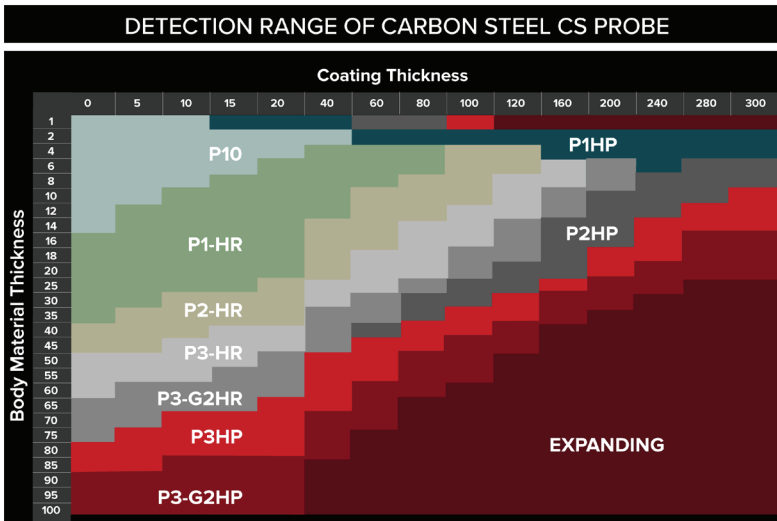
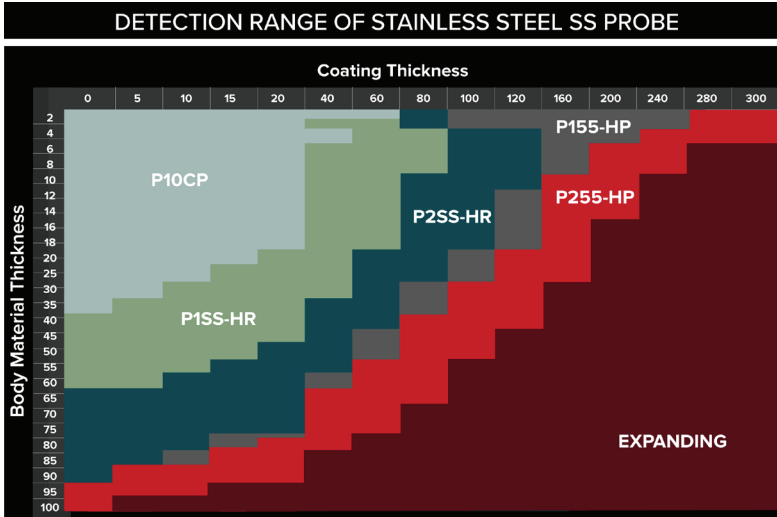
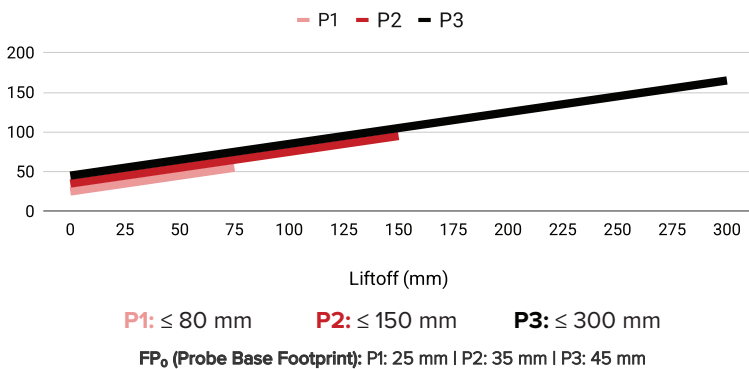


MFE PULSEPRO

DETECTION RANGE, FOOTPRINT, & INSPECTION PLANNING GUIDE



EFFECTIVE FOOTPRINT VS LIFTOFF



PROBE TYPE	PROBE MODE	APPLICATION RANGE
P10	High Resolution	No Insulation / Thin Wall
P1	High Resolution / High Penetration	Thin Insulation / Thin-Medium
P2	High Resolution / High Penetration	Medium Insulation / Medium Wall
P3	High Resolution / High Penetration	Thick Insulation / Thick Wall

