

air chem engineered systems LLC

FRP Duct & Fittings



AIR CHEM ENGINEERED SYSTEMS,LLC (aka Air Chem Systems) designs and fabricates an extensive line of air pollution control equipment for the electronic, metal finishing, plating, sewage treatment, and other industries that generate nonflammable corrosive fumes and odors.

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FRP DUCTWORK

Fiberglass reinforced plastic (FRP) is the most widely used duct material for corrosive and toxic fumes. FRP duct provides an economical solution to your ventilation system.

AIR CHEM ENGINEERED SYSTEMS (ACES) manufactures the following standard round duct and fittings sized in accordance with the ASTM D 3982-92, Standard Specification for Contact Molded Fiberglass Duct and Hoods (replaces NBS Voluntary Product Standard PS 15-69).

In addition to our standard polyester fire-retardant resin systems, **ACES** can incorporate resin systems to meet other conditions, such as, ICBO-equivalent requirements with a flame spread of 25 and an exterior smoke development rating of 50, or engineered systems requiring special thickness, coatings and materials.

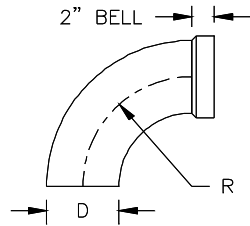
DUCT CHART

ACES PART NO.	I.D. DIA. (D)	DUCT LENGTH (L)	WALL THICKNESS (T)	APPROX. GLASS WT. (LBS.)	ALLOWABLE VACUUM OF WATER	ALLOWABLE PRESSURE OF WATER	DUCT SUPPORT SPACING	BONDING MAT'L PER JOINT	NO. OF WRAPS
D04	4"	20'	1/8"	1.10	434	1558	10.0'	1.70 lbs.	3
D06	6"	20'	1/8"	1.65	129	1039	10.5	2.30 lbs.	3
D08	8"	20'	1/8"	2.20	54	779	11.0	2.85 lbs.	3
D10	10"	20'	1/8"	2.75	28	623	11.5	3.45 lbs.	3
D12	12"	20'	1/8"	3.30	19	519	11.5	4.00 lbs.	3
D14	14"	20'	1/8"	3.85	15	445	12.0	4.60 lbs.	3
D16	16"	20'	1/8"	4.40	12	390	12.5	5.15 lbs.	3
D18	18"	20'	1/8"	4.95	10	346	12.5	5.75 lbs.	3
D20	20"	20'	1/8"	5.50	9	312	13.0	6.30 lbs.	3
*D22	22"	10'	1/8"	6.05	8	283	14.0	2.88 lbs.	3
D24	24"	20'	3/16"	9.90	18	390	15.0	7.45 lbs.	4
*D26	26"	10'	3/16"	10.72	16	360	15.0	5.5 lbs.	4
*D28	28"	10'	3/16"	11.55	14	334	15.0	5.5 lbs.	4
D30	30"	10'	3/16"	12.37	13	312	15.5	9.20 lbs.	4
*D32	32"	10'	3/16"	13.20	12	292	15.5	6.29 lbs.	4
*D34	34"	10'	3/16"	14.02	11	275	15.5	6.68 lbs.	4
D36	36"	10'	3/16"	14.85	10	260	16.0	10.90 lbs.	3
*D38	38"	10'	1/4"	20.89	21	437	16.5	9.95 lbs.	6
*D40	40"	10'	1/4"	21.99	20	416	18.0	10.48 lbs.	6
D42	42"	10'	1/4"	23.09	18	396	19.0	16.80 lbs.	4
*D44	44"	10'	1/4"	24.19	17	378	19.0	12.05 lbs.	6
*D46	46"	10'	1/4"	25.29	16	361	19.0	12.05 lbs.	6
D48	48"	10'	1/4"	26.39	15	346	19.5	19.10 lbs.	4
*D50	50"	10'	1/4"	27.49	14	332	19.5	13.09 lbs.	6
*D52	52"	10'	1/4"	28.59	13	320	19.5	13.84 lbs.	6
D54	54"	10'	1/4"	29.69	13	308	20.0	21.40 lbs.	4
*D56	56"	10'	5/16"	30.79	23	417	20.0	18.34 lbs.	9
*D58	58"	10'	5/16"	31.89	22	403	20.0	18.99 lbs.	9
D60	60"	10'	5/16"	41.24	21	390	24.0	23.70 lbs.	9
D66	66"	10'	5/16"	45.36	18	354	25.0	26.07 lbs.	9
D72	72"	10'	5/16"	49.49	16	325	25.0	28.44 lbs.	9

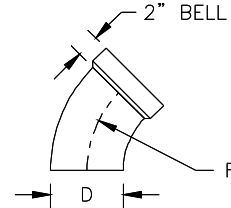
* indicates non-standard size.

To order, specify the **ACES** part number (standard sizes). For duct not listed, contact **ACES** for availability.

