



Second-Generation PEC Probe Selection and Footprint (Lyft 1.2)

This reference document is designed to assist you in selecting the second-generation PEC probes that are best suited to your application with Lyft software version 1.2. Knowing the nominal thickness of the component to be inspected and the nominal insulation/coating thickness in place, the selection tables below suggest the adequate probes.

The remaining information is intended to help you understand and determine the footprint of selected probes, the averaging area, and the edge effect. This is especially useful in quantifying the performance of the Lyft solution in a variety of conditions.

Selecting the Right Standard PEC Probes

WALL THICKNESS		INSULATION / COATING THICKNESS (LIFTOFF)																
		0	6	13	19	25	38	51	64	76	89	102	127	152	178	203	254	305
mm	in	0.00	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	10.00	12.00
3	0.13																	
6	0.25																	
10	0.38																	
13	0.50																	
16	0.63																	
19	0.75																	
25	1.00																	
32	1.25																	
38	1.50																	
51	2.00																	
64	2.50	Custom development Inquire for details																
76	3.00																	
102	4.00																	

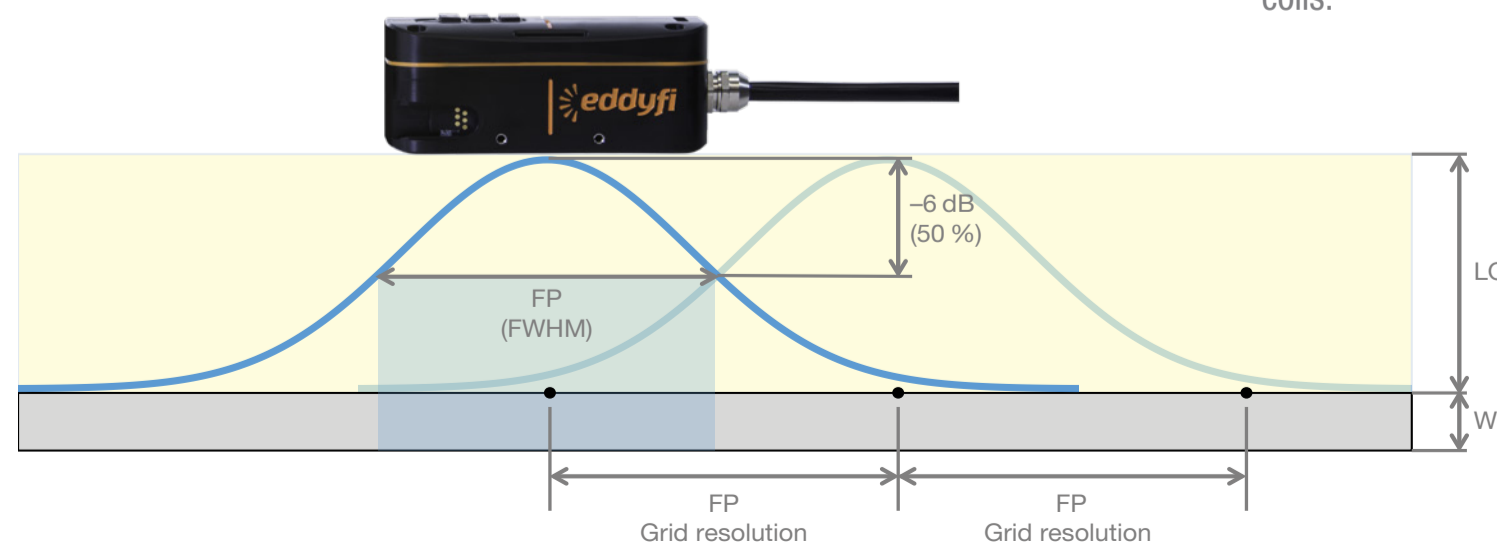
For applications over galvanized steel weather jackets, add 40 mm (1.5 in) lift-off for every 0.5 mm (0.020 in) of galvanized steel.

