FIBERGLASS MUDMATS

AIMS COMPOSITES

AIMS Composites is a world leader in offshore vortex induced vibration (VIV) suppression, engineered fiberglass structural systems, and platform dock fendering systems. Since 1982, AIMS has been the leader in supplying, engineering, and fabricating fiberglass grating and structural systems. AIMS supplies a full line of platforms, dock fenders, fiberglass signs, vortex breakers, VIV suppression products, blast panels, and mudmats. In addition, we are a leading supplier of fiberglass handrail and stair systems, as well as and other specialty fiberglass products.

AIMS prides itself on its ability to take the customer project from the initial design and engineering phase to the implementation and installation of the finished product.

In an effort to continually improve services, AIMS actively seeks expansion opportunities within the United States and in overseas markets. In 1993, we purchased Teledyne Monarch Rubber's platform fender product line, moved the product tooling to Houston, and began manufacturing and marketing a platform fender product line, i.e., energy cells, rubstrips, and barge bumpers. In 2017, AIMS began fabricating aluminum structures and handrails.

To market our products and services around the world, AIMS forms partnerships with local companies in various countries, including Malaysia, Australia, Korea, Singapore, India, United Arab Emirates, Nigeria, Brazil, and Mexico. Everywhere there is offshore oil and gas, you will find AIMS International.

Market Applications

AIMS' products and services have been successfully used in various applications in many different industries. Wherever there is value placed on safety, eliminating maintenance expenditures, ease of installation, and long service life, AIMS should be consulted. The following are industries and locations where our products are found:

Offshore Drilling & Production Facilities
wellhead access platforms around wells & vessels, stair towers, grating systems, electrical cable trays, mudmats

Petrochemical Plants & Refineries
walkways & platforms around vessels and equipment, stair towers, trench grating

Industrial & Municipal Wastewater Facilities
walkways & catwalks in and around clarifiers, settling basins, and platforms used as storage areas

Pulp & Paper Mills
walkways & catwalks in and around their waste water plants, including bleaching and washing areas

Metal Plating & Mining Facilities
platforms in processing areas, catwalks, stair towers, storage areas

Commercial Warehouses
grating systems for additional storage areas and mezzanines

Beverage & Food Processing Plants
grating systems & platforms in and around wash-down areas, access platforms, and storage areas

Hi-tech Computer Industry Facilities
grating systems in clean rooms and etching areas

Water Park & Recreational Facilities
trench grating in and around pools, structural systems for flowing streams

Cooling Tower Industry
access walkways & towers, de-misters

Federal & State Parks
bridges & erosion control

Valuable features of AIMS' products for these and other industries include:

- Excellent corrosion resistance and elimination of maintenance
- Lightweight and ease of installation
- High strength-to-weight ratio
- Excellent non-skid characteristics, safety, and ergonomics
- Fire resistance
- Electrical and thermal non-conductivity
- Durability and long service life
- Great return on investment

AIMS Fiberglass Mudmat Planks are the smart choice for fixed-jacket mudmats.

The useful life of a traditional steel mudmat—where the skin of the mudmat is steel plate—is one to two weeks, as the installation contractor is driving the piles. Once the jacket-to-pile connection is made, the useful life of the steel mudmat system is over. However, the steel mudmat plating continues to draft from the cathodic protection system. Therefore, you have to spend the money upfront for the anodes to protect steel that is doing nothing but draining from the cathodic protection system for the rest of the 20 to 30 year platform life. Because AIMS Fiberglass Mudmat Planks are non-metallic, you do not have to spend the upfront money to buy these anodes, thus resulting in a considerable upfront savings.

The bigger advantage to using the AIMS Fiberglass Mudmat Planks is their considerable strength advantage over steel plate. AIMS offers two mudmat planks – our Standard Duty Mudmat Planking and our Heavy Duty Mudmat Planking. We have performed a considerable amount of load deflection and failure testing, and using the average values of the testing minus two standard deviations, our planks possess a Flexural Strength of 51,000 psi and a Modulus of Elasticity of 3,600,000 psi. Compared to 1/4" steel plate, our Standard Duty Planking is 22.7 times stiffer than the 1/4" steel plate and 6.7 times stiffer than 3/8" steel plate (E x I = 10,288,800 lbs-in2). Comparing our Heavy Duty Mudmat Planking to 1/4" steel plate, the planking is 93.6 times stiffer and 27.7 times stiffer than 3/8" steel plate. What this means is that you can increase the spacing between your mudmat filler beams, thus eliminating filler beams and greatly reducing the number of steel joints to be fabricated, and at the same time, and further, greatly reducing the surface area to be protected by the cathodic protection system. Remember, steel plate has two surfaces—top and bottom.