1.5 X CENTERLINE 90°
SWEEPS



1.5 X CENTERLINE 45°
SWEEPS



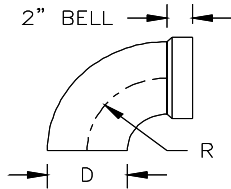
ACES PART NO.	I.D. DIA.	CENTER-LINE RADIUS	WALL THICKNESS	GLASS WEIGHT (LBS.)
DE9004A	4"	6"	1/8"	0.87
DE9006A	6"	9"	1/8"	1.95
DE9008A	8"	12"	1/8"	3.47
DE9010A	10"	15"	1/8"	5.41
DE9012A	12"	18"	1/8"	7.80
DE9014A	14"	21"	1/8"	10.61
DE9016A	16"	24"	1/8"	13.86
DE9018A	18"	27"	1/8"	17.54
DE9020A	20"	30"	1/8"	21.66
*DE9022A	22"	33"	1/8"	26.21
DE9024A	24"	36"	3/16"	46.78
*DE9026A	26"	39"	3/16"	54.90
*DE9028A	28"	42"	3/16"	63.67
DE9030A	30"	45"	3/16"	73.09
*DE9032A	32"	48"	3/16"	83.16
*DE9034A	34"	51"	3/16"	93.88
DE9036A	36"	54"	3/16"	105.25
*DE9038A	38"	57"	1/4"	156.37
DE9040A	40"	60"	1/4"	173.26
DE9042A	42"	63"	1/4"	191.02
*DE9044A	44"	66"	1/4"	209.54
*DE9046A	46"	69"	1/4"	229.13
DE9048A	48"	72"	1/4"	249.49
*DE9050A	50"	75"	1/4"	270.72
*DE9052A	52"	78"	1/4"	292.81
DE9054A	54"	81"	1/4"	315.76
*DE9056A	56"	84"	1/4"	339.58
*DE9058A	58"	87"	1/4"	364.27
DE9060A	60"	90"	5/16"	487.29
*DE9066A	66"	99"	5/16"	589.62

ACES PART NO.	I.D. DIA.	CENTER-LINE RADIUS	WALL THICKNESS	GLASS WEIGHT (LBS.)
DE4504A	4"	6"	1/8"	0.43
DE4506A	6"	9"	1/8"	0.97
DE4508A	8"	12"	1/8"	1.73
DE4510A	10"	15"	1/8"	2.71
DE4512A	12"	18"	1/8"	3.90
DE4514A	14"	21"	1/8"	5.31
DE4516A	16"	24"	1/8"	6.93
DE4518A	18"	27"	1/8"	8.77
DE4520A	20"	30"	1/8"	10.83
*DE4522A	22"	33"	1/8"	13.10
DE4524A	24"	36"	3/16"	23.39
*DE4526A	26"	39"	3/16"	27.45
*DE4528A	28"	42"	3/16"	31.84
DE4530A	30"	45"	3/16"	36.55
*DE4532A	32"	48"	3/16"	41.58
*DE4534A	34"	51"	3/16"	46.94
DE4536A	36"	54"	3/16"	52.63
*DE4538A	38"	57"	1/4"	78.18
DE4540A	40"	60"	1/4"	86.63
DE4542A	42"	63"	1/4"	95.51
*DE4544A	44"	66"	1/4"	104.82
*DE4546A	46"	69"	1/4"	114.57
DE4548A	48"	72"	1/4"	124.75
*DE4550A	50"	75"	1/4"	135.36
*DE4552A	52"	78"	1/4"	146.40
DE4554A	54"	81"	1/4"	157.88
*DE4556A	56"	84"	1/4"	169.79
*DE4558A	58"	87"	1/4"	182.14
DE4560A	60"	90"	5/16"	243.64
*DE4566A	66"	99"	5/16"	294.81

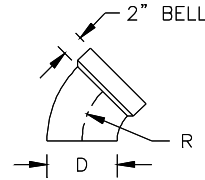
The table above is extrapolated in accordance with the ASTM D 3982-92, Standard Specifications for Contact-Molded Fiberglass Duct and Hoods (replaces NBS Voluntary Product Standard PS 15-69).

* Indicates non-standard size.