Selecting the Right Offshore PEC Probes

WALL THICKNESS		INSULATION / COATING THICKNESS (LIFTOFF)																
		0	6	13	19	25	38	51	64	76	89	102	127	152	178	203	254	305
mm	in	0.00	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	10.00	12.00
3	0.13																	
6	0.25																	
10	0.38																	
13	0.50																	
16	0.63																	
19	0.75																	
25	1.00																	
32	1.25																	
38	1.50																	
51	2.00																	
64	2.50	Custom development Inquire for details																
76	3.00																	
102	4.00																	

Footprint

The footprint (FP) of a probe is used to determine the **best grid resolution** for proper CUI detection. FP is defined as the **full width at half maximum (FWHM)** of the response detected by the probe. So doing, ensuring a 50% signal overlap between each point on the grid map.



Calculating the PEC Probe Footprint

Use the following formula to determine your probe's footprint.

$$FP \approx 0.65 \times LO + FP_0$$

Where:

LO is the **lift-off** (insulation, jacket, coating thickness).

FP₀ is the footprint at a **lift-off of zero**. For each probe, FP₀ is:

PEC-025-G2

FP₀ = 35 mm (1.4 in)

PEC-089-G2 / PEC-SZ-089-G2 / PEC-089-UW-G2

FP₀ = 62 mm (2.4 in)

PEC-152-G2 / PEC-152-UW-G2

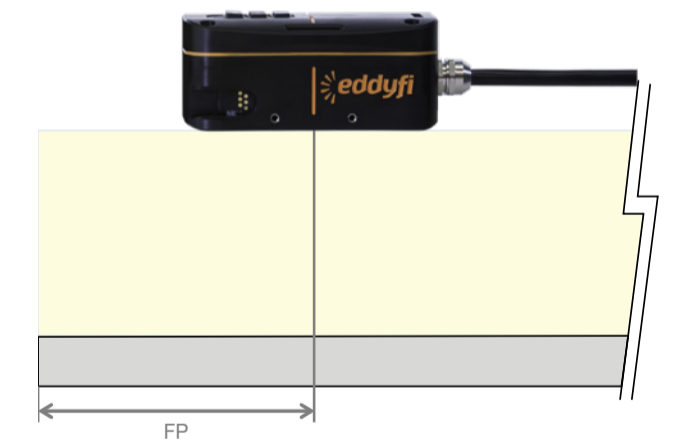
FP₀ = 100 mm (4.0 in)

FOOTPRINT		INSULATION / COATING THICKNESS (LIFTOFF)																
		0	6	13	19	25	38	51	64	76	89	102	127	152	178	203	254	305
mm	in	0.00	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	10.00	12.00
PEC-025-G2	mm	35	39	43	47	52	60	68	76	85	-	-	-	-	-	-	-	-
	in	1.38	1.54	1.70	1.87	2.03	2.36	2.68	3.00	3.35	-	-	-	-	-	-	-	-
PEC-089-G2 PEC-SZ-089-G2 PEC-089-UW-G2	mm	62	66	70	74	79	87	95	103	112	120	128	145	161	178	194	-	-
	in	2.44	2.60	2.77	2.93	3.09	3.42	3.74	4.07	4.39	4.72	5.04	5.69	6.34	7.00	7.64	-	-
PEC-152-G2 PEC-152-UW-G2	mm	100	104	108	112	117	125	133	141	150	158	166	183	199	216	232	265	298
	in	3.94	4.10	4.26	4.41	4.59	4.91	5.24	5.56	5.89	6.21	6.54	7.19	7.84	8.49	9.14	10.43	11.73

For applications over galvanized steel weather jackets, add 40 mm (1.5 in) lift-off for every 0.5 mm (0.020 in) of galvanized steel.

