

KILN CHAIN INSTALLATION GUIDE

Hanging patterns, shackle installation procedures, and chain system layout for optimal kiln coverage.

1. Pre-Installation Planning

System Survey

- ☐ Measure kiln internal diameter at each chain section
- ☐ Document kiln shell temperature profile by zone
- ☐ Identify existing hanger / bracket locations and condition
- ☐ Plan chain hanging pattern (garland, curtain, or spiral)
- ☐ Calculate total chain required — include 10% extra for adjustments
- ☐ Verify material grade selection matches temperature zone

2. Hanging Patterns

Garland Pattern

Chains hang in shallow loops (2m — 4m sag) between hangers. Provides uniform coverage and allows chain movement for heat distribution. Most common pattern for rotary kilns.

Spacing between hangers	0.5m — 1.5m depending on chain length
Sag depth	10% — 15% of span length
Best for	General kiln heating, cement, lime

Curtain Pattern

Chains hang vertically in dense rows, creating a curtain effect. Maximum heat transfer but restricted material flow. Used in specific preheat zones.

Spacing between chains	0.2m — 0.5m
Chain length	1m — 3m typically
Best for	Preheat zones requiring maximum heat transfer

Spiral Pattern

Chains wrap in a helical pattern along the kiln length. Provides progressive heating and reduces material buildup. Advanced pattern requiring precise installation.

3. Shackle & Hanger Installation

Procedure

1. Inspect all hanger brackets — replace any with >20% wear or cracking

- 2. Clean hanger pin holes of debris and old material
- 3. Install hanger pins with correct-grade shackles for the zone temperature
- 4. For each chain length, attach the top end to the hanger shackle first
- 5. Allow chain to hang freely — verify it does not contact the kiln shell
- 6. Attach bottom end to opposite hanger (garland) or let hang free (curtain)
- 7. Check minimum clearance: 150mm (6") between chain ends and kiln shell
- 8. Torque all shackle pins to specification — do not over-torque

SAFETY CRITICAL

Never install chains under tension. Kiln chains must hang freely to allow thermal expansion. Tensioned chains can cause shell damage, hanger failure, and chain breakage.

4. Installation Sequence

STEP	ACTION	VERIFICATION
1	Install hangers (if new or replacement)	Weld integrity, pin alignment, spacing
2	Survey and mark chain positions	Pattern matches design plan
3	Install cold-zone chains first (feed end)	Proper grade, correct length, free hang
4	Install warm-zone chains	Grade verification, shackle torque
5	Install hot-zone chains	High-temp grade, clearance check
6	Final inspection – rotate kiln 360°	No contact, no binding, free movement
7	Document installation – photos and chain map	Record for maintenance reference

5. Post-Installation Checks

- ☐ Rotate kiln one full revolution — check for chain contact with shell
- ☐ Verify all shackles are pinned and cottered
- ☐ Confirm minimum 150mm clearance between chain and shell at all points
- ☐ Check that chain ends are not tangled or crossed
- ☐ Verify material grades are correct for each zone (document with photos)
- ☐ Record chain count, total length, and material grades for maintenance records
- ☐ Create chain installation map for future reference

KILN CHAIN INSTALLATION SUPPORT

Uniking Canada provides installation supervision and chain system engineering.

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