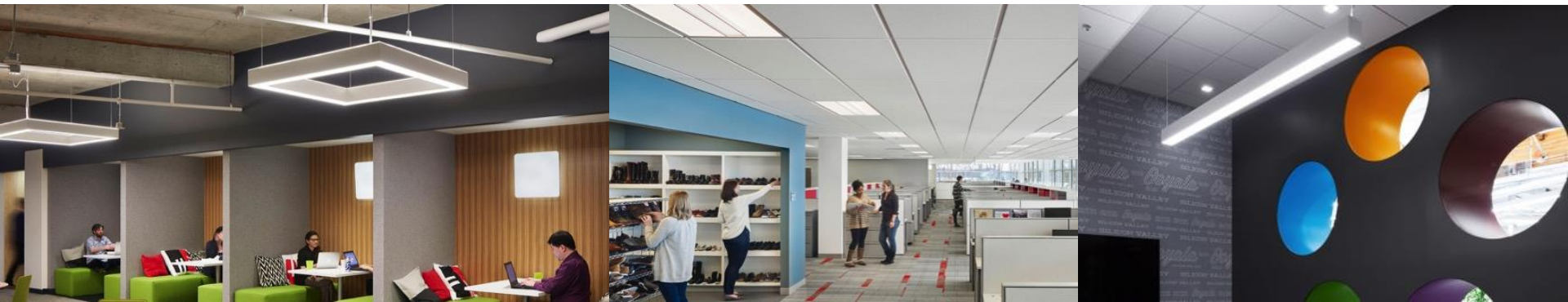


Thinking Ahead Domestic SSL Manufacturing

Presented by: Mark Benguerel, COO, Finelite, Inc.



Finelite

Finelite, Inc. designs and builds innovative, high performance lighting systems for offices, educational, healthcare, and retail market segments.

Finelite's commitment to developing better, more energy-efficient lighting, has brought innovation and unmatched customer service to the industry for over twenty five years.

Finelite

Over 25 year commitment to energy-efficient lighting systems

- Unmatched customer service.
- Finelite works closely with leading architects, lighting consultants, engineers, utilities personnel, and contractors.
- Through research and exhaustive testing, Finelite maximizes the technology's revolutionary form factors and controllability; and ensures energy-efficient performance over the source's long, long lifetime.

Looking Back – The School Research

CEC / PIER 4.5 Research

- Material costs reduced by 1/3
- Easily installation
- Single source warranty
- General and audiovisual mode
- Teacher Controls



Looking Back – The School Solution



Integrated Classroom Lighting System (ICLS) The Importance of Research

- Energy consumption and material reduction
- Technology advancements in the classroom
- Classroom flexibility



Looking Back – School Key Findings

- 1 Always use Indirect/Direct Luminaires
- 2 Always use Indirect/Direct luminaires spaced 14-16' apart.
- 3 Use General and A/V modes. General, 1 w/f^2 , A/V, $\frac{1}{2} \text{ w/f}^2$
- 4 Put controls at the front of the classroom
- 5 Use smart occupancy sensors
- 6 Add whiteboard luminaires

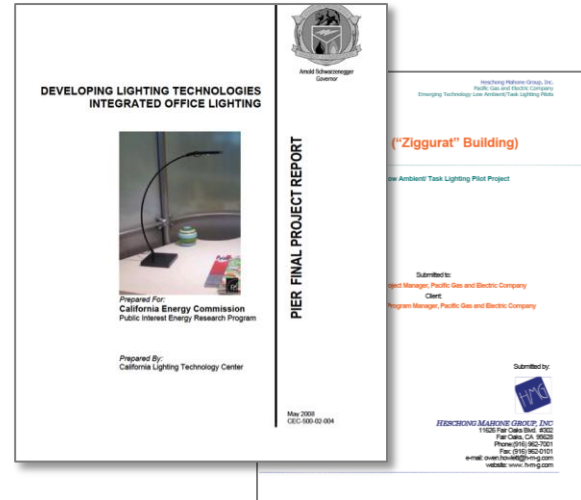
Looking Back – The Office Research

Integrated Office Lighting System (IOLS)

- Task
- Vertical
- Ambient

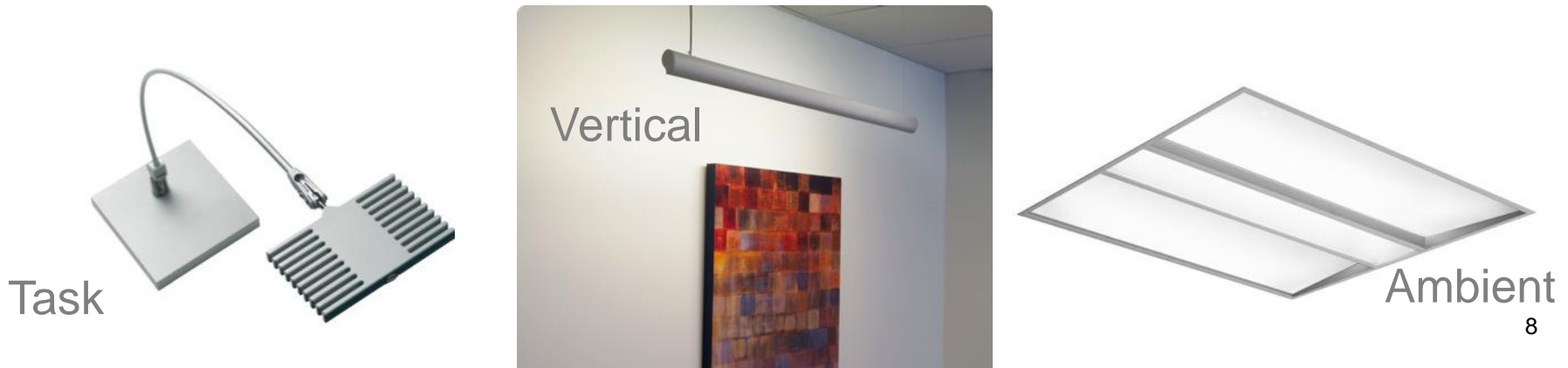


Research



Looking Back – The Office Solution

Task / Vertical / Ambient, the layered lighting approach lowers the watts per square foot and improves the quality of lighting in your space.



Looking Back – Office Key Findings

- 1 Reduced energy usage by 28-59% for office space
- 2 Achievable lower lighting power density ranging between 0.50 and 0.65 w/f²
- 3 The quality and energy efficiency of office lighting is directly related to the quality and energy efficiency of the task lighting
- 4 Poor quality task lighting is costly
- 5 The LED-task / low ambient lighting outcome results in tremendously improved user satisfaction
- 6 The LED-task / low ambient strategy is cost effective

