

# Choosing A Product for Boiler Lay-up

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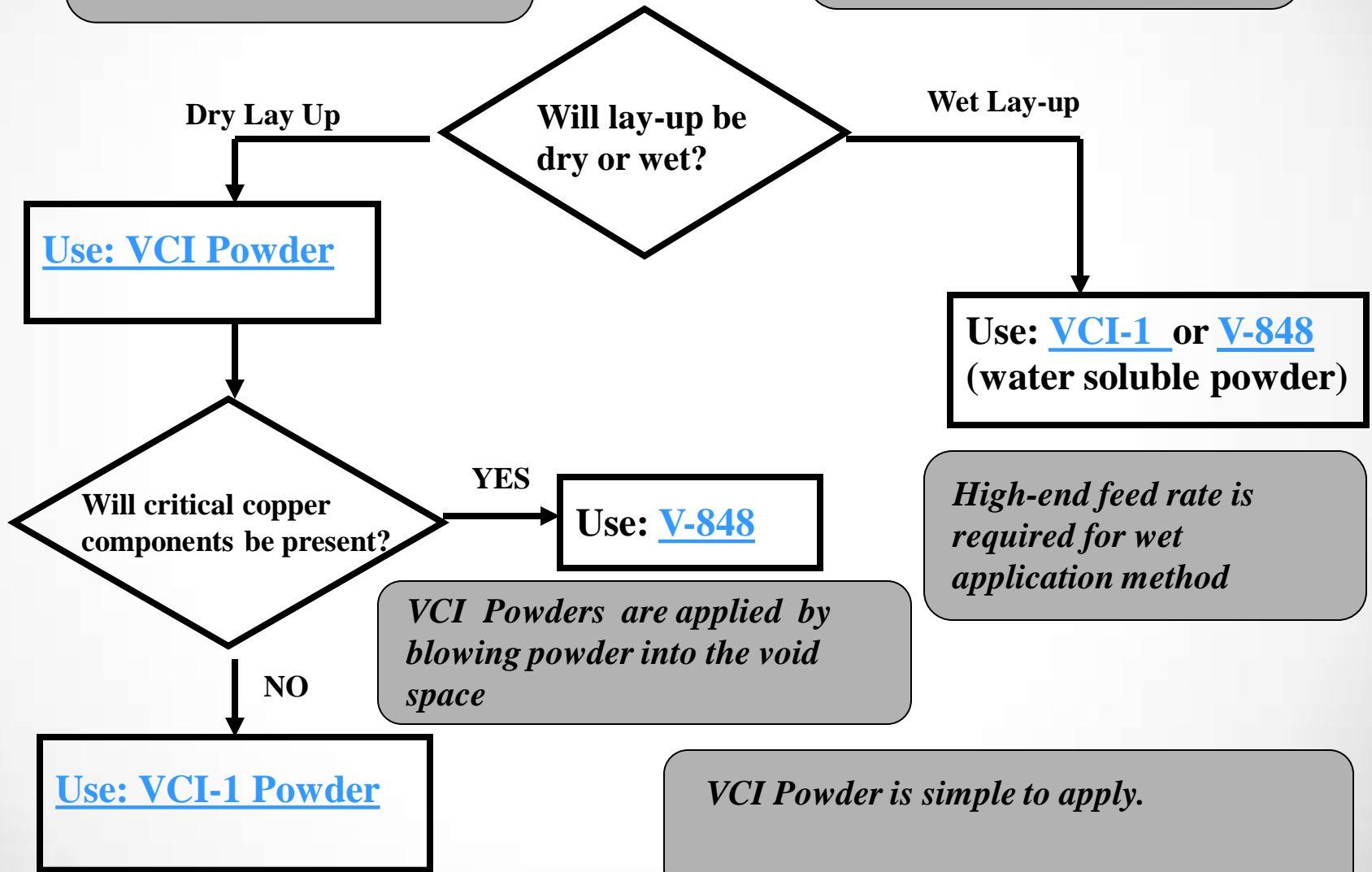
Links to: [Tower Lay Up](#)

[Hydro-testing Product Selection Chart](#)

