ARROW
EXTRUDED ALUMINUM
ARROW-FOIL DAMPERS
CLASS "IA" AIR LEAKAGE RATED

SPECIFICATIONS

DAMPERS SHALL BE ARROW-FOIL DAMPER
MODEL AFD-20 AS MANUFACTURED BY
ARROW UNITED INDUSTRIES, WYALUSING, PA
18853, LOW LEAKAGE DAMPER SHALL BEAR THE
AMCA CERTIFIED RATINGS SEAL FOR AIR
LEAKAGE AND AIR PERFORMANCE, HAVING
LEAKAGE THROUGH A 60"x36" DAMPER AT
4" WATER GAUGE PRESSURE DIFFERENTIAL
EQUAL TO CLASS 1 LEAKAGE.

FRAMES AND BLADES TO BE A MINIMUM
12 GA (.081") EXTRUDED ALUMINUM.
BLADES TO BE A SINGLE UNIT ARROW-FOIL
DESIGN, 6" WIDE WITH THE PIN-LOCK
AN INTEGRAL SECTION WITHIN THE BLADE CORE.
OVERLAP BLADES AND SEALS (NOT JUST
OVERLAP SEALS) ASSURE MINIMUM AIR LEAKAGE.
SILICONE SEALS FIT INTO RIBBED GROOVE INSERT
IN BLADES WITH A FORMED STAINLESS STEEL,
SPRING STEEL SEAL AT THE JAMB.

FRAMES TO BE EXTRUDED ALUMINUM
"HAT-SHAPED" CHANNEL WITH REINFORCING
BOSSES AND GROOVE INSERTS FOR SILICONE
SEALS. STANDARD FRAMES ARE 5" WIDE
"HAT-SHAPED" FRAMES TYPICAL (4) SIDES.
AXLE SHAFTS TO BE 1/2" DIA. EXTRUDED
ALUMINUM, PIN-LOCK DESIGN INTERLOCKING
INTO BLADE SECTION. BEARINGS TO BE
"DOUBLE-SEALED" TYPE WITH CELCON INNER
BEARING ON AXLE RIDING IN POLYCARBONATE
OUTER BEARING INSERTED IN FRAME SO THAT
OUTER BEARING CANNOT ROTATE.

AXLE BEARINGS TO BE DESIGNED SO THAT
THERE SHALL BE NO METAL-TO-METAL OR
METAL-TO-BEARING RIDING SURFACES.
INTERCONNECTING LINKAGE TO HAVE
CELCON BEARINGS TO ELIMINATE FRICTION
IN LINKAGE.

LINKAGE CONTAINED WITHIN THE JAMB CONSISTS
OF A HEAVY ALUMINUM CRANK-ARM PERMANENTLY
LOCKED TO THE BLADE SHAFT BY TWO STAINLESS
STEEL FASTENERS. THE CRANK-ARM CONTAINS A
1/2" DIA. CADMIUM PLATED AND CHROME TREATED
MACHINED STEEL TRUNNION RIDING IN A CELCON
BEARING. A PLASTIC SET SCREW WITH LOCKING PATCH, TIES THE PILOT TO THE
5/16" DIA. ALUMINUM LINKAGE ROD. THE LINKAGE
OF EACH DAMPER IS INDIVIDUALLY ADJUSTED.

MIN. SIZE: 12"W X 12"H - SINGLE BLADED
MIN. SIZE: 12"W X 14 5/8"TH - 2 BLADE OPP.
MAX. SIZE: 60"W X 72"H - MULTIPANEL SECTIONS
FOR LARGER THAN MAX. SINGLE PANEL
SECTION IS RECOMMENDED.

PLEASE SPECIFY WHETHER PARALLEL OR OPPOSED
OPERATION IS REQUIRED. NOT RECOMMENDED FOR
BLADES INSTALLED VERTICALLY.

NOMINAL DEDUCTIONS WILL BE MADE TO THE
OPENING SIZE GIVEN.

SCHEDULE

ITEM | OQT. | "A" DIM. | "B" DIM.

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ARCH./ENG.: 

CONTR.: 

PROJECT: 

EDR: 

ECN: 

JOB: 

DATE: DWN.: DWG.: 

841-E-MAY-2005-1
DAMPER MODEL AFD-20
EXTRUDED ALUMINUM - PARALLEL - OPPOSED
PERFORMANCE DATA

PRESSURE DROP
PRESSURE DROP RATINGS ARE BASED ON AMCA STANDARD 500 USING TEST SET-UP FIG. 5.3
FOR DAMPER INSTALLED WITH DUCT UPSTREAM AND DOWNSTREAM. STATIC PRESSURES ARE
CONNECTED TO 0.075 LB./CU. FT. AIR DENSITY.