Type of Mudmat Skin Material	Stiffness (E x I), lbs-in2
PL 1/4" Steel Plate x 12" Wide	453,125
PL 3/8" Steel Plate x 12" Wide	1,529,297
AIMS Standard Duty FRP Mudmats x 12" Wide	10,288,800
AIMS Heavy Duty FRP Mudmats x 12" Wide	42,436,800

When you add up the anodes eliminated, the weight saving, and the reduction in fabrication labor and welding due to the reduced number of fabricated joints, AIMS Fiberglass Mudmat Planks offer upfront monetary savings as compared to conventional steel plate mudmats. Further, the installation of the AIMS FRP Mudmats is simple—there is no bolting or epoxying required.

Direct, Upfront Monetary Saving:

- High flexural strengths
- High stiffness
- Allows mudmat filler beams to be spaced much further apart
- Reduction in the number of fabricated steel joints
- Reduction in steel weight
- Reduction in anodes
- Easily installed—NO BOLTING, NO EPOXYING

How to Calculate Reduction in Anodes

The reduction in anodes is a function of the "wetted" and "mudded" steel areas. Wetted steel is the steel surface that is in contact with water, and the mudded steel area is the steel surface area that is in contact with mud. For wetted steel, use the current draw of 0.006 amps/ft2, and for the mudded steel, a current draw of 0.002 amps/ft2. Further, for the anode consumption rate, we use 8.0 lbs/year/amp. We calculate the number of anodes to be eliminated by the formula:

N = [(WSA-steel – WSA-frp) ft2 x (0.006 amps/ft2) + (MSA-steel – MSA-frp) ft2 x (0.002 amps/ft2)] x (8.0 lbs/year/amp) x (PL-years)/LB-anode lbs, where:

N = Number of anodes to be eliminated

WSA-steel = Wetted Surface Area of the all-steel mudmat option

WSA-frp = Wetted Surface Area of the mudmat using FRP planks

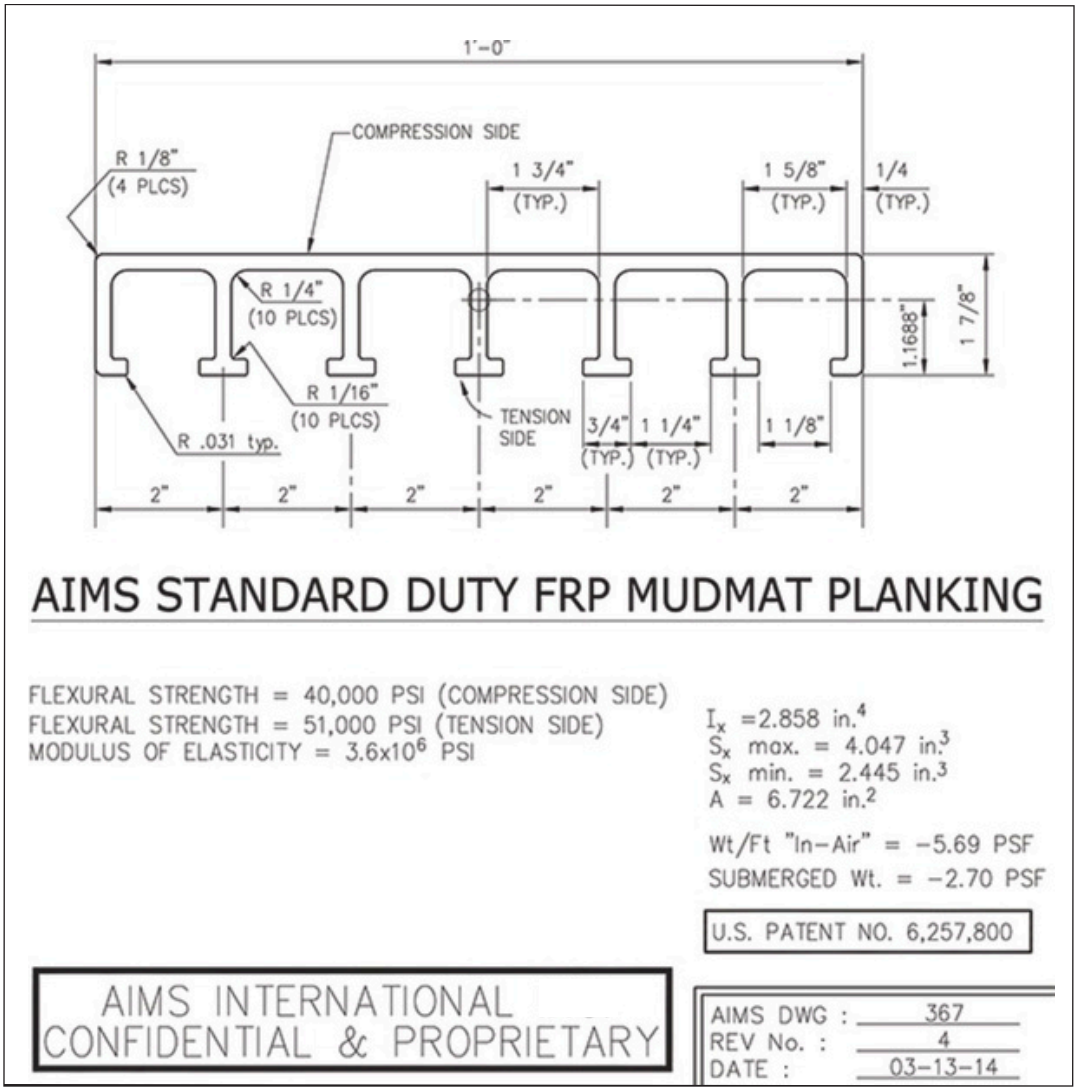
MSA-steel = Mudded Surface Area of the all-steel mudmat option

