

Offshore wind reference list

FOUNDATION OF EXPERTISE IN SEAL ENGINEERING, SUPPORTING THE POWER OF OFFSHORE WIND

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Self-Activating rubber grout seals for monopile foundations

Client	Project	No.	Grout seal type	Diam. [mm]	Year
Aarsleff/Billfinger	Horns II OWF	93	ESA2-330/200	4100	2007
BARD	Bard 1 OWF	30	ESA2-330/210	3400	2008
Bladt Industries	Belwind OWF	56	ESA2-330/200	4300	2009
BARD	Bard 1 OWF	210	ESA2-330/210	3400	2009
Weserwind	Bard 1 Transformator platf.	8	ESA2-330/210	3620	2009
Bladt Industries	Baltic 1 OWF	21	ESA2-380/260B	4550	2010
Bladt Industries	Baltic 1 OSS	1	ESA2-410/290	5720	2010
Weserwind	Walney 1 OWF	51	ESA2-380/260	4890	2010
Bladt Industries	Walney 2 OWF	51	ESA2-410/290	5796	2011
Bladt Industries	Anholt OWF	222	ESA2-360/270	4890	2011
Bladt Industries	Gwynt y Môr OWF	160	ESA2-410/290	4890	2012
Geldof	Riffgat OWF	30	ESA2-410/290	5520	2011
Ambau	Meerwind OWF	80	ESA2-360/270	5740	2012
Smulders	Teeside OWF	27	ESA2-400/270	4868	2012
ABJV	Dan Tysk OWF	81	ESA2-410/290	6220	2012
Nordic Yards	OSS Borwin - Helwin	16	ESA2-240/150	2600	2012
GI Windforce	Northwind OWF	73	ESA2-360/270	4470	2012
Siemens	OSS Sylwin Alpha	12	ESA2-300/240	2600	2013
Smulders	Amrumbank OWF	80	ESA2-300/240	5626	2013
Bladt Industries	Borkum Riffgrund OWF	77	ESA2-380/260B	5542	2013
Bladt Industries	Westermost Rough OWF	35	ESA2-360/270	6680	2013
Bladt Industries	Butendiek OWF	80	ESA2-395/265	5430	2013
Bladt Industries	Godewind OWF	96	ESA2-360/270	6697	2014
Smulders	Gemini OWF	150	ESA2-240/150	5640	2014
Bladt Industries	Burbobank OWF	33	ESA2-330/210	7269	2015
Smulders	Dudgeon OWF	67	ESA2-400/270	6620	2015
Bladt Industries	Veja Mate OWF	67	ESA2-300/240	6720	2015
Bilfinger Mars	Racebank OWF	91	ESA2-360/270	6726	2015
TD Steel	Belwind II OWF	50	ESA2-300/240	4710	2016
Bladt Industries	Walney 3 OWF	40	ESA2-330/260	7287	2016
Bladt Industries	Walney 4 OWF	47	ESA2-330/260	6914	2016
Bladt Industries	Arkona OWF	60	ESA2-300/240	6200	2016
Smulders	Rentel OWF	42	ESA2-405/285	6865	2017
Windar	Deutsche Bucht OWF	33	ESA2-330/260	6760	2018
Smulders	Norther OWF	44	ESA2-240/150	6840	2018
Bladt Industries	Northwester 2 OWF	24	ESA2-330/260	6730	2019
CTCI	Yunlin OWF	40	ESA2-400/270	8051	2019
Smulders	Yunlin OWF	40	ESA2-400/270	8051	2021
Windar	Baltic Eagle OWF	50	ESA2-300/240	6707	2021
EPG	Arcadis Ost 1 OSS	1	ESA2-300/240	6760	2022
Windar	Vineyard OWF	62	ESA2-300/240	8200	2022
Lamprell	Moray West OWF	62	ESA2-330/260	7710	2023
Smulders	NOY OWF	62	ESA2-330/260	6200	2023
Bladt Industries	Coastal Virginia OWF	176	ESA2-330/260	7740	2023
Windar	East Anglia 3 OWF	95	ESA2-280/220	8200	2023
Windar	Wind Anker	21	ESA2-300/240	8240	2024