1 X CENTERLINE 90°
SWEEPS



1 X CENTERLINE 45°
SWEEPS



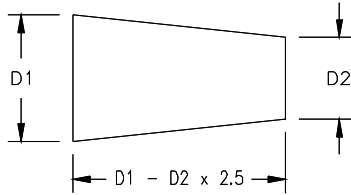
ACES PART NO.	I.D. DIA.	CENTER-LINE RADIUS	WALL THICKNESS	GLASS WEIGHT (LBS.)
DE9004B	4"	4"	1/8"	0.58
DE9006B	6"	6"	1/8"	1.30
DE9008B	8"	8"	1/8"	2.31
DE9010B	10"	10"	1/8"	3.61
DE9012B	12"	12"	1/8"	5.20
DE9014B	14"	14"	1/8"	7.07
DE9016B	16"	16"	1/8"	9.24
DE9018B	18"	18"	1/8"	11.69
DE9020B	20"	20"	1/8"	14.44
*DE9022B	22"	22"	1/8"	17.47
DE9024B	24"	24"	3/16"	31.19
*DE9026B	26"	26"	3/16"	36.60
*DE9028B	28"	28"	3/16"	42.45
DE9030B	30"	30"	3/16"	48.73
*DE9032B	32"	32"	3/16"	55.44
*DE9034B	34"	34"	3/16"	62.59
DE9036B	36"	36"	3/16"	70.17
*DE9038B	38"	38"	1/4"	104.24
DE9040B	40"	40"	1/4"	115.51
DE9042B	42"	42"	1/4"	127.34
*DE9044B	44"	44"	1/4"	139.76
*DE9046B	46"	46"	1/4"	152.76
DE9048B	48"	48"	1/4"	166.33
*DE9050B	50"	50"	1/4"	180.48
*DE9052B	52"	52"	1/4"	195.20
DE9054B	54"	54"	1/4"	210.51
*DE9056B	56"	56"	1/4"	226.39
*DE9058B	58"	58"	1/4"	242.85
DE9060B	60"	60"	5/16"	324.86

ACES PART NO.	I.D. DIA.	CENTER-LINE RADIUS	WALL THICKNESS	GLASS WEIGHT (LBS.)
DE4504B	4"	4"	1/8"	0.28
DE4506B	6"	6"	1/8"	0.62
DE4508B	8"	8"	1/8"	1.10
DE4510B	10"	10"	1/8"	1.72
DE4512B	12"	12"	1/8"	2.48
DE4514B	14"	14"	1/8"	3.37
DE4516B	16"	16"	1/8"	4.40
DE4518B	18"	18"	1/8"	5.57
DE4520B	20"	20"	1/8"	6.88
*DE4522B	22"	22"	1/8"	8.32
DE4524B	24"	24"	3/16"	14.85
*DE4526B	26"	26"	3/16"	17.43
*DE4528B	28"	28"	3/16"	20.21
DE4530B	30"	30"	3/16"	23.20
*DE4532B	32"	32"	3/16"	26.40
*DE4534B	34"	34"	3/16"	49.80
DE4536B	36"	36"	3/16"	33.41
*DE4538B	38"	38"	1/4"	49.64
DE4540B	40"	40"	1/4"	55.00
DE4542B	42"	42"	1/4"	60.64
*DE4544B	44"	44"	1/4"	66.55
*DE4546B	46"	46"	1/4"	72.74
DE4548B	48"	48"	1/4"	79.20
*DE4550B	50"	50"	1/4"	85.94
*DE4552B	52"	52"	1/4"	92.95
DE4554B	54"	54"	1/4"	100.24
*DE4556B	56"	56"	1/4"	107.80
*DE4558B	58"	58"	1/4"	115.64
DE4560B	60"	60"	5/16"	154.69

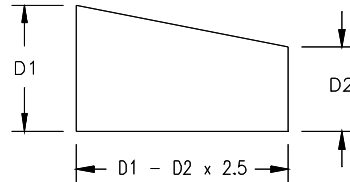
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* Indicates non-standard size

CONCENTRIC REDUCERS



ECCENTRIC REDUCERS



ACES PART NO.	D1	D2	WALL THICKNESS	LENGTH	APPROX. GLASS WT. (LBS.)
DRC06/04	6"	4"	1/8"	5"	0.55
DRC08/06	8"	6"	1/8"	5"	0.76
DRC10/08	10"	8"	1/8"	5"	0.98
DRC12/10	12"	10"	1/8"	5"	1.20
DRC14/12	14"	12"	1/8"	5"	1.42
DRC16/14	16"	14"	1/8"	5"	1.64
DRC18/16	18"	16"	1/8"	5"	1.85
DRC20/18	20"	18"	1/8"	5"	2.07
DRC22/20	22"	20"	1/8"	5"	2.29
DRC24/22	24"	22"	1/8"	5"	3.76
DRC26/24	26"	24"	3/16"	5"	4.09
DRC28/26	28"	26"	3/16"	5"	4.42
DRC30/28	30"	28"	3/16"	5"	4.74
DRC32/30	32"	30"	3/16"	5"	5.07
DRC34/32	34"	32"	3/16"	5"	5.40
DRC36/34	36"	34"	3/16"	5"	5.73
DRC38/36	38"	36"	1/4"	5"	8.07
DRC40/38	40"	38"	1/4"	5"	8.51
DRC42/40	42"	40"	1/4"	5"	8.94
DRC44/42	44"	42"	1/4"	5"	9.38
DRC46/44	46"	44"	1/4"	5"	9.82
DRC48/46	48"	46"	1/4"	5"	10.25
DRC50/48	50"	48"	1/4"	5"	10.69
DRC52/50	52"	50"	1/4"	5"	11.13
DRC54/52	54"	52"	1/4"	5"	11.56
DRC56/54	56"	54"	1/4"	5"	12.00
DRC58/56	58"	56"	1/4"	5"	12.44
DRC60/58	60"	58"	5/16"	5"	16.09
DRC66/60	66"	60"	5/16"	15"	51.54
DRC72/66	72"	66"	5/16"	15"	56.45

