

NEON ENERGY COMPUTER SIMULATION REPORT

SCOPE OF WORK

ULTRA CURTAIN WALL - NFRC 100/200/500

REPORT NUMBER

P2843.01-116-45 R1

TEST DATE

11/21/22

ISSUE DATE

11/21/22

REVISION DATE

03/14/23

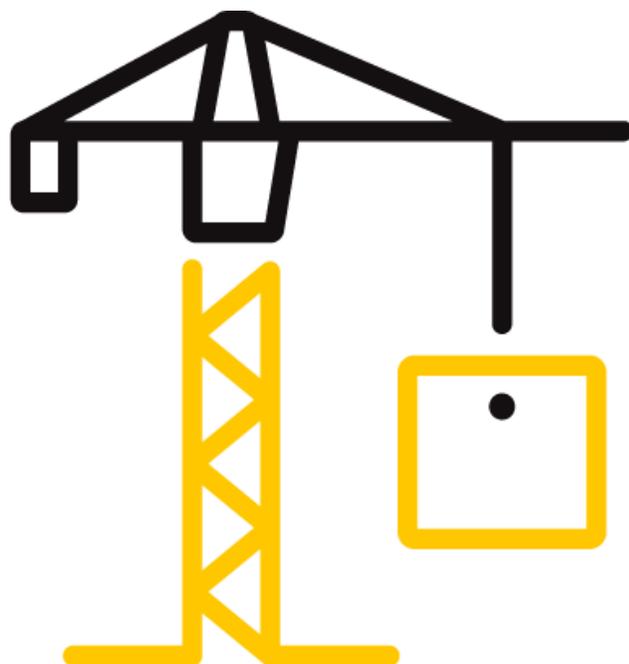
PAGES

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DOCUMENT CONTROL NUMBER

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TEST REPORT FOR NEON ENERGY

Report No: P2843.01-116-45 R1

Date: 03/14/23

REPORT ISSUED TO

NEON ENERGY

23 Corporate Plaza

Suite 150

Newport Beach, California 92660

SECTION 1

SUMMARY

SERIES/MODEL: Ultra Curtain Wall

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted to perform U-Factor, Solar Heat Gain Coefficient, Visible Transmittance and Condensation Resistance simulations in accordance with the National Fenestration Rating Council (NFRC).

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends five years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

FOR INTERTEK B&C:

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SIGNATURE:
DATE: 03/14/23

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MMY:mmy

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SECTION 2

TEST METHODS

The products were evaluated in accordance with the following:

ANSI/NFRC 100-2020, Procedure for Determining Fenestration Product U-Factors

ANSI/NFRC 200-2020, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

NFRC 500-2017, Procedure for Determining Fenestration Product Condensation Resistance Values

**Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation, and the thermal bridging that may occur due to the specific design and construction of the fenestration system opening.*

Ratings values included in this report are for submittals to an NFRC-licensed IA and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certificate of Authorization (CA) by an NFRC accredited Inspection Agency (IA) are to be used for labeling purposes. The ratings values were rounded in accordance with NFRC 601, NFRC Unit and Measurement Policy.

Intertek B&C is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications. The values included in this report are not considered in compliance with ANSI/NFRC 100, ANSI/NFRC 200, and/or NFRC 500 unless the associated validation test requirements have been satisfied, as applicable.

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SECTION 3

TEST PROCEDURE

The total product, including specific frame, spacer, and glass details, was modeled using NFRC approved software.

| | |
|-----------------------------------|---------------|
| FRAME AND EDGE MODELING | THERM 7.4.4 |
| CENTER-OF-GLASS MODELING | WINDOW 7.4.14 |
| TOTAL PRODUCT CALCULATIONS | WINDOW 7.4.14 |
| SPECTRAL DATA LIBRARY | IGDB 90.0 |

Modeling Assumptions / Technical Interpretations

Any modeling assumptions and technical interpretations required to model this product are listed below.

- 1) To prevent air infiltration, tape was applied to all interior sash crack locations.
- 2) The anodized and painted aluminum finishes were grouped per ANSI/NFRC 100-2020, Section 4.2.1.L. The painted finish is the group leader.

SECTION 4

SIMULATION SPECIMEN DESCRIPTION

| | |
|-----------------------|---|
| SERIES/MODEL | Ultra Curtain Wall |
| PRODUCT TYPE | Curtain Wall |
| FRAME MATERIAL | AT - Aluminum w/ Thermal Breaks - All Members |
| SASH MATERIAL | NA - Not Applicable |
| STANDARD SIZE | 2000mm x 2000mm |

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SECTION 4 (Continued)

SIMULATION SPECIMEN DESCRIPTION

| SPACER OPTIONS | | | |
|--------------------------|---------------------|-----------------------|-------------|
| TYPE | PRIMARY SEAL | SECONDARY SEAL | CODE |
| Aluminum Spacer | Butyl Rubber | Butyl Rubber | A1-D |
| Thermix TX.N Plus Spacer | Butyl Rubber | Silicone | TS-D |

| GRID OPTIONS | | |
|---------------------|------------------|---------------------|
| GRID SIZE | GRID TYPE | GRID PATTERN |
| None | - | - |

| REINFORCEMENT OPTIONS | |
|------------------------------|-----------------|
| LOCATION | MATERIAL |
| None | - |

| GAS FILLING TECHNIQUE | |
|------------------------------|-------------------------------------|
| FILL TYPE | METHOD |
| 90% Argon | Two-probe with concentration sensor |

| EDGE-OF-GLASS CONSTRUCTION | |
|-----------------------------------|--|
| INTERIOR CONDITION | EPDM gasket between glass and glazing bead |
| EXTERIOR CONDITION | EPDM gasket between glass and aluminum frame |

| WEATHERSTRIPPING | | |
|-------------------------|-----------------|-----------------|
| TYPE | QUANTITY | LOCATION |
| None | - | - |

| FRAME/SASH MATERIALS FINISH | |
|------------------------------------|--------------------------------|
| INTERIOR | Aluminum - Painted or Anodized |
| EXTERIOR | Aluminum - Painted or Anodized |

| VALIDATION MATRIX* | |
|---------------------------|----------------------|
| PRODUCT LINE | REPORT NUMBER |
| None | - |

**These products are part of a validation matrix. Only one is required for validation testing.*

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SPECIALTY PRODUCTS TABLE

The specialty products method allows the manufacturer to determine the overall product SHGC and VT for any glazing option. The center of glass SHGC and/or VT must be determined using WINDOW 7.4.14. The method calculates overall product SHGC and VT indexed on center of glass properties. All values used in the calculations are truncated to six decimal place precision.

| | No Dividers | Dividers < 1 | Dividers > 1 |
|--------------|-------------|--------------|--------------|
| SHGC0 | 0.006543 | 0.010031 | 0.013303 |
| SHGC1 | 0.918343 | 0.815940 | 0.719855 |
| VT0 | 0.000000 | 0.000000 | 0.000000 |
| VT1 | 0.911800 | 0.805910 | 0.706551 |

