed edges of the face panel to deliver a uniform 360 degree horizontal air pattern, without excessive noise or pressure drop. The TMS/TMSA are square ceiling diffusers that deliver supply air in a true 360B pattern with low pressure drop. Their uniform, nearly horizontal jet from the outer cone maintains effective room air distribution even when the air volume varies over a considerable range. All sizes have three cones, giving a uniform appearance where different neck sizes are used in the same area. Additional Titus products selected were the FlowBar, ML and MP.

## THE END RESULT

The new ASU Walter Cronkite School of Journalism and Mass Communication is a breathtaking building that is positioned to take the next generation of media to new levels of achievement. With access to so many media tools at their fingertips, these new scribes can utilize technology and their innate abilities to transform the way we learn about the latest news and events and even make Mr. Cronkite say his famous line - "And that's the way it is."

# ASU Walter Cronkite School of Journalism & Mass Communications

## PRODUCTS LIST

OMNI

DESV

TMS/TMSA

300/350R


## PROJECT - MOORES UCSD CANCER CENTER

ARCHITECT - ZIMMER GUNSUL FRASCA ARCHITECTS LLP
LOCATION - SAN DIEGO, CALIFORNIA
LEED CERTIFICATION - NONE

Moores UCSD Cancer Center

## ABOUT THE PROJECT

The University of California at San Diego Cancer Center is a stunning achievement for teaching, treatment and research into the causes and hopefully cures of all forms of cancer. The patients who walk through these doors will have access to the most advanced care, in a state-of-the-art setting. The groundbreaking work of the physicians and scientists associated with the Moores UCSD Cancer Center will benefit its patients for generations to come.

The UCSD Cancer Center is a 270,000 square-foot facility that houses clinical, research, educational, and outreach activities all under one roof. The center also includes a serene outdoor setting called the Garden of Hope. This tranquil, shaded bamboo garden can be used for dining and interaction with other patients. This location was designed specifically for the cancer patients to inspire hope and provide comfort during their treatment at the facility.

## THE TITUS SOLUTION

Providing air distribution solutions for critical environment or cleanroom applications is not new to Titus. We have been the industry leader for air management for several decades. The products selected for the Moores UCSD Cancer Center were the TriTec, the PSS and the FlowBar.

The Tritec diffuser is a high volume, low velocity unit that utilizes radial air diffusion technology to dilute airborne contaminants. The airflow pattern is designed to produce a uniform pattern to prevent dead spots where contaminants can linger. It is an excellent choice for Class 1,000 to 100,000 rooms. The Titus Series PSS perforated star diffusers generate a high induction air pattern that maximizes throw. The deflector is mounted directly under the neck of the diffuser to generate the long-throw star pattern. As a result, pressure drop and noise levels are lower than typical


curved blade perforated diffusers.

Titus FlowBar is an architectural linear diffuser system that maximizes engineering performance without sacrificing aesthetic considerations for the designer. Its outstanding performance allows higher airflows than conventional linear diffuser systems. The wide array of slot widths that are available allow for more CFM per linear foot while minimizing noise and pressure loss. The Flowbar system is available in continuous linear, incremental linear and square configurations.

FlowBar also provides an installation alternative to the conventional linear diffuser. Conventional linear diffusers are supported by the duct system and in most cases are installed after the ceiling system is in place. For complete ceiling integration, the FlowBar system is offered with a large selection os flange styles compatible with various ceiling applications. Our unique clip/hanger support system allows for quick and easy installations. The system actually supports and becomes an integral part of the ceiling system and is installed along with the ceiling suspension system.

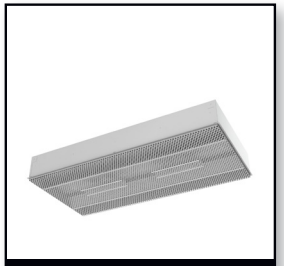
This entire series of diffusers is available with two unique pattern controllers.

