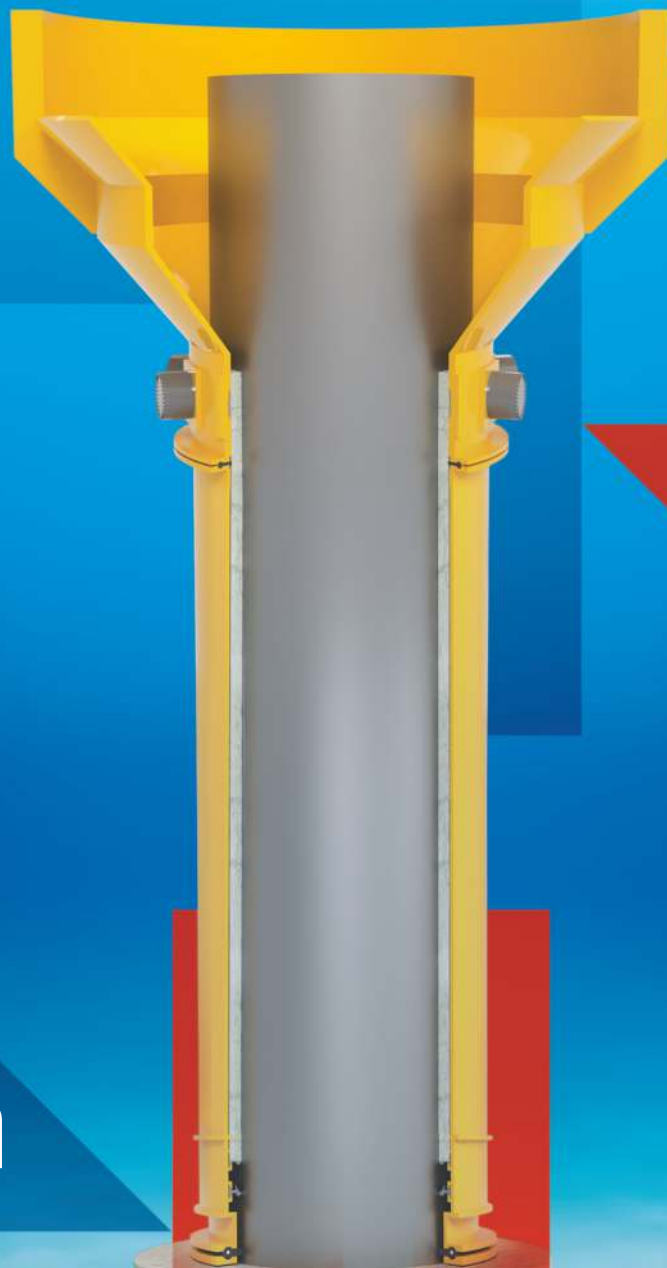




OFFSHORE PRODUCTS

JACKET LEG SOLUTIONS



Where
Innovation
is Tradition

FIXED PLATFORM INSTALLATION PROCESS

Hi-Tech leg can solutions provide secure
and efficient jacket leg installations

Hi-Tech has served the offshore industry with innovative and reliable products for decades now. With a 100% successful track record we are proud to be the reliable partner in any offshore jacket installations. Hitech is one of a very few companies with all the products used in jacket leg installations under one roof which makes us a preferred choice around the world.