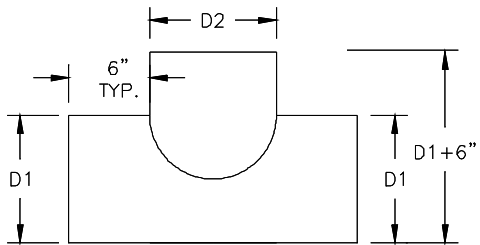
ACES PART NO.	D1	D2	WALL THICKNESS	LENGTH	APPROX. GLASS WT. (LBS.)
DRE06/04	6"	4"	1/8"	5"	0.55
DRE08/04	8"	4"	1/8"	5"	0.76
DRE10/06	10"	6"	1/8"	5"	0.98
DRE12/08	12"	8"	1/8"	5"	1.20
DRE14/10	14"	10"	1/8"	5"	1.42
DRE16/12	16"	12"	1/8"	5"	1.64
DRE18/14	18"	14"	1/8"	5"	1.85
DRE20/16	20"	16"	1/8"	5"	2.07
DRE22/18	22"	18"	1/8"	5"	2.29
DRE24/20	24"	20"	3/16"	5"	3.76
DRE26/22	26"	22"	3/16"	5"	4.09
DRE28/24	28"	24"	3/16"	5"	4.42
DRE30/26	30"	26"	3/16"	5"	4.74
DRE32/28	32"	28"	3/16"	5"	5.07
DRE34/30	34"	30"	3/16"	5"	5.40
DRE36/32	36"	32"	3/16"	5"	5.73
DRE38/34	38"	34"	1/4"	5"	8.07
DRE40/36	40"	36"	1/4"	5"	8.51
DRE42/38	42"	38"	1/4"	5"	8.94
DRE44/40	44"	40"	1/4"	5"	9.38
DRE46/42	46"	42"	1/4"	5"	9.82
DRE48/44	48"	44"	1/4"	5"	10.25
DRE50/46	50"	46"	1/4"	5"	10.69
DRE52/48	52"	48"	1/4"	5"	11.13
DRE54/50	54"	50"	1/4"	5"	11.56
DRE56/52	56"	52"	1/4"	5"	12.00
DRE58/54	58"	54"	1/4"	5"	12.44
DRE60/56	60"	56"	5/16"	5"	16.09
DRE66/60	66"	60"	5/16"	15"	51.54
DRE72/66	72"	66"	5/16"	15"	56.45

To determine weight and length add weights and lengths from desired D1 to D2. Example: 24" to 18" taper is 15" long and weighs 8.12 lbs.

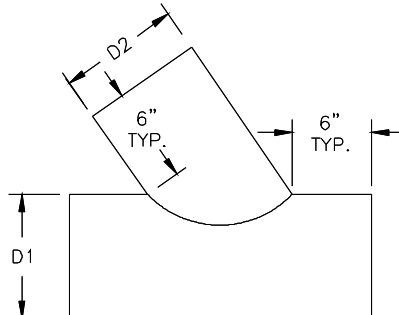
The table above is extrapolated in accordance with the ASTM D 3982-92, Standard Specifications for Contact-Molded Fiberglass Duct and Hoods (replaces NBS Voluntary Product Standard PS 15- 69).

Non-standard sizes, flanges, straights, and bell ends priced on request.