## THE END RESULT

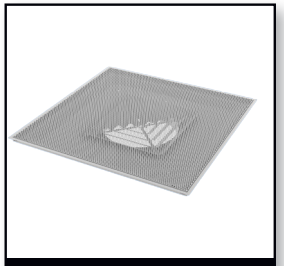
The new building represents a new beginning for UCSD as an NCI-designated Comprehensive Cancer Center. It is a tribute to the commitment of the university to establish a world-class cancer center that fosters interdisciplinary research and brings the benefits of research directly to the community it serves. The center serves as the benchmark for future facilities to meet or exceed.

# Moores UCSD Cancer Center

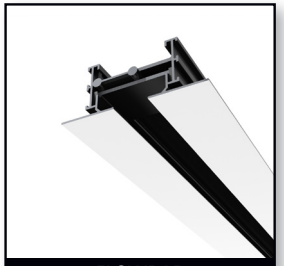
## PRODUCTS LIST



TRITEC



PSS



FLOWBAR

## PROJECT - KING ABDULLAH UNIVERSITY OF SCIENCE & TECHNOLOGY (KAUST)

ARCHITECT - HOK ARCHITECTS
LOCATION - SAUDI ARABIA
LEED CERTIFICATION - LEED PLATINUM CERTIFICATION

KAUST

## ABOUT THE PROJECT

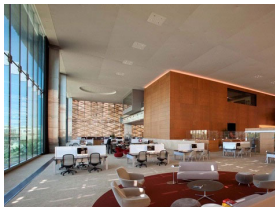
The King Abdullah University of Science and Technology (KAUST), is a graduate-level research university dedicated to bringing a new age of scientific discovery in Saudi Arabia and around the world. It brings together internationally renowned scientists to compete as one of the world's leading graduate research institutions. At KAUST, researchers, graduate-level students and faculty are challenged with advancing science and technology to have a global impact for future generations.

Having opened in September 2009, KAUST was designed by the architectural firm of HOK Architects to be the best university in the world. This LEED Platinum Certified campus features two million square feet of lab space spread across an interconnected complex of four five-story, 500,000-square foot buildings. The research centers focus on cutting-edge programs in biosciences and engineering, materials science and engineering, energy and the environment, and applied mathematics and computational science. The labs are designed and equipped to attract the world's best and brightest minds in science.

## THE TITUS SOLUTION

Titus was pleased to provide many air distribution solutions for this project. Several grille and diffuser products are featured throughout this magnificent campus. Two of our perforated ceiling diffusers were used in many different areas. Perforated ceiling diffusers are typically selected to meet architectural demands for air outlets that blend into the ceiling plane. Titus perforated diffusers can be selected for a round pattern to maximize capacity or star pattern to maximize throw.

The PCS-AA and PAR-AA are aluminum units. The PCS-AA is a flush face diffuser that is designed for longer throws in variable air volume systems. The PAR-AA is a return diffuser that provides a tight, uniform horizontal blanket of blanket of air and protects



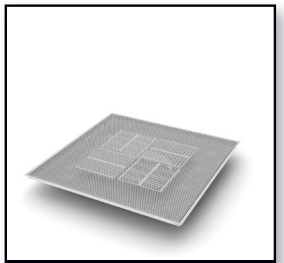
against smudging. Other aluminum products utilized throughout the campus are the OMNI-AA and the 3FL/FS grille. The Titus OMNI-AA diffuser satisfies architectural as well as engineering criteria. The curvature of the backpan works with the formed edges of the face panel to deliver a uniform 360° horizontal air pattern, without excessive noise or pressure drop. The OMNI-AA is an excellent choice for variable air volume systems. The 3FL/FS grille is a return grille with 45° deflection and 3/4" blade spacing. The blades are also parallel to the long dimension.

## THE END RESULT

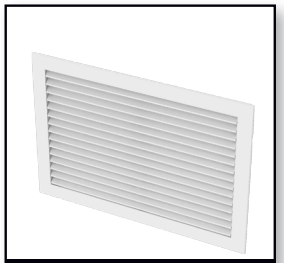
The King Abdullah University of Science and Technology has one main goal in which all others are based - to be the premier scientific institution for graduate research in the world. By providing cutting-edge facilities for all to utilize, KAUST has created the perfect environment to grow and develop the future leaders of the next generation.

