

CASTING CONNECTION

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

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Avoid Autoclave Cracking

Under certain operating conditions, autoclaves can often be the cause of shell cracking problems.

R&R recommends adhering to the following autoclave operating procedures to prevent or minimize shell cracking in your foundry.

Preheat the autoclave by running it through a complete operating cycle before dewaxing any shells.

After the preheat cycle, check the time it takes for the autoclave to get up to dry steam pressure. It should typically take no more than 10 seconds to reach 80 psi (5.5 bars)

from the time the valve is quickly opened.



It is recommended that the autoclave be operated to at least 100 psi. The temperature inside the autoclave will be about 340° F (171° C). Comparing the pressure and temperature readings will let you know that both are functioning properly.

Release pressure gradually after the cycle

has been completed. A minimum of 2 minutes should be taken to let pressure down to 20 psi. At 20 psi, the pressure can be released immediately.

Check for dry steam — the autoclave should only accumulate a certain amount of water during a complete cycle. If more water than allowed is being accumulated, the steam source (boiler or accumulator) is too close to the autoclave. This excess water will be deposited on the shells which will prevent the steam from reaching them properly and cause

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SculptaCast™ Wax FAQs

Can we recycle the wax?

You can recycle the waxes for sculpture casting; however, in order to benefit from the unique properties engineered into SculptaCast waxes, we recommend that you use virgin wax for the first three layers of wax.

Do you recommend painting on layers before slush? If you want to pick out fine detail and eliminate air bubbles on the surface of your wax patterns, then we recommend painting on 3-4 thin layers of wax before slushing your mold.

Do you supply the waxes in different colors?

SculptaCast Earth wax comes in two different colors.

Can you supply a glue?

Ultrabond Kryptonite sticky wax works like a glue for a ridged bond between wax parts. With

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Investing with Innovation™

PKI Kiln Korner



Thermo-Flo Pusher Tile



Source:
Pacific Kiln & Insulations
Degrees ° Newsletter
June 2017
Vol. 19 No. 2

Foundry Facts

Dear PKI,
Our pusher furnace metal trays are very expensive and don't last very long. What can we do?

~ Burned Out

Dear Burned Out,
Don't worry, there's light at the end of the tunnel. Those expensive alloy trays can be replaced

with Thermo-Flo Pusher tiles, a ceramic alternative. Typically our customers can get up to three times more life at one third the cost. And they give better heat and atmosphere circulation due to the ribbed surface. They are custom made to your exact size and shape requirements and

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R&R Report Card

Earlier this year, in an effort to help us provide products and services that continue to meet your needs, we asked you to complete a customer satisfaction survey.

Thank you for taking the time to share your thoughts! Here is what you had to say about us.

Overall, R&R products were described as high quality, reliable, useful and innovative.

On average, R&R received the following ratings to the following questions:

How well do R&R products meet your needs? *Very Well*

How would you rate R&R for customer service/order

placement? *Above Average*

How responsive has R&R been to your technical questions or concerns with regards to our products? *Very Responsive*

How responsive has R&R been to your technical questions or concerns with regards to process issues in your foundry? *Very Responsive*

How would you rate the usefulness of the answers you have received to your technical questions? *Excellent*

How likely is it that you would recommend R&R to another caster? *Very Likely*

How likely are you to

purchase from R&R again? *Extremely Likely*

Overall, how satisfied are you with R&R? *Very Satisfied*

As a token of our appreciation for your feedback, all completed surveys were entered in a raffle drawing to win one of five \$50 gift cards! The lucky winners were:

- Philip Richard, *Precise Cast Prototypes*
- Robert St. Croix, *Robert St. Croix Art Studio*
- Andrew DeVries, *River Studio*
- Stuart Virgo, *Stone Foundries Ltd.*
- Andrea Di Pietro, *Microcast S.r.l.*

Thank you again for your feedback!



SculptaCast™ Wax FAQs

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clean burning and low ash, it is ideal for adding runners to your wax pattern.

Can you use standard solvents, such as mineral spirits, to clean pattern defects or seams? Yes, SculptaCast Limerick wax cleans the easiest with very little tack, while SculptaCast Earth wax cleans well, but does have more tackiness because of its softer wax chemistry.

Are SculptaCast waxes stable, or

will they degrade and separate like many other waxes found in sculpture foundries? SculptaCast waxes exhibit exceptional thermal stability and are made with only high quality raw materials.



