

Estate Casement	Size Tested			NAFS Ratings			
	38" x 78"			AAMA/WDMA/CSA/1.S.2-/A440-08: CW-PG55-C			
	32" x 63"			AAMA/WDMA/CSA/1.S.2-/A440-08: CW-PG70-C			
Glass Option	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	18	2.3	0.41	0.51	0.53	44	
Clear w Grills	15	2.3	0.41	0.46	0.47	44	
LoE/Argon	31	1.6	0.28	0.46	0.52	58	N
LoE/Argon w Grills	28	1.6	0.28	0.41	0.47	58	N
Energlass	33	1.5	0.27	0.46	0.52	60	N
Energlass w Grills	30	1.5	0.27	0.41	0.47	60	N
LoE/Argon-LSG	21	1.5	0.27	0.25	0.45	59	N, NC, SC, S
LoE/Argon-LSG w Grills	19	1.5	0.27	0.23	0.41	59	N, NC, SC, S
Energlass-LSG	22	1.5	0.26	0.25	0.45	61	N, NC, SC, S
Energlass-LSG w Grills	20	1.5	0.26	0.23	0.41	61	N, NC, SC, S
Triple	30	1.7	0.29	0.46	0.48	61	N
Triple w Grills	28	1.7	0.29	0.42	0.43	61	N
Triple LoE/Argon x 1	36	1.3	0.22	0.41	0.47	70	N
Triple LoE/Argon x 1 w Grills	34	1.3	0.22	0.37	0.43	70	N, NC
Triple LoE/Argon x 1 LSG	27	1.2	0.21	0.23	0.41	70	N, NC, SC, S
Triple LoE/Argon x 1 LSG w Grills	26	1.2	0.21	0.21	0.37	70	N, NC, SC, S
Energlass Plus Argon	40	1.0	0.18	0.40	0.47	77	N, NC
Energlass Plus Argon w Grills	38	1.0	0.18	0.36	0.42	77	N, NC
Energlass Plus Argon LSG	30	1.0	0.17	0.20	0.35	78	N, NC, SC, S
Energlass Plus Argon LSG w Grills	29	1.0	0.17	0.18	0.32	78	N, NC, SC, S

Estate Awning	Sizes Tested			NAFS Ratings			
	48" x 40"			AAMA/WDMA/CSA/1.S.2-/A440-08: LC-PG70-AP			
	36" x 60"			AAMA/WDMA/CSA/1.S.2-/A440-08: LC-PG70-AP			
Glass Option	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	17	2.4	0.42	0.51	0.53	43	
Clear w Grills	14	2.4	0.42	0.46	0.47	43	
LoE/Argon	30	1.7	0.29	0.46	0.52	57	N
LoE/Argon w Grills	27	1.7	0.29	0.41	0.47	57	N
Energlass	31	1.6	0.28	0.46	0.52	59	N
Energlass w Grills	28	1.6	0.28	0.41	0.47	59	N
LoE/Argon-LSG	21	1.5	0.27	0.25	0.45	58	N, NC, SC, S
LoE/Argon-LSG w Grills	19	1.5	0.27	0.23	0.41	58	N, NC, SC, S
Energlass-LSG	22	1.5	0.26	0.25	0.45	60	N, NC, SC, S
Energlass-LSG w Grills	20	1.5	0.26	0.23	0.41	60	N, NC, SC, S
Triple	30	1.7	0.29	0.46	0.48	61	N
Triple w Grills	28	1.7	0.29	0.42	0.43	61	N
Triple LoE/Argon x 1	36	1.3	0.22	0.41	0.47	69	N
Triple LoE/Argon x 1 w Grills	34	1.3	0.22	0.37	0.43	69	N, NC
Triple LoE/Argon x 1 LSG	26	1.3	0.22	0.23	0.41	71	N, NC, SC, S
Triple LoE/Argon x 1 LSG w Grills	24	1.3	0.22	0.21	0.37	71	N, NC, SC, S
Energlass Plus Argon	40	1.0	0.18	0.40	0.47	76	N, NC
Energlass Plus Argon w Grills	38	1.0	0.18	0.36	0.42	76	N, NC
Energlass Plus Argon LSG	30	1.0	0.17	0.20	0.35	77	N, NC, SC, S
Energlass Plus Argon LSG w Grills	29	1.0	0.17	0.18	0.32	77	N, NC, SC, S