# King Abdullah University of Science & Technology (KAUST)

## PRODUCTS LIST

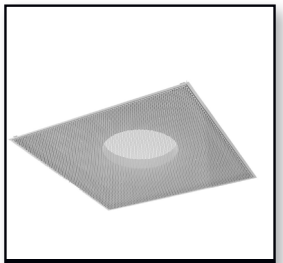


PCS-AA



3FL/FS

OMNI-AA



PAR-AA

## PROJECT - OHIO UNION AT THE OHIO STATE UNIVERSITY

ARCHITECT - MOODY NOLAN ARCHITECTS / MICHAEL DENNIS & ASSOCIATES
LOCATION - COLUMBUS, OHIO
LEED CERTIFICATION - LEED SILVER CERTIFICATION


Ohio Union at The Ohio State University

## ABOUT THE PROJECT

The Ohio State University is committed to enhancing the world in which we live. For many years, this was achieved by providing a high-level of quality education to the many students that utilize its campus. Now, the university is doing so with the new facilities the students use. The new Ohio Union at The Ohio State University is a 321,000 square-foot LEED Silver Certified building that replaces an older facility. It is the center of student activity on campus and fosters growth and development among the student body.

The design team with the aid of the student body created a building that would not only impact this generation, but future generations as well. There are several Green Building design features throughout this impressive and large facility. Recycled content and regional materials were heavily used during the design and construction process. The new union even used salvaged and refinished material from the previous union on the exterior of the new facility. Low emitting products such as: adhesives, carpet systems and sealants were also utilized. Other areas where Green elements were featured are the landscaping, the storm water management system, the transporation alternatives, and the ability to reduce the heat island effect.

## THE TITUS SOLUTION

Not to be overlooked, the HVAC systems were also Green in their design. The design team wanted HVAC systems installed to meet or exceed current ASHRAE Standards. Titus has several different products selected for this project. They all provide superior performance and aesthetics while helping the new union save energy as well.

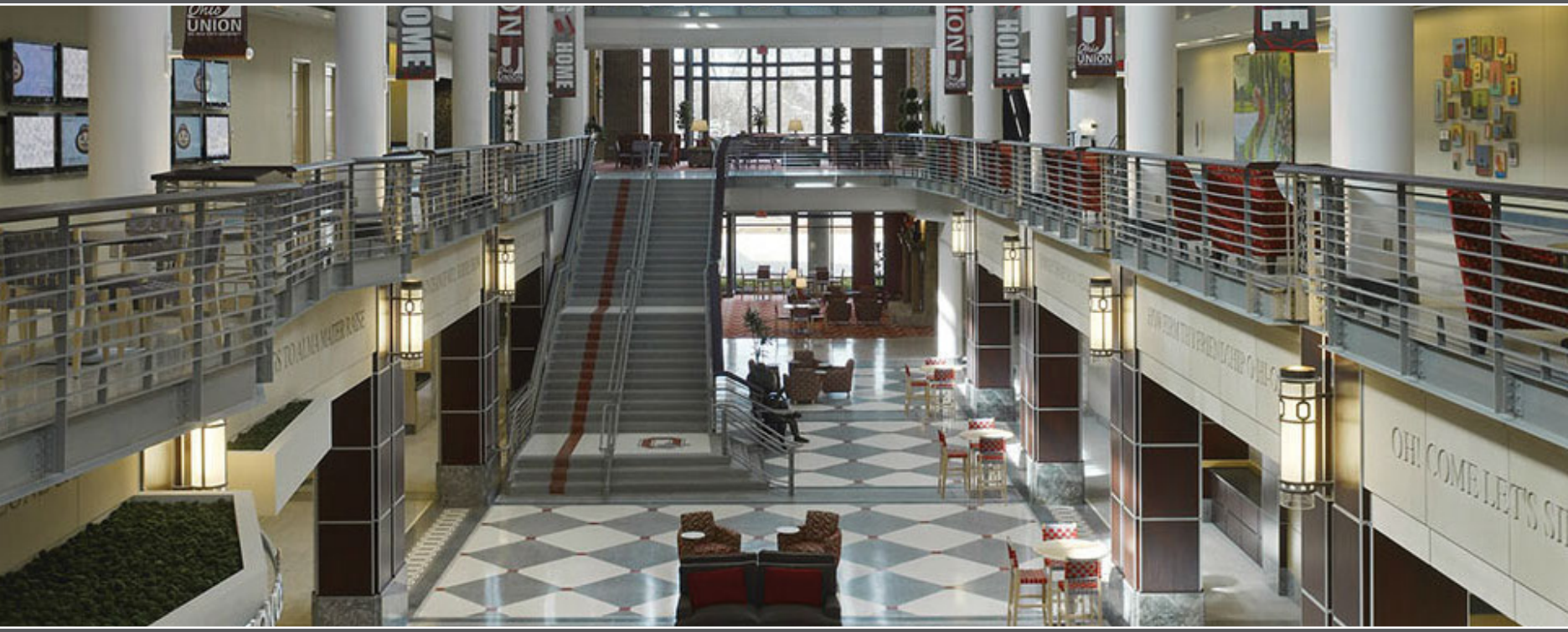
The TMSA and ML diffusers, the DESV terminal unit and our 300/350R series grilles were the main products selected for the new union project. The Titus TMSA diffuser features adjustable vanes which vary the discharge pattern between vertical and