$$SHGC = SHGC0 + SHGCc (SHGC1 - SHGC0)$$

$$VT = VT0 + VTc (VT1 - VT0)$$

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SECTION 6

SIMULATION RESULTS

| TOTAL PRODUCT CALCULATIONS (Ultra Curtain Wall) | | | | | | | | | | | | |
|---|--|------------------|-----------------------|--|-----------------------|------------------|-----------------------|--|-----------------------|------------------------------|--------|-----------|
| Option Number | Pane Thickness 1 (in) | Gap Width 1 (in) | Pane Thickness 2 (in) | Gap Width 2 (in) | Pane Thickness 3 (in) | Gap Width 3 (in) | Pane Thickness 4 (in) | Gap Fill | Low-e (Surface #) | Tint | Spacer | Grid Type |
| | U-Factor (Btu/Hr-Ft ² -F) | | | Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1) | | | | Visible Transmittance (VT) Grids (None / <1 / >=1) | | Condensation Resistance (CR) | | |
| 1 | SNX50/ARG90/CLR (6MM/5MM) - 27MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.191 | | | | | ARG90 | 0.027(#2) | CL | A1-D | N |
| | U-Factor 0.36 | | | SHGC(N) 0.21 | | | | VT(N) 0.45 | | CR 56 | | |
| 2 | SNX60/ARG90/CLR (6MM/5MM) - 27MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.191 | | | | | ARG90 | 0.026(#2) | CL | A1-D | N |
| | U-Factor 0.36 | | | SHGC(N) 0.25 | | | | VT(N) 0.54 | | CR 56 | | |
| 3 | SN4023/ARG90/CLR (6MM/5MM) - 27MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.191 | | | | | ARG90 | 0.026(#2) | CL | A1-D | N |
| | U-Factor 0.36 | | | SHGC(N) 0.21 | | | | VT(N) 0.36 | | CR 56 | | |
| 4 | SN7037/ARG90/CLR (6MM/6MM) - 28MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.230 | | | | | ARG90 | 0.022(#2) | CL | A1-D | N |
| | U-Factor 0.36 | | | SHGC(N) 0.32 | | | | VT(N) 0.63 | | CR 53 | | |
| 5 | SN7037/ARG90/CLR (6MM/5MM) - 27MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.191 | | | | | ARG90 | 0.022(#2) | CL | A1-D | N |
| | U-Factor 0.36 | | | SHGC(N) 0.32 | | | | VT(N) 0.64 | | CR 56 | | |
| 6 | SNX50/ARG90/CG-Dry (6MM/5MM) - 27MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.191 | | | | | ARG90 | 0.027(#2) / 0.200(#4) | CL | TS-D | N |
| | U-Factor 0.30 | | | SHGC(N) 0.20 | | | | VT(N) 0.44 | | CR 51 | | |
| 7 | SNX50/ARG90/CG-Premium2T (6MM/6MM) - 28MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.230 | | | | | ARG90 | 0.027(#2) / 0.041(#3) | CL | TS-D | N |
| | U-Factor 0.33 | | | SHGC(N) 0.21 | | | | VT(N) 0.44 | | CR 60 | | |
| 8 | SNX60/ARG90/CG-Dry (6MM/5MM) - 27MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.191 | | | | | ARG90 | 0.026(#2) / 0.200(#4) | CL | TS-D | N |
| | U-Factor 0.30 | | | SHGC(N) 0.24 | | | | VT(N) 0.53 | | CR 51 | | |
| 9 | SNX60/ARG90/CG-Premium2T (6MM/6MM) - 28MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.230 | | | | | ARG90 | 0.026(#2) / 0.041(#3) | CL | TS-D | N |
| | U-Factor 0.33 | | | SHGC(N) 0.25 | | | | VT(N) 0.53 | | CR 60 | | |
| 10 | SN4023/ARG90/CG-Dry (6MM/5MM) - 27MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.191 | | | | | ARG90 | 0.026(#2) / 0.200(#4) | CL | TS-D | N |
| | U-Factor 0.30 | | | SHGC(N) 0.20 | | | | VT(N) 0.35 | | CR 51 | | |

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SECTION 6 (Continued)

SIMULATION RESULTS

| TOTAL PRODUCT CALCULATIONS (Ultra Curtain Wall) | | | | | | | | | | | | |
|---|--|------------------|-----------------------|--|-----------------------|------------------|-----------------------|--|-----------------------|------------------------------|--------|-----------|
| Option Number | Pane Thickness 1 (in) | Gap Width 1 (in) | Pane Thickness 2 (in) | Gap Width 2 (in) | Pane Thickness 3 (in) | Gap Width 3 (in) | Pane Thickness 4 (in) | Gap Fill | Low-e (Surface #) | Tint | Spacer | Grid Type |
| | U-Factor (Btu/Hr-Ft ² -F) | | | Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1) | | | | Visible Transmittance (VT) Grids (None / <1 / >=1) | | Condensation Resistance (CR) | | |
| 11 | SN4023/ARG90/CG-Premium2T (6MM/6MM) - 28MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.230 | | | | | ARG90 | 0.026(#2) / 0.041(#3) | CL | TS-D | N |
| | U-Factor 0.33 | | | SHGC(N) 0.20 | | | | VT(N) 0.35 | | CR 60 | | |
| 12 | SN51/ARG90/CG-Dry (6MM/5MM) - 27MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.191 | | | | | ARG90 | 0.026(#2) / 0.200(#4) | CL | TS-D | N |
| | U-Factor 0.30 | | | SHGC(N) 0.23 | | | | VT(N) 0.45 | | CR 51 | | |
| 13 | SN51/ARG90/CG-Premium2T (6MM/6MM) - 28MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.230 | | | | | ARG90 | 0.026(#2) / 0.041(#3) | CL | TS-D | N |
| | U-Factor 0.33 | | | SHGC(N) 0.24 | | | | VT(N) 0.45 | | CR 60 | | |
| 14 | SN7037/ARG90/CG-Dry (6MM/6MM) - 28MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.230 | | | | | ARG90 | 0.022(#2) / 0.200(#4) | CL | TS-D | N |
| | U-Factor 0.30 | | | SHGC(N) 0.31 | | | | VT(N) 0.62 | | CR 52 | | |
| 15 | SN7037/ARG90/CG-Premium2T (6MM/6MM) - 28MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.230 | | | | | ARG90 | 0.022(#2) / 0.041(#3) | CL | TS-D | N |
| | U-Factor 0.33 | | | SHGC(N) 0.32 | | | | VT(N) 0.62 | | CR 60 | | |
| 16 | SN7037/ARG90/CG-Dry (6MM/5MM) - 27MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.191 | | | | | ARG90 | 0.022(#2) / 0.200(#4) | CL | TS-D | N |
| | U-Factor 0.30 | | | SHGC(N) 0.31 | | | | VT(N) 0.62 | | CR 51 | | |
| 17 | SN7037/ARG90/CG-Premium2T (6MM/4MM) - 26MM IG | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.151 | | | | | ARG90 | 0.022(#2) / 0.041(#3) | CL | TS-D | N |
| | U-Factor 0.34 | | | SHGC(N) 0.32 | | | | VT(N) 0.63 | | CR 60 | | |
| 18 | SN7037/ARG90/CLR/ARG90/CGPremium2T (6MM/5MM/6MM) - 39MM IG | | | | | | | | | | | |
| | 0.230 | 0.394 | 0.191 | 0.472 | 0.230 | | | ARG90 | 0.022(#2) / 0.041(#5) | CL | TS-D | N |
| | U-Factor 0.21 | | | SHGC(N) 0.29 | | | | VT(N) 0.57 | | CR 72 | | |
| 19 | SNX60/ARG90/CLR/ARG90/CGPremium2T (6MM/5MM/6MM) - 39MM IG | | | | | | | | | | | |
| | 0.230 | 0.394 | 0.191 | 0.472 | 0.230 | | | ARG90 | 0.026(#2) / 0.041(#5) | CL | TS-D | N |
| | U-Factor 0.21 | | | SHGC(N) 0.23 | | | | VT(N) 0.48 | | CR 72 | | |
| 20 | SNX60/ARG90/CLR/ARG90/CGPremium2T (6MM/4MM/4MM) - 36MM IG | | | | | | | | | | | |
| | 0.230 | 0.394 | 0.151 | 0.472 | 0.151 | | | ARG90 | 0.026(#2) / 0.041(#5) | CL | TS-D | N |
| | U-Factor 0.22 | | | SHGC(N) 0.23 | | | | VT(N) 0.49 | | CR 72 | | |

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SIMULATION RESULTS

| TOTAL PRODUCT CALCULATIONS (Ultra Curtain Wall) | | | | | | | | | | | | | | |
|---|---|------------------|--|------------------|-----------------------|------------------|--|----------|------------------------------------|------|--------|-----------|--|----|
| Option Number | Pane Thickness 1 (in) | Gap Width 1 (in) | Pane Thickness 2 (in) | Gap Width 2 (in) | Pane Thickness 3 (in) | Gap Width 3 (in) | Pane Thickness 4 (in) | Gap Fill | Low-e (Surface #) | Tint | Spacer | Grid Type | | |
| | U-Factor (Btu/Hr-Ft ² -F) | | Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1) | | | | Visible Transmittance (VT) Grids (None / <1 / >=1) | | Condensation Resistance (CR) | | | | | |
| 21 | SN7037/ARG90/CLR-LAMI (6MM/5MM 0,38PVB 5MM) - 32MM IG | | | | | | | | | | | | | |
| | 0.230 | 0.630 | 0.379 | | | | | ARG90 | 0.022(#2) | CL | TS-D | N | | |
| | U-Factor | | 0.33 | SHGC(N) | | | | 0.32 | VT(N) | | 0.62 | CR | | 60 |



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SECTION 7

DRAWINGS / BILL OF MATERIALS

The drawings which follow have been reviewed by Intertek B&C and are representative of the simulation results reported herein. Any deviations are documented herein or on the drawings.