# Lay-Up Decision Tree

*Using VCI technology both dry or wet lay-up is ideal*

*VCI technology will protect boilers for up to two years with a single dose*



*High-end feed rate is required for wet application method*

*VCI Powders are applied by blowing powder into the void space*

*VCI Powder is simple to apply.*

# Cost Comparison To Other Boiler Lay-up Methods

	Silica Dessiccant	Sulfite & OH Formulas 2203 + 2187	VCI-1 Dry Applied	VCI-1 Wet Applied
Type of Lay-up	Dry	Wet	Dry	Wet
Basis for Feed	5#/100 cu ft	200 ppm Sulfite pH >10.0	0.3 oz per cubic foot	12.5 lbs./10 cu ft. of water
Dosage for 400 HP Boiler (2500 – 3000 gal)	20#	50# Form. 2203 5# Form. 2187	6.5# - 7.5#	12.5#
OK with copper?	Y	Y?	Y	N
OK with steel?	Y	Y	Y	Y, Al+3 & Galvanized

## Notes:

- 1) Desiccant is not a corrosion inhibitor, but indirectly protects metal from corrosion by eliminating moisture. Desiccant needs to be replaced and is typically designed only to handle moisture level from ambient air, not water ingress. This method relies purely on eliminating all moisture.
- 2) Sulfite + caustic solution must be replenished with time, consequently cost will likely be higher than shown plus the manpower required to check levels. This method does not protect surfaces not in contact with solution. This wet method is not preferred for long term storage/mothballing.

# Frequently Asked Questions

***Q - Why VCI technology for boilers and related components?***

A - Vapor Corrosion Inhibitors (VCI) function by releasing or vaporizing into the air space and laying out on all the metal surface a protective film. This technology is ideally suited for dry lay-up (although wet lay-up is possible) and can protect for up to two years! Anytime a boiler or related equipment is non-operable and can be drained, VCI technology is an excellent choice.

***Q - Can I inspect the boiler with this material inside?***

A - The vapors are not hazardous. However, it is suggested that appropriate vessel entry safety procedures be followed. Protective clothing should be worn to avoid/minimize skin contact with any residual product in the boiler.

***Q - Can I start-up the boiler with this material inside?***

A - Yes, the products are water soluble. Ideally, a fill & flush would be performed prior to start-up but is not absolutely necessary. Boilers with a history of foaming and carryover problems should fill & flush first.

***Q - How do I determine dosage?***

A - Dosage is determined strictly based on system volume unless otherwise noted.

***Q - How do I assess performance?***

A - Corrosion coupons have been used or you can simply visually inspect the boiler routinely. A retractable corrosion coupon holder can be rigged if vessel opening is not desired or practical.