horizontal for heating and cooling applications. This diffuser delivers supply air in a 360º air discharge pattern and is designed to protect ceilings from smudging. All sizes have 3 cones providing a uniform appearance.

The Titus ML Modulinear diffuser is a high performance, high quality linear slot diffuser. Its unique "ice tong" deflector blades allow for both changes in air volume and direction from the face of the diffuser. Modulinear diffusers are designed for variable air volume systems. They project a uniform blanket of air that adheres to the ceiling even at low flow rates. This diffuser is also available in 1-, 2-, 3-, and 4-slot configurations. Finally, Titus' 300 / 350 series grilles define the standard for the HVAC industry. With high quality and competitive pricing, these grilles form the back bone of a standard offering that will meet any application requirement.

## THE END RESULT

The new Ohio Union opened in March of 2010, and continued the university's commitment to building new facilities that leave a lasting impression on the students without creating a greater impact on the world in which we live.




# Ohio Union at The Ohio State University

## PRODUCTS LIST


ML


DESV


TMSA


300/350R

Titus

## PROJECT - UCLA TERASAKI LIFE SCIENCE BUILDING

ARCHITECTS - BOHLIN CYWINSKI JACKSON / STENFORS ASSOCIATE ARCHITECTS
LOCATION - LOS ANGELES, CALIFORNIA
LEED CERTIFICATION - LEED CERTIFICATION

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UCLA Terasaki Life Science Building

## ABOUT THE PROJECT

The new UCLA Terasaki Life Sciences Building opened recently and ushered in a new chapter in the evolution of science education at the university. Consisting of two wings with open laboratories, offices, scholarly activity space, and building support spaces on five floors, the new new facility will be the foundation for the next phase of biomedical research. The 175,000 square-foot structure is supported by a cast-in-place concrete frame with flat-slab floor decks and is the new home of the Biological Sciences Department. Divisions within the department include Molecular Studies; Cell and Developmental Biology; Physiological Science; and Biology, Ecology and Evolution. The design team also built this lab building to attain LEED certification.

## THE TITUS SOLUTION

Titus was able to provide many air distribution solutions for this project. The products were selected due to their ability to provide superior performance while blending into the overall design of the building.