Estate Casement Fixed Sash	Size Tested			NAFS Ratings			
	79" x 79"			AAMA/WDMA/CSA/ISO.2-/A440-08: CW-PG45-FW			
Glass Option	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	22	2.4	0.43	0.61	0.63	43	
Clear w Grills	18	2.4	0.43	0.54	0.56	43	
LoE/Argon	36	1.6	0.28	0.54	0.62	57	N
LoE/Argon w Grills	33	1.6	0.28	0.49	0.55	57	N
Energlass	37	1.5	0.27	0.54	0.62	60	N
Energlass w Grills	35	1.5	0.27	0.49	0.55	60	N
LoE/Argon-LSG	25	1.5	0.26	0.30	0.54	59	N, NC
LoE/Argon-LSG w Grills	23	1.5	0.26	0.27	0.48	59	N, NC
Energlass-LSG	26	1.4	0.25	0.30	0.54	61	N, NC
Energlass-LSG w Grills	24	1.4	0.25	0.27	0.48	61	N, NC
Triple	34	1.7	0.30	0.55	0.58	61	N
Triple w Grills	31	1.7	0.30	0.49	0.51	61	N
Triple LoE/Argon x 1	42	1.2	0.21	0.49	0.57	70	N
Triple LoE/Argon x 1 w Grills	39	1.2	0.21	0.44	0.50	70	N
Triple LoE/Argon x 1 LSG	29	1.2	0.21	0.27	0.49	71	N, NC
Triple LoE/Argon x 1 LSG w Grills	28	1.2	0.21	0.25	0.44	71	N, NC, SC, S
Energlass Plus Argon	46	1.0	0.17	0.47	0.56	76	N
Energlass Plus Argon w Grills	43	1.0	0.17	0.42	0.50	76	N
Energlass Plus Argon LSG	33	0.9	0.16	0.23	0.42	78	N, NC, SC, S
Energlass Plus Argon LSG w Grills	32	0.9	0.16	0.21	0.37	78	N, NC, SC, S

Estate Casement Wide Picture	Size Tested			NAFS Ratings			
	79" x 79"			AAMA/WDMA/CSA/ISO.2-/A440-08: CW-PG70-FW			
Glass Option	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	20	2.5	0.44	0.61	0.63	44	
Clear w Grills	17	2.5	0.44	0.55	0.56	44	
LoE/Argon	36	1.6	0.28	0.54	0.62	58	N
LoE/Argon w Grills	33	1.6	0.28	0.49	0.56	58	N
Energlass	36	1.6	0.28	0.54	0.62	60	N
Energlass w Grills	33	1.6	0.28	0.49	0.56	60	N
LoE/Argon-LSG	25	1.5	0.26	0.30	0.54	59	N, NC
LoE/Argon-LSG w Grills	23	1.5	0.26	0.27	0.48	59	N, NC
Energlass-LSG	25	1.5	0.26	0.30	0.54	61	N, NC
Energlass-LSG w Grills	23	1.5	0.26	0.27	0.48	61	N, NC
Triple	34	1.7	0.30	0.55	0.58	61	N
Triple w Grills	31	1.7	0.30	0.50	0.52	61	N
Triple LoE/Argon x 1	42	1.2	0.21	0.49	0.57	69	N
Triple LoE/Argon x 1 w Grills	39	1.2	0.21	0.44	0.51	69	N
Triple LoE/Argon x 1 LSG	30	1.2	0.21	0.28	0.49	70	N, NC
Triple LoE/Argon x 1 LSG w Grills	28	1.2	0.21	0.25	0.44	70	N, NC, SC, S
Energlass Plus Argon	46	1.0	0.17	0.47	0.56	75	N
Energlass Plus Argon w Grills	43	1.0	0.17	0.42	0.50	75	N
Energlass Plus Argon LSG	34	0.9	0.16	0.24	0.42	77	N, NC, SC, S
Energlass Plus Argon LSG w Grills	32	0.9	0.16	0.21	0.37	77	N, NC, SC, S