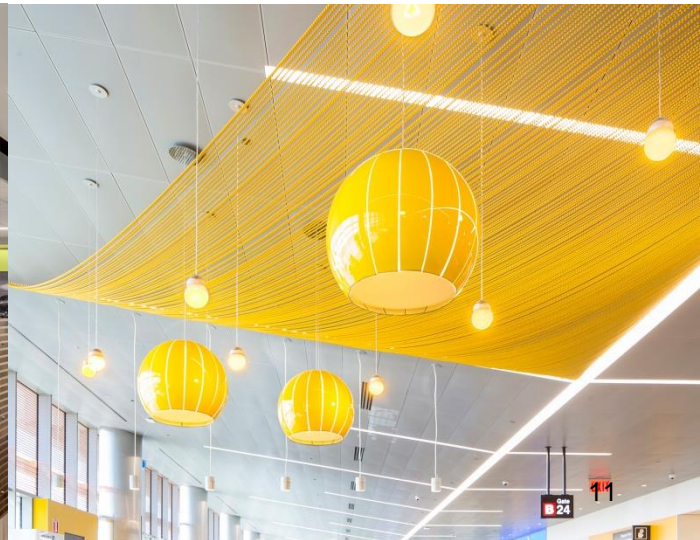
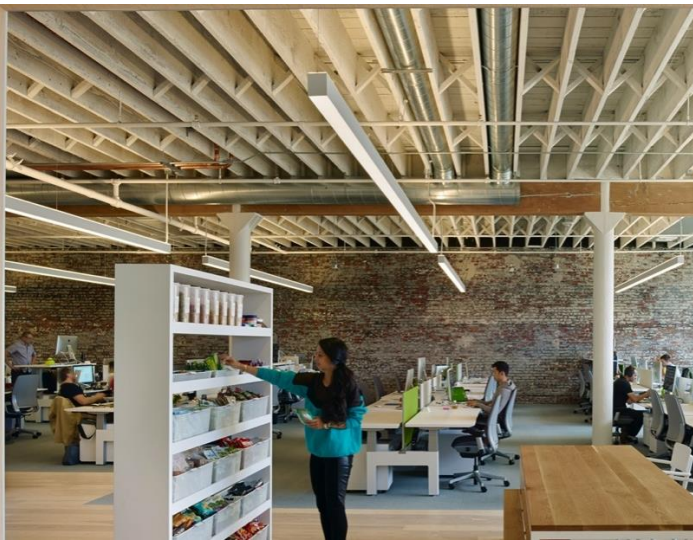
SSL Implementation After Research

Because of the Integrated Office Lighting Solution (IOLS) research, Finelite started using SSL in task lighting (desk lamps and undercabinets) for the following reasons:

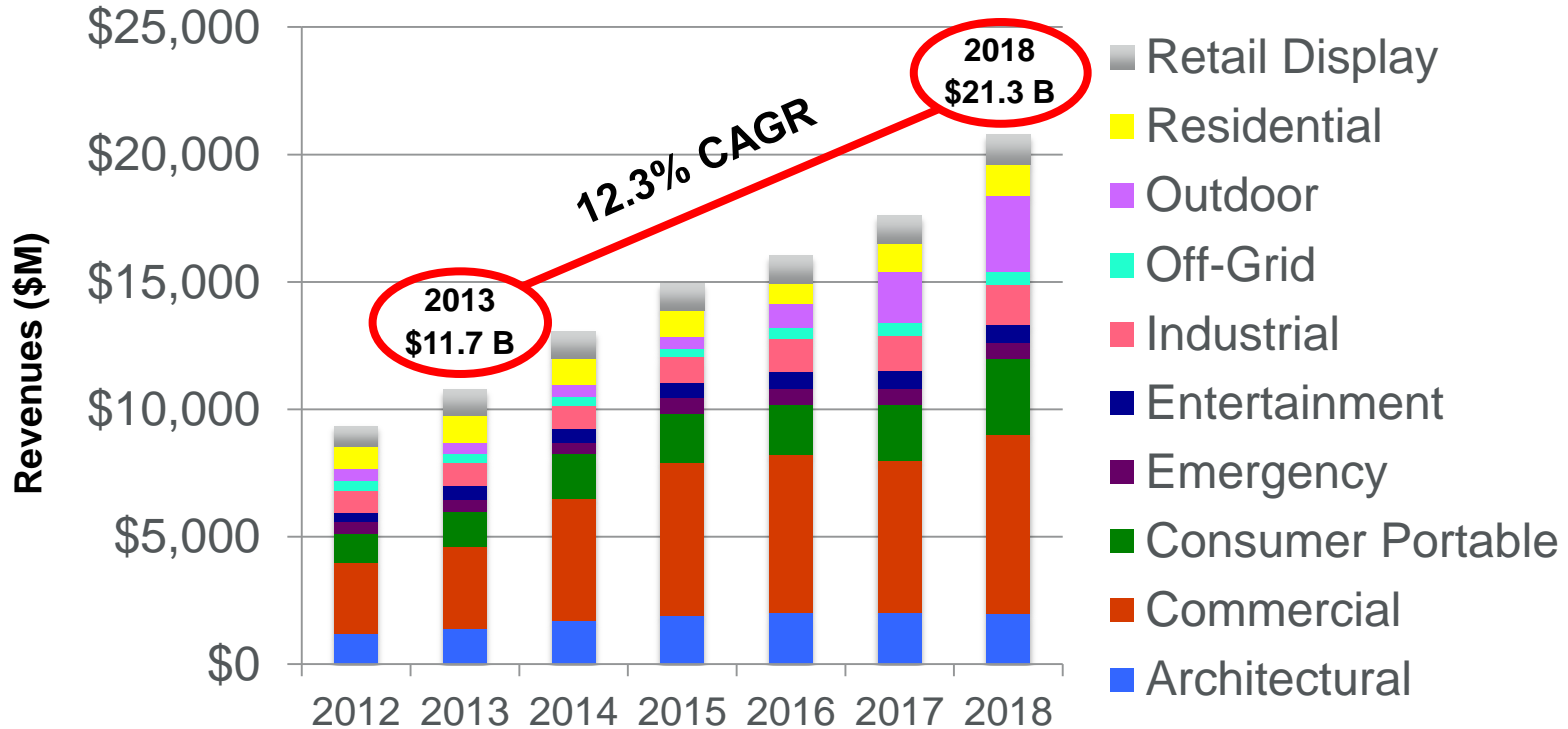
- Less Energy
- Long life
- Added light where it was needed
- SSL is a point source instead of long, round tube

What is happening in lighting?

Solid-state lighting has invigorated the industry and captured the imagination of professionals and end users.

