



# Raven 400 Technical Bulletin

---

## MANUFACTURER

Raven Lining Systems  
13105 E. 61<sup>st</sup> Street, Suite A  
Broken Arrow, OK 74012  
(918) 615-0020

## DESCRIPTION

Raven 400 ultra-high build Novolac epoxy coating is a 100% solids, solvent-free formulation that provides excellent protection against concentrated acids such as 98% sulfuric acid in immersion service. Raven 400 has excellent adhesion strength to concrete, steel, masonry and can be used to provide superior protection in extremely acidic waste water environments. Also Raven 400 has been used to protect holding tanks and secondary containment structures in the industrial markets.

**The following is standard spray application parameters for Raven 400 epoxy coating.**

**Consult with Raven technical services for additional information.**

## Spray Application of Raven 400 Recommendations

Heat materials using in-line heaters to:

Raven 400 Part A: 125-135 F

Raven 400 Part B: 110-120 F

Plural Component Heated Hose: 140 F Drum heaters: 110-130 F

\*\*\*Material in drum must be thoroughly preheated prior to spray application\*\*\*

Spray Gun: Graco Flex Plus with RACV 531 tip or similar Static Mixers: one 12" minimum (prefer 24") x 0.25" dia.

Whip Hose: 1/4" x 20' or similar

Feed Pressure: minimum 100-psi fluid pressure during spray (typically set 5:1 pump w/75 psi air pressure) Spray Pressure: Typically 1500-3000 psi depending upon materiel tempter and hose length

WFT Application: 60-80 mils per coat. Successive coats may be applied as soon as coating begins to gel. Cure time is comparable to Raven 405.

***Material Cross Contamination Issues: Raven 400 is a high performance, acid resistant coating. The performance characteristics of 400 may be reduced by cross contamination with other products, such as 405, during equipment changeover. Prior to recirculating material into 400 containers, be sure to purge the system with a minimum of 2-3 gallons of Part A and Part B. See purging and loading procedures.***

### **Purging System and Loading with Raven 400**

Remove drum pumps from existing containers and thoroughly clean the exterior of the pump and the interior of the foot valve.

Insert the drum pumps into the containers of Raven 400. Reconnect feed hoses to the drum pumps. Place the recirculation hoses into separate 5-gallon containers (one for Part A and one for Part B).

Begin pumping the 400 through the system. Initially 405 will be pushed from the recirculation hoses into the pails. This material can be reclaimed and used as 405.

When 400 begins to come through the recirculation hoses switch to new pails.

Pump a minimum of 2 gallons of both Part A and Part B through the system into the pails (or pump until there are no visible remains of 405 exiting the hoses).

Once purged, place the recirculation hoses into the 400 containers and recirculate and heat as normal.

Once heated, spray the system until pure 400 is coming out of the spray gun. If it is feasible, the heated hose section may be replaced with short (10-20') hoses for Part A (3/8") and Part B (1/4"). This will eliminate the need to purge the heated hose and will reduce material waste. These hoses may need to be insulated depending upon ambient temperatures. A hose similar to Synflex or Hytron hose (with nylon inner tube) should be used with the proper pressure rating.

***Be sure pure 400 is being sprayed from the gun before applying in the structure.***

Complete the same steps to switch spray system back to Raven 405.

### **Cure Rate of Raven 400**

Raven 400 will cure at a rate in correlation to the temperature of the substrate onto which it has been applied. Listed below are typical cure rates for Raven 400. While other variables such as application temperature, changing substrate temperature or elevated ambient temperature may have an impact upon the listed cure rates, the table provides a guide to which application schedules and testing may be planned.

For specific information please contact Raven Lining Systems.

**Thin film cure rate to specified state for Raven 400<sup>1</sup>**

Substrate Temp, F	Time, Hours				
	Set-to-touch <sup>2</sup>	Tack-free <sup>3</sup>	Dry-through <sup>4</sup>	3-day Cure <sup>5</sup>	7-day Cure <sup>5</sup>
40	7.1	16.9	21.4	256.6	598.6
50	4.8	11.5	14.5	174.6	407.3
60	3.3	7.8	9.9	118.8	277.1
70	2.2	5.3	6.7	80.8	188.5
80	1.5	3.6	4.6	55.0	128.3
90	1.0	2.5	3.1	37.4	87.3
100	0.7	1.7	2.1	25.5	59.4
110	0.5	1.1	1.4	17.3	40.4
120	0.3	0.8	1.0	11.8	27.5

<sup>1</sup> Per ASTM 1640

<sup>2</sup> Set-to-touch: No transfer to clean fingertip when coating is lightly touched

<sup>3</sup> Tack-free: No tacky feel to clean fingertip when coating is touched

<sup>4</sup> Dry-through: No wrinkle or distortion when thumb is pressed down on coating and rotated 90 degrees

<sup>5</sup> Equivalent cure time based upon cure at 72 degrees F