MIAMI-DADE COUNTY

MIAMI-DADE COUNTY, FLORIDA
METRO-DADE FLAGLER BUILDING

BUILDING CODE COMPLIANCE OFFICE
METRO-DADE FLAGLER BUILDING
140 WEST FLAGLER STREET, SUITE 1603
MIAMI, FLORIDA 33130-1563
(305) 375-2901 FAX (305) 375-2908
CONTRACTOR LICENSING SECTION
(305) 375-2527 FAX (305) 375-2558
CONTRACTOR ENFORCEMENT SECTION
(305) 375-2966 FAX (305) 375-2908
PRODUCT CONTROL DIVISION
(305) 375-2902 FAX (305) 372-6339

October 5, 2005

TO: **Glazing Consultants and Engineers**

FROM: **Jaime D. Gascon, Acting Chief, Product Control Division**

The Miami-Dade County Product Control Division is hosting a meeting to discuss a proposed method to address compliance with ASTM E1300-02, while conforming to the reductions for flexible supports.

The meeting will be held as follows:

Date: **November 2, 2005**

Time: **2:00 P.M.**

Place: **Miami-Dade Flagler Building**
140 West Flagler St.
16th Floor, Conference Room #1605
Miami, FL 33130

Agenda:

1. Presentation by the proponent.
2. Discussion of suggested and overall procedure outlined in attachments.

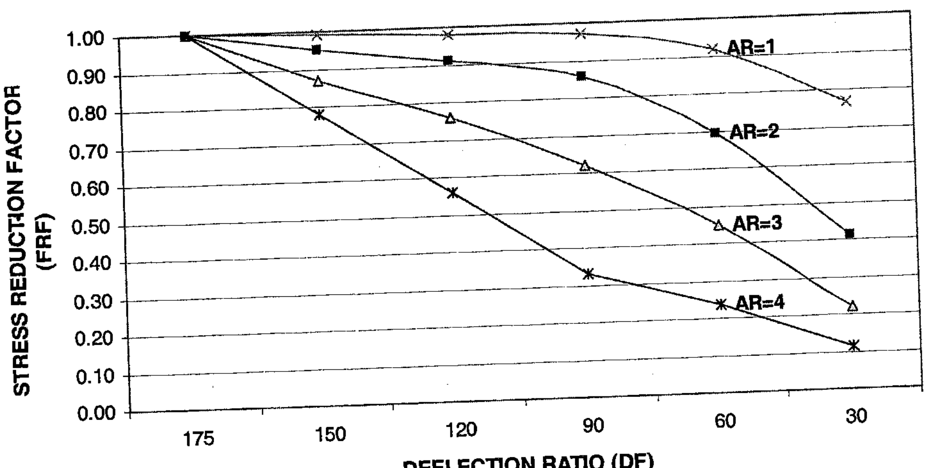
* The enclosed graphs are provided for discussion at the scheduled meeting and are not endorsed by Miami-Dade County

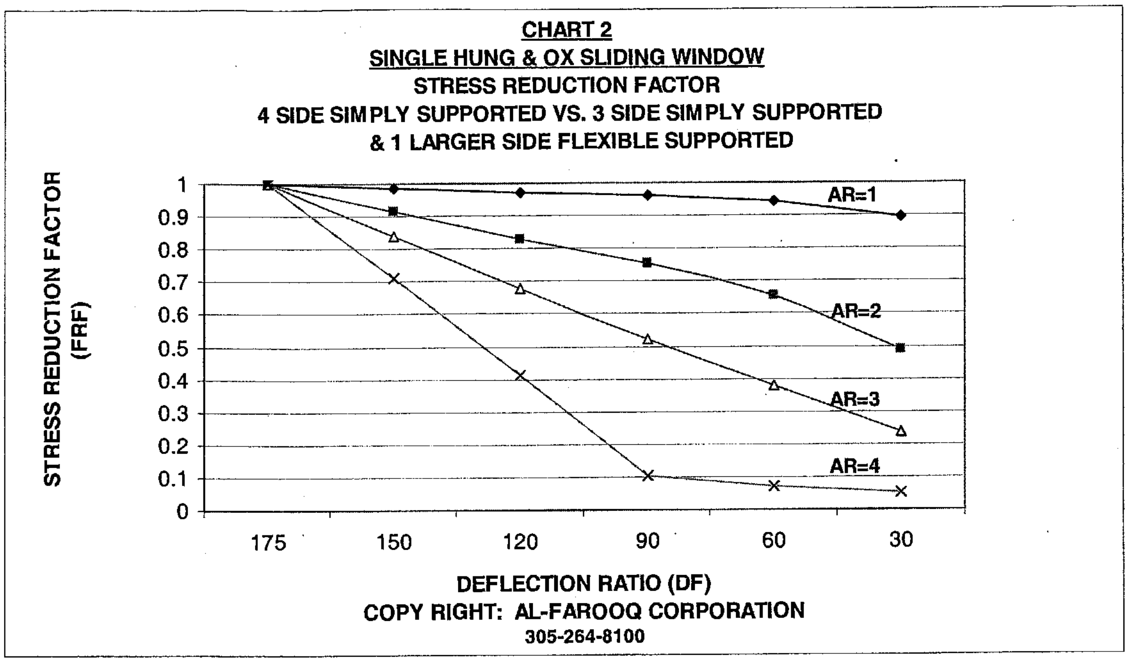
Reduction Factor Method

This design aid is prepared to analyze the flexible support encountered in sliding glass doors and/or single hung/double hung windows. Flexible support of operable windows & doors are not covered under ASTM E 1300-02, however FBC-2004 under section 2403.2 permits engineering analysis by registered design professionals and also section 5.4 of ASTM E-1300-02 permits engineering analysis for situation not covered in the standard.