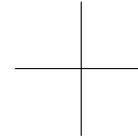
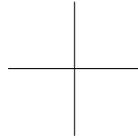


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2000mm



2000mm

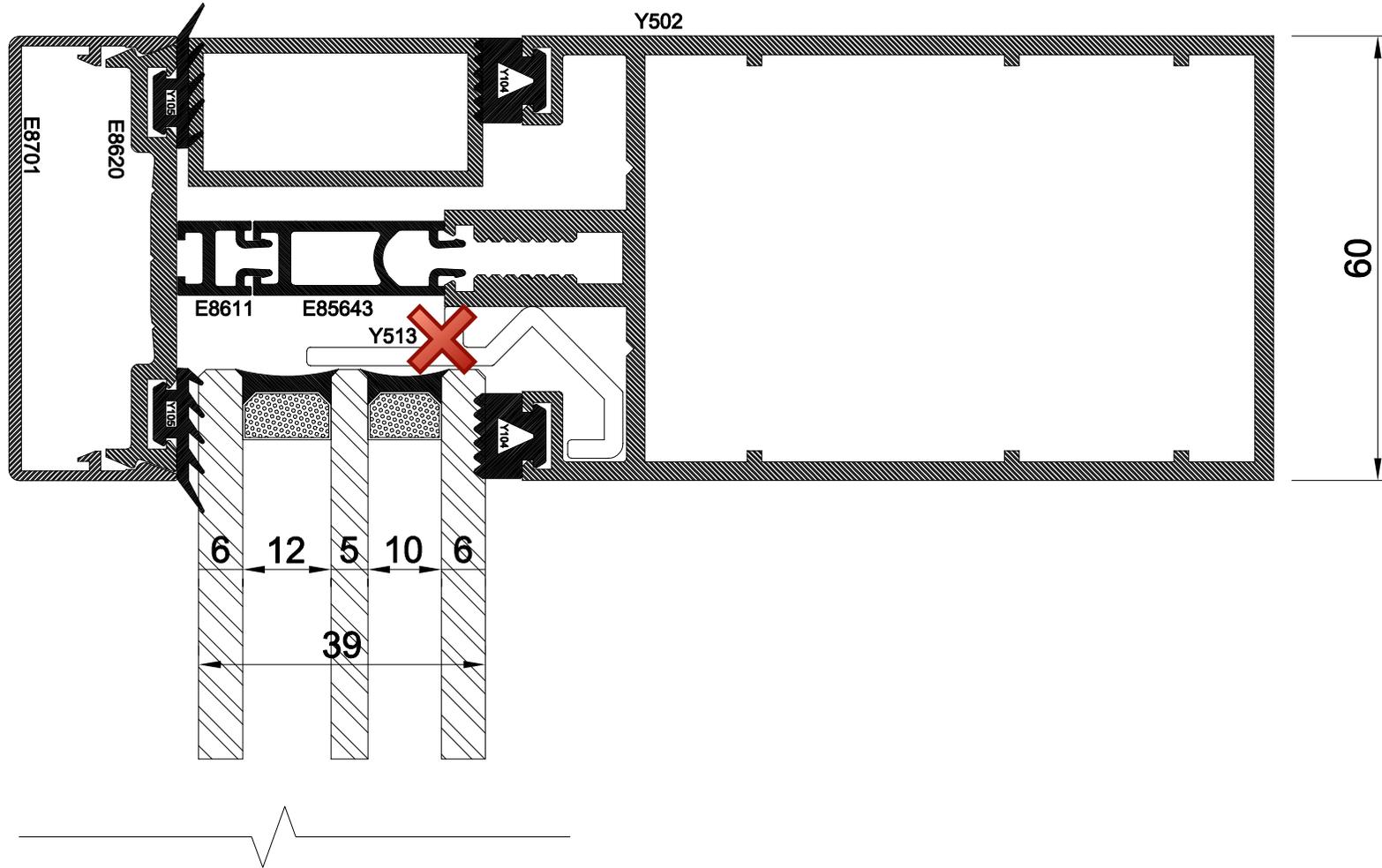


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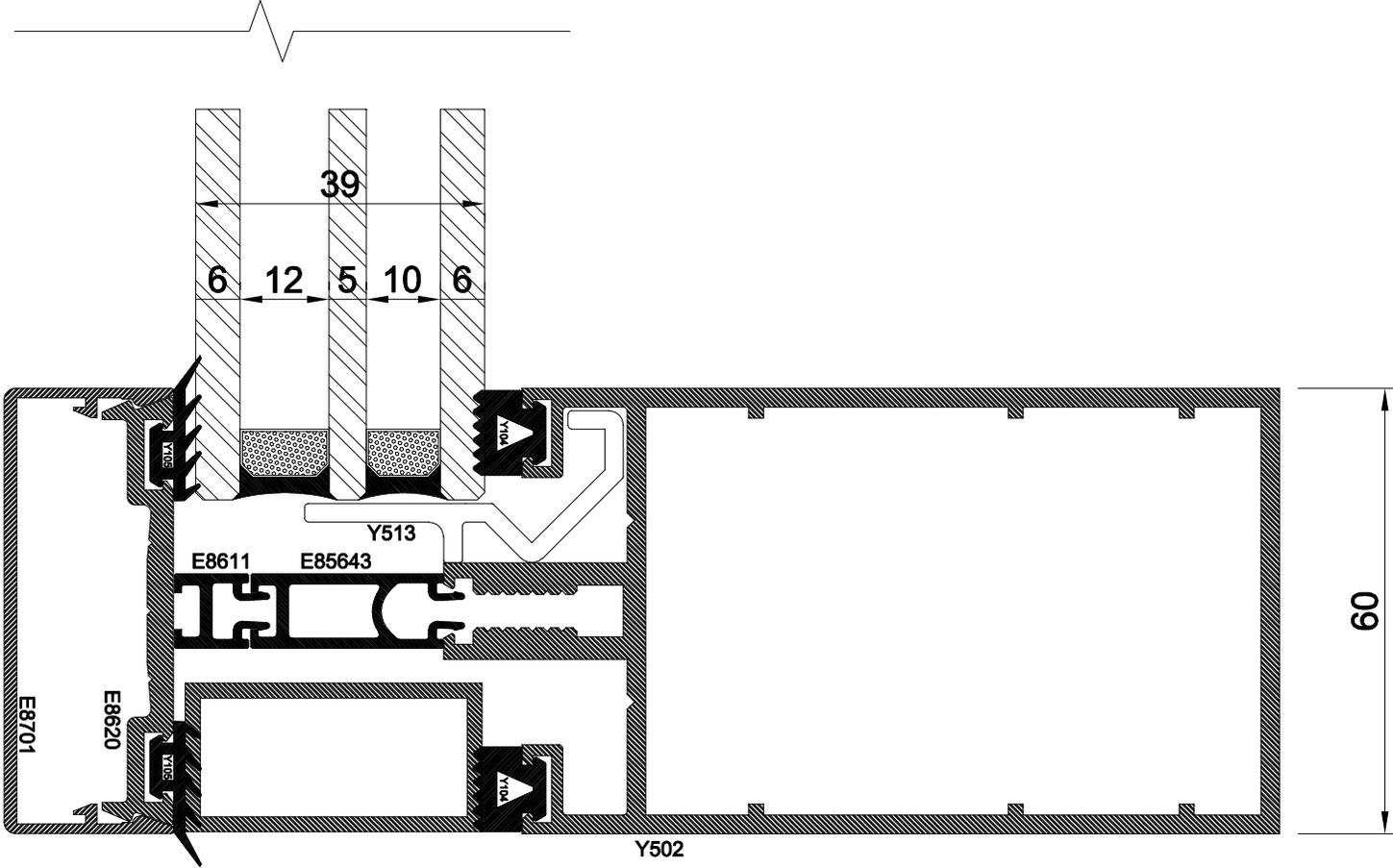
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Head Assembly