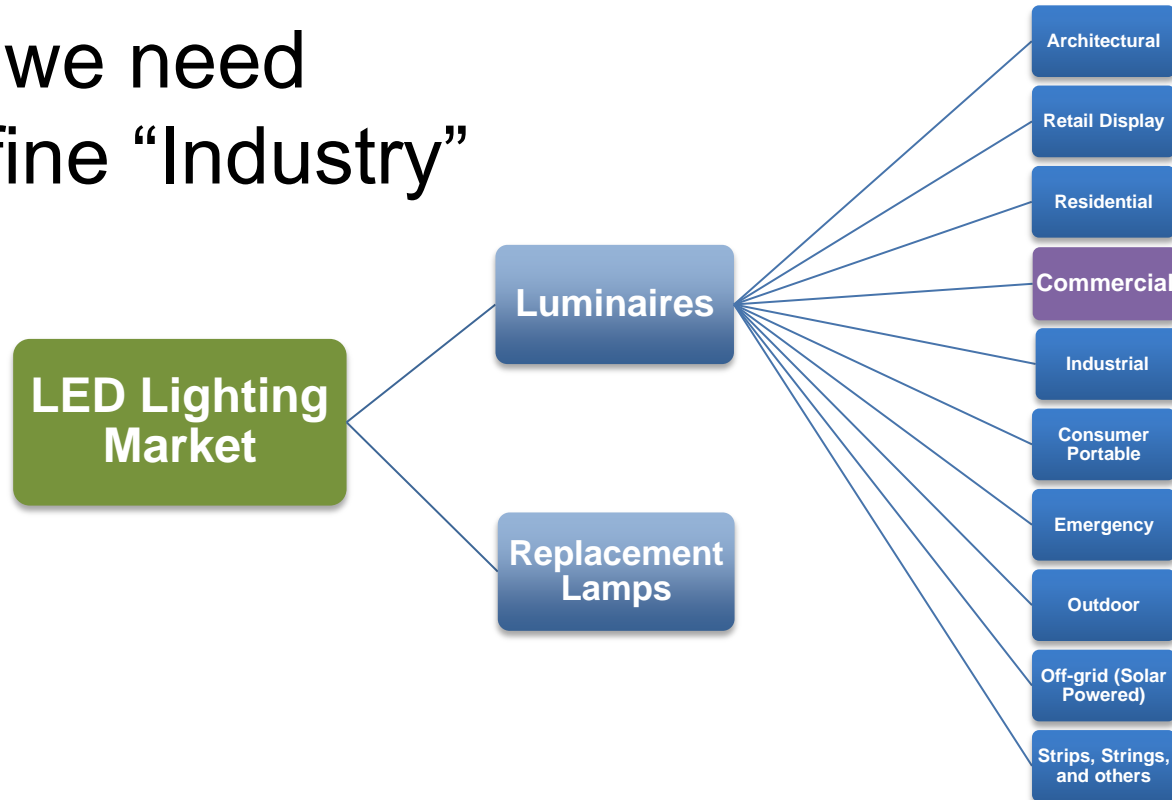


LED luminaire Market



How will this impact our industry?

First, we need to define “Industry”



Why is this interesting?



75%

By the year 2040, approximately three-quarters (75%) of the built environment will be either new or renovated.

Source: McKinsey + Company 2007

Why SSL?



- Long Life – 90% of initial light output for 100,000 hours
- Proper thermal management
- High lumens per watt (LPW)
- Quality luminaires
- Color quality
- Any length, any output in lumens and watts
- Any CCT, any configuration
- Dims from 100% to 10%, standard; .01% available
- Tunable White option

Transitioning from Fluorescent to SSL

- Finelite pioneered a custom wiring solution for a specific job with fluorescent lighting and has realized Tailored Lighting is the future with introduction of SSL.
- Fluorescent: 95% of sales in 2011
- SSL: Over 95% by the end of 2016

Tailored Lighting

- Defined by the Architecture
- Free of traditional constraints on lengths, wattage, and color
- Increases visual comfort for every occupant

SSL and Tailored Lighting

Moved away from the 4-foot constraint to

Tailored Lighting

Delivered Fast

- Tailored Output
- Tailored Control
- Tailored Lengths
- Tailored Angles
- Tailored Color

{ 10-day shipping
{ 10-year warranty

Tailored Lighting Manufacturing

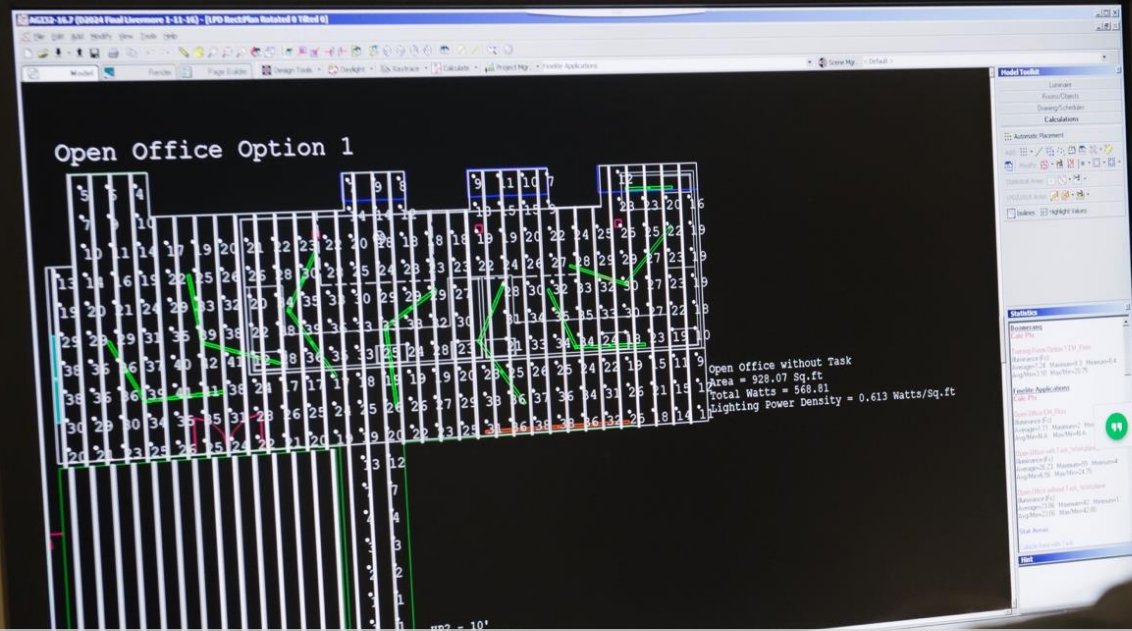


Tailored Lighting Manufacturing



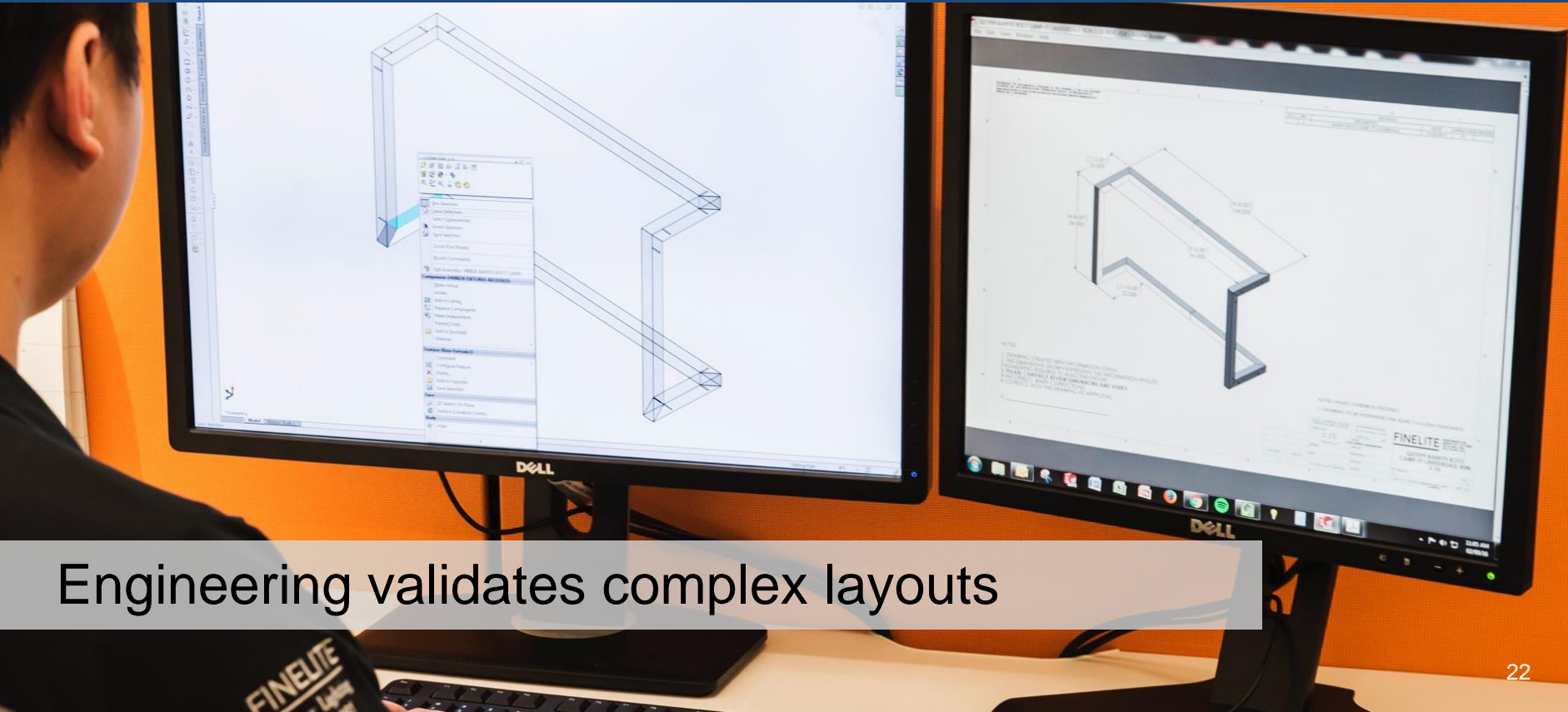
A digital bill of materials is created from plans