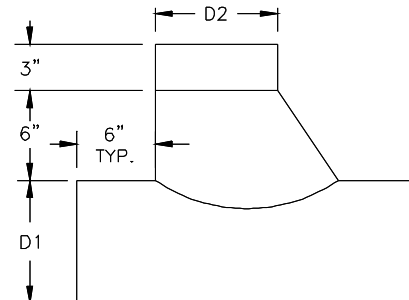
STRAIGHT TEE
LATERAL



Y TEE
LATERAL



SHOE TEES
LATERAL



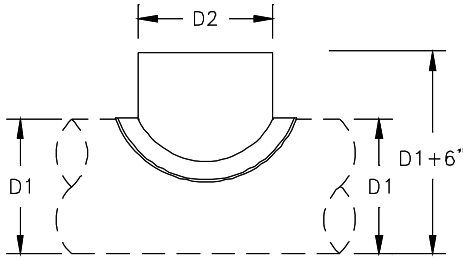
STRAIGHT TEE PART NO.	I.D. DIA. (D2)	SIZE (D1)	WALL THICKNESS
DBLST06	6"		1/8"
DBLST08	8"		1/8"
DBLST10	10"		1/8"
DBLST12	12"		1/8"
DBLST14	14"		1/8"
DBLST16	16"		1/8"
DBLST18	18"		1/8"
DBLST20	20"		1/8"
DBLST22	22"		3/16"
DBLST24	24"		3/16"
DBLST26	26"		3/16"
DBLST28	28"		3/16"
DBLST30	30"		3/16"
DBLST32	32"		3/16"
DBLST34	34"		3/16"
DBLST36	36"		3/16"
DBLST38	38"		1/4"
DBLST40	40"		1/4"
DBLST42	42"		1/4"
DBLST44	44"		1/4"
DBLST46	46"		1/4"
DBLST48	48"		1/4"
DBLST50	50"		1/4"
DBLST52	52"		1/4"
DBLST54	54"		1/4"
DBLST56	56"		1/4"
DBLST58	58"		1/4"
DBLST60	60"		5/16"
DBLST66	66"		5/16"

Y TEE PART NO.	I.D. DIA. (D2)	SIZE (D1)	WALL THICKNESS
DBLY06	6"		1/8"
DBLY08	8"		1/8"
DBLY10	10"		1/8"
DBLY12	12"		1/8"
DBLY14	14"		1/8"
DBLY16	16"		1/8"
DBLY18	18"		1/8"
DBLY20	20"		1/8"
DBLY22	22"		3/16"
DBLY24	24"		3/16"
DBLY26	26"		3/16"
DBLY28	28"		3/16"
DBLY30	30"		3/16"
DBLY32	32"		3/16"
DBLY34	34"		3/16"
DBLY36	36"		3/16"
DBLY38	38"		1/4"
DBLY40	40"		1/4"
DBLY42	42"		1/4"
DBLY44	44"		1/4"
DBLY46	46"		1/4"
DBLY48	48"		1/4"
DBLY50	50"		1/4"
DBLY52	52"		1/4"
DBLY54	54"		1/4"
DBLY56	56"		1/4"
DBLY58	58"		1/4"
DBLY60	60"		5/16"
DBLY66	66"		5/16"

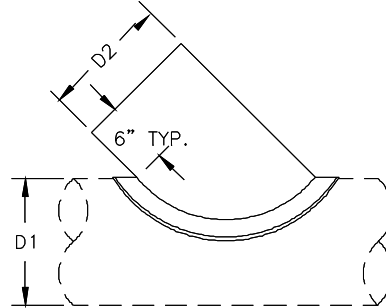
SHOE TEE PART NO.	I.D. DIA. (D2)	SIZE (D1)	WALL THICKNESS
DBLS06	6"		1/8"
DBLS08	8"		1/8"
DBLS10	10"		1/8"
DBLS12	12"		1/8"
DBLS14	14"		1/8"
DBLS16	16"		1/8"
DBLS18	18"		1/8"
DBLS20	20"		1/8"
DBLS22	22"		3/16"
DBLS24	24"		3/16"
DBLS26	26"		3/16"
DBLS28	28"		3/16"
DBLS30	30"		3/16"
DBLS32	32"		3/16"
DBLS34	34"		3/16"
DBLS36	36"		3/16"
DBLS38	38"		1/4"
DBLS40	40"		1/4"
DBLS42	42"		1/4"
DBLS44	44"		1/4"
DBLS46	46"		1/4"
DBLS48	48"		1/4"
DBLS50	50"		1/4"
DBLS52	52"		1/4"
DBLS54	54"		1/4"
DBLS56	56"		1/4"
DBLS58	58"		1/4"
DBLS60	60"		5/16"
DBLS66	66"		5/16"

This table above is extrapolated in accordance with the ASTM D 3982-92 Standard Specifications for Contact-Molded Fiberglass Duct and Hoods (replaces NBS Voluntary Product Standard PS 15-69). Non standard sizes, flanges, straights, and bell ends priced on request.

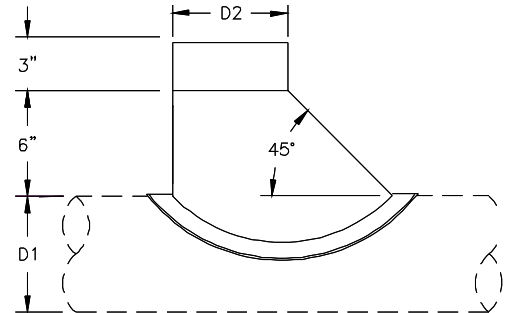
STRAIGHT TEE SADDLES



Y TEE SADDLES



SHOE TEE SADDLES



STRAIGHT TEE SADDLE PART NO.	I.D. DIA. (D2)	SIZE (D1)	WALL THICKNESS
DSLST06	6"		1/8"
DSLST08	8"		1/8"
DSLST10	10"		1/8"
DSLST12	12"		1/8"
DSLST14	14"		1/8"
DSLST16	16"		1/8"
DSLST18	18"		1/8"
DSLST20	20"		1/8"
DSLST22	22"		3/16"
DSLST24	24"		3/16"
DSLST26	26"		3/16"
DSLST28	28"		3/16"
DSLST30	30"		3/16"
DSLST32	32"		3/16"
DSLST34	34"		3/16"
DSLST36	36"		3/16"
DSLST38	38"		1/4"
DSLST40	40"		1/4"
DSLST42	42"		1/4"
DSLST44	44"		1/4"
DSLST46	46"		1/4"
DSLST48	48"		1/4"
DSLST50	50"		1/4"
DSLST52	52"		1/4"
DSLST54	54"		1/4"
DSLST56	56"		1/4"
DSLST58	58"		1/4"
DSLST60	60"		5/16"
DSLST66	66"		5/16"
DSLST72	72"		5/16"