This method uses 4-sided support with a reduction factor determined using strength properties of rails and interlocks. The glass load resistant thus obtained is somewhere between glass load resistant obtained using ASTM E-1300-02 (free edge support) & ASTM E 1300-02 (4-sided support), as well as ASTM E-1300-98 (4-sided)

CHART 1
SLIDING DOOR
STRESS REDUCTION FACTOR
4 SIDE SIMPLY SUPPORTED VS. 2 LARGER SIDE FLEXIBLE SUPPORTED & 2 SMALL SIDE SIMPLY SUPPORTED





The following iterative steps are required:

<u>Step 1:</u> For given day light opening (DLO), glass type & temper calculate 4-sided allowable factored load capacity Q_{4ss} (psf). For first iteration assume $Q_1 = Q_{4ss}$.

<u>Step 2</u>: For given size width & length, determine the flexible side (large or small) and using strength properties of flexible side & design load, calculate the deflection as Δ_1

<u>Step 3</u>: Calculate Deflection Ratio (DF) = Flexible span / Δ_1

Step 4: Calculate Aspect Ratio (AR) =larger/ small frame dimension.

Step 5: Using DF & AR obtained from steps 3 & 4 and applicable chart 1 or 2, estimate the stress reduction factor FRF (linear & inside graph interpolation is allowed).

Step 6: Calculate reduce capcity QRF = Q_{4ss} X FRF

Step 7: Calculate new Δ_2 using QRF obtained from step 6.

Step 8: Using Q_1 from step 1 and Δ_2 from step 7, calculate new DF and using AR from step 4, calculate new FRF.

Step 9: Repeat step 6 to find the reduce capacity QRF = Q_{4ss} X FRF (new)

Step 10: For succeeding iterations using new QRF, find new Δ to establish new FRF, and than calculate reduced capacity QRF, per step 6.

Step 11: If FRF converges than no new calculation required and the allowable final QRF capacity will be QRF (final) = Q_{4ss} X FRF (final).

Step 12: Continue iteration (Minimum three FRF iteration required).

Example

Sliding glass Door

Panel size 48 x 96"

D/O size 45 x 90 laminated 5/8 H.S.

flexable side = 96"

Step 1 : ASTME-1300-02 (P209): $Q_1 = Q_{455} = 209$ psf

2 : $\Delta = \frac{5wL^4}{384EI}$ $\Delta_{assumed} \simeq 1'' = \Delta_1$

3: $DF = \frac{\text{flex span}}{\Delta_1} = \frac{96}{1} = 96$

4: $AR = \frac{96}{48} = 2$

5: DF = 96, AR = 2 use chart 1, $F_{RF} = .87$ estimated

6: $Q_{RF} = 209(.87) = 182$ (psf)

7: Δ_2 (@ 182 psf) = .87"

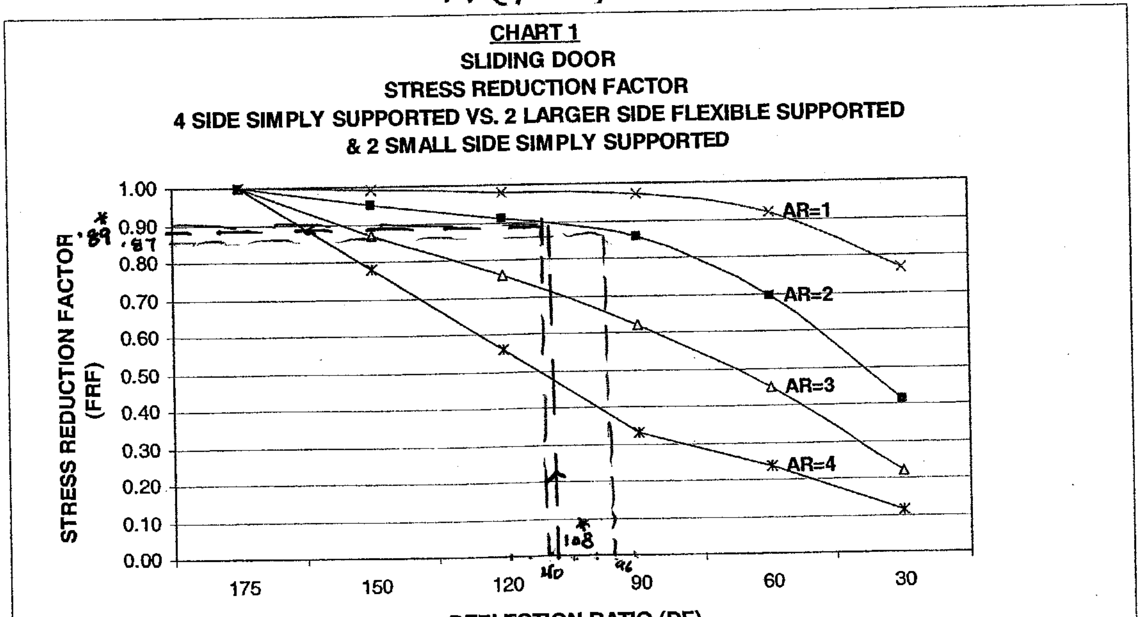
8: $DF_{new} = \frac{96}{.87} = 110$ & AR = 2 ⇒ $F_{RF_{new}} = .90$

9: $Q_{RF} = 209(.9) = 188$ psf

10: Δ_3 (@ 188 psf) = .89", $DF = \frac{96}{.89} = 108$ ⇒ $F_{RF} = .89$

11 & 12: 3-iteration completed

$Q_{RF(final)} = 209(.89) = 186$ psf



COPY RIGHT: AL-FAROOQ CORPORATION