Sill Assembly



60

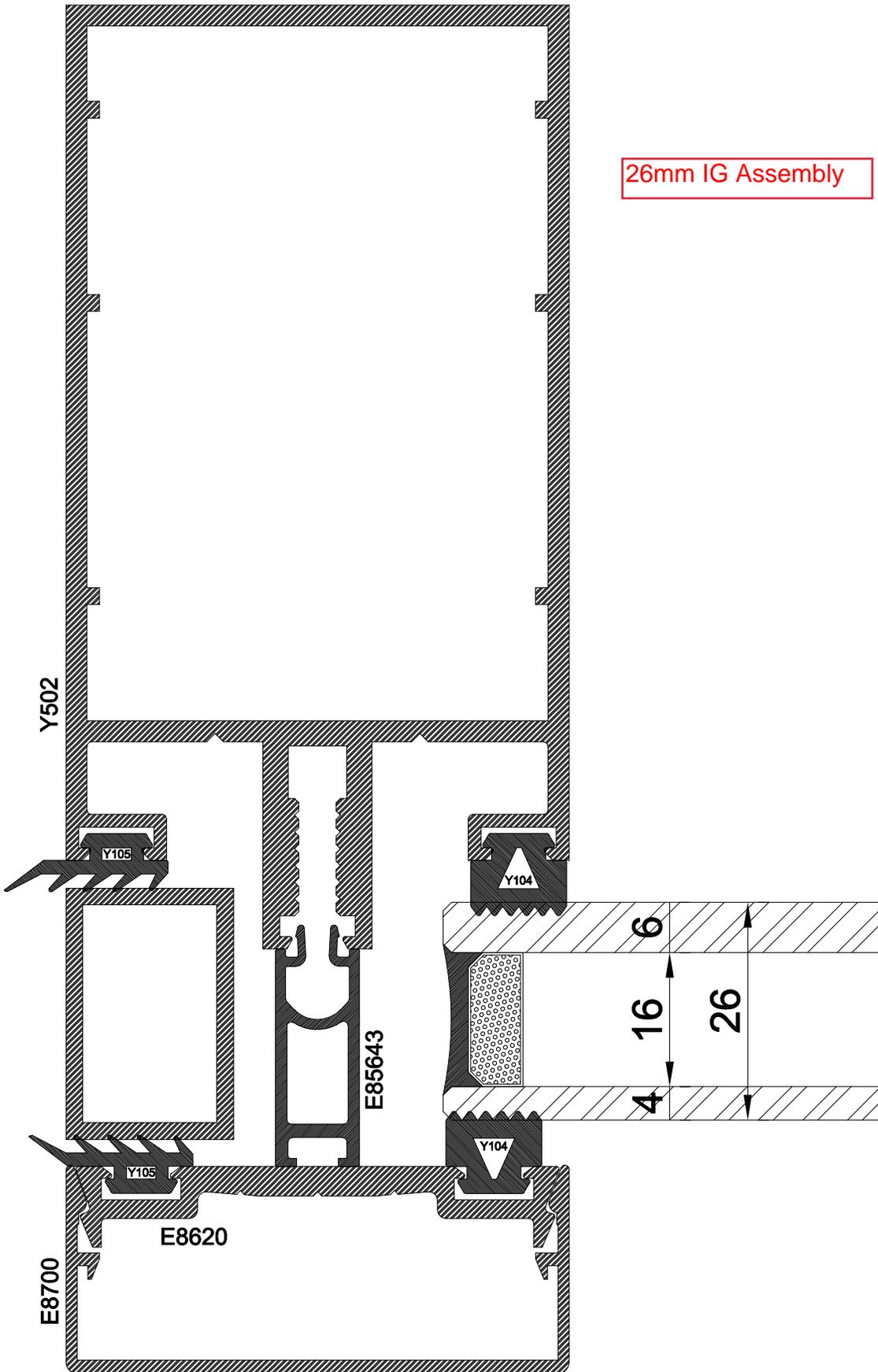


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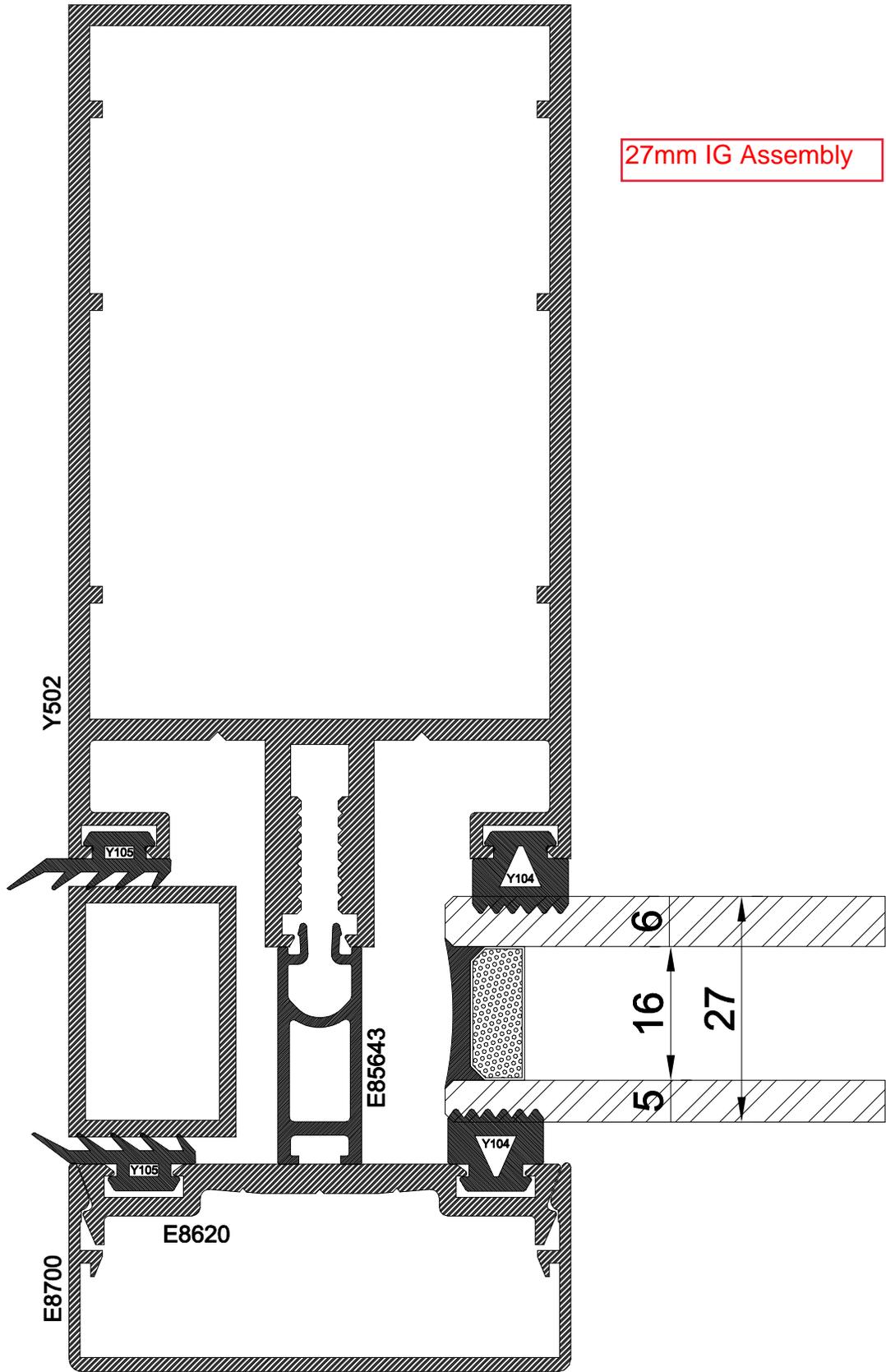
26mm IG Assembly