Tailored Lighting Manufacturing



Lighting calculations are run upon request

Tailored Lighting Manufacturing



Engineering validates complex layouts

Tailored Lighting Manufacturing



The order is placed and manufacturing kicks into gear

Tailored Lighting Manufacturing



High precision saws cut lengths

Tailored Lighting Manufacturing



And angles

Tailored Lighting Manufacturing



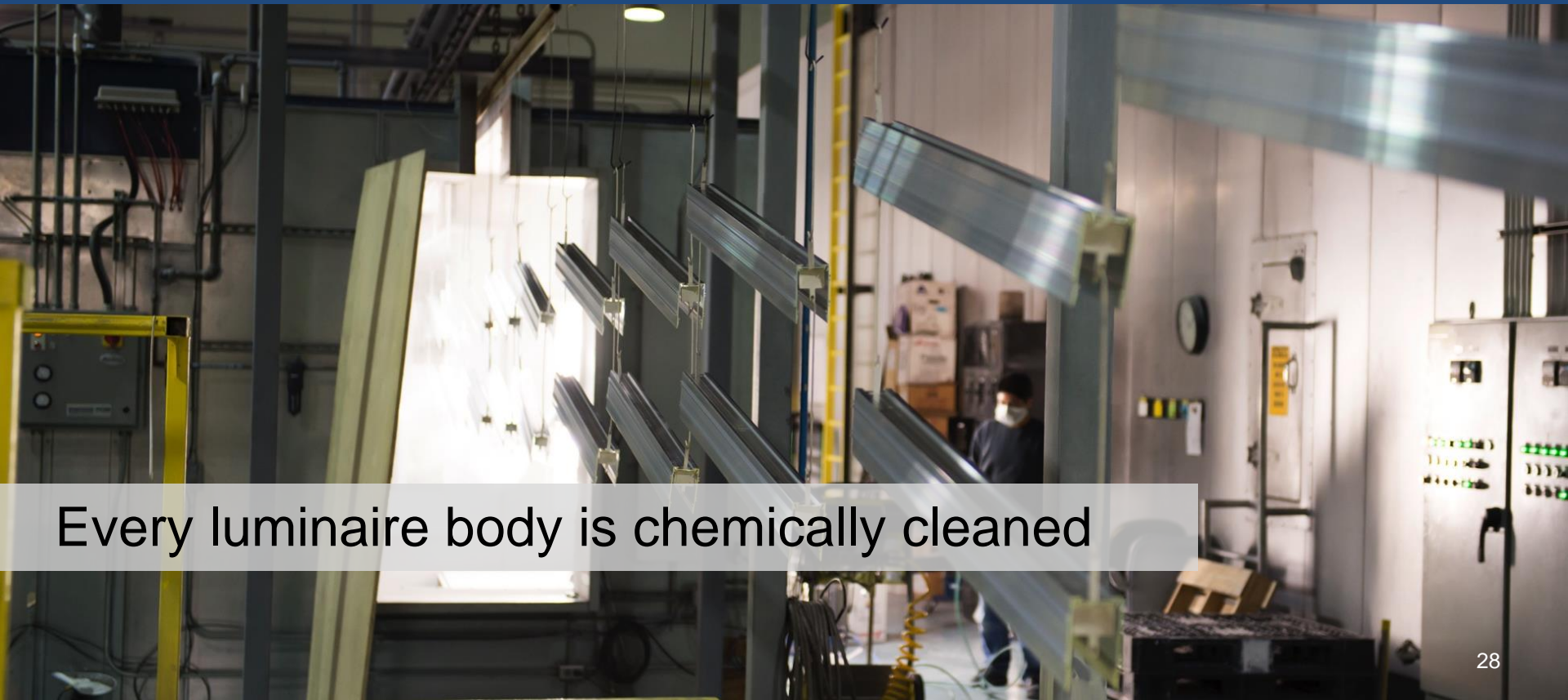
To exact specifications

Tailored Lighting Manufacturing



Every luminaire gets a unique ID number

Tailored Lighting Manufacturing



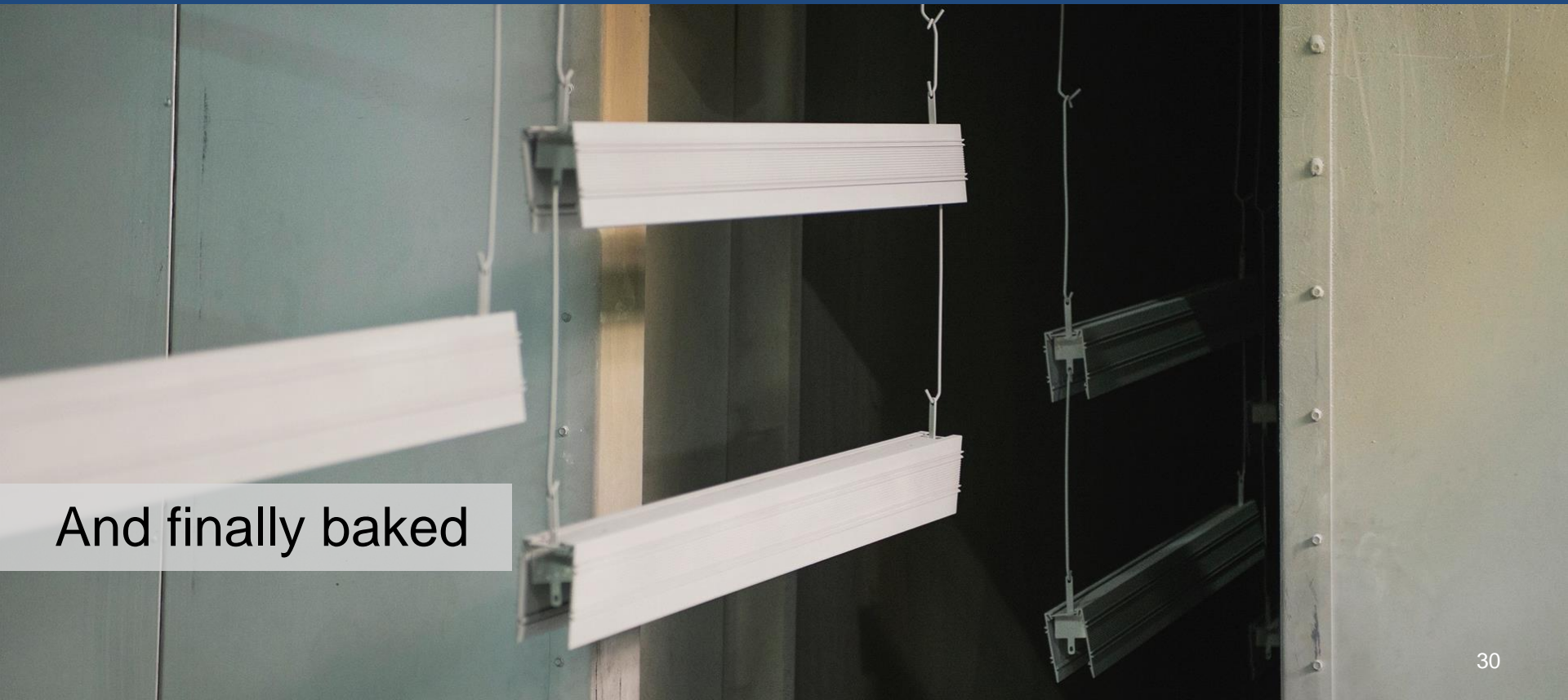
Every luminaire body is chemically cleaned