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Client	Project	No.	Grout seal type	Diam. [mm]	Year
GI Windforce	Northwind OHVS	2	SA2-400/210	4440	2013
Smulders	Rampion OWF	118	SA2-380/250	5355	2015
Smulders	Hohe See OWF	71	SA2-295/315/01	7400	2017
CUEL	Formosa 1 OWF	20	SA2-295/315/02	7230	2018
Smulders	Seamade OWF	58	SA2-295/315/01	6510	2019
Smulders	Saint-Nazaire OWF	80	SA2-295/315/02	6821	2020
Kajima Corporation	Akita & Noshiro OWF	33	SA2-340/480/01	5790	2020
Smulders	He Dreih OWF	67	SA2-340/480	8461	2023

Non-grouted monopile foundation seals

Client	Project	No.	Sealing system	Type	Diam. [mm]	Year
Ambau	Nordsee One OWF	54	Inflatable seal	PS-150/25	5650	2015
		54	Wavebreaker	ESA2-240/150		
Smulders	Galopper OWF	56	Lip seal	ESA2-300/240	6914	2016
		56	Wavebreaker	ESA2-240/150		
Smulders	Triton Knoll OWF	77	Lip seal	ESA2-240/150	6670	2019
		77	Wavebreaker	ESA2-240/150		
Bladt Industries	Kaskasi OWF	38	Lip seal	ESA2-300/240	6150	2020
		38	Wavebreaker	ESA2-300/240		
Smulders	Baltic Power	76	Lip seal	ESA2-240/150	7692	2024
CS Wind	Baltic Power OSS	2	Lipseal	ESA2 300/240	7760	2024
Samil	Nakwol	64	Lipseal	ESA2-330/210	6210	2024
Chantiers de l'Atlantique	Nordsee 2 OSS	1	Skirt seal	ESA2 280/220	7750	2024

Flange protection sealing system for monopile foundations

Client	Project	No.	Sealing system	Type	Diam. [mm]	Year
Subsea 7 (SHL)	Borkum West II OWF	32	Comp. seal	CS-80/100 C	6354	2018
		32	Inflatable seal	EPS-82/30		



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Monopile/Transition piece flange seals

Client	Project	No.	Seal type	Diam. [mm]	Year
DEME Geosea	Merkur OWF	66	O-13	5950	2017
Bladt Industries	Northwester 2 OWF	24	VW-12	6460	2019
Bladt Industries	Kaskasi OWF	38	VW-13	5950	2020
EPG	Arcadis Ost 1 OSS	1	VW-13	6480	2022
Lamprell	Moray West OWF	62	VU-19/26	7450	2023
Smulders	NOY OWF	62	VW-13	5860	2023
Smulders	Baltic Power	60	VU-19/26-2	7460	2024
Smulders	Baltic Power	16	VU-19/26-2	7400	2024
CS wind	Baltic Power OSS	2	VU-19/26-2	7450	2024
Samil	Nakwol	64	VU19/26-2	5920	2024
Chantiers de l'Atlantique	Nordsee 2 OSS	1	VU19/26-3	7460	2024
Windar	Wind Anker	21	VU19/26-3	7950	2024

TP Tower flange seals

Client	Project	No.	Seal type	Diam. [mm]	Year
Scottish Power	East Anglea 3	105	VU19/26-3	7940	2024

Tower flange seals

Client	Project	No.	Seal type	Diam. [mm]	Year
Siemens Gamesa	N/A	267	X-Ring 16	6963	2022