Estate Casement Narrow Picture	Size Tested			NAFS Ratings			
	79" x 79"			AAMA/WDMA/CSA/1.S.2./A440-08: CW-PG70-FW			
	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	22	2.6	0.46	0.68	0.71	44	
Clear w Grills	18	2.6	0.46	0.61	0.64	44	
LoE/Argon	39	1.7	0.29	0.61	0.70	54	N
LoE/Argon w Grills	35	1.7	0.29	0.55	0.63	54	N
Energlass	40	1.6	0.28	0.61	0.70	56	N
Energlass w Grills	37	1.6	0.28	0.55	0.63	56	N
LoE/Argon-LSG	25	1.5	0.27	0.33	0.61	59	N, NC
LoE/Argon-LSG w Grills	24	1.5	0.27	0.30	0.54	59	N, NC
Energlass-LSG	26	1.5	0.26	0.33	0.61	61	N, NC
Energlass-LSG w Grills	25	1.5	0.26	0.30	0.54	61	N, NC
Triple	37	1.8	0.31	0.62	0.65	61	
Triple w Grills	34	1.8	0.31	0.56	0.58	61	
Triple LoE/Argon x 1	46	1.2	0.21	0.55	0.64	70	N
Triple LoE/Argon x 1 w Grills	43	1.2	0.21	0.50	0.57	70	N
Triple LoE/Argon x 1 LSG	32	1.2	0.21	0.31	0.55	71	N, NC
Triple LoE/Argon x 1 LSG w Grills	30	1.2	0.21	0.28	0.50	71	N, NC
Energlass Plus Argon	50	0.9	0.16	0.53	0.63	76	N
Energlass Plus Argon w Grills	48	0.9	0.16	0.48	0.56	76	N
Energlass Plus Argon LSG	36	0.9	0.15	0.26	0.47	78	N, NC
Energlass Plus Argon LSG w Grills	35	0.9	0.15	0.24	0.42	78	N, NC, SC, S

Estate Double Hung	Size Tested			NAFS Ratings			
	32" x 63"			AAMA/WDMA/CSA/1.S.2./A440-08: CW-PG70-C			
	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	15	2.6	0.46	0.58	0.60	43	
Clear w Grills	12	2.6	0.46	0.52	0.54	43	
LoE/Argon	31	1.8	0.31	0.52	0.59	55	
LoE/Argon w Grills	27	1.8	0.31	0.46	0.53	55	
Energlass	31	1.8	0.31	0.52	0.59	58	
Energlass w Grills	27	1.8	0.31	0.46	0.53	58	
LoE/Argon-LSG	18	1.7	0.30	0.28	0.51	56	N
LoE/Argon-LSG w Grills	16	1.7	0.30	0.25	0.45	56	NC, SC, S
Energlass-LSG	19	1.6	0.29	0.28	0.51	58	N
Energlass-LSG w Grills	17	1.6	0.29	0.25	0.45	58	NC, SC, S
Energlass Plus Argon LSG	21	1.4	0.25	0.23	0.40	65	N, NC, SC, S
Energlass Plus Krypton LSG	26	1.2	0.21	0.22	0.40	66	N, NC, SC, S
Energlass Plus Argon	33	1.5	0.26	0.45	0.53	66	N
Energlass Plus Krypton	38	1.2	0.22	0.45	0.53	66	N

Estate Double Hung Picture Window	Size Tested			NAFS Ratings			
	60" x 60"			AAMA/WDMA/CSA/ISO.2./A440-08: CW-PG70-FW			
Glass Options	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	19	2.5	0.44	0.59	0.62	44	
Clear w Grills	16	2.5	0.44	0.53	0.55	44	
LoE/Argon	34	1.6	0.29	0.53	0.61	58	N
LoE/Argon w Grills	31	1.6	0.29	0.47	0.54	58	N
Energlass	36	1.6	0.28	0.53	0.61	61	N
Energlass w Grills	32	1.6	0.28	0.47	0.54	61	N
LoE/Argon-LSG	23	1.5	0.27	0.29	0.53	60	N, NC
LoE/Argon-LSG w Grills	21	1.5	0.27	0.26	0.47	60	N, NC
Energlass-LSG	24	1.5	0.26	0.29	0.53	62	N, NC
Energlass-LSG w Grills	23	1.5	0.26	0.26	0.47	62	N, NC
Energlass Plus Argon LSG	31	1.0	0.22	0.23	0.41	71	N, NC, SC, S
Energlass Plus Krypton LSG	26	1.2	0.18	0.23	0.41	72	N, NC, SC, S
Energlass Plus Argon	38	1.3	0.23	0.46	0.55	70	N
Energlass Plus Krypton	43	1.1	0.19	0.46	0.55	72	N