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27mm IG Assembly

60

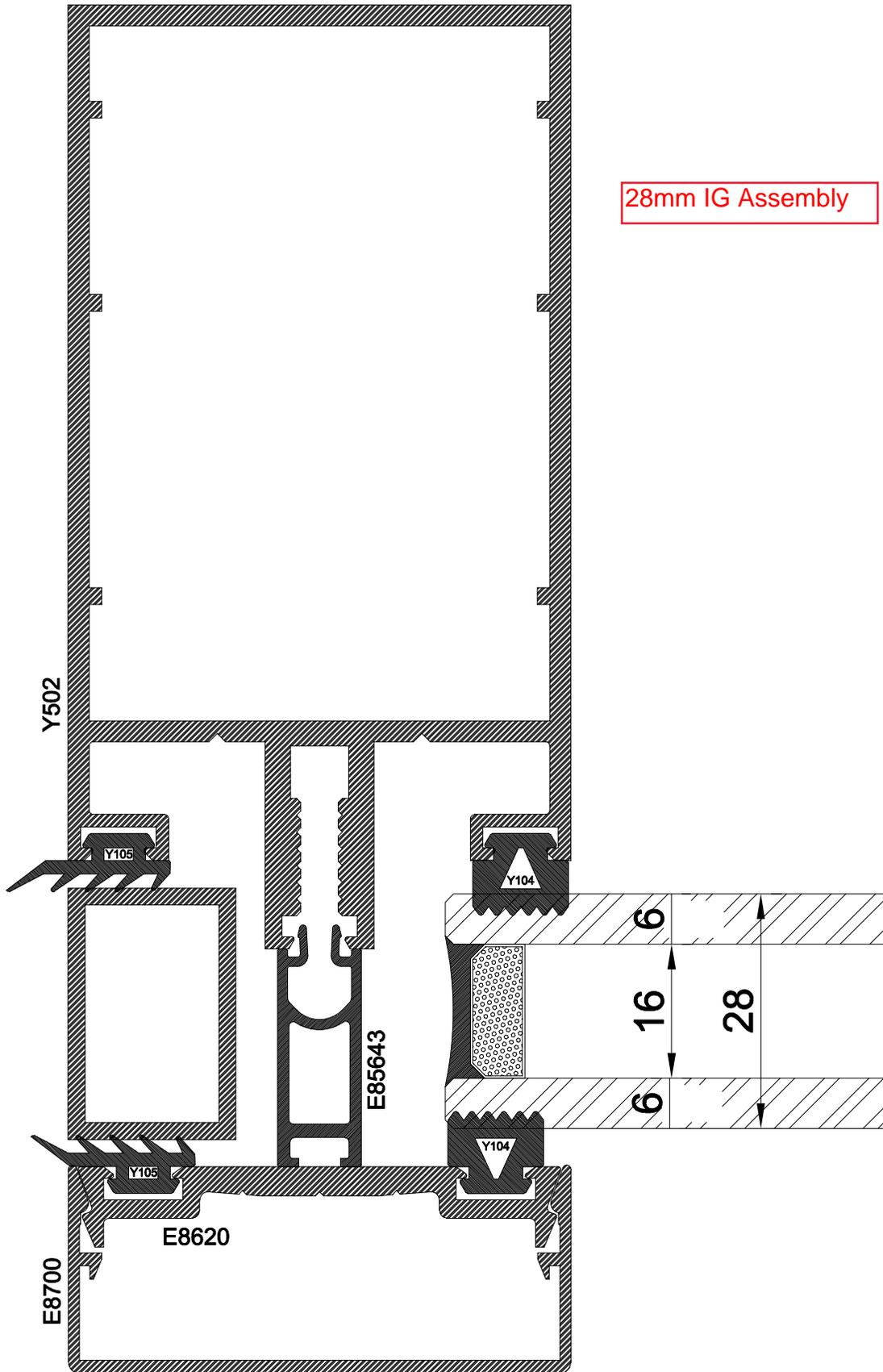


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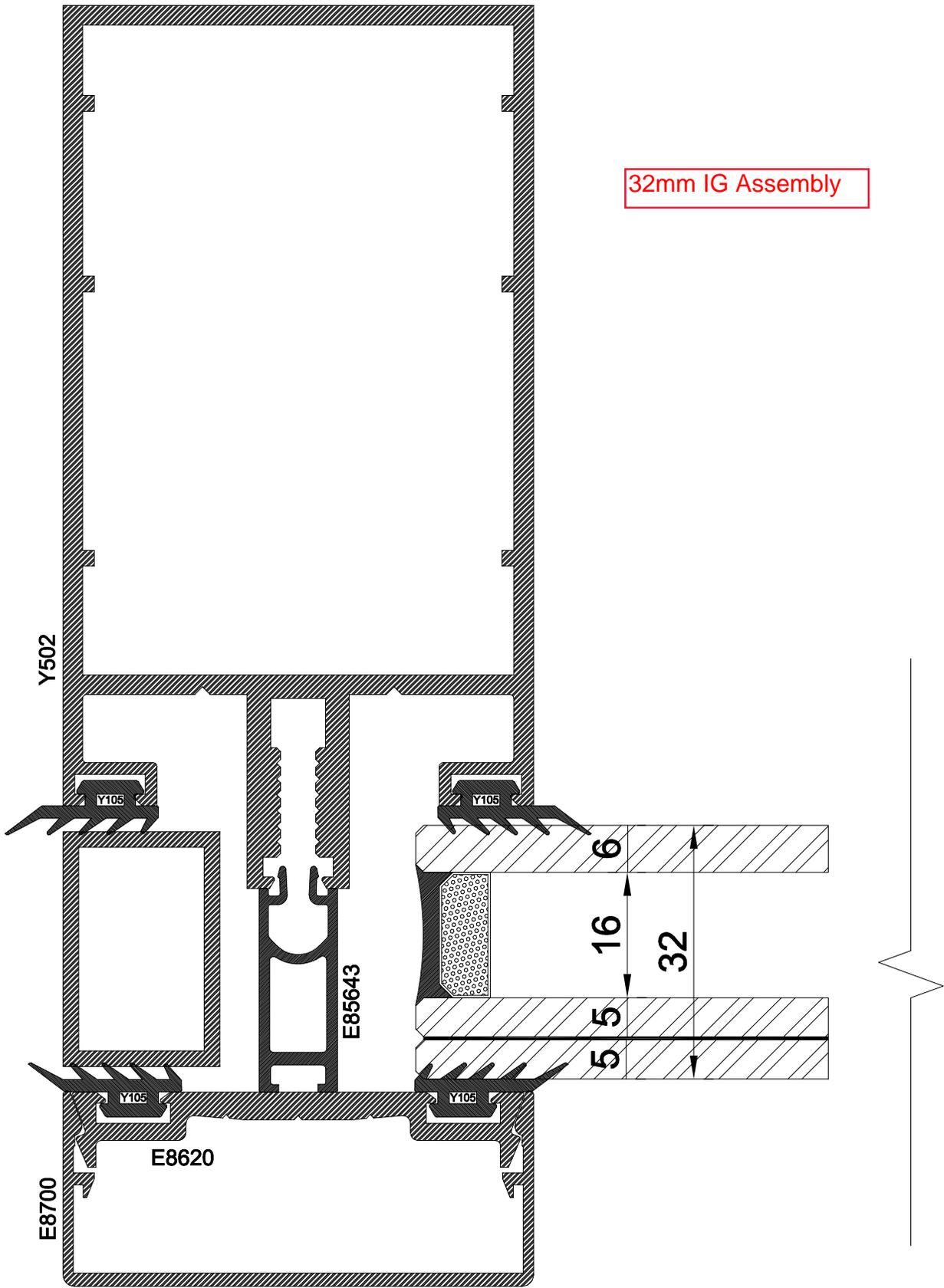
28mm IG Assembly

