# AE3212-II SVV Structures Assignment Aircraft Allocation & Data

This document is part of the SVV Structures assignment 2020. It contains the allocation of aircraft type to each project group. More importantly, it contains the required data for the aircraft types that are considered in the AE3212-II SVV structures assignment. The values provided in this document correspond to the variables which are illustrated in figures 1 to 5 of the structures assignment document.

## Group Aircraft Allocation

Each project group is allocated one of four aircraft types:

- Airbus A320
- Bombardier CRJ700
- Dornier Do 228
- Fokker 100

The allocation of aircraft type to each group is given in table 1. Groups must use the aircraft type allocated to them for the SVV structures assignment.

**Table 1:** group aircraft allocation

| Group | Aircraft | Group | Aircraft | Group | Aircraft |
|---|---|---|---|---|---|
| A01 | A320 | A18 | CRJ700 | A35 | Do 228 |
| A02 | CRJ700 | A19 | Do 228 | A36 | F100 |
| A03 | Do 228 | A20 | F100 | A37 | A320 |
| A04 | F100 | A21 | A320 | A38 | CRJ700 |
| A05 | A320 | A22 | CRJ700 | A39 | Do 228 |
| A06 | CRJ700 | A23 | Do 228 | A40 | F100 |
| A07 | Do 228 | A24 | F100 | A41 | A320 |
| A08 | F100 | A25 | A320 | A42 | CRJ700 |
| A09 | A320 | A26 | CRJ700 | A43 | Do 228 |
| A10 | CRJ700 | A27 | Do 228 | A44 | F100 |
| A11 | Do 228 | A28 | F100 | A45 | A320 |
| A12 | F100 | A29 | A320 | A46 | CRJ700 |
| A13 | A320 | A30 | CRJ700 | A47 | Do 228 |
| A14 | CRJ700 | A31 | Do 228 | A48 | F100 |
| A15 | Do 228 | A32 | F100 | A49 | A320 |
| A16 | F100 | A33 | A320 | A50 | CRJ700 |
| A17 | A320 | A34 | CRJ700 | A51 | Do 228 |

# Airbus A320


**Data Airbus A320 (Please refer to the drawings)**

| Property | Symbol | Value | Unit |
|---|---|---|---|
| Chord length aileron | $C_a$ | 0.547 | m |
| Span of the aileron | $l_a$ | 2.771 | m |
| x-location of hinge 1 | $x_1$ | 0.153 | m |
| x-location of hinge 2 | $x_2$ | 1.281 | m |
| x-location of hinge 3 | $x_3$ | 2.681 | m |
| Distance between actuator 1 and 2 | $x_a$ | 28.0 | cm |
| Aileron height | $h$ | 22.5 | cm |
| Skin thickness | $t_{sk}$ | 1.1 | mm |
| Spar thickness | $t_{sp}$ | 2.9 | mm |
| Thickness of stiffener | $t_{st}$ | 1.2 | mm |
| Height of stiffener | $h_{st}$ | 1.5 | cm |
| Width of stiffener | $w_{st}$ | 2.0 | cm |
| Number of stiffeners (equally spaced along the periphery of the cross-section) | $n_{st}$ | 17 | - |
| Vertical displacement hinge 1 | $d_1$ | 1.103 | cm |
| Vertical displacement hinge 3 | $d_3$ | 1.642 | cm |
| Maximum upward deflection | $\theta$ | 26 | deg |
| Load in actuator 2 | P | 91.7 | kN |

# Boeing 737


**Data Boeing 737 (Refer to the drawings)**

| Property | Symbol | Value | Unit |
|---|---|---|---|
| Chord length aileron | $C_a$ | 0.605 | m |
| Span of the aileron | $l_a$ | 2.661 | m |
| x-location of hinge 1 | $x_1$ | 0.172 | m |
| x-location of hinge 2 | $x_2$ | 1.211 | m |
| x-location of hinge 3 | $x_3$ | 2.591 | m |
| Distance between actuator 1 and 2 | $x_a$ | 35.0 | cm |
| Aileron height | $h$ | 20.5 | cm |
| Skin thickness | $t_{sk}$ | 1.1 | mm |
| Spar thickness | $t_{sp}$ | 2.8 | mm |
| Thickness of stiffener | $t_{st}$ | 1.2 | mm |
| Height of stiffener | $h_{st}$ | 1.6 | cm |
| Width of stiffener | $w_{st}$ | 1.9 | cm |
| Number of stiffeners (equally spaced along the periphery of the cross-section) | $n_{st}$ | 15 | - |
| Vertical displacement hinge 1 | $d_1$ | 1.154 | cm |
| Vertical displacement hinge 3 | $d_3$ | 1.840 | cm |
| Maximum upward deflection | $\theta$ | 28 | deg |
| Load in actuator 2 | P | 97.4 | kN |