Estate Double Hung Transom	Size Tested			NAFS Ratings			
	79" x 79"			AAMA/WDMA/CSA/ISO.2./A440-08: CW-PG70-FW			
Glass Options	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	21	2.6	0.46	0.66	0.70	48	
Clear w Grills	17	2.6	0.46	0.59	0.63	48	
LoE/Argon	38	1.6	0.29	0.60	0.70	57	N
LoE/Argon w Grills	35	1.6	0.29	0.55	0.63	57	N
Energlass	40	1.6	0.28	0.60	0.70	59	N
Energlass w Grills	37	1.6	0.28	0.55	0.63	59	N
LoE/Argon-LSG	27	1.5	0.26	0.33	0.60	60	N, NC
LoE/Argon-LSG w Grills	25	1.5	0.26	0.30	0.54	60	N, NC
Energlass-LSG	27	1.5	0.26	0.33	0.60	62	N, NC
Energlass-LSG w Grills	25	1.5	0.26	0.30	0.54	62	N, NC
Energlass Plus Argon LSG	36	0.9	0.15	0.26	0.47	80	N, NC
Energlass Plus Argon	50	0.9	0.16	0.52	0.62	78	N

Estate Double Hung Replacement	Size Tested			NAFS Ratings			
	40" x 63"			AAMA/WDMA/CSA/1.S.2./A440-08: R-PG50-H			
Glass Options	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	15	2.6	0.46	0.58	0.60	43	
Clear w Grills	12	2.6	0.46	0.52	0.54	43	
LoE/Argon	31	1.8	0.31	0.52	0.59	55	
LoE/Argon w Grills	27	1.8	0.31	0.46	0.53	55	
Energlass	31	1.8	0.31	0.52	0.59	58	
Energlass w Grills	27	1.8	0.31	0.46	0.53	58	
LoE/Argon-LSG	18	1.7	0.30	0.29	0.52	57	NC
LoE/Argon-LSG w Grills	17	1.7	0.30	0.26	0.46	57	NC
Energlass-LSG	20	1.6	0.29	0.29	0.52	59	NC
Energlass-LSG w Grills	18	1.6	0.29	0.26	0.46	59	NC
Triple LoE/Argon x 1	29	1.7	0.30	0.47	0.54	61	N
Triple LoE/Argon x 1 LSG	18	1.6	0.29	0.27	0.47	63	NC
Energlass Plus Argon LSG	21	1.4	0.25	0.23	0.40	66	N, NC, SC, S
Energlass Plus Krypton LSG	27	1.1	0.20	0.23	0.40	67	N, NC, SC, S
Energlass Plus Argon	33	1.5	0.26	0.45	0.53	66	N
Energlass Plus Krypton	38	1.2	0.22	0.45	0.53	66	N

Estate Double Hung Replacement Picture Window	Size Tested			NAFS Ratings			
	32" x 63"			AAMA/WDMA/CSA/1.S.2./A440-08: CW-PG70-C			
Glass Options	Energy Rating	U-value (metric)	U-value (imperial)	Solar Heat Gain Coefficient	Visible Transmittance	Condensation Resistance	Energy Star Zones 2016
Clear	18	2.6	0.46	0.62	0.65	46	
Clear w Grills	14	2.6	0.46	0.56	0.58	46	
LoE/Argon	35	1.7	0.30	0.56	0.64	57	N
LoE/Argon w Grills	31	1.7	0.30	0.50	0.57	57	N
Energlass	35	1.6	0.29	0.56	0.64	59	N
Energlass w Grills	31	1.6	0.29	0.50	0.57	59	N
Triple Clear	24	2.2	0.37	0.56	0.59	53	
Triple LoE/Argon x 1 LSG	22	1.6	0.28	0.29	0.51	62	NC
Energlass Plus Argon LSG	26	1.3	0.23	0.25	0.44	66	N, NC, SC, S
Energlass Plus Krypton LSG	32	1.0	0.18	0.25	0.44	67	N, NC, SC, S
Energlass Plus Argon	36	1.4	0.25	0.48	0.58	66	N
Energlass Plus Krypton	43	1.1	0.20	0.48	0.58	67	N
LoE/Argon-LSG	23	1.6	0.28	0.31	0.56	59	NC
LoE/Argon-LSG w Grills	21	1.6	0.28	0.28	0.50	59	NC
Energlass-LSG	24	1.5	0.27	0.31	0.56	61	N, NC
Energlass-LSG w Grills	22	1.5	0.27	0.28	0.50	61	N, NC