Tailored Lighting Manufacturing



Then its powder coated by unique ID

Tailored Lighting Manufacturing



And finally baked

Tailored Lighting Manufacturing



For a long lasting finish

Tailored Lighting Manufacturing



Choose from 185 RAL colors

Tailored Lighting Manufacturing



The ID is critical to building each luminaire

Tailored Lighting Manufacturing

OSRAM Programmeable Drivers

PN	Description	Profile
77543	30W, 10% dim	350mA
77541	30W, 10% dim	700mA
77543	50W, 10% dim	700mA
	10W, 10% dim	1050mA
	10W, 10% dim	350mA
	10W, 10% dim	700mA
	10W, 10% dim	700mA

Driver outputs are set per specifications



Tailored Lighting Manufacturing



Luminaires are wired to specifications by ID

Tailored Lighting Manufacturing



Emergency LED Driver Battery

Model:	C2500mAh	Cells Qty.	7 cells
Voltage	8.4V	Nominal Capacity	

RECHARGE ONLY.
MAY EXPLODE IF DISPOSED OF IN FIRE.
DO NOT SHORT CIRCUIT.

Indoors use only
Please recycle the used
batteries.

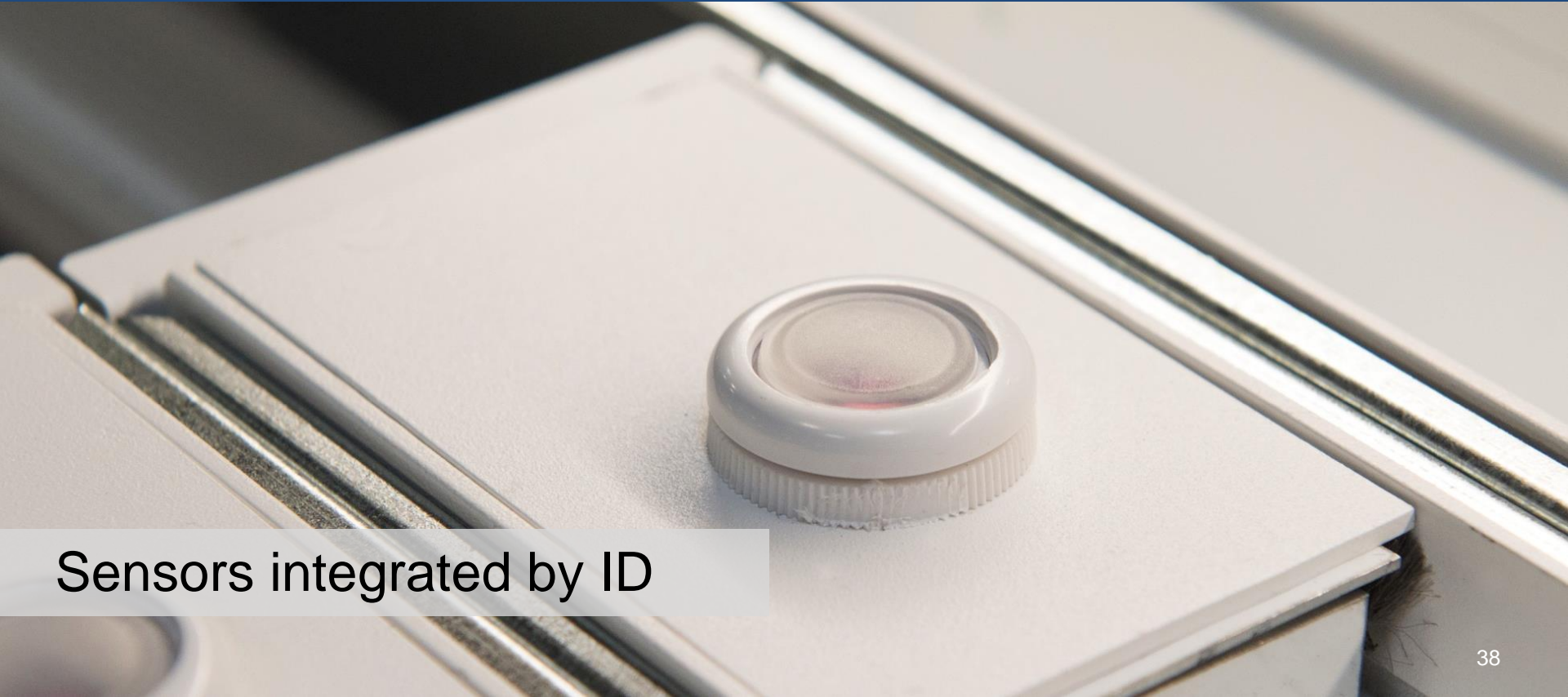
Low profile emergency batteries
for low profile luminaires

