







R5 Commercial Windows

DOE Project # DE- EE0004012

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DOE Window Technololy Roadmap Meeting

Minneapolis, MN; June 28, 2012



Project Summary

Design & Develop highly-insulating commercial aluminum windows

U-Factor of 0.22 (R5) or less

"AW" NAFS
Structural rating

Advance Framing system

Triple-Glazing units with warm-edge spacer

Manufacturing capability addition with productivity improvements

Focus on product cost reduction

\$2.6M project cost, 50% Cost share (\$1.3M DOE; \$1.3M Traco)

Accelerate product commercialization



Project Scope & Update

Product Design

- Design R5 AL window (Architectural grade)
- Casement/Projected/FX
- Double-Hung, SH/FX
- Double Slider, SS/FX



Glass Line Upgrades



- Triple Glazing (R10) capability
- Glass optimization s/w
- In-line Edge deletion (automation)

R5 Windows

Paintline Upgrades Q4'12

- Low-e coating capability
- Finer application control
- Improved Quality; Safety;Productivity

T/B Line Upgrades Q3'12

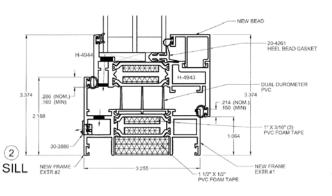
- Assemble Wider T/B
- Productivity benefit (Automation)



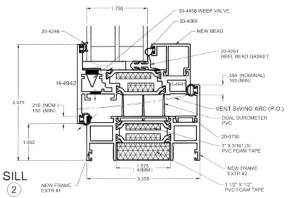
Phase I: Product Development Update

Product	U-Factor (COG U=0.12)	AAMA	Water Resistance	Air Leakage	CR (NFRC)	CRF (AAMA)
In-swing Casement/Projected	0.22	AW-80	15 lbs	<0.01	74	76
Out-swing Casement/Projected	0.22	AW-80	15 lbs	<0.01	74	n/a
Fixed	0.17	AW-80	15 lbs	<0.01	75	78

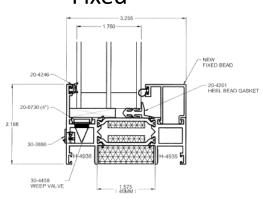
In-swing



Out-swing

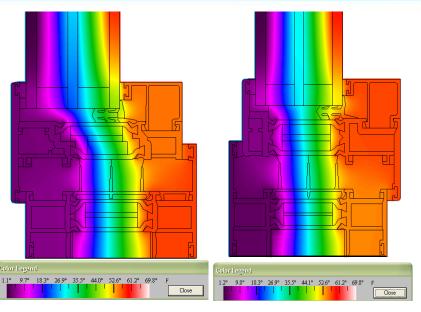


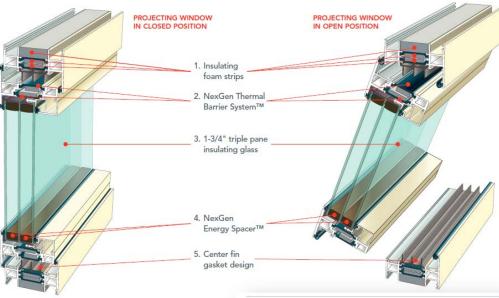
Fixed



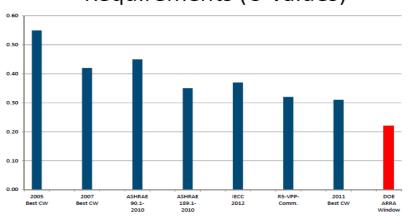


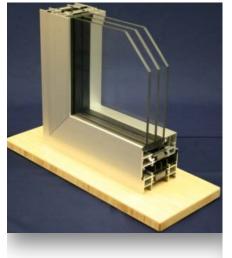
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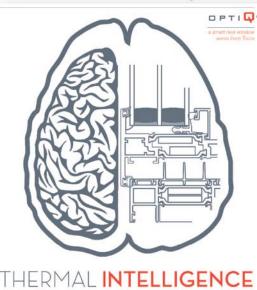




Commercial Window – High Structural Requirements (U Values)









Project Impact

Development of Highly-insulating, High-structural Windows

Series of window products with R5 and AW ratings

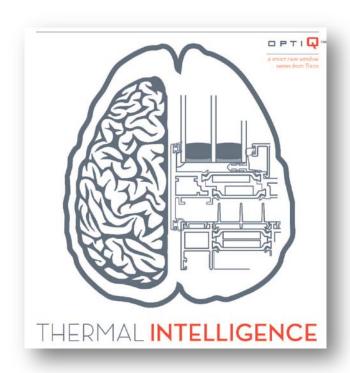
Excellent Condensation resistance, Thermal comfort

Immediate product commercialization

Building design opportunities, WWR dynamics change

A step closer to NZEB





Thank You!

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