Airtight platform seals

Client	Project	No.	Seal type	Diam. [mm]	Year
TD Steel	Belwind II OWF	50	OS-250/90	4096	2016
DEME Geosea	Merkur OWF	66	CS-80/70	5200	2017
Orsted	Borkum West II OWF	36	CS-111/114	5560	2017
Bladt Industries	Hornsea 2 OWF	109	CS-111/114	5560	2018
OSB/Bladt AS	Hornsea 2 OWF	56	CS-111/114	5560	2018
Subsea 7 (SHL)	Borkum West II OWF	32	ECS-44/42	5072	2018
Smulders	Borssele 3 & 4 OWF	77	ECS-60/60	5750	2019
Bladt Industries	Northwester 2 OWF	24	CS-111/114	5560	2019
Smulders	Seamade OWF	58	ECS-120	5256	2019
Bladt Industries	Kaskasi OWF	38	CS-111/114	5124	2020
Smulders	Hollandse Kust Zuid OWF	140	CS-80/70	6240	2021
Windar	Baltic Eagle OWF	50	CS-111/114	5480	2021
Smulders	Dogger Bank A OWF	100	CS-111/114-UPE80	6844	2021
EPG	Arcadis Ost 1 OWF	28	CS-111/114	5614	2022
Smulders	Dogger Bank B OWF	100	CS-111/114-UPE80	6844	2022
Windar	Vineyard OWF	62	CS-111/114	6512	2022
CCCC 1rd	HuaNeng LeMen II	52	CS-111/114	6850	2022
CCCC 1rd	HuaNeng LeMen II	52	CS-111/114	6850	2022
Lamprell	Moray West OWF	62	CS-111/114	6126	2023
Smulders	NOY OWF	62	CS-111/114-UPE80	4760	2023
Bladt Industries	Coastal Virginia OWF	176	CS-111/114-UPE80	6560	2023
Windar	East Anglia 3 OWF	95	CS-116/114-UPE80	6843	2023
CCCC 3rd	China GuoDian XiangShan II	54	CS-111/114	7245	2023
CCCC 3rd	Huaneng BW	32	CS-111/114	7245	2023
CCCC 3rd	CGN Huizhou Port II	10	CS-111/114	7230	2023
CCCC 3rd	China GuoDian XiangShan II	54	CS-111/114	7245	2023
Smulders	Baltic power	76	CS-116/114-UPE80	6274	2024
CS wind	Baltic power OSS	2	CS-116/114-UPE80	6240	2024
Smulders	Empire 1	54	IRIS 14/742	6464	2024
Lykomitros	Thor OWF	36	CS80/100 with hole	6283	2024
Wulcan	Thor OWF	36	CS80/100 with hole	6283	2024
Samil	Nakwol	64	CS-116/114-UPE80	4994	2024
Chantiers de l'Atlantique	Nordsee 2 OSS	1	CS-116/114-UPE80	6220	2024
CCCC 3rd	Datang LeMen I	10	CS-111/114	7230	2024
Ferrum	Nordsee cluster	44	CS-116/114-UPE80	5860	2024
Windar	Wind Anker	21	CS-116/114-UPE80	6632	2024

Inflatable reinforced rubber grout seals

Client	Project	No.	Grout Seal type	Diam. [mm]	Year
Ballast Nedam	Egmond OWF	1	PS-400/20	2900	2003
Ballast Nedam	Egmond OWF	38	PS-400/20	4300	2003
Kencana	Tangga Barrat TBDR-A	4	PS-300/25	1600	2009
Technip	Turkmenistan Pr 5495-003	6	PS-300/25	1011	2009
HMC Heerema	Venture F3FA	4	PS-300/25	3400	2010
Bladt Industries	Gwynt y Môr OWF	160	PS-400/50	4890	2012
Siemens	Sylwin Alpha	12	PS-300/50	2600	2013
IV Oil & Gas	Shell UK Leman Uptime	4	PS-300/25	1625	2013
Bluewater	Noivy Port	6	PS-400/50	2643	2015
Navantia	Nissum Bredning	12	PS-300/25	1640	2017
Subsea 7	Repsol YME CPS	4	PS-1000/60	6070	2018
Guangzhou Salvage Bureau	Wind tower	4	PS-300/25	1732	2018
Nippon Steel	Hibikinada OWF	88	PS-600/30	1900	2023

Self-Activating rubber grout seals for pre-piled jacket foundations (WTG)