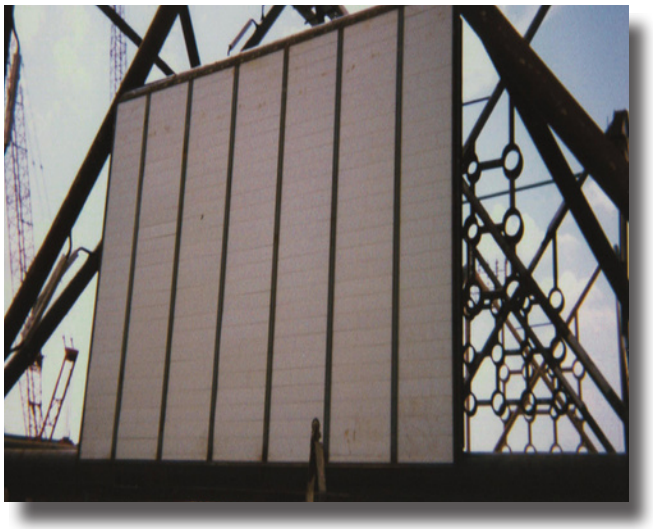
WSA-frp = Mudded Surface Area of the mudmat using FRP planks

PL = Platform Life (20 years, 30 years, etc.)

LBa-node = Poundage of anodes eliminated, such as 725 lbs or 1100 lbs

Standard Duty Mudmats





Load Deflection Tables - Standard Duty Mudmats

Modulus of Elasticity	3,600,000 psi
Flexural Strength, Tension Side	51,000 psi
Flexural Strength, Compression Side	40,000 psi
Moment of Inertia	2.858 in^4
Section Modulus, Compression Side	4.047 in^3
Section Modulus, Tension Side	2.445 in^3

Deflection, Δ, $= \frac{(SwL^4)}{(384/EI)}$

ft = flexural stress, tension-side
fc = flexural stress, compression-side

Simple Beam Deflection of AIMS Standard Duty Mudmats, inches									
Clear	Loading, lbs/square feet (Note: because the planks are 1" wide, lbs/square feet = lbs/linear feet)								
Span, ft.	250	500	750	1000	1250	1500	2000	2500	3000
3	0.044	0.089	0.133	0.177	0.221	0.266	0.354	0.443	0.531
ft	2453.988	4907.975	7361.963	9815.951	12269.939	14723.926	19631.902	24539.877	14825.580 2965.159 29447.853
fc	4447.739	5930.319	7412.898	8895.478	11860.638	14825.797			17790.956
4	0.140	0.280	0.420	0.560	0.700	0.840	--	--	--
5	0.342	0.683	1.025	1.367	--	--	--	--	--
6	0.709	1.417	2.126	--	--	--	--	--	--
7	1.313	2.625	--	--	--	--	--	--	--
8	2.239	--	--	--	--	--	--	--	--
9	3.587	--	--	--	--	--	--	--	--
10	5.467	--	--	--	--	--	--	--	--

Note: Deflections represented with an "--" are not provided and are not recommended, because the Flexural Safety Factor is less than 3.0.