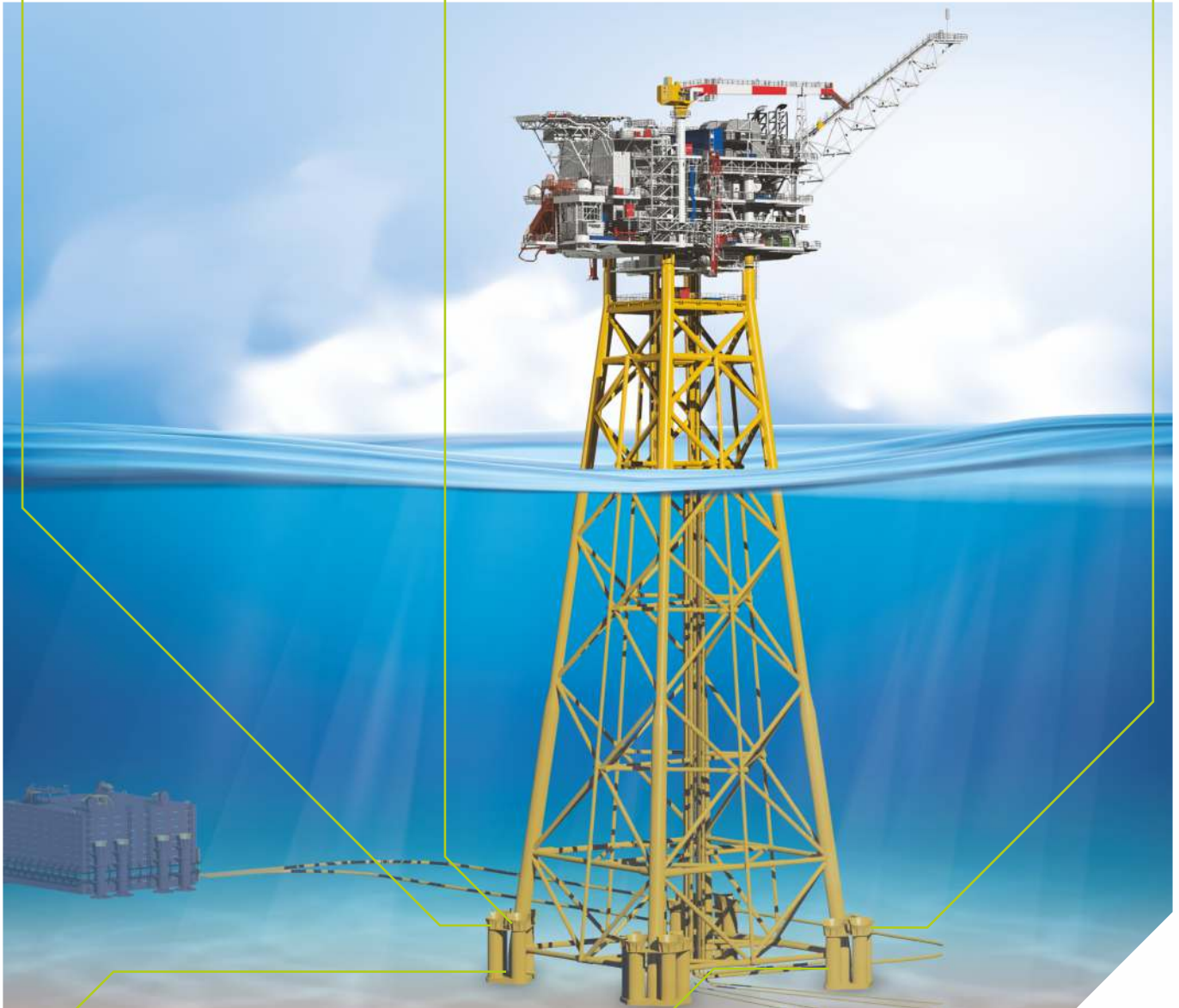
GROUT SEALS



LIP SEAL



PILE GRIPPER



DIAPHRAGM CLOSURE



INFLATABLE GROUT PACKERS



DIAPHRAGM CLOSURE

The Hitech rubber diaphragm is an installation aid for offshore jacket installation. The Rubber diaphragm consists of a rubber bladder reinforced with high strength chord and specially manufactured steel rings to which the offshore jacket is welded. The diaphragm acts as a seal to provide buoyancy to the jacket during installation. It enables the jacket to float on water and can be positioned perfectly and water may be flooded in the buoyancy chamber to upend the jacket. once the jacket is in its desired location the diaphragm is designed to rupture under the pile driving load. Thus they are a very critical component for offshore installations.

Hitech has a 100% success rate and has supplied diaphragms to offshore jackets all over the world. Clients may test each and every diaphragm at full scale at our in-house testing facility which gives 100% satisfaction and safety to clients. Hitech offshore diaphragms can be manufactured up to 144" diameter pile and special sizes may be developed on request.

FEATURES

- Specially formulated rubber compound that allows high expansion during loading condition
- Custom steel rings with a unique design to fit and positive seal the rubber diaphragm
- A set of rings and special fasteners can be supplied with an offshore-certified and durable Xylan coating.
- Stand-alone diaphragm or diaphragm with can and grout seal or inflatable packer can be supplied
- Diaphragm can be designed according to the hydrostatic loads of a specific project
- All diaphragms can be individually load tested in our in-house testing equipment

APPLICATIONS

- Offshore jackets
- Offshore buoyancy tanks
- Offshore jetty installation

JACKET LEG SOLUTIONS

DIAPHRAGM CLOSURE

Hi-Tech Diaphragm Closures are most important and critical installation aid for launching of Offshore Jacket. The critical function of these Diaphragms is to provide buoyancy and withstand very high Hydrostatic pressure while launching the Offshore Fabricated Jackets.

They are specially designed to bear very high-water pressure and at the same time to act as a Flexible barrier to seal effectively the jacket legs and enables the Platform to float in the sea, allowing its movement and positioning on site after launching. If the Diaphragm fails while launching, the whole jacket sinks into deep sea and it would be practically very difficult to retrieve the same. The specific purpose of using these flexible Diaphragms is, it can be easily ruptured by driving piles or using integral cutter depending on its design.