Client	Project/Developer	No.	Grout seal type	Diam. [mm]	Year
Huadian heavy industries	Three Gorges Yangxi Shapa	32	SA2-295/340	1900	2018
CCCC 3rd	CGN Yangjiang Nanpeng Island	60	SA2-295/340	1900	2019
Shanghai Salvage Bureau	CGN Yangjiang Nanpeng Island	80	SA2-295/340	1900	2019
Guangdong Power	Yuedian Shapa	36	SA2-295/340	1900	2019
CGN (Changfeng)	CGN Yangjiang Nanpeng Island	12	SA2-295/340	1900	2019
Guangzhou Salvage Bureau	Energy-saving Yangjiang Nanpeng Island	20	SA2-295/340	1900	2019
Guangzhou Salvage Bureau	Energy-saving Yangjiang Nanpeng Island	60	SA2-295/340	1900	2020
CGN (Changfeng)	CGN Shanwei	32	SA2-295/340	1900	2020
Guangzhou salvage Bureau	Energy-saving Yangjiang Nanpeng Island	140	SA2-295/340	1900	2020
China Railway Bridge Bureau	Three Gorges Fujian Changle A	156	SA2-295/340	2500	2020
China Railway Bureau	Three Gorges Fujian Changle A	6	SA2-295/340	2700	2020
Poly Changda	The Three Gorges Yangjiang	72	SA2-295/340	1900	2020
Guangzhou Salvage Bureau	The Three Gorges Yangjiang	184	SA2-295/340	3000	2020
Guangzhou Salvage Bureau	The Three Gorges Yangjiang	88	SA2-295/340	3500	2020
Guangzhou Salvage Bureau	The Three Gorges Yangjiang	16	SA2-295/340	4500	2020
China Railway Bridge Bureau	The Three Gorges Yangjiang	32	SA2-295/340	3000	2020
Poly Changda	The Three Gorges Yangjiang	55	SA2-295/340	3000	2020
Poly Changda	The Three Gorges Yangjiang	45	SA2-295/340	4500	2020
Tianjin Port & Waterway	The Three Gorges Yangjiang	48	SA2-295/340	4500 & 3500	2020



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China Railway Bridge Bureau	Yuedian Yangjiang	18	SA2-295/340	1900	2020
China Railway Bridge Bureau	Yuadian Yangjiang	78	SA2-295/340	3000	2020
CCCC Tianjing	The Three Gorges Yangjiang	32	SA2-295/340	4500	2020
Poly Changda	Mingyang Yangjiang	8	SA2-295/340	3000	2021
Guangzhou Salvage Bureau	CGN Huizhou Port	16	SA2-295/340	2610	2021
CCCC 3rd	CGN Huizhou Port	64	SA2-295/340	2610	2021
Guizhou Electric Power	Huadian Qingzhou III	264	SA2-295/340	2300	2021
GuangDong Power	Huadian Qingzhou III	272	SA2-295/340	2300	2021
Poly Changda	The Three Gorges Phase 5	20	SA2-295/340	1900	2021
CCCC 3rd	MingYang Guishan	8	SA2-295/340	4500	2022
LongYuan ZhenHua	MingYang QingZhou IV	344	SA2-295/340	2300	2022
LongYuan ZhenHua	YueDian QingZhou I & II	736	SA2-295/340	2300 & 2600	2022
China Railway Bridge Bureau	The three gorges Pingtan	4	SA2-295/340	2920	2022
Guangzhou Salvage Bureau	CGN Huizhou Port II	232	SA2-295/340	2800	2023
CCCC 3rd	CGN Huizhou Port II	200	SA2-295/340	2800	2023
CCCC 3rd	The three gorges Qingzhou 6	80		2740	2023
China Railway Bridge Bureau	The three gorges Qingzhou 6	68		2740	2023
China Railway Bridge Bureau	The three gorges ZhangPu II	104		2920 & 2740	2023
CCCC 3rd	GuangTou FangChenggang I	132		1700	2023
China Railway Bridge Bureau	GuangTou FangChenggang II	78		1900	2024
China Railway Bridge Bureau	DaTang PingTan	18		2500	2024
ZhongGuo TieJian GangHang Bureau	HuaRun LianJiang	24		3000	2024
CCCC 3rd	HuaNeng RuiAn 1	44		3070	2024
China Railway Bridge Bureau	HuaNeng RuiAn 1	44		3070	2024