Tailored Lighting Manufacturing



EM light by ID

Tailored Lighting Manufacturing



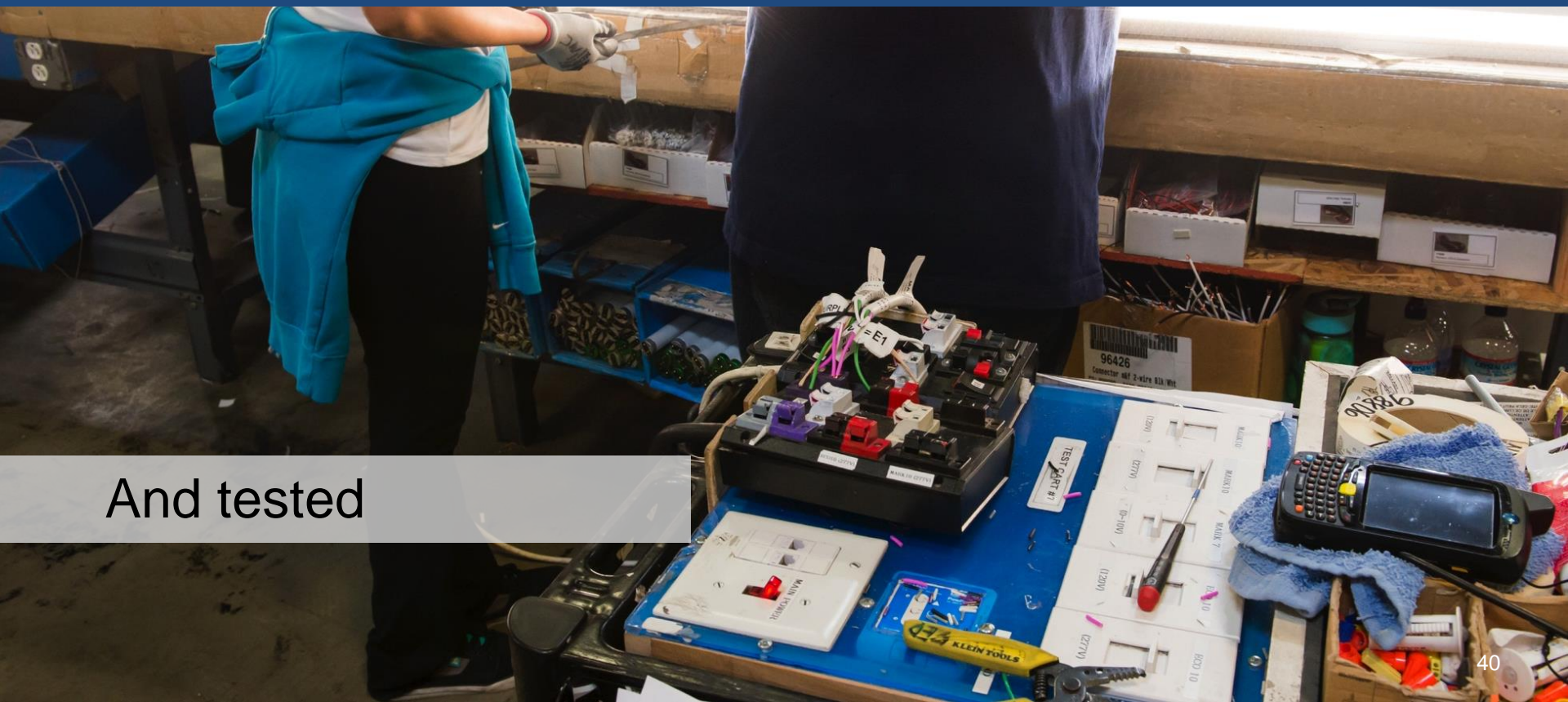
Sensors integrated by ID

Tailored Lighting Manufacturing



Every configuration is
preassembled by ID

Tailored Lighting Manufacturing



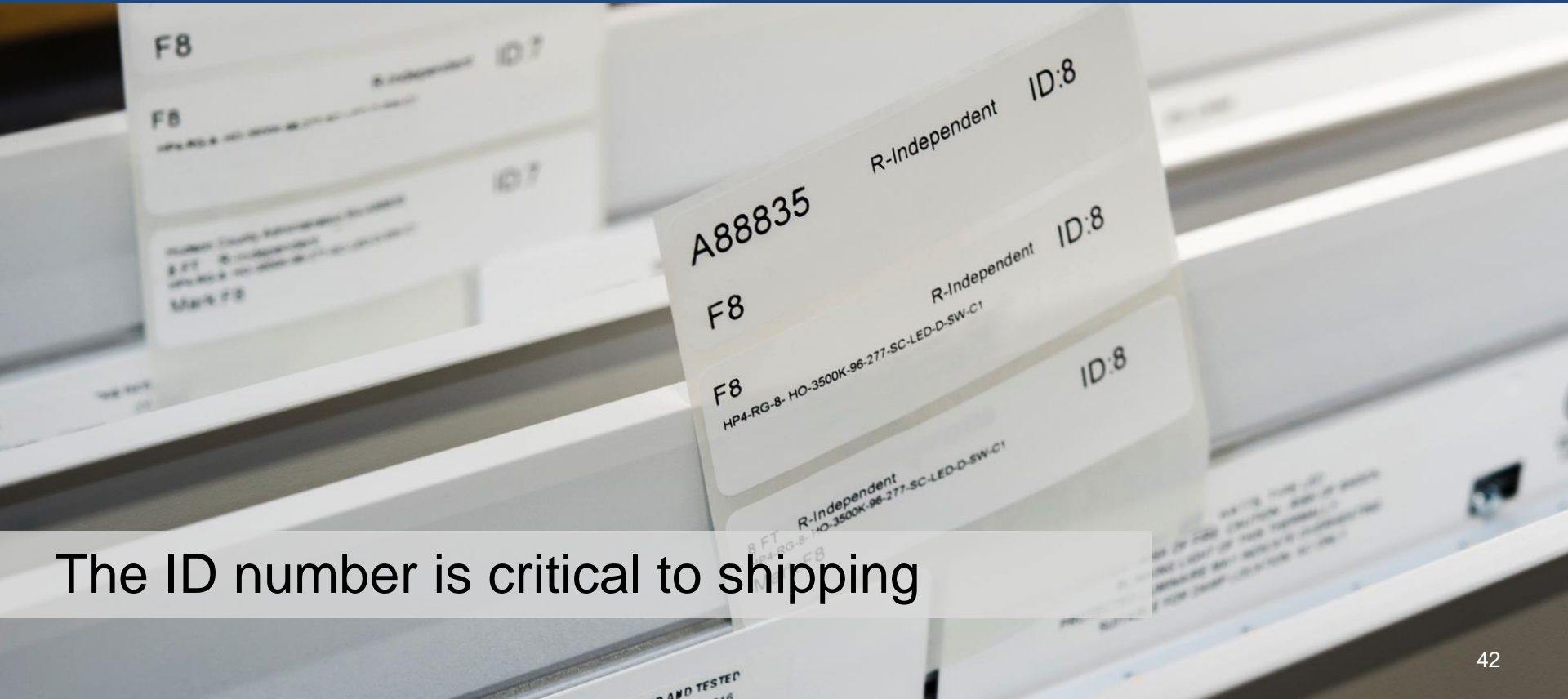
And tested

Tailored Lighting Manufacturing



Miles of Tailored Lighting are built every day

Tailored Lighting Manufacturing



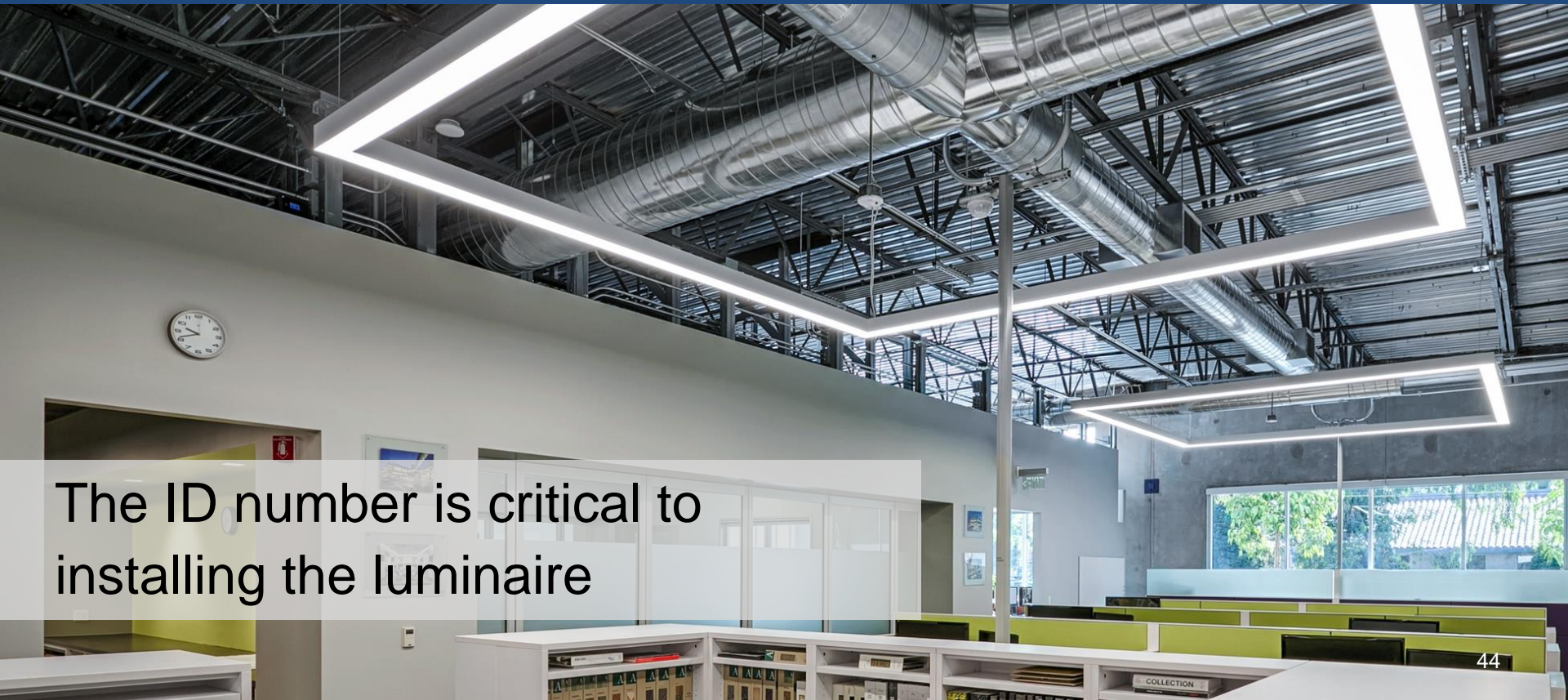
The ID number is critical to shipping

Tailored Lighting Manufacturing



