



SUSTAINABLE DESIGN PROGRAM

Re: ALPHA & SIGMA, Welded Steel Panel Construction

According to the World Watch Institute, significant portions of the world's resources are consumed by the construction of modern buildings. As a result, the Architectural Community is increasingly concerned about Sustainable Design for materials and products utilized on projects. USGBC (US Green Build Council) has implemented the LEED® (Leadership in Energy and Environmental Design) program to establish measurable standards for Sustainable Design.

ALPHA & SIGMA panel constructions incorporate Sustainable Design principles both in materials and production methods.

PRODUCTION METHODS:

1. Sheet steel as received from suppliers is protected from corrosion by an oil coating. Before the steel can be utilize it must first be cleaned. AEC utilizes sheet-washing equipment to remove the protective oil coating. The sheets are cleaned with detergent in an aqueous solution as opposed to solvent-based cleaners. AEC's wash and rinse system has no connection to sewage or storm drains. Contaminated water is removed to drums and sent through an evaporation process where the water is removed. The remaining sludge is picked up by a licensed waste disposal firm and disposed or recycled as allowed by California and local statutes.
2. Panel face sheets are prime painted prior to application of any finish. Special racks and material handling equipment allow AEC to roller apply the primer rather than using spray equipment. Roller application significantly reduces the amount of paint particulates released into the air when compared with spray application.
3. Aluminum and steel waste materials are recycled.
4. Panels are steel weldments. Computer controlled, robotic fusion welding process with arc-length control insures quality welds and efficient use of electrical power.
5. Finishes are laminated to the panel face using adhesives that meet air quality standards as established by the LEED® program.

MATERIALS:

ALPHA & SIGMA panels are constructed with sheet steel faces (14 to 20- gauge) that are robotically fusion welded to 14 and 16-gauge steel frame members. Face sheets are stiffened with steel shapes welded to the interior surface of each face. The interior of the panels is filled with ½ pound density fiberglass. Aluminum extrusions are secured to the perimeter edges of the panel. These extrusions hold the acoustic seals and create the interlocking vertical edges. Mechanical, retractable bottom seal assemblies are constructed from aluminum and steel components.

1. **STEEL** – Depending on the panel construction and finish, steel content in ALPHA & SIGMA panels typically exceeds 85 %. The steel AEC uses is produced by the Basic Oxygen Furnace method (BOF). The Steel Recycling Institute lists BOF steel as having recycled content of 22.6% post-consumer and 6.1% pre-consumer.
2. **ALUMINUM** – By weight, aluminum content varies from 4% to 8% for ALPHA & SIGMA panels. As reported to AEC by its primary suppliers, pre-consumer recycled content comprises more than 80% of this aluminum with insignificant post consumer content.
3. **LEED** - Based on the recycled content for aluminum and steel, ALPHA & SIGMA panels will in most cases qualify for Credits MR 4.1 and MR 4.2. LEED –NC version 2.2 indicates that to achieve these credits the sum of post-consumer recycled content and ½ of pre-consumer recycled content must exceed 10% and 20% respectively. AEC panels will qualify for both credits with vinyl, carpet or paint finishes. Application of other finishes such as wood veneer or plastic laminate may reduce the percentage (by weight) of recycled content so that the panels do not qualify for MR 4.2.
4. **PANEL FINISH** – While some finishes are manufactured from recycled materials, most are not. Since panel finish is specified by the Architect or Interior Designer, responsibility for evaluating principles of Sustainable Design as they may apply to finish rests with these individuals.
5. **TRACKS** - AEC tracks are either steel or a composite of aluminum with CR steel bar running surface. Recycled content for these items is as noted above in items 1 and 2.

LIFE CYCLE

1. ALPHA panel construction was introduced in 1982. Advanced Equipment is not aware of any panels that have been replaced because of product damage or structural failure since the ALPHA introduction.

Use of heavy gauge steel components and computer controlled welding processes results in the ALPHA panel being extremely strong. Proof load testing by an independent laboratory confirms this. Trolley plate anchorage with withstand 10,000-pound tensile load without failure. A 4-ft. wide by 24-ft. high panel of ALPHA construction will resist a uniform load of 20 pounds per square foot applied normal to the panel face when tested in accordance with ASTM E-72 without damage.

Anticipated life for an “ALPHA” panel is to be measured in decades. It is expected that in most cases the panels will last the life of the building.

SIGMA panel construction was introduced in 2007. These panels use the same frame members and welding processes as the ALPHA constructions. Face sheets are typically 20 or 18-gauge. It is anticipated that these panels will also provide a very long service life.

2. It is to be expected, at some time in the future, that ALPHA or SIGMA panels will reach the end of their useable life; be it the result of building demolition, room remodel or need for product upgrade. It is at this point that the most significant Sustainable Design benefit is to be appreciated; **ALPHA & SIGMA panels can be recycled** back into the material supply chain as opposed to being deposited in a waste disposal site.

The design of these panels makes it economically feasible to recycle the steel and aluminum components. Unlike steel panels from other manufacturers, AEC panels do not have any gypsum board components. With other products, gypsum board is typically laminated to the interior surfaces of the panel face in order to keep the face flat whereas AEC panels have steel ribs welded to the interior surface. It is anticipated that the labor cost to separate the gypsum board from the face will make it economically unfeasible to recycle panel.