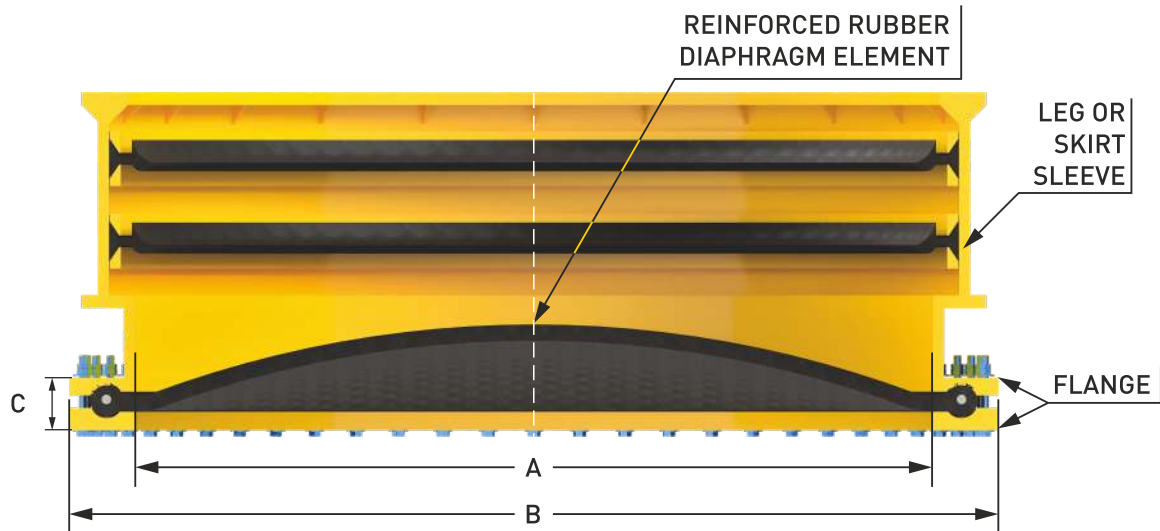
They are also pressure tested in house, for the required pressure. Hi-Tech Diaphragm Closures are having 100% success rate without any failure and are supplied to many Platforms Worldwide. Hi-Tech Diaphragm Closures are available in a wide range from 24-inch OD Pile to 144-inch OD. OD Pile. Special size can also be developed to suits client's requirements.



JACKET LEG SOLUTIONS

DIAPHRAGM CLOSURE

DIMENSIONS



PILE SIZE		A		B		C		WEIGHT OF ASSEMBLY
inch	mm	inch	mm	inch	mm	inch	mm	kg
18	457	24	610	34	864	3.0	74	135
24	610	28	711	38	965	3.0	74	164
24	610	30	762	40	1016	3.0	76	190
30	762	33	838	43	1092	3.0	79	201
36	914	38	965	48	1219	3.0	79	236
36	914	40	1016	50	1270	3.0	86	284
42	1067	44	1118	54	1372	3.0	86	316
42	1067	49	1245	59	1499	4.0	86	354
48	1219	51	1295	61	1549	4.0	89	374
48	1219	55	1397	65	1651	4.0	91	409
54	1372	58	1473	68	1727	4.0	91	442
60	1524	64.	1613	74.	1867	4.0	94	491
60	1524	66	1676	76	1930	4.0	94	512
66	1676	68	1727	78	1981	4.0	99	585
66	1676	71	1803	81	2057	4.0	99	620
72	1829	75	1905	85	2159	4.0	99	650
72	1829	78	1981	88	2235	4.0	102	684
78	1981	82	2083	92	2337	4.0	102	724
84	2134	87	2210	97	2464	4.0	104	770
84	2134	90	2286	100	2540	4.0	104	794
96	2438	101	2565	111	2819	4.0	104	898
120	3048	128	3251	138	3505	4.0	107	1150
132	3353	139	3531	149	3785	4.0	107	1285
144	3658	149	3785	159	4039	4.0	107	1390

*Above data is for reference only actual values may differ depending on project requirements. Please contact hitech office for accurate details.

PRODUCT INSTALLATION PICTURES





GROUT SEALS

Hitech grout Seals provide reliable and robust sealing between the inner diameter of the jacket/skirt and the outer diameter of the pile. Grout Seals are the very effective mechanical seal that requires no work and is self-sealing. The grout seal can also help in re-aligning of concentric piles and act as a mud wiper which can remove unwanted debris from the surface of the pile.

Passive grout seals can seal the grout that is filled between the pile and the jacket skirt which significantly reduces the losses of grout due to leakage and helps in generating a strong and secure bond.

Hitech grout seals can be 100% tested in our in-house load testing facility at 100% load. Hitech has supplied hundreds of grout seals over the years and is proud to have a perfect record. Hitech grout seals can be manufactured up to 144" pile dia however custom sizes are available upon request.