# VCI Powder Dosage for Fire-tube Boilers

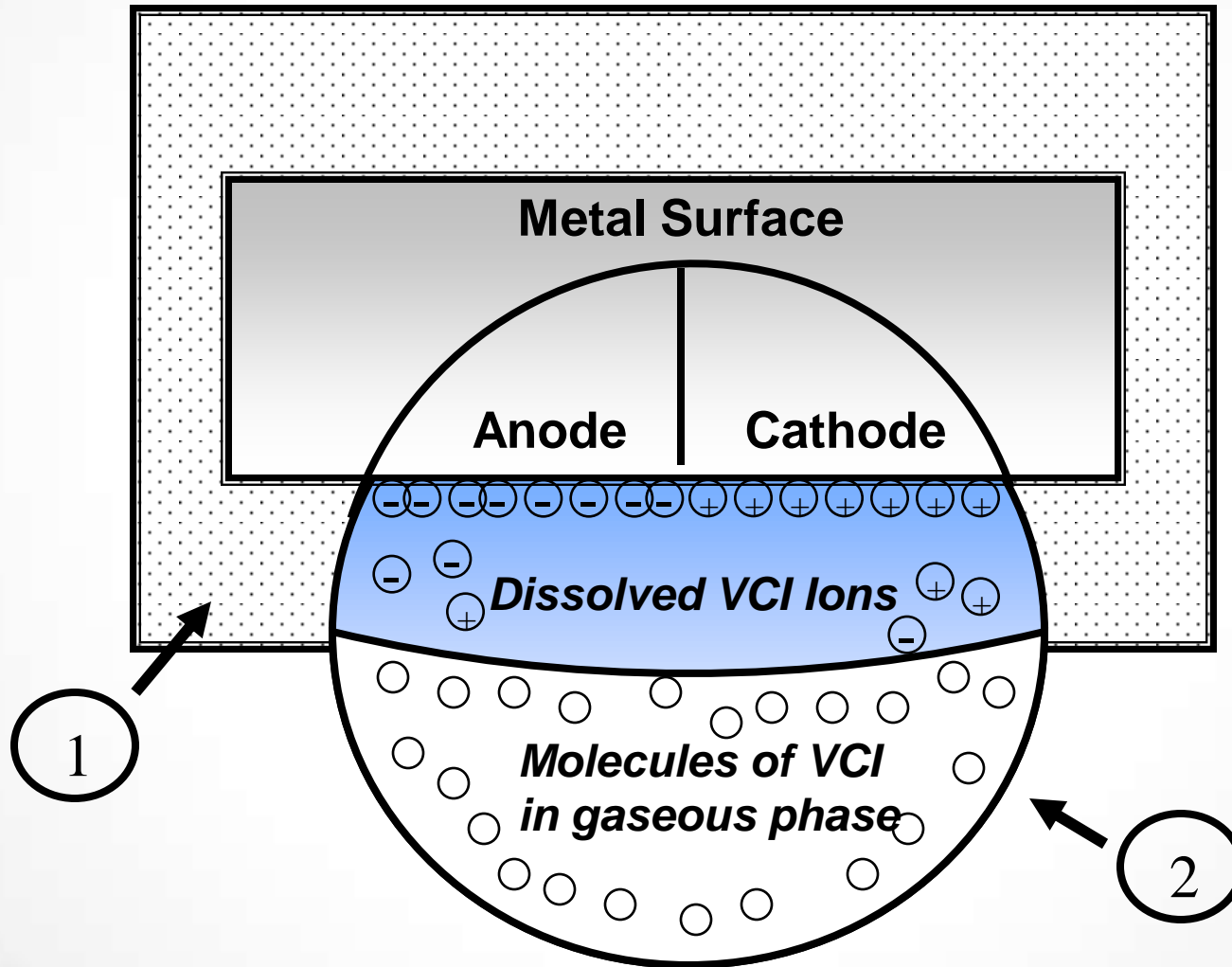
Fire-tube Horse Power Rating	Boiler Volume, Gallons	Number of Boiler Lizard Bags Required
≤150	≤1500	3.5 lbs.
200 -300	1300 – 2500	7.0 lbs.
350 – 400	2200 – 3300	10 lbs.
450 – 550	3000 – 4300	13 lbs.
600 – 750	4000 – 5500	16.5 lbs.

## **Notes:**

- 1) These recommendations are reasonable for typical fire-tube boilers (CB, Kewanee, Superior, York Shipley, and Johnston). Use the higher-end recommendation for long-term lay-up and/or for the higher-end horse power range.***
- 2) Due to various water-tube boiler designs and configurations, you will need to get the information on a case by case basis.***
- 3) In fire-tube boilers blow in the dry powder so it is spread out horizontally along the belly. In water-tube boilers blow in the dry powder so it is spread out vertically (i.e., mud drum and steam drum). This will optimize distribution of VCIs.***

# How VCI Technology Works

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# See Diagram above for ILLUSTRATION

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## How our VCI Works

1. VCI products contain inhibitors which sublime or emit into the air space. In order to ensure all metal surfaces are protected, enough VCI product must be added so that enclosed air space is saturated with gaseous VCI molecules. This vaporizing ability enables VCIs to protect metals without direct application to the metal surface.
2. A close up view illustrates how the VCI molecules layout onto the the metal surface (as a barrier) once equilibrium/saturation is reached in the vapor space. The slightest amount of moisture will wet & ionize the molecules to form a barrier that will effectively protect metal surfaces for up to two years.
3. Call KPR for [Boiler Water Treatment Products](#)  
Toll Free Customer Service at: 1-866-577-2326