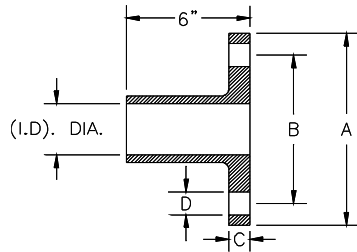
Y TEE SADDLE PART NO.	I.D. DIA. (D2)	SIZE (D1)	WALL THICKNESS
DSLY06	6"		1/8"
DSLY08	8"		1/8"
DSLY10	10"		1/8"
DSLY12	12"		1/8"
DSLY14	14"		1/8"
DSLY16	16"		1/8"
DSLY18	18"		1/8"
DSLY20	20"		1/8"
DSLY22	22"		3/16"
DSLY24	24"		3/16"
DSLY26	26"		3/16"
DSLY28	28"		3/16"
DSLY30	30"		3/16"
DSLY32	32"		3/16"
DSLY34	34"		3/16"
DSLY36	36"		3/16"
DSLY38	38"		1/4"
DSLY40	40"		1/4"
DSLY42	42"		1/4"
DSLY44	44"		1/4"
DSLY46	46"		1/4"
DSLY48	48"		1/4"
DSLY50	50"		1/4"
DSLY52	52"		1/4"
DSLY54	54"		1/4"
DSLY56	56"		1/4"
DSLY58	58"		1/4"
DSLY60	60"		5/16"
DSLY66	66"		5/16"
DSLY72	72"		5/16"

SHOE TEE SADDLE PART NO.	I.D. DIA. (D2)	SIZE (D1)	WALL THICKNESS
DSLS06	6"		1/8"
DSLS08	8"		1/8"
DSLS10	10"		1/8"
DSLS12	12"		1/8"
DSLS14	14"		1/8"
DSLS16	16"		1/8"
DSLS18	18"		1/8"
DSLS20	20"		1/8"
DSLS22	22"		3/16"
DSLS24	24"		3/16"
DSLS26	26"		3/16"
DSLS28	28"		3/16"
DSLS30	30"		3/16"
DSLS32	32"		3/16"
DSLS34	34"		3/16"
DSLS36	36"		3/16"
DSLS38	38"		1/4"
DSLS40	40"		1/4"
DSLS42	42"		1/4"
DSLS44	44"		1/4"
DSLS46	46"		1/4"
DSLS48	48"		1/4"
DSLS50	50"		1/4"
DSLS52	52"		1/4"
DSLS54	54"		1/4"
DSLS56	56"		1/4"
DSLS58	58"		1/4"
DSLS60	60"		5/16"
DSLS66	66"		5/16"
DSLS72	72"		5/16"

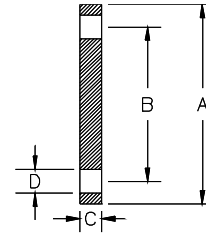
This table above is extrapolated in accordance with the ASTM D 3982-92 Standard Specifications for Contact-Molded Fiberglass Duct and Hoods (replaces NBS Voluntary Product Standard PS 15-69). Non standard sizes, flanges, straights, and bell ends priced on request.