FEATURES

- Self-sealing design with no intervention needed
- Acts as mud wiper to remove unwanted debris from the pile OD
- Will positively seal the pile DO and jacket ID to help in creating a durable and secure bond for grout
- Can be supplied with a grout seal can that can be welded on the jacket leg
- Significant cost saving in terms of installation time and grout saving

APPLICATIONS

- Offshore jacket installations
- Pile grouting application
- Mud wiping application
- Jetty piling grouting
- Offshore monopile installation

JACKET LEG SOLUTIONS

GROUT SEALS

For grouting the jacket legs, a special sealing solution is offered through passive/ inflatable grout seals. With a 100% success rate, our Hitech grout seals have proven their excellence by significantly reducing the cost of grouting. There are many different sizes of Hi-Tech Grout Seals, ranging from 24-inch OD to 144-inch OD Pile. In accordance with the needs of the client, special sizes can also be produced. As an option, the Hi-Tech grout seal assembly can be provided with a mud wiper to enable wiping of the pile which helps in superior sealing and solid grout bonding.

3 TYPES OF GROUT SEALS

1. PASSIVE GROUT SEAL A - SINGLE GROUT SEAL



B - DOUBLE GROUT SEAL



2. MUD WIPER SEAL (LIP SEAL)



3. INFLATABLE GROUT PACKER



JACKET LEG SOLUTIONS

GROUT SEALS

1. PASSIVE GROUT SEAL

SINGLE GROUT SEALS



Hitech grout seals provide secure sealing of the annulus between the jacket pile and jacket leg can. This type of passive seal requires no additional input thus it is self-activating. Hitech grout seals also function as a mud wiper helps in cleaning the pile which results in stronger grout bond.

FEATURES

- Self-sealing design with no intervention needed
- Acts as mud wiper to remove unwanted debris from the pile OD
- Will positively seal the pile DO and jacket ID to help in creating a durable and secure bond for grout
- Can be supplied with a grout seal can that can be welded on the jacket leg
- Significant cost saving in terms of installation time and grout saving

APPLICATIONS

- Offshore jacket installations
- Pile grouting application
- Mud wiping application
- Jetty piling grouting
- Offshore monopile installation



JACKET LEG SOLUTIONS

GROUT SEALS

1. PASSIVE GROUT SEAL

DOUBLE GROUT SEALS



Hitech dual grout seals provide the same benefits as single seals however, dual seal arrangement allows for better contingency and safety of offshore operations.

FEATURES

- Self-sealing design with no intervention needed
- Acts as mud wiper to remove unwanted debris from the pile OD
- Will positively seal the pile DO and jacket ID to help in creating a durable and secure bond for grout
- Can be supplied with a grout seal can that can be welded on the jacket leg
- Significant cost saving in terms of installation time and grout saving

APPLICATIONS

- Offshore jacket installations
- Pile grouting application
- Mud wiping application
- Jetty piling grouting
- Offshore monopile installation

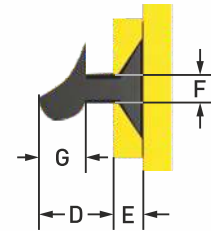
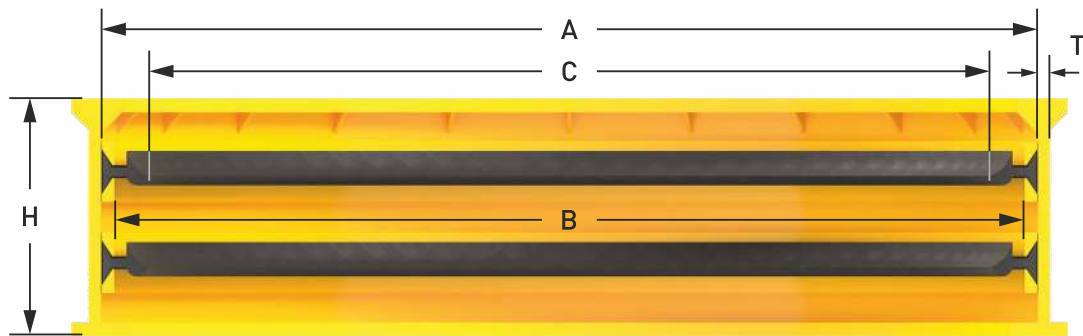


JACKET LEG SOLUTIONS

GROUT SEALS

1. PASSIVE GROUT SEAL

DIMENSIONS



PILE SIZE		A±5	B±5	C±5	D	E	F	G	T
inch	mm	mm	mm	mm	mm	mm	mm	mm	mm
20	508	708	648	392	128	30	30	75	18
24	610	810	750	494	128	30	30	75	20
30	762	962	902	646	128	30	30	75	20
36	914	1114	1054	798	128	30	30	75	22
42	1067	1267	1207	951	128	30	30	75	25
48	1219	1419	1359	1103	128	30	30	75	25
54	1372	1572	1514	1258	128	30	30	75	25
60	1524	1724	1664	1408	128	30	30	75	25
66	1676	1876	1816	1560	128	30	30	75	25
72	1829	2029	1969	1713	128	30	30	75	25
78	1981	2181	2121	1865	128	30	30	75	32
84	2134	2334	2274	2018	128	30	30	75	38
96	2436	2636	2576	2320	128	30	30	75	38
108	2743	2943	2883	2627	128	30	30	75	38
120	3048	3248	3188	2932	128	30	30	75	38

*Above data is for reference only actual values may differ depending on project requirements. Please contact hitech office for accurate details.