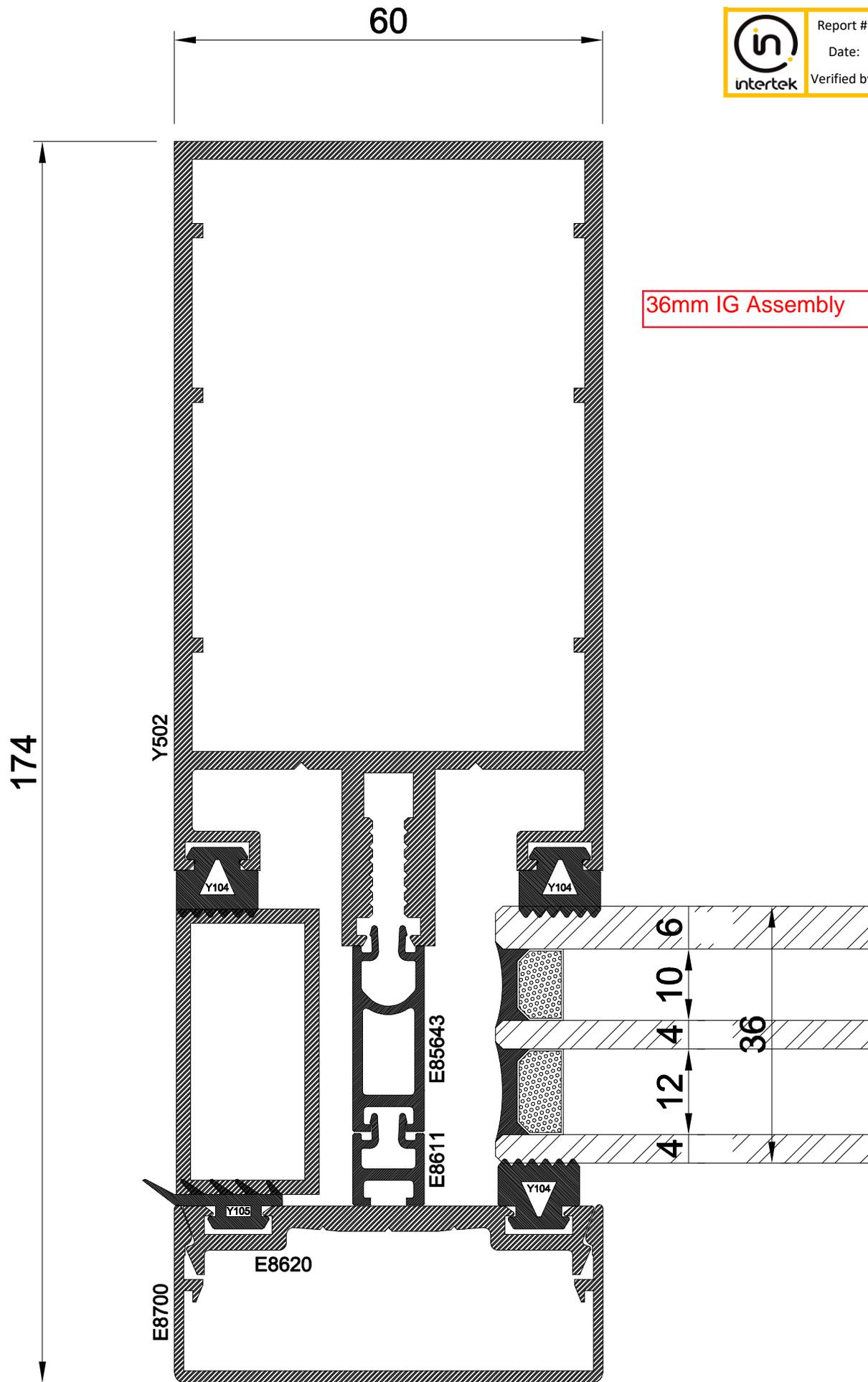


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32mm IG Assembly





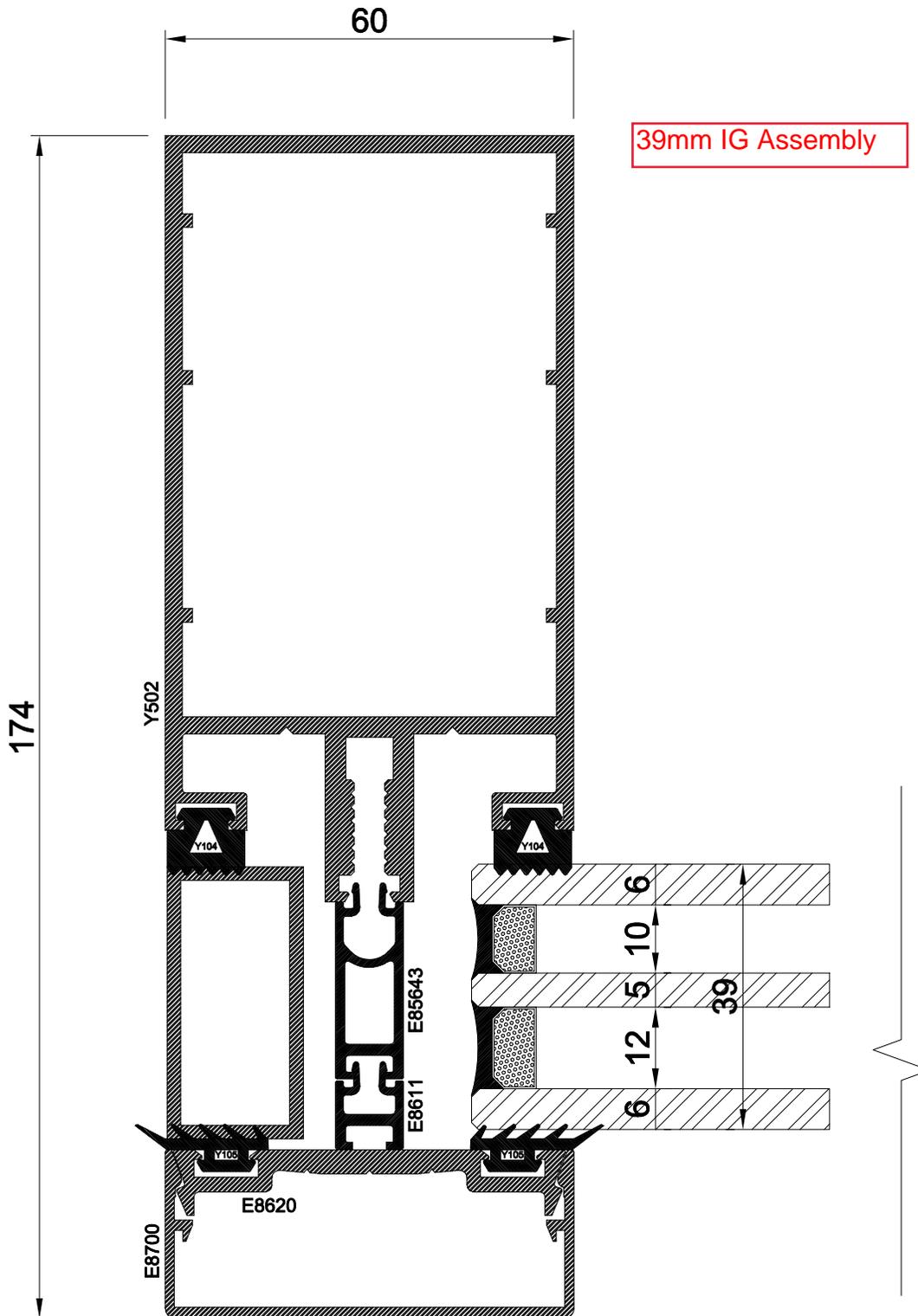
36mm IG Assembly



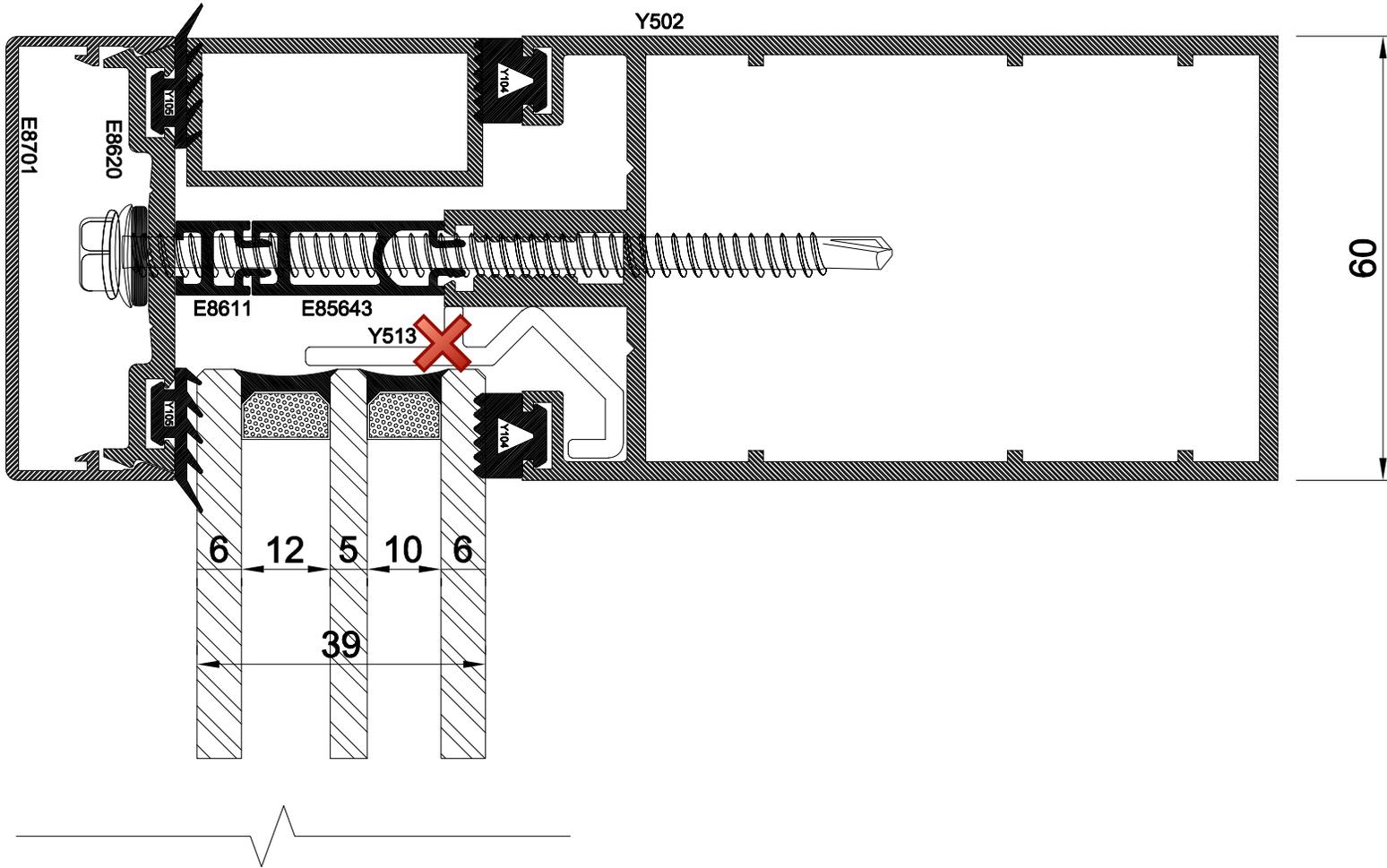