<table>
<thead>
<tr>
<th>FACE AREA VELOCITY (ft/min)</th>
<th>PRESSURE DROP (in wg)</th>
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<td>100</td>
<td>0.04</td>
</tr>
<tr>
<td>200</td>
<td>0.16</td>
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<tr>
<td>400</td>
<td>0.66</td>
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<td>500</td>
<td>1.00</td>
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<th>PRESSURE DROP (in wg)</th>
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<tr>
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<td>0.31</td>
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<tr>
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<tr>
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<td>0.10</td>
</tr>
<tr>
<td>2000</td>
<td>0.16</td>
</tr>
<tr>
<td>2500</td>
<td>0.21</td>
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LEAKAGE
AIR LEAKAGE REQUIREMENTS MEET INTERNATIONAL
ENERGY CONSERVATION CODE (IECC) BY LEAKING
LESS THAN 3 CFM/SQ.FT. AT 1" OF STATIC PRESSURE
AND IS AMCA LICENSED AS A CLASS "IA" DAMPER.

<table>
<thead>
<tr>
<th>DAMPER SIZE WIDTH x HEIGHT</th>
<th>1 IN W.G. CLASS</th>
<th>4 IN W.G. CLASS</th>
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<tbody>
<tr>
<td>12&quot;x12&quot;</td>
<td>IA</td>
<td>I</td>
</tr>
<tr>
<td>24&quot;x24&quot;</td>
<td>IA</td>
<td>I</td>
</tr>
<tr>
<td>36&quot;x36&quot;</td>
<td>IA</td>
<td>I</td>
</tr>
<tr>
<td>48&quot;x12&quot;</td>
<td>IA</td>
<td>I</td>
</tr>
<tr>
<td>60&quot;x36&quot;</td>
<td>IA</td>
<td>I</td>
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LEAKAGE RATINGS ARE BASED ON AMCA STANDARD 500
USING TEST SET-UP FIG. 5.5 AT AN OPERATION TEMPERATURE RANGE BETWEEN 50°F & 104°F. DATA
ARE BASED ON A SEALING TORQUE OF 40 LB/IN.
FOR DAMPERS LESS THAN 4 SQ. FT. IN SIZE, DAMPERS
ABOVE 4 SQ. FT., 5 LB/IN/SQ. FT. IS APPLIED TO
HOLD THE DAMPER IN THE CLOSED POSITION.

DAMPER AIR LEAKAGE CLASSIFICATION

<table>
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<tr>
<th>PRESSURE CLASS</th>
<th>1 IN W.G.</th>
<th>4 IN W.G.</th>
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<td>8</td>
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<tr>
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<td>10</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
<td>80</td>
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ARROW UNITED INDUSTRIES CERTIFIES
THAT THE MODEL AFD-20 DAMPER SHOWN
HEREIN IS LICENSED TO BEAR THE AMCA
SEAL. THE RATINGS SHOWN ARE BASED
ON TESTS AND PROCEDURES PERFORMED
IN ACCORDANCE WITH AMCA PUBLICATION
511 AND COMPLY WITH THE REQUIREMENTS
OF THE AMCA CERTIFIED RATINGS PROGRAM.
THE AMCA CERTIFIED RATINGS SEAL APPLIES
TO AIR PERFORMANCE/AIR LEAKAGE ONLY.
ARROW UNITED INDUSTRIES HAS TESTED A VARIETY OF ARROW FOIL BLADE WIDTHS 4" 5" & 6" IN VARIOUS ARRANGEMENTS FROM ALL PARALLEL, ALL OPPOSED, AND COMBINATIONS OF PARALLEL AND OPPOSED BLADES IN A COMMON FRAME FOR A SINGLE DAMPER INSTALLED IN A DUCT.

TEST UNITS WERE INSTALLED IN DUCTWORK WITH DUCT UPSTREAM AND DOWNSTREAM PER AMCA TEST SET-UP FIG. 5.3. USING MOST COMMON APPROACH VELOCITIES AND FAN STATIC PRESSURES TO CONDUCT LINEAR AIR FLOW TEST.

THE RESULTS OF THE TESTS SHOW THAT FAN STATIC PRESSURE DOES HAVE AN EFFECT ON THE LINEAR AIR FLOW CHARACTERISTICS OF A DAMPER. GRAPHS BELOW WILL IDENTIFY THE SIMULATED SYSTEM CONDITIONS USED FOR THE SINGLE DAMPER IN DUCT SYSTEM APPLICATION.

CURVES SHOWN IN THE GRAPHS BELOW SHOW THAT MODEL AFD-20 ALL OPPOSED, "AS STANDARDLY BUILT" IS A VERY EFFECTIVE CONTROL DAMPER FOR USE IN A VARIETY OF VELOCITIES AND PRESSURES.