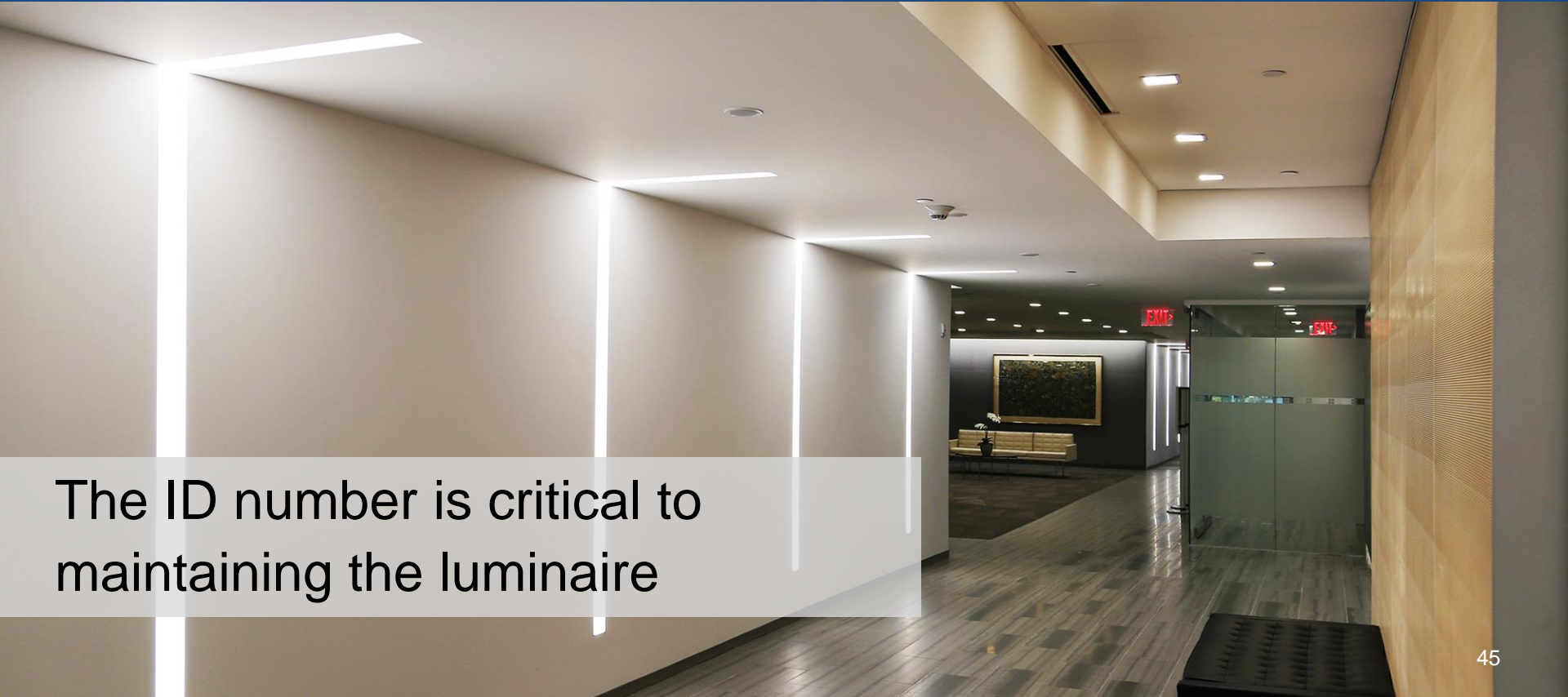
Every luminaire is bagged,
boxed, and shipped

Tailored Lighting Manufacturing



The ID number is critical to installing the luminaire

Tailored Lighting Manufacturing

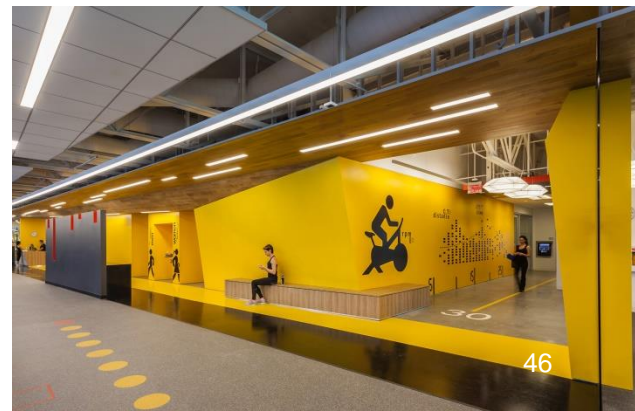
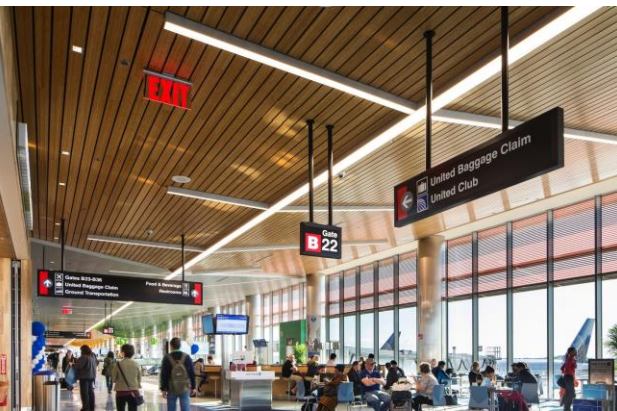


The ID number is critical to maintaining the luminaire

Tailored Lighting Manufacturing



**You Dream.
We Deliver.**





Project: Boston Logan Airport – Terminal B
Architect: AECOM
Lighting Designer: Collaborative Lighting, LLC