STUB DUCT FLANGE



BLIND DUCT FLANGE



ACES FLANGE P/N	I.D. DIA.	A	B	C	D	BOLT SIZE	NO. OF BOLT HOLES	DED MAXIMUM BOLT	ACES BLIND FLANGE P/N
DFL04	4"	8 3/8"	7"	1/4"	7/16"	3/8"	4	25/40	DBFL04
DFL06	6"	10 3/8"	9"	1/4"	7/16"	3/8"	8	25/40	DBFL06
DFL08	8"	12 3/8"	11"	1/4"	7/16"	3/8"	8	25/40	DBFL08
DFL10	10"	14 3/8"	13"	3/8"	7/16"	3/8"	12	25/40	DBFL10
DFL12	12"	16 3/8"	15"	3/8"	7/16"	3/8"	12	25/40	DBFL12
DFL14	14"	18 3/8"	17"	3/8"	7/16"	3/8"	12	25/40	DBFL14
DFL16	16"	20 3/8"	19"	1/2"	7/16"	3/8"	16	25/40	DBFL16
DFL18	18"	22 3/8"	21"	1/2"	7/16"	3/8"	16	25/40	DBFL18
DFL20	20"	24 3/8"	23"	1/2"	7/16"	3/8"	20	25/40	DBFL20
*DFL22	22"	26 3/8"	25"	1/2"	7/16"	3/8"	20	25/40	*DBFL22
DFL24	24"	28 3/8"	27"	1/2"	7/16"	3/8"	20	35/50	DBFL24
*DFL26	26"	30 3/8"	29"	1/2"	7/16"	3/8"	24	35/50	*DBFL26
DFL28	28"	32 3/8"	31"	1/2"	7/16"	3/8"	24	35/50	DBFL28
DFL30	30"	34 3/8"	33"	1/2"	7/16"	3/8"	28	35/50	DBFL30
*DFL32	32"	36 3/8"	35"	1/2"	7/16"	3/8"	28	35/50	*DBFL32
*DFL34	34"	38 3/8"	37"	1/2"	7/16"	3/8"	28	35/50	*DBFL34
DFL36	36"	40 3/8"	39"	1/2"	7/16"	3/8"	32	35/50	DBFL36
*DFL38	38"	42 3/8"	41"	5/8"	7/16"	3/8"	32	35/50	*DBFL38
DFL40	40"	44 3/8"	43"	5/8"	7/16"	3/8"	32	35/50	DBFL40
DFL42	42"	46 3/8"	45"	5/8"	7/16"	3/8"	36	35/50	DBFL42
*DFL44	44"	48 3/8"	47"	5/8"	7/16"	3/8"	40	35/50	*DBFL44
*DFL46	46"	50 3/8"	49"	5/8"	7/16"	3/8"	40	35/50	*DBFL46
DFL48	48"	54 3/8"	52"	5/8"	9/16"	1/2"	44	35/50	DBFL48
*DFL50	50"	56 3/8"	54"	5/8"	9/16"	1/2"	44	35/50	*DBFL50
*DFL52	52"	58 3/8"	56"	5/8"	9/16"	1/2"	44	35/50	*DBFL52
DFL54	54"	60 3/8"	58"	5/8"	9/16"	1/2"	44	35/50	DBFL54
*DFL56	56"	62 3/8"	60"	5/8"	9/16"	1/2"	48	35/50	*DBFL56
*DFL58	58"	64 3/8"	62"	5/8"	9/16"	1/2"	48	35/50	*DBFL58
DFL60	60"	66 3/8"	64"	5/8"	9/16"	1/2"	52	35/50	DBFL60

The table above is extrapolated in accordance with the ASTM D 3982-92, Standard Specifications for Contact-Molded Fiberglass Duct and Hoods (replaces NBS Voluntary Product Standard PS 15-69).

*Indicates non-standard size

FLANGES SHIPPED UNDRILLED.



ACES DUCT SPECIFICATIONS

AIR CHEM ENGINEERED SYSTEMS (ACES) has adopted the following standards for fiberglass reinforced plastic (FRP) duct and fittings for non-flammable, corrosive and chemical environments. These standards are in accordance with ASTM D 3982-92, Standard Specifications for Contact-Molded Fiberglass Duct and Hoods (replaces National Bureau of Standards Voluntary Product Standard PS 15-69).

1.0 MATERIALS

- A. RESINS:** Standard fiberglass duct and fitting resin systems will be DION 9300NP fire-retardant resin or equal. Non-standard resin systems may be substituted for ICBO-equivalent requirements or for harsher environments based on corrosion guides as supplied by the resin manufacturers or determined from actual testing by the customer on a test coupon supplied by **ACES**.
- B. FILLERS:** The above resins shall not contain any fillers except as required for viscosity control or as a fire retardant. Antimony trioxide shall be added, if necessary, to comply with the resin manufacturer's recommendation to achieve a flame spread of 15 or less when tested per the ASTM-E 84 tunnel test.
- C. GLASS MATERIALS:** The glass fiber material shall be a commercial grade with a coupling agent to provide a suitable bond between glass fiber and resin.

2.0 CONSTRUCTION

- A. LAMINATE:** The laminate shall consist of an inner surface, an interior layer and an exterior layer or laminate body.
- B. INNER SURFACE:** The inner surface shall be free of cracks and crazing with a smooth finish and resin-rich to avoid exposure of glass fibers. Some waviness is permissible as long as the surface is smooth and free of pits. A c-glass or synthetic surfacing veil shall be used on the inner surface for added corrosion resistance.
- C. INTERIOR LAYER:** A minimum of .100 inches of the laminate next to the inner surface shall be reinforced with not less than 20 percent and no more than 30 percent by weight of non-continuous glass strands having fiber lengths from 0.5 to 2.0 inches.
- D. EXTERIOR LAYER:** The exterior layer or body of the laminate shall be of chemically resistant construction suitable for the service and providing the additional strength necessary to meet the tensile and flexural requirements. This layer may be chopped strand roving, mat, cloth or unidirectional roving.
- E. GEL COAT:** The gel coat shall be a commercially available material consisting of a polyester resin with a pigment for color and ultraviolet inhibitor.

