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ACOUSTIC

SOUND TRANSMISSION CLASS TEST REPORT

Series/Model: T-WDW4 Teutonic Tilt-Turn Window

Prepared for:

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US

Customer PO: Signed Quote

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AIRBORNE SOUND TRANSMISSION LOSS (STC) ASTM E90-09

INTRODUCTION:

This report presents the sound transmission results of a:

T-WDW4 Teutonic Tilt-Turn Window

The testing and data analysis were completed on: **Monday, September 08, 2014**

Summary of Results

T-WDW4 Teutonic Tilt-Turn Window

Glazing Description		Test Results		
		STC	Def	OITC
Glass Type:	**1 1/32" (26.3 mm) Insulated Glass Unit (IG)**	***35***	**30**	**29**
Exterior Lite:	1/4" (6.4 mm)			
Gap / Airspace:	17/32" (13.5 mm)			
Interior Lite:	1/4" (6.4 mm)			

SPECIMEN DESCRIPTION:

Manufacturer:	Kolbe & Kolbe Millwork Co., Inc.	**Specimen:**	Tilt-Turn Window
Model # / Series:	T-WDW4 Teutonic	**Material:**	Vinyl
Size:	35.50" W x 71.50" H	**Area:**	17.6 $-ft^2$
Weight:	147.8-lbs	**Weight (psf):**	8.4 $-lb/ft^2$

Glazing Details: (Measured Thickness) **1 1/32" (26.3 mm) Insulated Glass Unit (IG)**

Exterior Lite:	1/4" (6.4 mm)
Space/Gap:	17/32" (13.5 mm)
Interior Lite:	1/4" (6.4 mm)

Sash Size: 32 3/8" x 68 3/8"

Daylight Opening: 26 1/2" x 62 1/8"

Additional Details: The Specimen was identified as a T-WDW4 Teutonic Vinyl Tilt-Turn Window.

Hardware: Rotary Operator and latch

Drainage: 2 Weeps

Weatherstripping:

Component	Location	Weatherstrip Type	Height, in	Qty
Frame	Entire Perimeter	Rubber Compression Seal	1/4"	1
Sash	Entire Perimeter	Rubber Compression Seal	1/4"	1

TEST METHOD:

Sound Transmission Test
ASTM:E90(09), "Laboratory Measurement of Airborne Sound Transmission of Building Partitions," was followed in every respect. The STC value was obtained by applying the Transmission Loss (TL) values to the STC reference contour of ASTM: E413(10), “Determination of Sound Transmission Class.” The actual transmission loss at each frequency was calculated by the following equations:

$$TL = NR + 10 \log S - 10 \log A2$$

where: TL = Transmission Loss (dB)
NR = Noise Reduction (dB)
S = Surface area common to both sides (sq. ft.)
A2 = Sound absorption of the receiving room with the sample in place (sabins)

OITC Procedure
ASTM:E1332(10a), "Determination of Outdoor-Indoor Transmission Class", was followed in every respect. Basically, the OITC was calculated by using the sound transmission loss values in the 80 to 4000 Hz range as measured in accordance with ASTM E-90(09). These transmission loss data are then used to determine the A-weighted sound level reduction of the specimen for the reference source spectrum specified in Table 1 of ASTM E1332(10a). The appropriate calculations were made to determine the OITC value. TL measurements were obtained in a single direction, from Source Room to the Receiving room. The source room has a volume of 2948-ft3 (83-m3) and the receiving room has a volume of 5825-ft3 (165-m3).

Windows & Doors: Windows and Doors are operated at least 5-times prior to testing. The test unit is operational unless otherwise stated. The temperatures and relative humidity of the termination room met the requirements of the standard during and after the test. All frequencies met the requirements for 95% confidence established by the standard unless noted. Noise reduction measurements were performed in a single direction (source room to receiving room).

TEST EQUIPMENT:

Item Description	ID#	Manufacturer/Model	Serial #	Cal. Due	Location
1/2" Pressure Condensor Mic	PT-162-075	Gras/40AD	19220-1244	5/22/2015	Reverberation Chamber
1/2" Pressure Condensor Mic	PT-162-108	Gras/46AD	167994	12/10/2014	Source Chamber
Microphone Calibrator	PT-162-076	Norsonic/1251	29144	5/22/2015	N/A
Data Acquisition Module	PT-162-086	National Instruments/NI9234	154DoE4_1548E92	7/1/2015	Control Center
Temp/Humidity Sensor	PT-162-077	Dwyer/Series RH	M90714-e4SV-Y	6/4/2015	Reverberation Chamber
Temp/Humidity Sensor	PT-162-079	Dwyer/Series RH	m93237-E09w-A	6/4/2015	Source Chamber

REMARKS:

The test sample will be retained for a period of 10-days and then discarded if no written return-request received.