JACKET LEG SOLUTIONS

GROUT SEALS

2. LIP SEAL

The Lip Seals has been developed to provide efficient sealing for water or grout or act as a mud wiper. Its excellent record of reliability has been proven during the installation of the World's largest Offshore Wind Farms.

The Lip Seals is used for installations where the piles are pre-driven for Monopile/Transition- Piece foundations and Jacket/Tripod structures.

- A large range of diameters is supported. Lip Seals of over 5.5m diameter can be manufactured
- The Lip Seals design is adaptable to a wide range of annulus.
- The Lip Seals can be configured to be welded to a jacket leg or can be supplied with a can to be welded on the jacket leg.

ADVANTAGES

- The Lip Seals has a very high record of reliability in sealing as well as mud wiping.
- Continuous molded seals with no joints.
- Can serve a dual purpose of sealing and mud wiping





3. INFLATABLE GROUT PACKERS

Hitech Inflatable Grout Packers are installed between the jacket and pile to get a secured seal for the grouting application. Grout packers consist of a rubber bladder with reinforced chords designed according to load and application. Upon inflation, the rubber body seals the annulus, and specially formulated rubber compounds are used. Grout packers can be operated via ROV hot stabs or inflation power packs on the surface. Grout packers are not limited by a column of grout or water depth as they can be customized based on any application.

Hitech grout packers have a 100% track record of successful sealing and clients can test their Grout packers at our in-house full-scale load testing facility for complete satisfaction and assurance of performance. Grout packers are generally made for up to 144" dia pile but custom sizes are available on request.

FEATURES

- Fast, reliable inflatable seal holds the grout column while grouting
- Single-stage grouting operation saves time and money over multiple-stage grouting.
- Not limited by water depth or grout weight
- Inflation via ROV or surface manifold possible
- Verify seal integrity via an inflation pressure gauge

APPLICATIONS

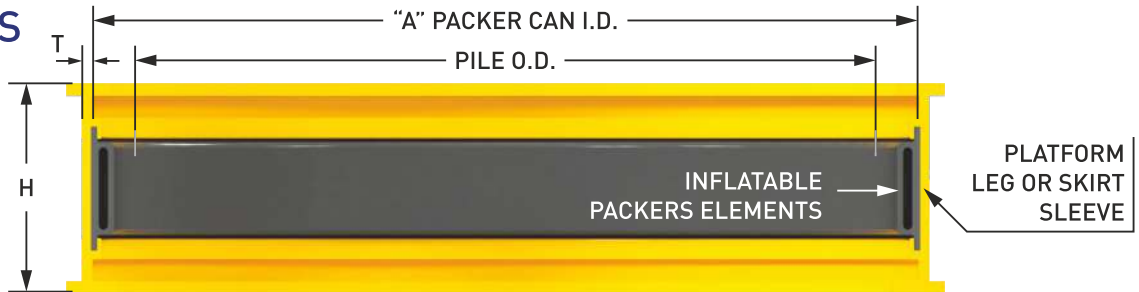
- Offshore jackets
- High column height offshore structures
- Offshore jetty piles
- Pipe plug applications

JACKET LEG SOLUTIONS

GROUT SEALS

3. INFLATABLE GROUT PACKERS

DIMENSIONS



PILE SIZE		A		B		C		WEIGHT OF ASSEMBLY
inch	mm	inch	mm	inch	mm	inch	mm	kg
18	457	23	584	0.75	19	24	610	247
22	559	27	686	0.75	19	24	610	289
24	610	30	762	0.75	19	24	610	321
30	762	35	889	0.75	19	24	610	374
30	762	36	914	0.75	19	24	610	385
36	914	41	1041	0.75	19	24	610	438
38	965	44	1118	0.75	19	24	610	470
40	1016	45	1143	0.75	19	24	610	481
42	1067	46	1168	0.75	19	24	610	445
42	1067	47	1194	0.75	19	24	610	502
42	1067	48	1219	0.75	19	24	610	486
44	1118	49	1245	0.75	19	24	610	523
44	1118	50	1270	0.75	19	24	610	534
46	1168	52	1321	0.75	19	24	610	555
48	1219	53.	1334	0.75	19	24	610	535
48	1219	54	1372	0.75	19	24	610	577
53	1346	59.	1486	0.75	19	24	610	624
54	1372	59.	1486	0.75	19	24	610	596
54	1372	60.	1511	0.75	19	24	610	635
56	1422	62	1575	1.00	25	24	610	815
60	1524	66	1676	1.00	25	30	762	1061
62	1575	68	1727	1.00	25	24	610	874
66	1676	72	1829	1.00	25	30	762	1156
66	1676	74	1880	1.00	25	30	762	1188
72	1829	78	1981	1.00	25	30	762	1252
72	1829	79	2007	1.00	25	30	762	1268
74	1880	80	2032	1.00	25	30	762	1284
78	1981	84	2134	1.50	38	30	762	1881
78	1981	85	2159	1.50	38	30	762	1904
84	2134	90	2286	1.50	38	30	762	2009
84	2134	91	2311	1.50	38	30	762	2031
87	2210	93	2367	1.50	38	36	914	2366
96	2438	102	2591	1.50	38	30	762	2264
96	2438	104	2642	1.50	38	34	864	2596
102	2591	108	2743	1.50	38	30	762	2315
104	2642	110	2794	1.50	38	30	762	2226
104	2642	112	2845	1.50	38	36	914	2843
108	2743	114	2896	1.50	38	30	762	2442
120	3048	127	3226	1.50	38	30	762	2857

