

CASTING CONNECTION

• Your Link to Investment Casting News from Ransom & Randolph •

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Spalling of Primary Shell Coats



The spalling defect is often believed to be caused by the primary coat. However, several other factors can in fact cause this troublesome defect to occur in your foundry. Let's take a closer look as some of the more common causes and potential solutions.

Fines in Stucco

If the primary stucco contains a high level of fines, or dust, it will dust over the slurry coat,

keeping the actual stucco from coating the shell properly. The next slurry layer will not adhere well to this fine particle surface and weak adhesion between layers will result in delamination and spalling. To solve this issue, R&R recommends de-dusting the stucco using a dust collector; checking to see if the stucco has been degraded by mechanical means, such as bucket elevators in the rainfall sander or friction in fluid beds; and change the stucco, if necessary.

Improper Draining

Slurries need to be applied in an even, uniform coat. When the

slurry viscosity is too high or the tree is not drained properly, heavy layers of slurry are left behind. These heavy areas do not dry properly and leave a soft, poorly cured moisture pocket behind. When the part is autoclaved, this moisture tries to escape and causes the primary coats to pop off. This condition normally occurs on the second prime. R&R suggests draining the slurry away from areas where it may pool. If necessary, use a prewet or, if possible, use a second primary slurry with a lower viscosity.

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2016 Capital Planning

Planning your capital expenditures for 2016? Let the experts at R&R help! We offer a complete line of wax injection, shell room, dewax, burnout and preheat equipment to meet your needs. Learn more at www.ransom-randolph.com/equipment.html. To request a quote, contact Marti Hunyor at Marti.Hunyor@dentsply.com today!



CTM 4 Post Wax Injection Machines



CTM C-Frame Injection Machines



PKI FlashFire Dewax Systems



PKI Burnout Furnaces



Investing with Innovation™

New R&R Team Member



Eric Chong
West Coast
Regional Technical
Sales Manager

R&R is pleased to announce that Eric Chong has joined the team as West Coast Regional Technical Sales Manager for ceramic shell and industrial mold products.

In this position, Eric will be responsible for conducting field evaluations and trouble-shooting and will be based out of Los Angeles, California.

Eric graduated from the University of California, Riverside with a Bachelor of Arts in Chemistry. He has extensive

experience providing technical sales support, as well as diagnosing problems and providing solutions. Eric, a California resident, enjoys spending time with his family and friends, traveling, hiking and exercising.

Eric can be reached via phone at 213-332-2274 or email at Eric.Chong@dentsply.com.

Please join us in welcoming Eric to the R&R team!

Managing Freezable Shipments

During winter months, freezable materials, like colloidal silica based binders, should be shipped as early as possible in the week to ensure that they are continuously moving to their destination. While this does not guarantee product will not freeze, it reduces the risk associated with shipping over a weekend where product may sit at a freight

facility unprotected from freezing temperatures.

To help you ensure that the product you receive has not been damaged, Ransom & Randolph applies a freeze check indicator, which features a check mark in a green circle. Temperature-sensitive liquid is encased in a clear bubble over the check mark. The fluid will turn opaque and the

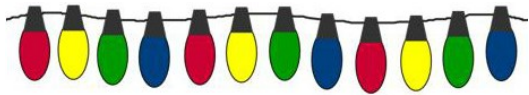
check mark is no longer visible once it has been exposed to subfreezing temperatures.

Note: This does NOT mean that the material in the package has been frozen; it only means the package has been exposed to freezing temperature.

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R&R 2015 Holiday Schedule



Happy
Holidays!

Please consider these closing dates when planning for your material needs.

Contact R&R at 800.800.7496 if you have any questions regarding this schedule.

CLOSED for Thanksgiving
Thursday, November 26th & Friday, November 27th

CLOSED for Christmas
Thursday, December 24th & Friday, December 25th

OPEN to take orders & ship materials
Monday, December 28th & Tuesday, December 29th
Hours of operation
Customer Service & Shipping from Ohio: 10AM – 3PM EST

CLOSED for New Year's
Wednesday, December 30th, Thursday, December 31st & Friday, January 1st

REOPEN for the 2016 New Year
Monday, January 4th at 8AM EST

Spalling

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Poor Slurry Control

High binder solids in the primary slurry will inhibit drying, causing the slurry to dry on the surface and entrap moisture underneath. This moisture will try to migrate out too fast during autoclaving and cause spalling. R&R urges you to institute a slurry control program and can provide information regarding the necessary testing procedures, if needed. If you currently have a program, increase the frequency or have a sample checked by the R&R Technical Department to test the accuracy of your results.

Excess Prewet

Prewetting is used to stop the previous shell layers from absorbing excess binder from the slurry. The shell will shine after the prewet drains off. Excess prewet can also be washed into an area by the next slurry layer causing a liquid pocket. This

pocket becomes a void when the binder evaporates, leaving a weak area in which spalling and delamination can potentially occur. R&R recommends draining the prewet away from pockets and out of detail. When the prewet is properly drained, the shell will take on a dull or matte finish.

Excess Stucco Buildup

Sometimes the primary stuccos will build up too heavily, that is, a given stucco coat has too many layers of grain for that individual coat. This happens because they are fine and light and require very little slurry contact to stick. If this excess stucco is not removed, the next slurry coat cannot penetrate the stucco properly and causes a weak bond between layers, which leads to spalling. As a result, one way to reduce this spalling is to blow off excess stucco between primary coats. R&R advocates the use of a low pressure air hose or wand to remove excess stucco. Manipulation of the part may be

inadequate to remove loose stucco.

Poor Bond between Primary and Backup Slurries

For a combination of the above reasons, the first backup slurry coat does not bond to the primary coat. If you have checked the above conditions and are unable to resolve spalling completely, R&R suggests trying to use coarser stucco on the second or final primary slurry coat. This will leave a rougher surface to which the first backup coat can bond.





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Investing with Innovation™

Founded in 1872, Ransom & Randolph is dedicated to advancing the investment casting industry. R&R has provided foundries with innovative product technology, process knowledge and technical expertise since the 1800s. By coupling revolutionary product developments with experienced staff, manufacturing and warehousing facilities, R&R successfully helps customers become casting industry leaders. R&R is an operating division of DENTSPLY (NASDAQ: XRAY).

R&R's core businesses are composed of Ceramic Shell, Industrial Mold, Jewelry and Dental Investment Casting.

R&R takes great pride in providing customers with a pleasant procurement experience. R&R's Maumee, Ohio based Customer Service team services North America and US export customers. Our UK-based agent, HTM Tradeco, Ltd., provides service for the European Union. From initial order placement through delivery, R&R's Customer Service team takes responsibility for accurate and efficient processing of your material needs. As a result, R&R's Customer Service team is unmatched in the industry.

We're on the web!
www.ransom-randolph.com

Freezable Shipments

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If this occurs, immediately:

1. Make a notation on your carrier delivery receipt prior to the carrier leaving your facility:

**"POSSIBLE CONCEALED
DAMAGE - PRODUCT HAS
BEEN EXPOSED TO FREEZING
TEMPERATURES"**

2. Contact R&R customer service to have a freeze test kit sent to you. The material will need to be tested as soon as possible. Instructions will be inside the kit as how to proceed.

Always accept a damaged shipment unless the damage has made the goods worthless. In cases of partial damage or loss, accept the entire shipment, document the loss/damage on the carrier receipt and follow the instructions on *How to Handle Lost/Damaged Shipments* available at www.ransom-randolph.com/winter-weather-reminder.html.