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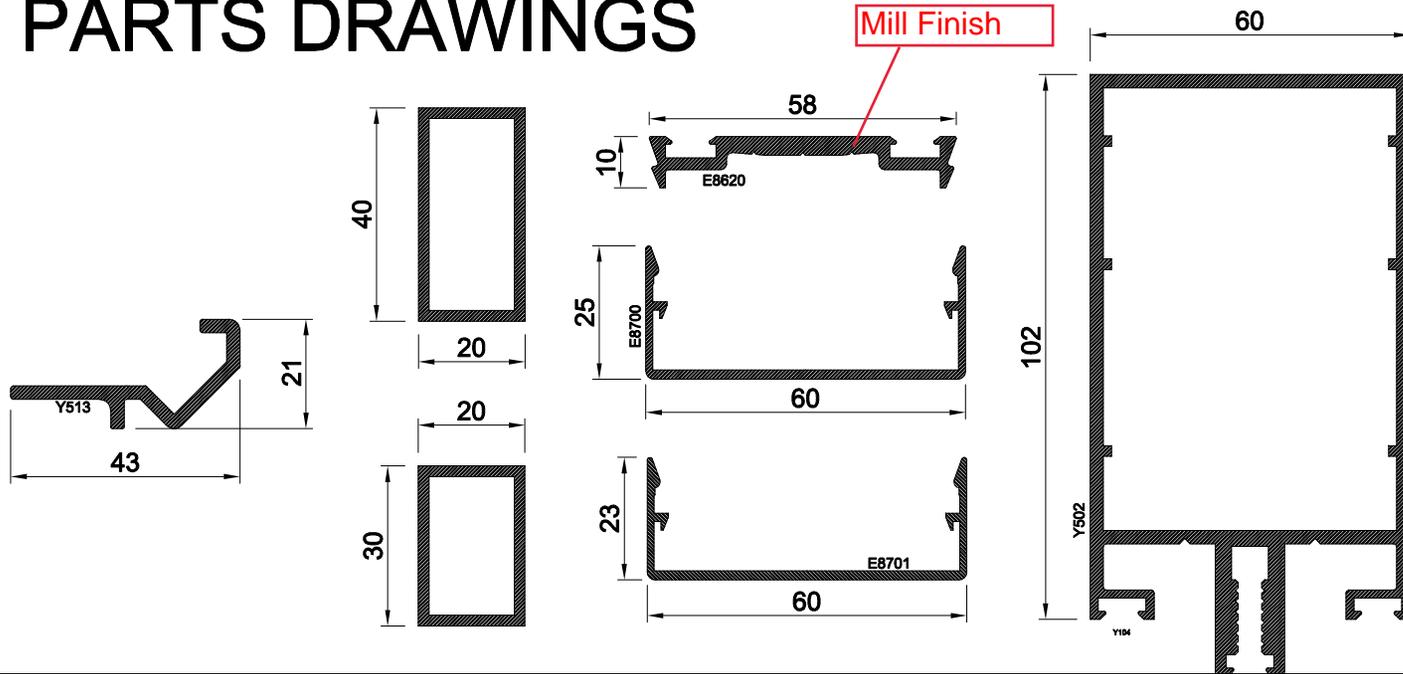
Verified by: *Megan M. Young*



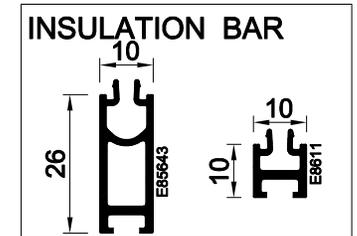
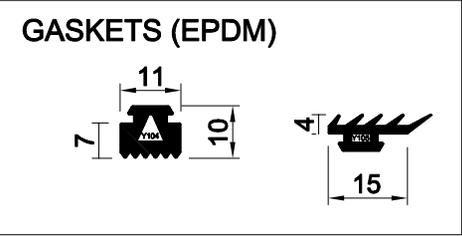
Assembly with Bolt



