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# THE HIGH DEMAND FOR LAB CONNECTIVITY

# The High Demand for Lab Connectivity

*The Benefits of Pre-wired Anodized Aluminum Raceway For Power, Data/Communication and Lab Gas Connection Products*

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wide array of research projects. This has amplified the importance of connectivity devices that are easily accessible, versatile and add to an aesthetically pleasing work environment. These aspects have become a high priority as research facilities strive to bring in top scientists and personnel to their institutions.

New and renovated academic and healthcare laboratories utilize pre-wired lab connectivity solutions. These products are constructed from extruded aluminum, with barrier channels that provide isolation between adjacent power, data/communication and lab gases. Factory assembled raceway systems offer an aesthetic advantage as well as considerable time savings at installation, as opposed to field cutting and wiring bulk raceway components. Use of pre-wired service pedestals, power strips, power poles, service carriers and ceiling connection plates can reduce electrical installation expenditures by 70%. That is a major reduction in labor associated with wiring the devices in the field. Since the material is shipped ready to be installed, installation time is reduced, resulting in a reduction of overall costs by up to 60%. There is also the added benefit of lower scrap rates as opposed to doing the work in the field, since pre-cut and pre-fit cover plate lengths reduce material costs by as much as 25%.

Engineered and manufactured to plan specifications, pre-wired and pre-assembled raceways bring devices and circuits exactly where the end-user needs them. This greatly improves the functionality of laboratory systems and eliminates a great deal of pre-planning and rough-in on the installer's part. In addition, due to their modular design, these raceway systems are easily reconfigured in the event that a space is re-purposed.

Pre-wired connectivity systems are UL Listed and fully compliant with applicable Codes, including NEC (NFPA-70). It



**Versatility and scalability** are the most important design factors in modern laboratory space planning today. "Private research companies make physical changes to an average of 25% of their labs each year while most academic laboratories change 5 to 10% of their layouts." (*Architectural Science Review*)<sup>1</sup> (*Watch & Tolat, 2007*)<sup>2</sup> As research priorities and funding shift, facilities must be able to adapt quickly. Power, data and plumbing utilities must be flexible and easily re-routed to accommodate portable workstations. Customizable connection management solutions give architects and engineers options well beyond the standard "pipe and box", by providing ways to build versatility into any laboratory design. Typical connectivity configurations include devices secured to removable cover plates on service pedestals, power strips, power poles, ceiling connection plates, overhead service carriers and surface metal raceway.

"Use of pre-wired service pedestals, power strips, power poles, service carriers and ceiling connection plates can reduce electrical installation expenditures by 70%."

This provides easy access in the field and maximizes the ability to add or delete power, data/communication and lab gases.

The power and data/communication demand in laboratories continues to grow, driven by the technological requirements of today's research methods. There is a greater need for enhancing access to advanced technology and data analysis for a

should be noted that some of the standard code requirements for connectivity products include the need for normal and emergency power to be separated. In fact, NEC Code states that, “wiring from an emergency source or source distribution over current protection to emergency loads shall be kept entirely independent of all other wiring and equipment, unless otherwise permitted”. (*National Electrical Code*)<sup>3</sup> In some states, including California, strict adherence to this separation of power is required. Also, it should be understood that data, gas and power can’t occupy the same raceway channel and provisions must be made to ensure that they are kept separate.

Extruded aluminum connectivity products in academic and healthcare laboratories also have an aesthetic advantage that can’t be overlooked. The aesthetic value of extruded aluminum alloy can be summed up in its properties. The primary advantage is corrosion resistance, making this material more conducive to a laboratory environment. Anodized aluminum is extremely durable, easy to maintain and clean. Aluminum also withstands aggressive conditions experienced in many laboratories. The other benefits of extruded aluminum, as noted by the AEC (*Aluminum Extruders Council*)<sup>4</sup>, include:

- Lightweight – Aluminum is about 1/3 the weight of steel. This makes handling the material easier and reduces shipping costs.
- Strong – Aluminum profiles can be made as strong as needed for the majority of applications.
- High strength-to-weight ratio – Aluminum can bear heavier loads at a lesser weight than steel.
- Non-sparking – This feature makes aluminum suitable for laboratories where, in most cases, both flammable and combustible liquids are used.
- Resilient – Combines both strength and flexibility. Aluminum provides flex under load and springs back when impacted.
- Non-combustible – Aluminum does not burn at any temperature nor does it emit toxic fumes.
- Suited to cold – The strength of aluminum increases in very cold temperatures making it a good fit for cool laboratory environments.
- Allows for various finishes – Aluminum



easily accepts many finishes. These finishes include: liquid paint, powder coating, anodizing and electroplating. Finishes can add to the service life of the aluminum with, for example, an anodized coating having a service life of approximately 20+ years.

- Recyclable – Aluminum has a high scrap value and “can be recycled indefinitely without losing any of its superior characteristics, making it especially appealing according to both environmental and economic criteria.”<sup>4</sup> This is a very important characteristic since the need to reduce the solid waste that is put into landfills is becoming paramount.
- Green attributes – Aluminum can be recycled, is sustainable and has versatility. These are key attributes required for material being used in the construction of green buildings.

Along with extruded aluminum’s material advantages there are process advantages that are well suited to power and data/communication connection products for laboratories. In addition to being attractive there is the added advantage in the ease of fastening, the versatility of joining extruded aluminum sections, shorter lead times and its cost effectiveness.

## Conclusion

As academic and healthcare research facilities continue to expand or renovate laboratories, the demand for connectivity

products will increase due to the ever evolving technology needed for research methods and data analysis. The requirement for wire and cable connectivity management solutions that are easily installed, movable and can be upgraded will be critical to the Architects and Engineers that are responsible for successfully designing and implementing these projects. As with any project, the choices available need to be evaluated so the right product is provided to meet the needs of the end-user. As hospitals and universities try to attract top personnel to their facilities, aesthetics, as well as functionality, must be a consideration. Recognizing the benefits of pre-wired anodized aluminum raceway for power and data requirements is one way to address this demand in an efficient and cost effective way. □

## References

<sup>1</sup> *Architectural Science Review, Volume 50.3, pp 281-292. 2007 University of Sydney. www.arch.usyd.edu.au.asr*

<sup>2</sup> Watch, D., & Tolat, D., (last updated 03-14-2007). *Research laboratory. Whole Building Design Guide (WBDG). http://www.wbdg.org/design/research\_lab.php (accessed 6 June 2007).*

<sup>3</sup> *NEC 2008 Handbook, NFPA 70: National Electrical Code®, 700.9 Wiring, Emergency System.*

<sup>4</sup> *Copyright 2010 Aluminum Extruders Council. http://www.aec.org/exbasics/aluminum.html.*



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