*Above data is for reference only actual values may differ depending on project requirements. Please contact hitech office for accurate details.

JACKET LEG SOLUTIONS

GROUT SEALS

3. INFLATABLE GROUT PACKERS

ADVANTAGES

- High-strength, nylon-reinforced packer seal element allows one-stage grouting regardless of water depth or grout weight
- No seal contact during pile installation
- Positive packer seal can be verified by pressure monitoring
- Regular guide shims above the packer protect it during pile driving and ensure centering
- Packers are designed to withstand pile-driving vibrations and shock loads.
- Packer seal element can be supplied with a can that can be directly welded to the jacket leg

SAVES TIME AND MONEY

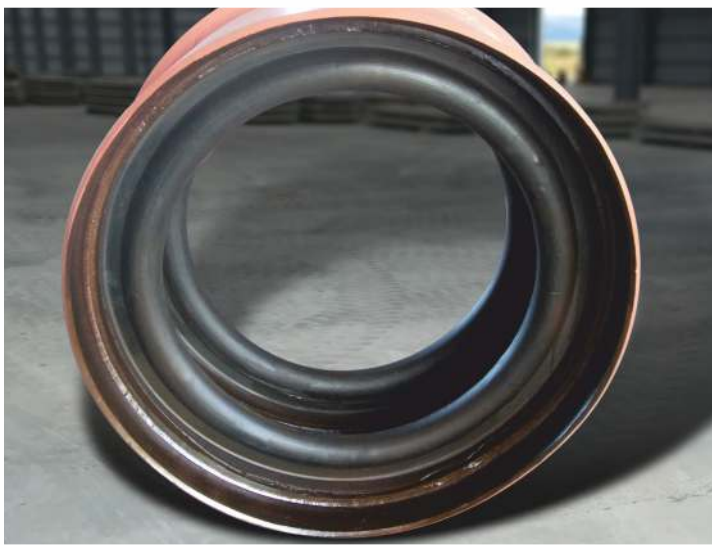
Efficient use of precious offshore time is accomplished by performing single-stage grouting operations. The HI-TECH packer provides a cost effective seal which is not limited by water depths or grout weights.

EASE OF OPERATION

After the pile is driven, the grouting packer is inflated by gas or liquid. The inflation operation may be initiated from the jacket deck through stainless steel tubing or flexible hose or by sub-sea ROV or diver connections. The inflatable seal is confirmed prior to grouting operations with the use of pressure gauges located at the surface or a subsea manifold.



PRODUCT INSTALLATION PICTURES





PILE GRIPPER

For offshore platforms and wind turbines, it's crucial to level a jacket foundation into the proper position and create a secure grouted connection. Hitech pile grippers consist of hydraulic jacks with a high coefficient of friction shoe. When actuated the hydraulic force grips the pile and helps in leveling or aligning the jacket into its desired position.

Pile grippers overall help in generating better-grouted connections and lower the installation time and cost.

The operation can be temporarily abandoned after the grippers are activated in events like severe weather, which minimizes risk during installation.

Hitech pile grippers can be Customised with several features like ROV panel for sub-sea operation, accumulators, and pile catcher integration

FEATURES

- Maximum gripping force that can be manufactured is 3800 Tons however custom sizes are available
- Pile diameters upto 144" however custom sizes can be customized
- Hydraulically operated gripping system with optional backup hydraulic
- Optional diaphragms, grout wipers, grout seals, or grout packers can be included on request
- Inclusion of pile catcher cone structures can be designed and included on request
- Integrated ROV panel system with hot stab can be included
- Hitech smart power packs can be supplied on rent or for sale

APPLICATIONS

- Offshore platform installation
- Wind farm offshore structure
- Offshore jetty construction
- Bear clamps
- Pile lifting tools
- Internal pile-lifting tools