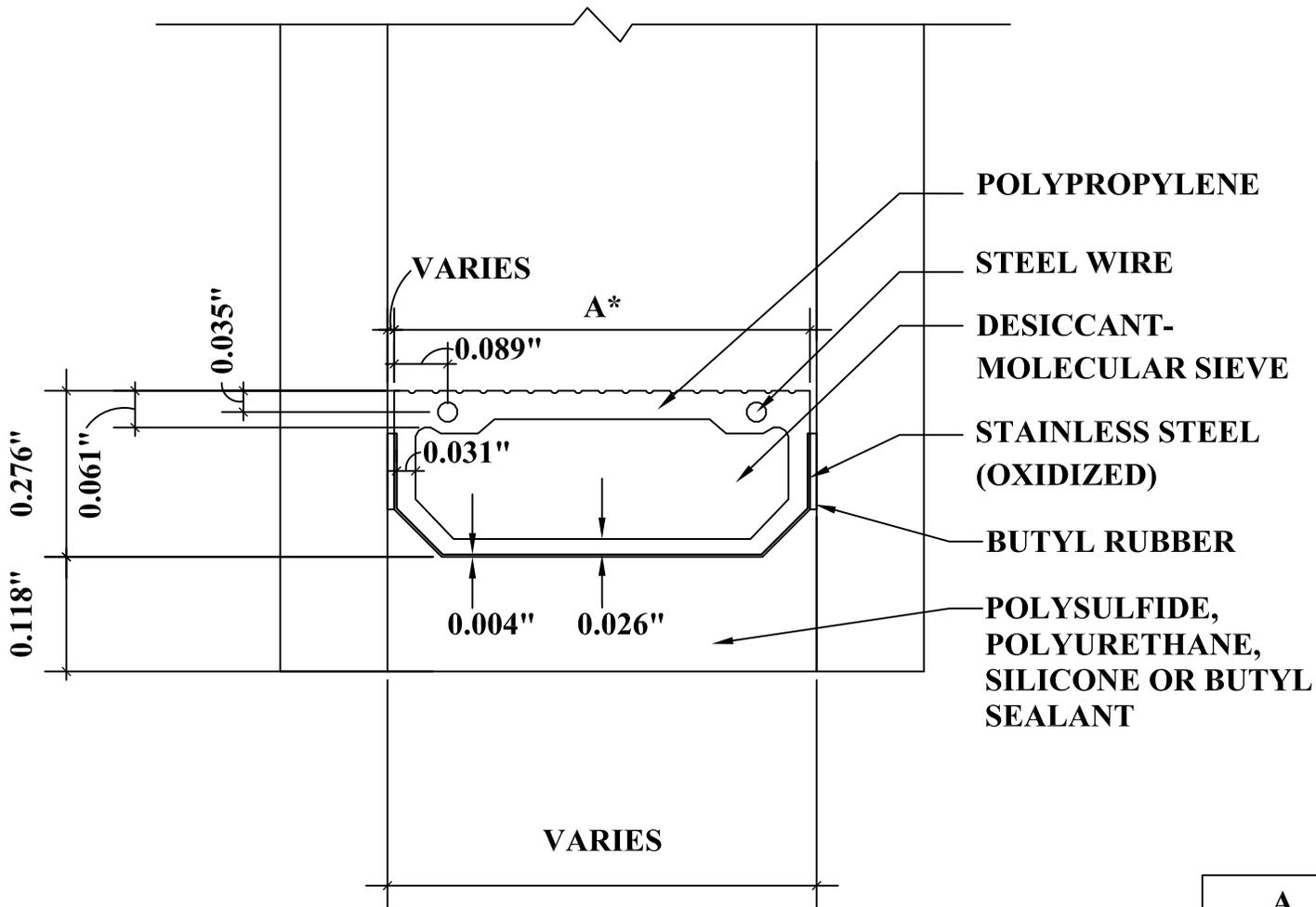
PARTS DRAWINGS



Material = Anodized or Painted Aluminum



Material = Polyamide



DETAIL FOR THERMAL MODELING OF
ENSINGER THERMIX TX.N PLUS SPACER (TS-D)

***SPACER AVAILABLE IN 10 SIZES.**

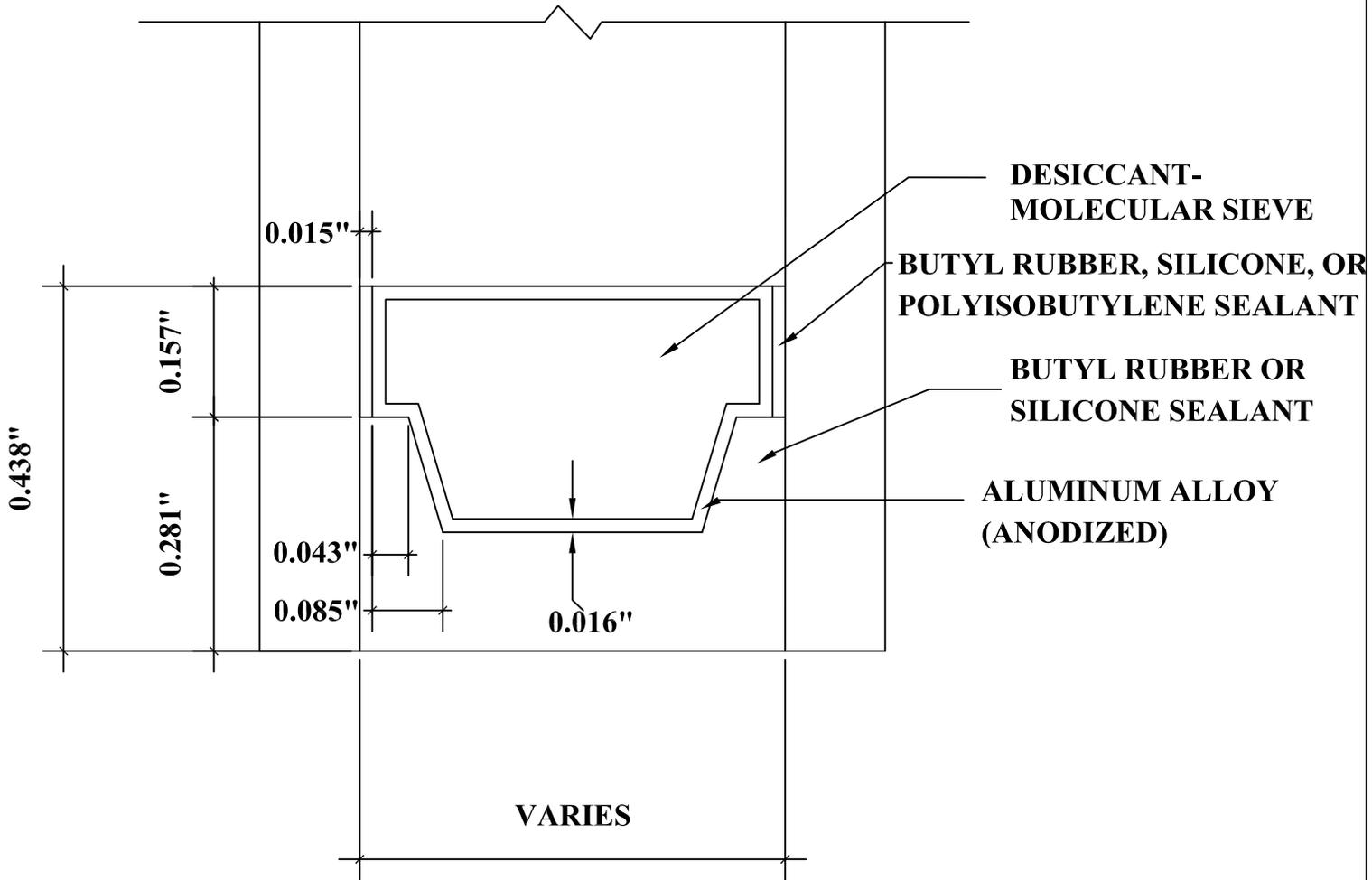
| A |
|--------|
| 0.945" |
| 0.866" |
| 0.787" |
| 0.709" |
| 0.630" |
| 0.591" |
| 0.551" |
| 0.472" |
| 0.394" |
| 0.315" |



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DETAIL FOR THERMAL MODELING OF ALUMINUM SPACER (A1-D)

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SECTION 8

REVISION LOG

| REVISION # | DATE | PAGES | REVISION |
|------------|----------|-------|--|
| .01R0 | 11/21/22 | All | Original report issued to Neon Energy |
| .01R1 | 03/14/23 | All | Fixed all models with mill presure plate and updated results |