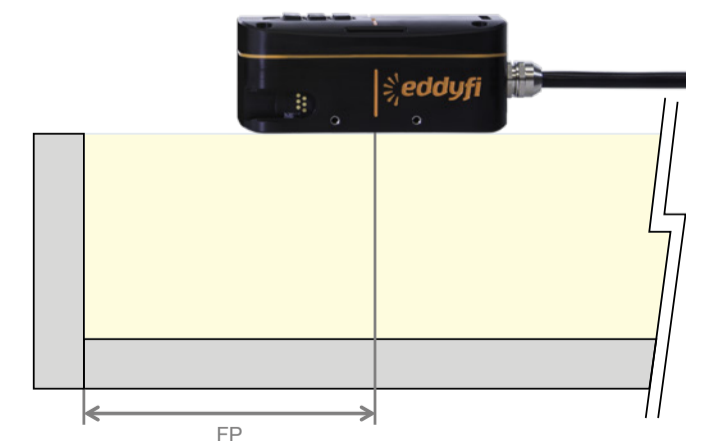
Averaging Area

This is the **surface viewed by the probe** on the component. The wall thickness determined by Lyft is the **average wall thickness** within the **averaging area**. As a result, **corrosion flaws smaller than the averaging area are underestimated**. The averaging area diameter is **1.8 times** the probe footprint ($AvgA_{\phi} = 1.8 \times FP$).



Edge Effect

The edge effect impacts PEC measurements when a probe **nears geometry variations** such as nozzles, flanges, or the end of a structure. Measurements begin to **vary from a distance of one FP** from the center of a probe's coils.





First-Generation PEC Probe Selection & Footprint (Lyft 1.2)

This reference document is designed to assist you in selecting the PEC probe that is best suited to your application with Lyft software version 1.2. Knowing the nominal thickness of the component to be inspected and the nominal insulation/coating thickness in place, the selection table below suggests the adequate probe.

The remaining information helps understand and determine the footprint of the selected probe, the averaging area, and the edge effect. This is especially useful in quantifying the performance of the Lyft solution in a variety of conditions.