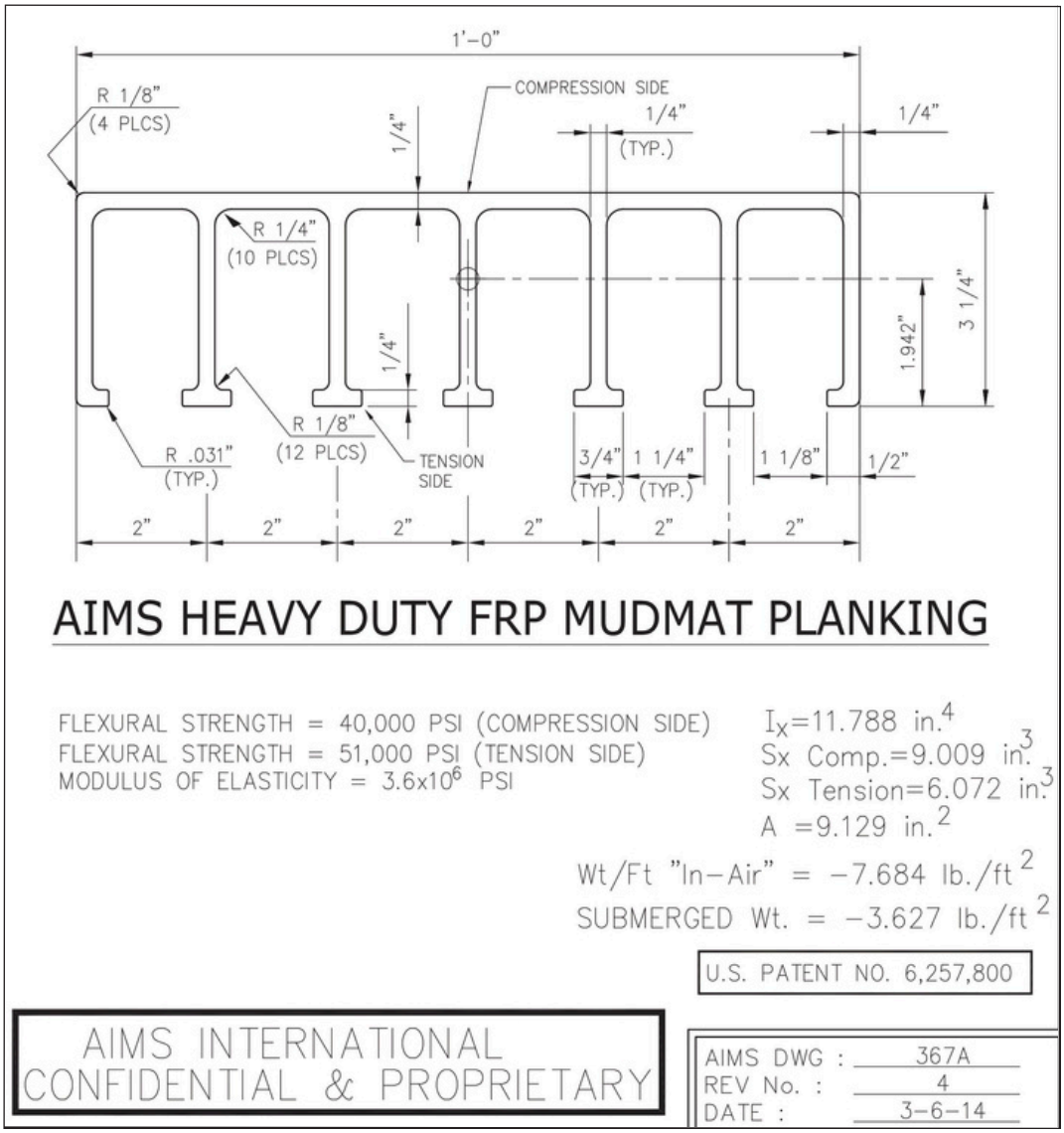
Longitudinal Shear Stress Table - Standard Duty Mudmats

Longitudinal Shear Stresses at the Web-to-Flange Interface, Ignoring the Fillets
Q = 1.9256 in3 at the interface t = 1.75 inches at the interface