# Bombardier CRJ 700


**Data Bombardier CRJ700 (Refer to the drawings)**

| Property | Symbol | Value | Unit |
|---|---|---|---|
| Chord length aileron | $C_a$ | 0.484 | m |
| Span of the aileron | $l_a$ | 1.691 | m |
| x-location of hinge 1 | $x_1$ | 0.149 | m |
| x-location of hinge 2 | $x_2$ | 0.554 | m |
| x-location of hinge 3 | $x_3$ | 1.541 | m |
| Distance between actuator 1 and 2 | $x_a$ | 27.2 | cm |
| Aileron height | $h$ | 17.3 | cm |
| Skin thickness | $t_{sk}$ | 1.1 | mm |
| Spar thickness | $t_{sp}$ | 2.5 | mm |
| Thickness of stiffener | $t_{st}$ | 1.2 | mm |
| Height of stiffener | $h_{st}$ | 1.4 | cm |
| Width of stiffener | $w_{st}$ | 1.8 | cm |
| Number of stiffeners (equally spaced along the periphery of the cross-section) | $n_{st}$ | 13 | - |
| Vertical displacement hinge 1 | $d_1$ | 0.681 | cm |
| Vertical displacement hinge 3 | $d_3$ | 2.030 | cm |
| Maximum upward deflection | $\theta$ | 26 | deg |
| Load in actuator 2 | P | 37.9 | kN |

# Dornier Do 228


**Data Dornier Do 228 (Refer to the drawings)**

| Property | Symbol | Value | Unit |
|---|---|---|---|
| Chord length aileron | $C_a$ | 0.515 | m |
| Span of the aileron | $l_a$ | 2.691 | m |
| x-location of hinge 1 | $x_1$ | 0.174 | m |
| x-location of hinge 2 | $x_2$ | 1.051 | m |
| x-location of hinge 3 | $x_3$ | 2.512 | m |
| Distance between actuator 1 and 2 | $x_a$ | 30.0 | cm |
| Aileron height | $h$ | 24.8 | cm |
| Skin thickness | $t_{sk}$ | 1.1 | mm |
| Spar thickness | $t_{sp}$ | 2.2 | mm |
| Thickness of stiffener | $t_{st}$ | 1.2 | mm |
| Height of stiffener | $h_{st}$ | 1.5 | cm |
| Width of stiffener | $w_{st}$ | 3.0 | cm |
| Number of stiffeners (equally spaced along the periphery of the cross-section) | $n_{st}$ | 11 | - |
| Vertical displacement hinge 1 | $d_1$ | 1.034 | cm |
| Vertical displacement hinge 3 | $d_3$ | 2.066 | cm |
| Maximum upward deflection | $\theta$ | 25 | deg |
| Load in actuator 2 | P | 20.6 | kN |

# Fokker 100


**Data Fokker 100 (Refer to the drawings)**

| Property | Symbol | Value | Unit |
|---|---|---|---|
| Chord length aileron | $C_a$ | 0.505 | m |
| Span of the aileron | $l_a$ | 1.611 | m |
| x-location of hinge 1 | $x_1$ | 0.125 | m |
| x-location of hinge 2 | $x_2$ | 0.498 | m |
| x-location of hinge 3 | $x_3$ | 1.494 | m |
| Distance between actuator 1 and 2 | $x_a$ | 24.5 | cm |
| Aileron height | $h$ | 16.1 | cm |
| Skin thickness | $t_{sk}$ | 1.1 | mm |
| Spar thickness | $t_{sp}$ | 2.4 | mm |
| Thickness of stiffener | $t_{st}$ | 1.2 | mm |
| Height of stiffener | $h_{st}$ | 1.3 | cm |
| Width of stiffener | $w_{st}$ | 1.7 | cm |
| Number of stiffeners (equally spaced along the periphery of the cross-section) | $n_{st}$ | 11 | - |
| Vertical displacement hinge 1 | $d_1$ | 0.389 | cm |
| Vertical displacement hinge 3 | $d_3$ | 1.245 | cm |
| Maximum upward deflection | $\theta$ | 30 | deg |
| Load in actuator 2 | P | 49.2 | kN |