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Sealing systems for grouted post-piled jacket foundations (OSS)

Client	Project	No.	Sealing system	Type	Diam. [mm]	Year
Nordic Yards	OSS Borwin - Helwin	10	Inflatable seal	PS-300/50	2600	2012
Weserwind	Baltic 2 OSS	5	Inflatable seal	PS-400/50	5250	2013
CCCC 3rd	CGN Yangjiang Nanpeng Island	4	Inflatable seal	PS-400/25	2800	2019
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
Guangzhou Salvage Bureau	Energy-saving Yangjiang Nanpeng Island	4	Inflatable seal	PS-400/25	2840	2019
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
Guangzhou Salvage Bureau	Three Gorges Yangjiang Phase 3	8	Inflatable seal	PS-500/25	3670	2020
		8	Wiper seal	ESA2-240/180		
		8	Diaphragm	-		
CCCC 3rd	CGN Jiazi I	4	Inflatable seal	PS-500/25	3000	2020
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 3rd	CGN Shanwei East Area	4	Inflatable seal	PS-500/25	3040	2020
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 3rd	CGN Shanwei East Area	4	Inflatable seal	PS-500/25	3060	2020
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
China Railway Bridge Bureau	Yuedian Yangjiang Substation	4	Inflatable seal	PS-500/25	3740	2020
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
Poly Changda	Mingyang Yangjiang	4	Inflatable seal	PS-500/25	3040	2020
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 3rd	Cangnan Substation	4	Inflatable seal	PS-500/25	3180	2021
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
Guangzhou Salvage Bureau	CGN Huizhou Port Substation	4	Inflatable seal	PS-500/25	3200	2021
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 3rd	Datang Shantou Substation	4	Inflatable seal	PS-500/25	2940	2021
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 1st	Fujian Energy Group Changle C	4	Inflatable seal	PS-500/25	4120	2021
		4	Wiper seal	ESA2-240/180		
GuangDong Power	Huadian Qingzhou Yangjiang	4	Inflatable seal	PS-500/25	4450	2021
		4	Wiper seal	ESA2-240/180		
CCCC 3rd	SPIC ShenQuan II Substation	4	Inflatable seal	PS-500/25	4450	2022
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
LongYuan ZhenHua	MingYang QingZhou IV Substation	4	Inflatable seal	PS-500/25	4640	2022
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 3rd	Guohua B2 susbtation	4	Inflatable seal	PS-500/25	2600	2022
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 3rd	SPIC Peninsula South Substation	4	Inflatable seal	PS-500/25	2840	2022
		4	Wiper seal	ESA2-240/180		



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		4	Diaphragm	-		
Guangzhou Salvage Bureau	CGN JiaZi II Substation	4	Inflatable seal	PS-500/25	3200	2022
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
LongYuan ZhenHua	YueDian Qingzhou I & II Substation	4	Inflatable seal	PS-500/25	4550	2022
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 1st	HuaNeng LeMen II substation	4	Inflatable seal	PS-500/25	4250	2022
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
China Railway Bridge Bureau	Three Gorges zhangpu Phase 2	4	Inflatable seal	PS-500/25	3690	2023
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 3rd	Guohua U2 susbtation	4	Inflatable seal	PS-500/25	2640	2023
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 3rd	CGN Huizhou Port II substation	4	Inflatable seal	PS-500/25	5050	2023
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 1st	Three Gorges zhuanghe	4	Inflatable seal	PS-500/25	2990	2024
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
TianJinGangHang	Datang Lemen kuorong Substation	4	Inflatable seal	PS-500/25	3450	2024
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
Guangzhou Salvage Bureau	CGN JiaZi II Substation	4	Inflatable seal	PS-500/25	4550	2024
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
Guangzhou Salvage Bureau	CGN JiaZi II Substation	4	Inflatable seal	PS-500/25	3100	2024
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		
CCCC 3rd	Huaneng RuiAn 1 Substation	4	Inflatable seal	PS-500/25	3200	2024
		4	Wiper seal	ESA2-240/180		
		4	Diaphragm	-		



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