Longitudinal Shear Stresses Table									
Clear	Loading, lbs/square feet (Note: because the planks are 1" wide, lbs/square feet = lbs/linear feet)								
Span, ft.	250	500	750	1000	1250	1500	2000	2500	3000
3	144	289	433	578	722	866	1155	1444	1733
4	193	385	578	770	963	1155	--	--	--
5	241	481	722	963	--	--	--	--	--
6	289	578	866	--	--	--	--	--	--
7	337	674	--	--	--	--	--	--	--
8	385	--	--	--	--	--	--	--	--
9	433	--	--	--	--	--	--	--	--
10	481	--	--	--	--	--	--	--	--
9	3.587	--	--	--	--	--	--	--	--
10	5.467	--	--	--	--	--	--	--	--

Note: Deflections represented with an "--" are not provided and are not recommended, because the Flexural Safety Factor is less than 3.0, or the Longitudinal Shear Stress, r, exceeds the Allowable Longitudinal Shear Stress of 2,333 psi, which incorporates a Shear Safety Factor of 3.0.

Heavy Duty Mudmats



Load Deflection Tables - Heavy Duty Mudmats

Modulus of Elasticity	3,600,000 psi
Flexural Strength, Tension Side	51,000 psi
Flexural Strength, Compression Side	40,000 psi
Moment of Inertia	11.788 in^4
Section Modulus, Compression Side	9.009 in^3
Section Modulus, Tension Side	6.072 in^3

Deflection, Δ, $= \frac{(5SwL^4)}{(384/EI)}$

ft = flexural stress, tension-side
fc = flexural stress, compression-side

Simple Beam Deflection of AIMS Heavy Duty Mudmats, inches									
Clear	Loading, lbs/square feet (Note: because the planks are 1" wide, lbs/square feet = lbs/linear feet)								
Span, ft.	250	500	750	1000	1250	1500	2000	2500	3000
3	0.011	0.021	0.032	0.043	0.054	0.064	0.086	0.107	0.129
4	0.034	0.068	0.102	0.136	0.170	0.204	0.271	0.339	0.407
5	0.083	0.166	0.249	0.331	0.414	0.497	0.663	0.828	--
6	0.172	0.344	0.515	0.687	0.859	1.031	--	--	--
7	0.318	0.637	0.955	1.273	1.591	--	--	--	--
8	0.543	1.086	1.629	2.172	--	--	--	--	--
9	0.870	1.739	2.609	--	--	--	--	--	--
10	1.326	2.651	--	--	--	--	--	--	--
11	1.941	3.881	--	--	--	--	--	--	--
12	2.749	--	--	--	--	--	--	--	--
13	3.786	--	--	--	--	--	--	--	--
14	5.092	--	--	--	--	--	--	--	--
15	6.710	--	--	--	--	--	--	--	--
16	8.687	--	--	--	--	--	--	--	--

Note: Deflections represented with an "--" are not provided and are not recommended, because the Flexural Safety Factor is less than 3.0.

Longitudinal Shear Stress Table - Heavy Duty Mudmats

Longitudinal Shear Stresses at the Web-to-Flange Interface, Ignoring the Fillets
Q = 4.5284 in3 at the interface t = 1.75 inches at the interface

Longitudinal Shear Stresses Table									
Clear	Loading, lbs/square feet (Note: because the planks are 1" wide, lbs/square feet = lbs/linear feet)								
Span, ft.	250	500	750	1000	1250	1500	2000	2500	3000
3	82	165	247	329	412	494	659	823	988
4	110	220	329	439	549	659	878	1098	1317
5	137	274	412	549	686	823	1098	1372	--
6	165	329	494	659	823	988	--	--	--
7	192	384	576	768	960	--	--	--	--
8	220	439	659	878	--	--	--	--	--
9	247	494	741	--	--	--	--	--	--
10	274	549	--	--	--	--	--	--	--
11	302	604	--	--	--	--	--	--	--
12	329	--	--	--	--	--	--	--	--
13	357	--	--	--	--	--	--	--	--
14	384	--	--	--	--	--	--	--	--
15	412	--	--	--	--	--	--	--	--
16	439	--	--	--	--	--	--	--	--

Note: Deflections represented with an "--" are not provided and are not recommended, because the Flexural Safety Factor is less than 3.0, or the Longitudinal Shear Stress, r, exceeds the Allowable Longitudinal Shear Stress of 2,333 psi, which incorporates a Shear Safety Factor of 3.0.

AIMS Composites

... dedicated to customer service and support

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