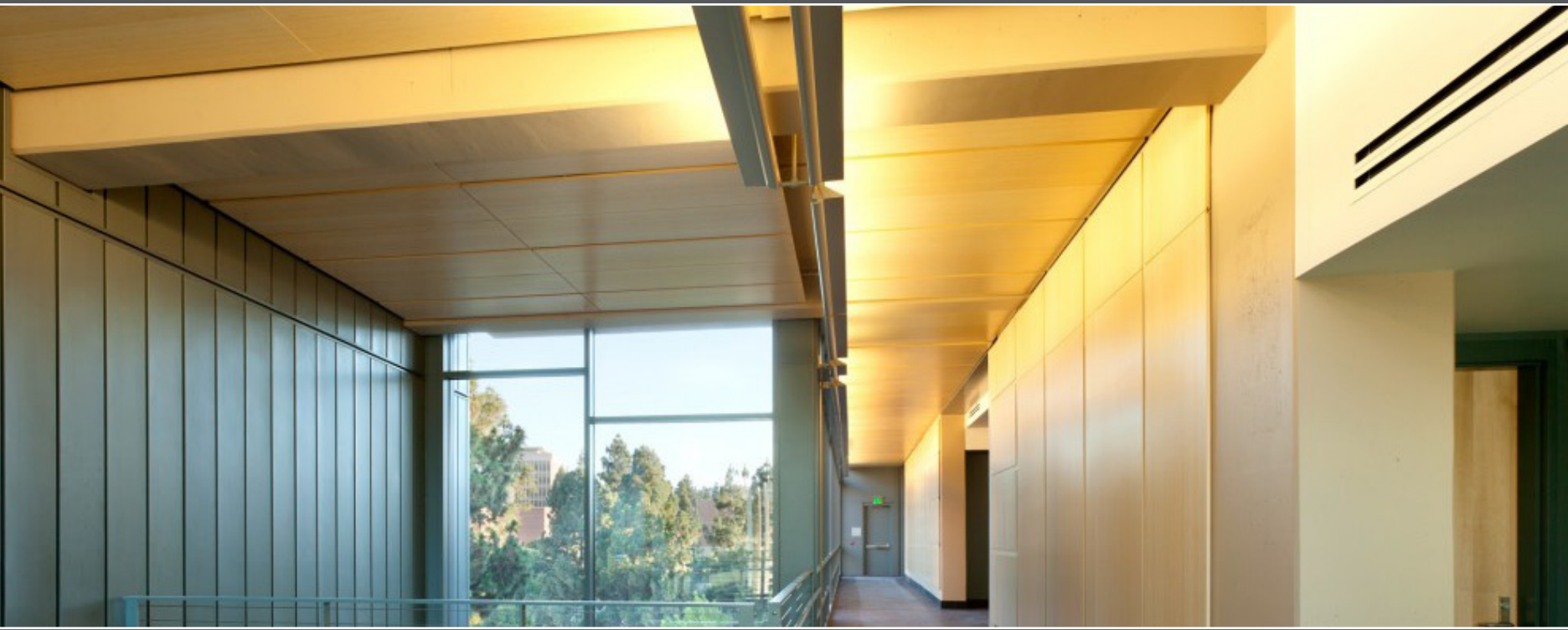
The new lab building utilizes a couple of Titus' best critical environment solutions - the TriTec and TLF diffusers. Titus TriTec diffusers are designed to meet the challenge of diluting airborne contaminants by supplying high-volume, low-velocity airflow to displace these impurities. The airflow pattern is designed to produce a uniform pattern to prevent dead spots where contaminants can linger. It is an excellent choice for Class 1,000 to 100,000 rooms. TLF diffusers can be used to create clean zones by positioning the diffuser directly over the area to be washed with clean air.

The Titus DESV is a digitally controlled single duct terminal unit that is unique as it incorporates many design features that increase performance, decrease service and installation costs, and offer increased value, over and above this basic function. The Titus FlowBar is an architectural linear diffuser that maximizes engineering

performance. It's outstanding performance allows higher airflows than conventional linear diffusers, with lower noise levels, making it ideal for high profile designs.