3.0 FINISH

- A. CUT EDGES:** All cut edges shall be coated with resin so that no glass fibers are exposed.
- B. JOINTS:** Finished joints shall be built up in successive layers to be as strong as the pieces being joined and as crevice free as is commercially practicable. The width of the first layer shall be 4" and staggered until desired thickness is achieved.
- C. APPEARANCE:** The finished laminate shall be as free as commercially practicable from visual defects such as dry spots, air bubbles, foreign inclusions, pinholes, pimples and de-lamination.



ACES DUCT SPECIFICATIONS

4.0 DUCT SIZE AND TOLERANCE

- A. **ROUND DUCTING:** The size of round ducting shall be determined by the inside diameter in inches. The standard sizes shall be per the Duct Chart in this Section. The tolerance, including out-of-roundness, shall be $\pm 1/16$ " for ducting up to 6" inside diameter; and $\pm 1/8$ " or $\pm 1\%$ for 8" inside diameter, whichever is greater, for ducting larger than the 6" inside diameter.
- B. **RECTANGULAR DUCTING:** The size of rectangular ducting shall be determined by the inside dimensions as there are no standard sizes for rectangular ducting.
- C. **THICKNESS:** The nominal thickness of round ducting shall be in accordance with the Duct Chart in this Section. For rectangular ducting, the minimum thickness shall be as specified in the Duct Chart by substituting the longer side for the diameter.
- D. **FITTING:** Tolerance on angles shall be ± 1 degree through the 24" size; $\pm 7/8$ degree for 30" size; $\pm 3/4$ degree for 36" size; $\pm 5/8$ degree for 42" size; and $\pm 3/4$ degree for 48" size and above. Wall thickness of the fittings shall be at least that of the duct of an equivalent size.
Please refer to the Fitting Charts in this section.
- E. **ELLS:** Standard ells shall have a centerline radius of 1.5 times the duct diameter in sizes up to 36" diameter, and 1.0 times the duct diameter in sizes of 42" diameter and larger. Please refer to the Fitting Charts in this section.
- F. **REDUCERS** : *Concentric or Eccentric:* The length of standard reducers shall be 2.5 times the difference in diameters (D1-D2). Minimum wall thickness shall be that required for the larger diameter duct as given in the Duct Chart in this section.
- G. **LATERALS:** Standard laterals shall be 45°.

5.0 STRAIGHT CONNECTORS

- A. **BUTT JOINT:** Strength of the butt joint shall be at least equal to that of the duct itself and shall be made in accordance with Item 3.0 in these standards. Total minimum width of a joint shall be 4" for $3/16$ " thickness or less, and 6" for $1/4$ " thickness.
- B. **BELL AND SPIGOT JOINT:** Standard duct and fittings are bell and spigot. Straight duct shall be inserted into the 2" bell and over-wrapped in such a manner as to provide strength at least equal to that of the duct itself and shall be made in accordance with Item 3.0 above.



ACES DUCT SPECIFICATIONS

6.0 FLANGES

- A. FLANGE DIMENSIONS:** Dimensions of reinforced plastic flanges for round duct shall be in accordance with the Flange Chart in this section. Flange thickness and width for rectangular duct shall correspond to these for round duct having the same diameter as the longer side of the rectangular duct.
- B. FLANGE ATTACHMENT:** Duct wall at hub of flange shall be at least 1.5 times the normal thickness of the duct and will taper to normal thickness over the distance of the flange width.
- C. FACE OF FLANGE:** Face of flange shall have no projections or depressions and shall be perpendicular to the centerline of the duct to within 1/2 degree.
- D. DRILLING:** Standard flanges shall be supplied undrilled.
- E. FLANGE BOLTING:** Bolt holes shall straddle centerline unless otherwise specified. The number of bolt holes, the diameters of bolt holes and the bolt circles shall be in accordance with the Flange Chart in this section. Bolt spacing and rectangular flange width shall be the same as that for diameters corresponding to the longer sides.

7.0 OPTIONS

The following options can be provided at an additional cost:

- A. HARDWARE: All bolts, nuts, washers, gaskets, hanging brackets, etc.
- B. FLEX CONNECTORS
- C. ACCESS PORTS
- D. DRAINS
- E. FLANGE DRILLING

8.0 CUSTOM ENGINEERED DUCT AND FITTINGS

- A. RECTANGULAR DUCT
- B. BURIED DUCT
- C. THERMOPLASTIC LINED DUCT—PVC, CPVC, Polypropylene, Kynar, Teflon
- D. SPECIAL PRESSURE AND VACUUM DUCT
- E. ICBO-EQUIVALENT DUCT
- F. CUSTOM FITTINGS
- G. SPECIAL SIZES



Hoods

Scrubbers

Duct & Fittings

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Centrifugal Fans

Special Systems

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