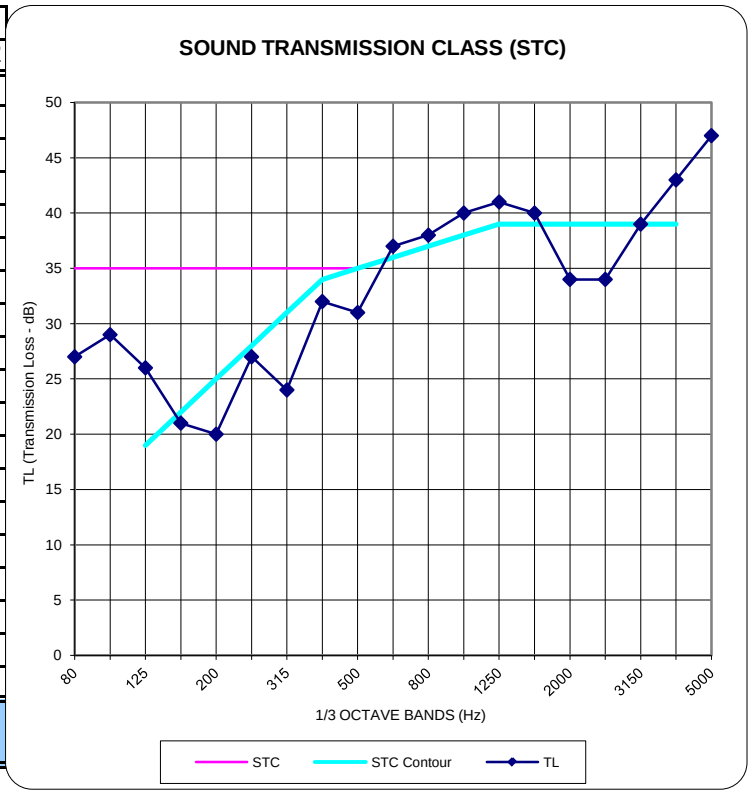
TEST RESULTS

1/3 Oct. Band, Hz	L_1 (dB)	L_2 (dB)	Bkgd (dB)	A_2 (m^2 Sabins)	TL (dB)	Def (dB)	95% Conf.	Notes 1	Notes 2
80	91.3	60.5	39.6	4.6	**27**	-	1.9		
100	96.8	64.2	43.6	4.7	**29**	-	1.8		
125	98.8	69.7	42.0	3.4	**26**	0	2.5		
160	94.9	71.0	38.5	3.6	**21**	1	2.1		
200	89.7	65.2	36.7	4.4	**20**	5	1.2		
250	93.5	62.3	39.0	4.3	**27**	1	0.9		
315	94.8	67.0	34.7	4.1	**24**	7	0.6		
400	96.1	59.8	34.2	4.1	**32**	2	0.5		
500	98.6	62.6	33.8	4.8	**31**	4	0.7		
630	97.4	56.1	29.1	5.0	**37**	0	0.4		
800	95.4	52.0	25.9	5.2	**38**	0	0.3		
1000	93.0	47.5	24.8	5.9	**40**	0	0.5		
1250	92.4	45.9	22.9	6.3	**41**	0	0.4		
1600	93.3	47.6	20.2	6.8	**40**	0	0.4		
2000	93.4	52.2	20.5	7.8	**34**	5	0.3		
2500	94.3	53.1	19.2	8.8	**34**	5	0.4		
3150	91.6	45.2	19.8	9.8	**39**	0	0.3		
4000	86.9	35.7	20.7	12.0	**43**	0	0.3		
5000	85.0	29.8	21.8	13.2	**47**	-	0.3	1	

STC Rating: *35*

Deficiency: 30

OITC Rating: 29



TL = Transmission Loss (dB)
Def = Deficiencies (below STC contour)

Note #1: Noise Level was less than 10dB above ambient.

Note #2: Confidence Level Exceeded

Test Conditions:

Laminated Glass	Temp(°C):
Exterior:	N/A
Interior:	N/A

	Temp(°C):	% RH:	ATM (hPa)
Source Room:	23.2	50	979
Receive Room:	22.6	51	979

SPECIMEN IDENTIFICATION:

Type: Tilt-Turn Window
Series: T-WDW4 Teutonic Tilt-Turn Window
Size: 35.50" W x 71.50" H **Area:** 17.6 -ft^2
Depth: 3 1/4""
Mass: 148 -lbs **Mass (psf):** 8.4 -lb/ft^2

Test Date: *8-Sep-14*
Time Stamp: *7:38 AM*
Tested by: PAD

Glazing Description

1 1/32" (26.3 mm) Insulated Glass Unit (IG)	
Exterior Lite:	1/4" (6.4 mm)
Gap / Space:	17/32" (13.5 mm)
Interior Lite:	1/4" (6.4 mm)

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* As stated by Manufacturer.