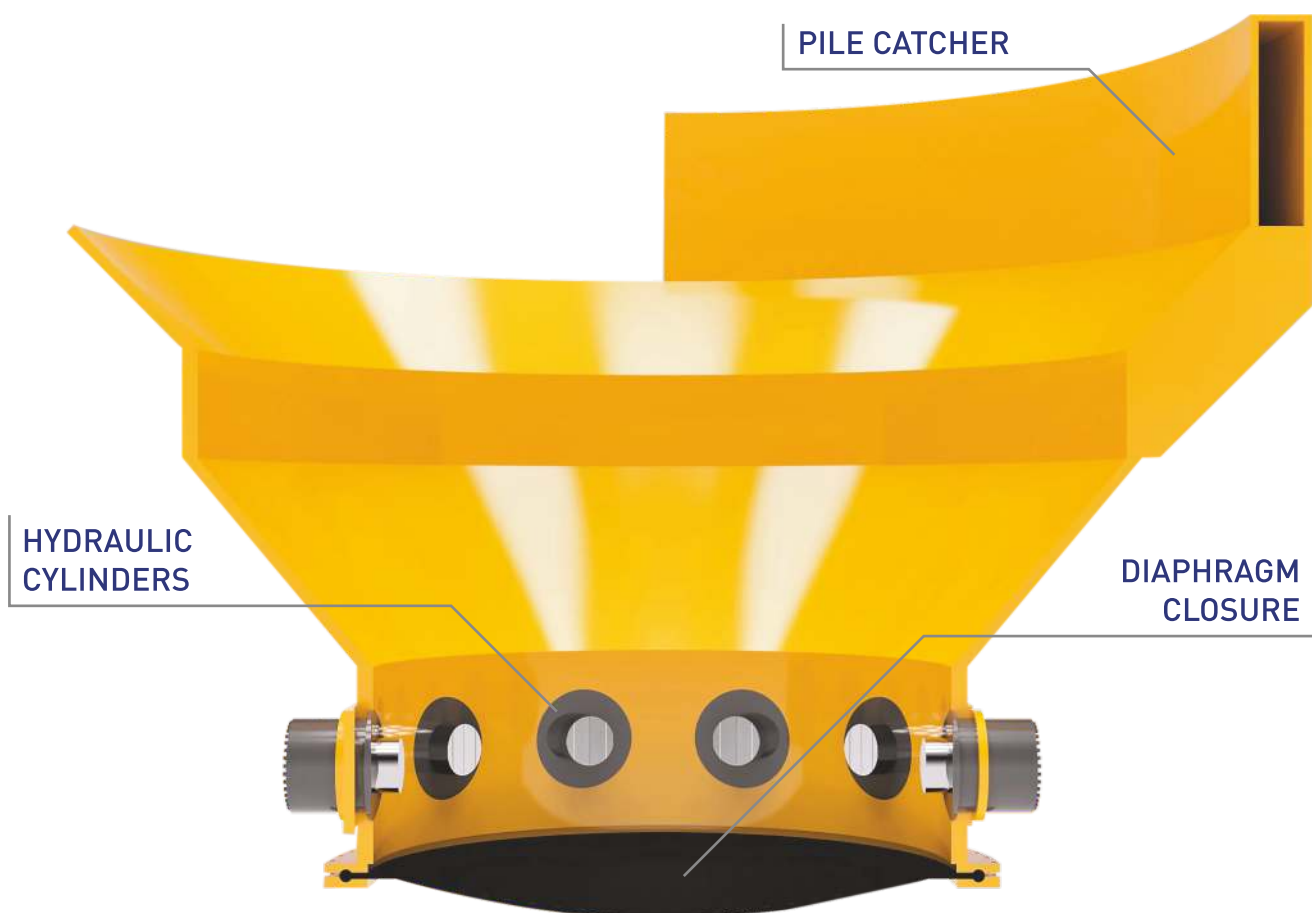
JACKET LEG SOLUTIONS

PILE GRIPPER

Hi-Tech Pile Grippers assist in leveling and securing an offshore jacket while grouting or in adverse weather conditions. Hitech pile gripper comes with unique dual seal technology which assures there is no oil leak under any circumstances and provides the offshore operation with additional safety. All pile grippers include high-strength steel teeth on top of the piston to assist with a firm grip on the pile. Additionally, a pile catcher and diaphragm assembly can be delivered with the pile gripper system as a complete package.

The Pile Gripper can be used via subsea manifold, from the barge or ROV operation

It is mostly used to secure the jackets from the outside, but can also be used to secure jackets from the inside (internal pile gripper) with the Inside-out Pile Gripper.



