Conley Composites
an ANDRONACO INDUSTRIES company

FGD-AR SCHEDULE 50
ABRASION RESISTANT PIPING

ASTM DESIGNATION CODE RTRP-11FW1-2113
ASTM DESIGNATION CODE RTRP-11EW1-2113

Conley Product Data

ABRASION RESISTANT PIPING FOR FGD SERVICES ~ SLURRIES

Description

- Heavy duty corrosion/abrasion resistant barrier for longer wear filament wound piping for service up to 250 psi
- 100 mil four layers (min) Nexus® reinforced corrosion barrier (inner liner) available in Epoxy or Vinyl Ester resin
- Designed for services in flue gas desulphurization scrubber applications for slurries of limestone, ammonium sulfate & gypsum
- Premium aromatic amine cured product for operating temperatures up to 275^{o}F
- Sizes available from 1" through 30"
- Complete line of filament wound abrasion resistant fittings available
- In house fabrication facilities "From your blueprints to pipe assemblies"
- Color coding available
- See FGD-AR Sch 50 Specification

Typical Applications

- Power plant scrubber applications
- Slurry systems
- Limestone and gypsum slurries
- Fly ash
- Saturated brines

Performance

- Excellent chemical and abrasion resistant inner liner ~ See the chemical resistance chart for fluid services
- Maximum recommended gypsum slurry velocity is 7 fps (2 m/s)
- Taber abrasive test data wear index:
  - Conley Epoxy = 17.4 (20% SiC)
  - Conley Vinyl Ester = 25 (Derakane® 411-20% SiC)
- External UV/Corrosion barrier minimum 10 mil on all pipe and fittings
- 25 year guarantee against *'fiber blooming'* on all pipe and fittings
- Straight socket joining system (No expensive tapering tools required)

Specifications

- ASTM D2996 Filament-Wound "Fiberglass" Pipe
- ASTM D2310 Classification for Machine-Made "Fiberglass" Pipe
- ASTM D3567 Determining Dimensions of "Fiberglass" Pipe and Fittings
- ASTM D4024 Machine Made "Fiberglass" Flanges
- ASTM D5685 "Fiberglass" Pressure Pipe Fittings

Codes & Standards

- ASME B31.3 Power Piping Code
- ASME B31.1 Process Piping Code
- AWWA C950 Fiberglass Pressure Pipe Standards

PERRY JOHNSON REGISTRARS, INC.

FGD-AR Schedule 50 Pipe Dimensional Data* and Pressure Ratings[1] from –50° to 275°F

[1]Static pressure rating; steady (stationary) pressure is created when using a gear pump, turbine pump, centrifugal pump, etc.
[2]Vacuum Service: A full vacuum within the pipe is equivalent to 14.7 psi external pressure at sea level. Contact Conley for higher external pressure ratings.

NOM PIPE DIA	PIPE I.D.	PIPE O.D.	NOM LINER THK (IN)	NOM REINF THK (IN)	NOM UV THK (IN)	TOT THK (IN)	INT PRESS (PSI)	VAC PRESS (PSI)[2]
1”	0.88	1.36	0.100	0.120	0.020	0.240	250	1852
1 ½”	1.38	1.90	0.100	0.150	0.010	0.260	250	1327
2"	1.88	2.38	0.100	0.120	0.030	0.250	250	345
2 ½”	2.38	2.88	0.100	0.120	0.030	0.250	250	195
3"	3.00	3.47	0.100	0.090	0.045	0.235	250	47.1
4"	4.00	4.47	0.100	0.090	0.045	0.235	250	22.0
6"	6.00	6.57	0.100	0.165	0.020	0.285	250	42.7
8"	8.00	8.60	0.100	0.165	0.035	0.300	175	19.0
10"	10.00	10.68	0.100	0.220	0.020	0.340	175	22.9
12"	12.25	13.04	0.100	0.275	0.020	0.395	175	24.6
14"	14.25	15.00	0.100	0.220	0.055	0.375	175	8.3
16"	16.25	17.00	0.100	0.220	0.055	0.375	125	5.7
18"	18.25	19.00	0.100	0.220	0.055	0.375	100	4.1
20"	20.25	20.96	0.100	0.220	0.035	0.355	100	3.0
24"	24.25	25.04	0.100	0.275	0.020	0.395	100	3.5
30"	30.50	31.43	0.100	0.330	0.035	0.465	100	3.0

*All values are nominal. Minimum wall thickness shall not be less than 87.5% of nominal wall thickness in accordance with ASTM D2996.

Support Spans* and Capacities at 75°F

NOM PIPE DIA	TYPE I SIMPLE SPAN (FT)	TYPE II MAX CONT SPAN (FT)	TYPE IV FIXED END SPAN (FT)	MIN BEND RADIUS (FT)	WT/FT (LBS)	CAP (GAL/FT)
1”	7.6	8.9	11.4	20	0.68	0.03
1 ½”	9.1	10.7	13.6	32	1.08	0.08
2"	9.0	10.6	13.5	44	1.35	0.14
2 ½”	9.4	11.0	14.0	55	1.66	0.23
3"	10.7	12.6	16.1	69	1.92	0.37
4"	13.0	15.2	19.4	93	2.51	0.65
6"	15.3	18.0	22.9	139	4.52	1.47
8"	16.9	19.8	25.3	185	6.29	2.61
10"	18.1	21.2	27.0	231	8.88	4.08
12"	20.0	23.5	30.0	284	12.62	6.12
14"	20.9	24.5	31.3	330	13.55	8.28
16"	22.6	26.4	33.7	376	15.75	10.77
18"	24.1	28.2	36.0	422	17.64	13.59
20"	24.8	29.1	37.1	469	18.48	16.73
24"	26.8	31.4	40.1	561	24.59	23.99
30"	29.3	34.4	43.9	706	36.37	37.95