## THE END RESULT

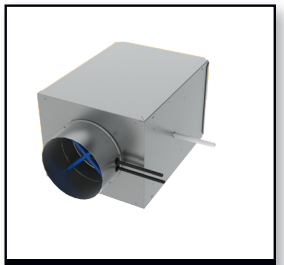
The new Terasaki Life Science Building fulfills a direct need that was lacking at the university. It provides a state-of-the-art facility for scientists, students and researchers to unwrap and discover more about the science of life. New innovations and potentially life altering secrets have the possibility of being unlocked now that key personel have been given the tools needed.



# UCLA Terasaki Life Science Building

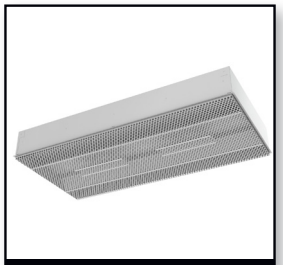
## PRODUCTS LIST

FLOWBAR



DESV

TLF



TRITEC

## PROJECT - ASU BIODESIGN INSTITUTE BUILDING A

ARCHITECTS - GOULD EVANS / LORD, AECK & SARGENT
LOCATION - TEMPE, ARIZONA
LEED CERTIFICATION - LEED GOLD CERTIFICATION

Titus

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ASU BioDesign Institute Building A

## ABOUT THE PROJECT

Considered by most as the "lab of the future," The ASU BioDesign Institute is a massive multi-building learning and research center built to meet the demands of an ever-changing world. Buildings A & B encompass 350,000 square-feet of award-winning, state-of-the-art LEED-certified space. The Biodesign Institute represents the State of Arizona's largest investment in bioscience-related research. Arizona State University is the first university in the U.S. to create an interdisciplinary research institute solely devoted to bio-inspired innovation principles. The three major areas in which The Biodesign Institute is working to make a difference are: biomedicine & health outcomes, sustainability and security. This framework allows the Institute to address these critical global challenges by creating "use-inspired," as well as "bio-inspired" solutions.

Building A achieved a LEED NC 2.2 Gold Certification after it was built. Designed with Green Building concepts in mind, Building A is filled with sustainable elements. Some of the green elements featured are the use of public transportation. The university encourages all to take advantage of alternate transportation by offering free passes for public service, has several bike racks spread throughout campus and many showers in all the buildings. It also makes excellent use of the abundance of natural light provided. Building A has an impressive atrium that spans the entire space. Instead of having several walls to divide offices and labs, the facility utilizes glass so that light easily penetrate the building. This also offers impressive views of the surrounding landscape while saving energy. Other Green Building elements are the state-of-the-art storm drain system and the use of a reflective roof membrane to reduce the effect of the heat island.

## THE TITUS SOLUTION

The BioDesign Institute has several air distribution products from Titus ranging from

grilles and diffusers to terminal units. Our laminar flow diffusers, models TLF-AA and TLF-SS, are the industry standard for unidirectional flow. TLF diffusers can be used to create clean zones by positioning the diffuser directly over the area to be washed with clean air. They are also used in most operating rooms as the center diffuser. The vertical piston of air created by the TLF is used to discharge clean air over the patient during operations. The Titus CT linear bar diffusers are designed for both heating and cooling applications, supply as well as return. They are available in eight different core styles plus a wide selection of frames and borders. These diffusers can be used for ceiling, side wall, or sill installations. Accessories such as directional blades, dampers, blank-offs, access doors and mitered corners make these diffusers even more versatile.

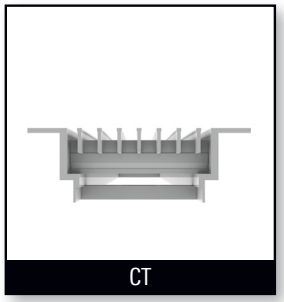
Single Duct terminals are the fundamental building blocks for Variable Air Volume (VAV) systems. Their primary function is to regulate airflow to a zone, in response to zone temperature requirements. The Titus DESV is unique as it incorporates many design features that increase performance, decrease service and installation costs, and offer increased value, over and above this basic function. This unit also contains a standard AeroCross ™ multi-point center averaging velocity sensor. The 50F is an Eggcrate grille. It has the highest free area of any return grille. These grilles are available with an aluminum border and aluminum grid; steel border and aluminum grid; or entirely stainless steel construction. It is offered in ½ x ½ x ½-inch, ½ x ½ x 1-inch, or 1 x 1 x 1-inch core sizes. The 50F is also available as a filtered return grille.