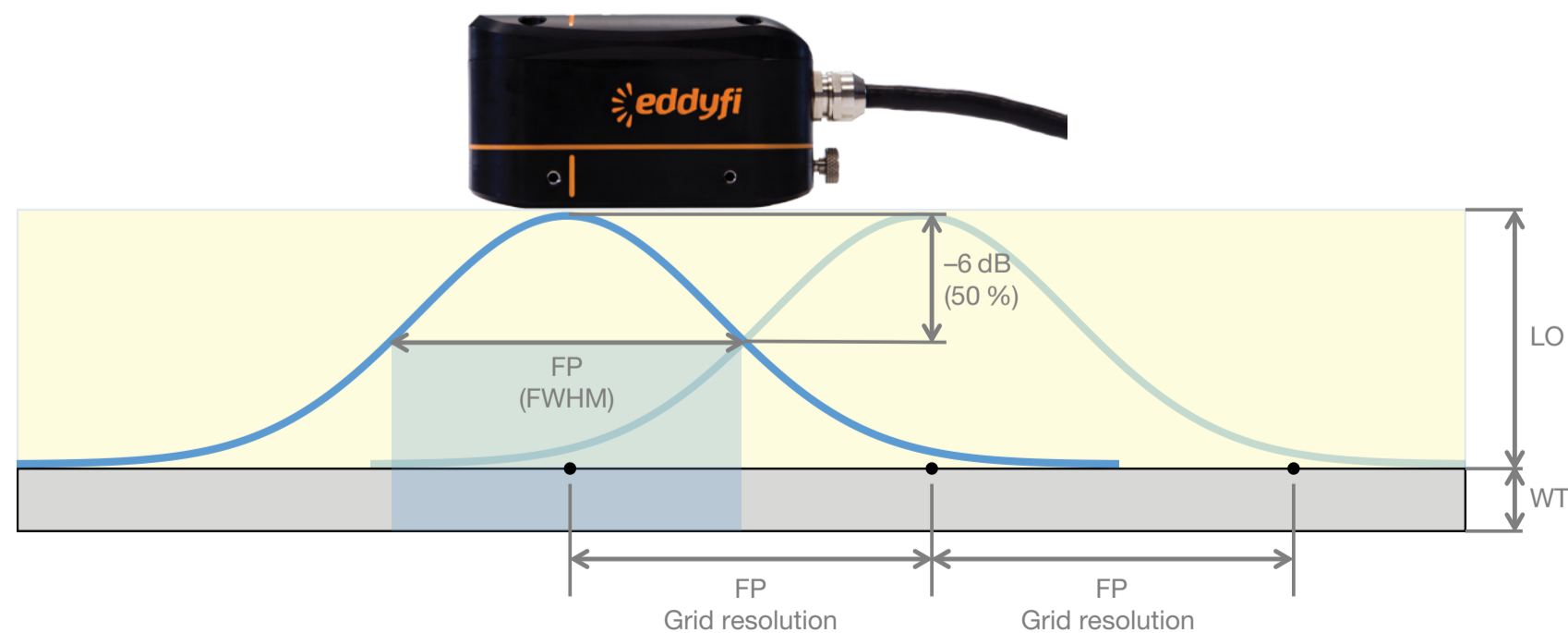
Selecting the Right PEC Probe

Reference the chart to choose a probe.

WALL THICKNESS		INSULATION / COATING THICKNESS (LIFTOFF)															
		0	6	13	19	25	38	51	64	76	89	102	127	152	178	203	
mm	in	0.00	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	
3	0.13	PEC-025															
6	0.25	PEC-025															
10	0.38	PEC-025															
13	0.50	PEC-025															
16	0.63	PEC-089 / PEC-SZ-089															
19	0.75	PEC-089 / PEC-SZ-089															
25	1.00	PEC-152															
32	1.25	PEC-152															
38	1.50	PEC-152															
51	2.00	PEC-152															
64	2.50	PEC-152															

Footprint

The footprint (FP) of a probe is used to determine the **best grid resolution** for proper CUI detection. FP is defined as the **full width at half maximum (FWHM)** of the response detected by the probe. So doing, ensuring a 50% signal overlap between each point on the grid map.



Calculating the PEC Probe Footprint

Use the following formula to determine your probe's footprint.

$$FP \approx 0.65 \times LO + FP_0$$

Where:

LO is the **liftoff** (insulation, jacket, coating thickness).

FP₀ is the footprint at a **liftoff of zero**. For each probe, FP₀ is:

PEC-025

FP₀ = 35 mm (1.38 in)

PEC-089 / PEC-SZ-089

FP₀ = 62 mm (2.44 in)

PEC-152

FP₀ = 100 mm (3.94 in)

FOOTPRINT		INSULATION / COATING THICKNESS (LIFTOFF)															
		0	6	13	19	25	38	51	64	76	89	102	127	152	178	203	
mm	in	0.00	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	
PEC-025	mm	35	39	43	47	52	-	-	-	-	-	-	-	-	-	-	
	in	1.38	1.54	1.70	1.87	2.03	-	-	-	-	-	-	-	-	-	-	
PEC-089 / PEC-SZ-089	mm	62	66	70	74	79	87	95	103	112	120	128	145	161	-	-	
	in	2.44	2.61	2.77	2.93	3.09	3.42	3.74	4.07	4.39	4.72	5.04	5.69	6.34	-	-	
PEC-152	mm	100	104	108	112	117	125	133	141	150	158	166	183	199	216	232	
	in	3.94	4.10	4.26	4.43	4.59	4.91	5.24	5.56	5.89	6.21	6.54	7.19	7.84	8.49	9.14	

Averaging Area

This is the **surface viewed by the probe** on the component. The wall thickness determined by Lyft is the **average wall thickness** within the *averaging area*. As a result, **corrosion flaws smaller than the averaging area are underestimated**. The averaging area diameter is **1.8 times** the probe footprint ($AvgA_{\phi} = 1.8 \times FP$).

Edge Effect

The edge effect impacts PEC measurements when a probe **nears geometry variations** such as nozzles, flanges, or the end of a structure. Measurements begin to **vary from a distance of one FP** from the center of a probe's coils.