***NOTE:** Span deflection = ½” with fluid of 1.0 specific gravity

Span multipliers for fluids of different specific gravities

FLUID SPECIFIC GRAVITY							
AIR	0.75	0.9	**1.0**	1.1	1.25	1.5	2.0
1.40	1.07	1.02	**1.0**	0.98	0.95	0.90	0.84
(MULTIPLIER FOR CORRECTED SPAN LENGTHS)							

Span multipliers for fluids at different temperatures

FLUID TEMPERATURE						
75°F	100°F	150°F	200°F	225°F	250°F	275°F
1.0	0.98	0.93	0.88	0.84	0.80	0.75
(MULTIPLIER FOR CORRECTED SPAN LENGTHS)						

Typical Properties

TEMPERATURE	**75°F**	**250°F**	
PROPERTY	**VALUE**	**VALUE**	**METHOD**
AXIAL TENSILE STRENGTH	14,200 psi	10,650 psi	ASTM D2105
AXIAL TENSILE DESIGN STRENGTH	3,550 psi	2,660 psi	ASTM D2105
AXIAL MODULUS OF ELASTICITY	1.75×10^6 psi	1.30×10^6 psi	ASTM D2105
COMPRESSIVE STRENGTH	22,750 psi	17,000 psi	ASTM D695
COMPRESSIVE DESIGN STRENGTH	5,685 psi	4,250 psi	ASTM D695
COMPRESSION MODULUS	2.80×10^6 psi	2.10×10^6 psi	ASTM D695
POISSON'S RATIO $V_{a/h}$ ($V_{h/a}$)	0.33 (0.23)		*CONLEY METHOD #20
BEAM BENDING, ULTIMATE STRESS	30,000 psi	22,500 psi	CONLEY METHOD 8
BEAM BENDING, DESIGN STRESS[(1)]	3,750 psi	2,810 psi	CONLEY METHOD 8
SHEAR MODULUS	1.30×10^6 psi	1.00×10^6 psi	*CONLEY METHOD #9
HYDROSTATIC DESIGN BASIS	16,000 psi	8,000 psi	ASTM D2992 PROCEDURE B
HYDROSTATIC BURST (WALL STRESS @ 72°F)	32,000 psi	24,000 psi	ASTM D1599
CIRCUMFERENTIAL MODULUS OF ELASTICITY	2.50×10^6 psi	1.87×10^6 psi	ASTM D1599
FLEXURAL MODULUS OF ELASTICITY	1.75×10^6 psi	1.30×10^6 psi	ASTM 2790
COEFFICIENT OF LINEAR THERMAL EXPANSION	$9.5 \times \frac{10^{-6}\ \text{IN}}{\text{IN-}\ ^\circ\text{F}}$		CONLEY METHOD 3
COEFFICIENT OF THERMAL CONDUCTIVITY	$2.9\ \frac{\text{BTU/HR-IN}}{\text{FT}^2 - ^\circ\text{F}}$		CONLEY METHOD 16
SPECIFIC GRAVITY	1.85		
DENSITY	0.067 LB/CU IN		
DIELECTRIC STRENGTH	$535\ \frac{\text{VOLTS}}{\text{MIL}}$		ASTM D149
DEGREE OF CURE	175°C (347°F) Tg		DMA
HEAT DEFLECTION TEMPERATURE	150°C (302°F)		ISO 75-3
FLOW FACTOR (HAZEN-WILLIAMS)	150		
SURFACE ROUGHNESS	1.7×10^{-5} FEET		
MANNING'S "n"	0.009 INCH		

[(1)]Beam bending design stress is 1/8 of ultimate to allow for combined stress (bending and pressure)

Pipe Section Properties

(1)Use these values to calculate permissible spans.
(2)Use these values for calculating longitudinal thrust.

NOMINAL PIPE SIZE (IN)	REINFORCEMENT ONLY(STRUCTURAL CAGE)			TOTAL WALL END AREA (IN^2)(2)
	END AREA (IN^2)	MOMENT OF INERITA (IN^4)(1)	SECTION MODULUS (IN^3)	
1	0.42	0.07	0.11	0.84
1 ½	0.78	0.27	0.30	1.34
2	0.80	0.45	0.40	1.67
2 ½	0.99	0.85	0.62	2.07
3	0.91	1.17	0.71	2.39
4	1.19	2.64	1.23	3.13
6	3.26	16.10	4.98	5.63
8	4.30	36.87	8.71	7.82
10	7.15	95.58	18.07	11.05
12	10.93	218.51	33.76	15.69
14	10.08	268.45	36.18	17.23
16	11.47	394.65	46.86	19.59
18	12.85	555.26	58.92	21.94
20	14.23	754.42	72.36	22.98
24	21.29	1617.13	129.52	30.58
30	32.09	3843.41	245.24	45.24

ISO 9001:2008 CERTIFIED Conley Composites Tulsa, Oklahoma USA

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