## THE END RESULT

Winner of the 2006 Lab of the Year by R & D Magazine, the ASU BioDesign Institute is now the benchmark for new research facilities being constructed. The Green Building elements featured throughout all the buildings not only help to save energy, but fosters a unique learning environment for the next generation of researchers and scientists to grow and develop.

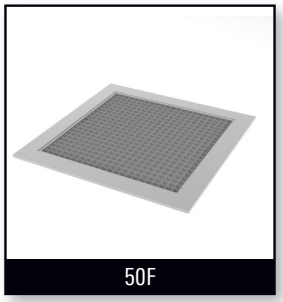

# ASU BioDesign Institute Building A

## PRODUCTS LIST


CT


DESV


TLF-AA


50F

## PROJECT - THE OHIO STATE WILLIAM OXLEY THOMPSON LIBRARY

ARCHITECT - ACOCK ASSOCIATE ARCHITECTS
LOCATION - COLUMBUS, OHIO
LEED CERTIFICATION - NONE

OSU Thompson Library

## ABOUT THE PROJECT

In an age where new and technologically advanced buildings are being built everyday, The Ohio State University faced a difficult decision - to demolish their existing library or renovate it. The answer was renovation and it turned out to be the correct one. The new Thompson Library was recently reopened after a three year renovation and offers many amentities that patrons would expect at new libraries.

With funding from the Athletic Department, the architects at Gund Partnership and Acock Associates were able preserve the rich history of the original library and infuse it with modern conveniances from today. The renovation and expansion transforms the original library into a 309,000 square-foot building. Places to study throughout this 11-story building have drastically increased. New computers and wireless access to the internet are definite upgrades. Other amentities include a cafe for study breaks, a gallery that houses special collections of art from the library and breathtaking views of the campus and Columbus, Ohio can be found on the eleventh floor.

## THE TITUS SOLUTION

Titus has extensive experience in renovating outdated HVAC systems into new efficient systems that help save energy. We were able to supply this project with an assortment of grilles and diffusers that not only blend well architecturally, but provide superior performance.