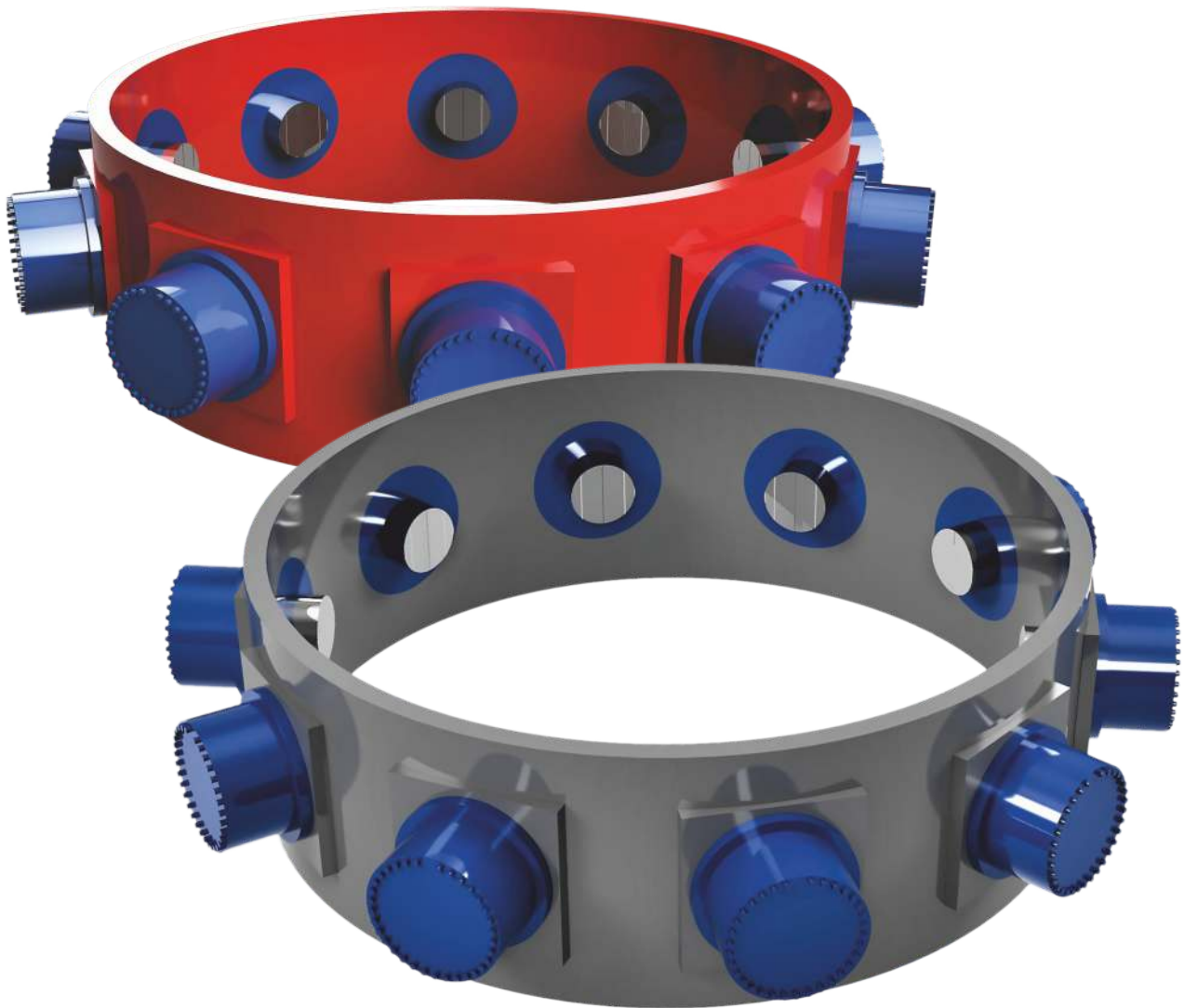
JACKET LEG SOLUTIONS

PILE GRIPPER

OPTIONS

Pile gripper can be supplied as a stand alone gripper assembly which can be directly welded to the jacket. Moreover, pile catchers can be welded to the top of the pile gripper as a combined system. Hitech provides a total package system of pile gripper, pile catcher and diaphragm closure assembly which can be welded with the jacket leg.

- Several redundancy options possible
- Back-up operation via ROV
- Special rubber and steel guides to assist centering of pile
- Accumulator integration
- Unique gripping shoe depending on application



Available Size Range

56"	64"	72"	86"	96"	108"	114"
-----	-----	-----	-----	-----	------	------

*Other sizes are available on request

*Maximum gripping force upto 4000 Tonnes

PRODUCT INSTALLATION PICTURES



NOTES



HI-TECH ELASTOMERS LTD.

WHERE INNOVATION IS A TRADITION

OFFICE

227, Hitech Elastomers, Santej-Vadsar Road,
Gandhinagar, Gujarat, INDIA - 384004.

Phone : +91-9824 654 671

Email : vpsales@hitechelastomers.com
sales1@hitechelastomers.com
sales@hitechelastomers.com

MANUFACTURING PLANT I:

798, Sola-Kalol Highway, Rakanpur,
Dist.: Gandhinagar, Gujarat, INDIA - 384002.

MANUFACTURING PLANT II:

227, Santej-Vadsar Road, Santej,
Dist. Gandhinagar, Gujarat, INDIA - 384004.

www.hitechelastomers.com