EXIT

United Baggage Claim
United Club

Gate
B22

Gates B23-B36
United Baggage Claim
Ground Transportation
Food & Beverage
Restrooms

47



Project: Burlington Coat Factory HQ
Architect: KSS Architects



Project: LinkedIn
Architect: AP+I



Project: Radian Group, Inc.
Architect: Nelson Group



Project: Gensler Offices – Detroit, MI
Architect: Gensler



Project: Extreme Networks
Architect: RMW Architecture & Interiors



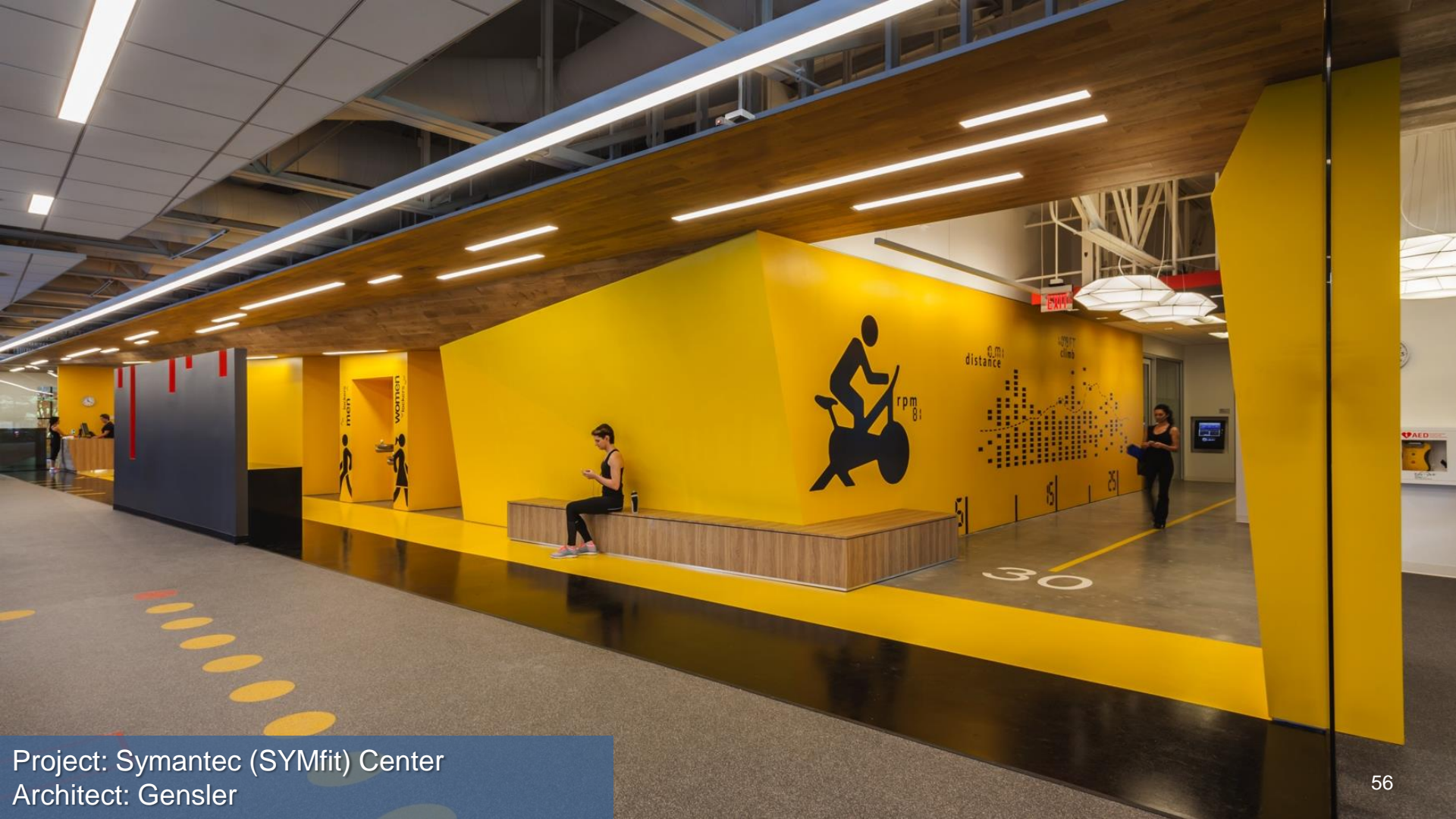
Project: ChildServe Center
Architect: SVPA Architects



Project: Finelite, Inc. Remodel
Better Lighting



Project: Baltimore / Washington International
(BWI) Thurgood Marshall Airport
Architect: The Sheward Partnership, LLC



Project: Symantec (SYMfit) Center
Architect: Gensler

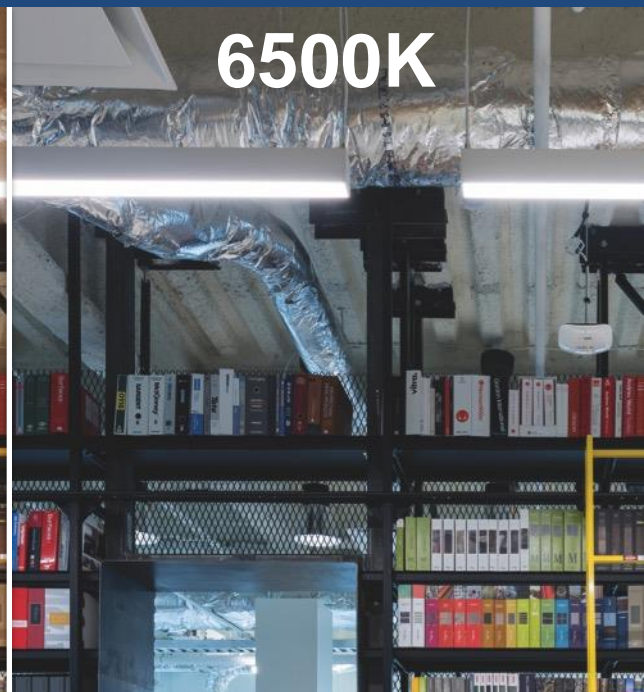


Project: CAS Architects office
Architect: CAS Architects



Project: Solar Turbines – A Caterpillar Company
Architect: Inventure Design Group

Tailored Lighting: White Color Tuning is the Future



Project: Gensler Oakland Offices | **Architect:** Gensler



Two-Source Tunable White Light 6500 CCT



6500K

Two-Source Tunable White Light 6000 CCT



6000K

Two-Source Tunable White Light

5700 CCT



5700K

Two-Source Tunable White Light 5100 CCT



5100K

Two-Source Tunable White Light 4500 CCT



4500K

Two-Source Tunable White Light 4000 CCT



4000K

Two-Source Tunable White Light 3500 CCT



3500K

Two-Source Tunable White Light 2700 CCT



2700K

The Future of the Lighting Industry



- **Wireless Sensors and Controls**
- **Internet of Things (IoT)**
- **Use for Health and Circadian Rhythm Applications**

What matters to customers is value

Finelite LED Difference



- 10-year warranty



- 90% of initial light output for 100,000 hours



- Replaceable LED light array



- Dimming standard

What matters to customers is value

Finelite Commitment



- **10-day shipping on all standard orders**



- **Focus on sustainability**



- **Buy American Act of 2009 Compliant**

Thank You

This concludes our presentation.
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