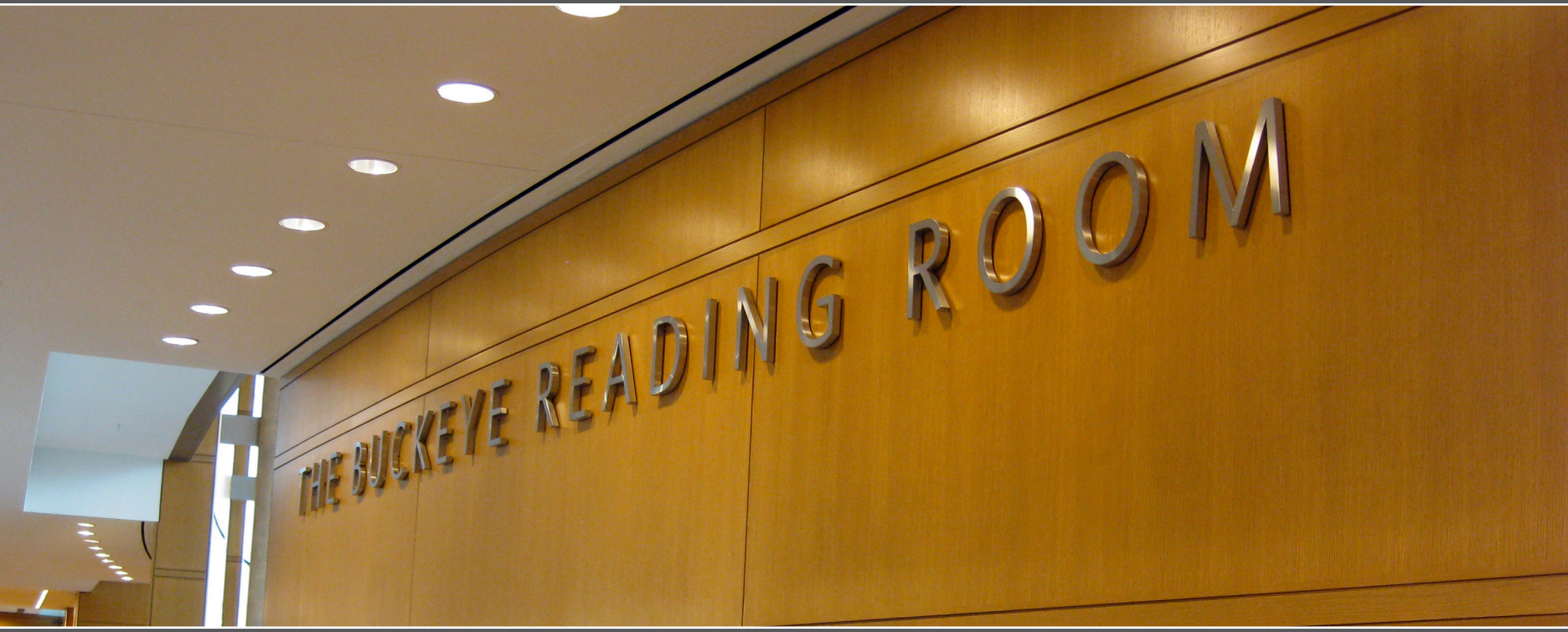
TDCA diffusers handle an unusually large amount of air for a given pressure drop and noise level. Their pleasing appearance harmonizes with various architectural details, especially in modular ceiling systems. It also has an adjustable air discharge pattern and maintains an unbroken horizontal flow pattern from maximum cfm down to minimum cfm. The TDCA is truly an excellent selection for variable air volume systems. The 50F is an Eggcrate grille that has one of the highest free areas of any


return grille. These grilles are available with an aluminum border and aluminum grid; a steel border and aluminum grid; or entirely stainless steel construction. It is offered in ½ x ½ x ½-inch, ½ x ½ x 1-inch, or 1 x 1 x 1-inch core sizes. The 50F is also available as a filtered return grille too.

The Titus ML Modulinear diffuser is a high performance, high quality linear slot diffuser. Its unique "ice tong" deflector blades allow for both changes in air volume and direction from the face of the diffuser. Modulinear diffusers are designed for variable air volume systems. They project a uniform blanket of air that adheres to the ceiling even at low flow rates. This diffuser is also available in 1-, 2-, 3-, and 4-slot configurations. Finally, Titus' 300 / 350 series grilles define the standard for the HVAC industry. With high quality and competitive pricing, these grilles form the back bone of a standard offering that will meet any application requirement.

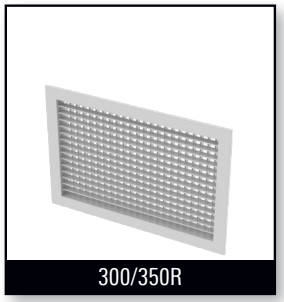
## THE END RESULT

The new William Oxley Thompson Library is now a library that students, faculty, and staff can be proud of for quite some time. This renovation begins a new era of learning for the university.back to life while creating an open and stunning work environment.



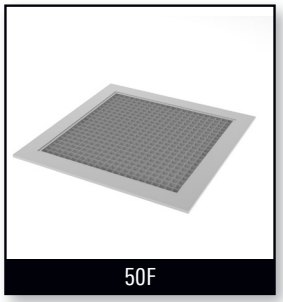

## The Ohio State University William Oxley Thompson Library

PRODUCTS LIST


300/350R


ML


TDCA


50F

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notes

# Titus

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## *Colleges & Universities*

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