ASSET TYPE	WALL THICKNESS & INSULATION RANGE	RECOMMENDED SCAN STRATEGY
Pipe Racks	Thin-Medium	Standard grid / High-Resolution / Position scan
Vessels	Medium-Thick	Reduced grid / High-Penetration / Point test
Tank Floors	Thin	High-Resolution / Position scan / Point test
Supports	Variable	Localized confirmation / Re-test

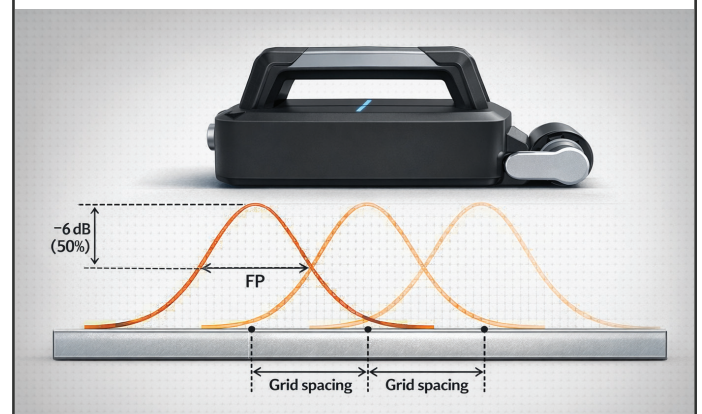
GRID SPACING & COVERAGE FOOTPRINT

Pulsed Eddy Current (PEC) test results reflect the average wall thickness over a defined inspection area. The diameter of the circular area covered by the probe is calculated as:

$$FP = 0.4 \times L_0 + FP_0$$

- FP = detection footprint diameter
- L₀ = insulation (lift-off) thickness
- FP₀ = probe base footprint

Scan density is adjusted based on probe footprint and inspection objective. Smaller footprint probes support tighter grid spacing for improved defect localization.



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PERFORMANCE, DETECTABILITY & FIELD GUIDANCE

SCAN PLANNING INPUTS

PARAMETER	REQUIRED	NOTES
Geometric shape	YES	Supports, welds, nozzles affect response
Body material	YES	Measure or verify before setup
Wall thickness	YES	Measure or verify before setup
Insulation thickness	YES	Measure or verify before setup
Metal protective skin	YES	Correction of calibration and detection results

CORROSION & DEFECT SENSITIVITY

Pulsed Eddy Current (PEC) measures the average wall thickness within the probe footprint area and is optimized for corrosion monitoring under insulation and fireproofing.

CONDITION	SUITABILITY
General corrosion	✓ Suitable
CUI (Corrosion Under Insulation)	✓ Suitable
Uniform wall thinning	✓ Suitable
Localized pitting	Limited – averaged within footprint
Cracks / fracture-type defects	Limited - Visible cracks/cracks ≥ 1mm

SENSITIVITY & RESOLUTION

- Detects approximately 5% wall loss (volume ratio)
- Repeatability approximately ±2% under stable conditions
- Sensitivity influenced by liftoff, material grade, and geometry

MATERIAL & APPLICATION LIMITS

- Designed for carbon steel inspection
- Suitable for non-conductive insulation up to 300 mm
- Ferromagnetic jacketing reduces penetration depth
- Elbows and complex geometry require separate calibration
- Measures average wall thickness within the probe footprint

MINIMUM DETECTABLE WALL LOSS

Liftoff	Wall	5% WL	10% WL	15% WL
Low	Thin	✓	✓	✓
Medium	Medium	—	✓	✓
High	Thick	—	—	✓

DEFECT SENSITIVITY SUMMARY

Defect Type	Sensitivity	Notes
General corrosion	High	Primary application
CUI	High	Designed use case
Clustered pitting	Moderate	Detectable when extensive
Isolated pitting	Low	Averaged within footprint
Cracks	Low	Unconventional method of crack detection

PRE-INSPECTION CHECKLIST

- Confirm probe type matches insulation thickness and wall range
- Calibrate on representative material and geometry
- Verify insulation is non-conductive and free of metal jacketing interference
- Ensure battery level is sufficient for full inspection
- Check for nearby electromagnetic interference sources
- Confirm surface condition allows stable probe placement
- Measures average wall thickness within the probe footprint