Can SculptaCast waxes reduce or prevent lifting and bulging? Absolutely, SculptaCast Earth wax has been technically engineered to greatly reduce or completely eliminate lifting.

SculptaCast Limerick wax offers a substantial reduction, while SculptaCast Dragon wax has not been specifically designed with this attribute.

Are we able to blend the different products to achieve our desired properties? Although we don't recommend this, because each product offers properties which are very unique, our products do readily blend to create your desired results.

Visit: ransom-randolph.com/cs-sculptacast-waxes.html

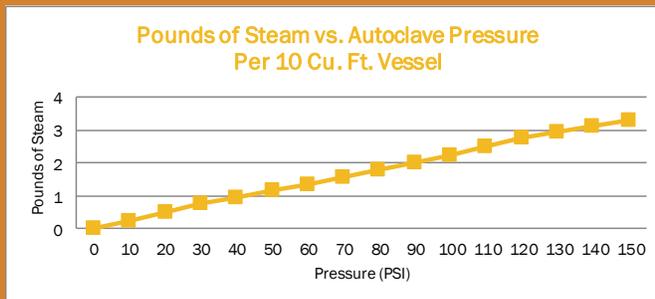
Avoid Autoclave Cracking

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the wax to heat too slowly. The wax will then expand, causing a higher incident of shell cracking. Refer to the Pounds of Steam vs. Autoclave Pressure graph and Standard Autoclave Sizes and Steam Capacities table to the right.

The Pounds of Steam vs. Autoclave Pressure graph shows the expected amount of water to be accumulated in various sized autoclaves.

The Standard Autoclave Sizes and Steam Capacities table provides the necessary information and uses pressures of 100 and 120 psi as examples.



Standard Autoclave Sizes and Steam Capacities						
Diameter (in)	Length (in)	Straight Vessel Volume (FT ³)	Volume of STD ASTM Domes	Total Volume (FT ³)	Accum. Water (lbs. at 100 PSI)	Accum. Water (lbs. at 120 PSI)
24	36	9.4	2.0	11.4	2.6	3.1
30	36	14.7	4.0	18.7	4.2	5.1
36	36	21.7	7.0	28.4	6.4	7.7
36	48	31.4	7.0	38.4	8.7	10.4
42	48	38.5	11.5	50.0	11.3	13.6
48	48	50.3	16.5	66.8	15.1	18.1
48	60	62.8	16.5	79.3	17.9	21.5
48	66	69.1	16.5	85.6	19.4	23.2
48	72	75.4	16.5	91.9	20.8	24.9
54	72	95.4	24.0	119.4	27.0	32.4
60	60	98.2	32.0	130.2	29.5	35.3
60	72	117.8	32.0	149.8	33.9	40.6
72	72	169.6	56.0	225.6	51.0	61.1

Graph and table data: Shell Cracking, American Foundrymen's Society, 1987.



RANSOM & RANDOLPH

Maumee, OH 43537 USA
Toll Free: 800.253.4502
Phone: 419.865.9497
Fax: 419.865.9777

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Founded in 1872, Ransom & Randolph is dedicated to advancing the investment casting industry. R&R has provided foundries with extensive process knowledge, exceptional technical expertise and innovative product technology 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 a wholly owned subsidiary of DENTSPLY International (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.



PKI Kiln Korner

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usually a direct replacement for your metal trays without any furnace modifications. Call Pacific Kiln and ask how we can get started with your Thermo-Flo Pusher tiles.

~ The Pyro Maniac

If you have questions about FlashFire dewax, burnout, or Preheat, PKI would like to hear from you.

Hot Tips

Afterburner Systems for Today's Foundry

Environmental issues have never been more prominent than they are today. The investment casting

foundry is being scrutinized in almost every part of their operation, including dewax and in the burnout process of shells. The need for a clean, efficient and cost-effective means of eliminating emissions in the burnout process has grown tremendously with local, state and federal environmental regulations.

Pacific Kiln has been involved in the evolution and development of emissions control for the burnout furnace since its beginning in 1978. PKI was the first to incorporate afterburners as a fundamental component in the design of their burnout furnaces. Until just recently, these proprietary afterburner designs were available only on new FlashFire Dewax and Burnout Furnace Systems. Pacific



Kiln now offers afterburner retrofit packages not only for their own furnaces but any other furnace brand.

Contact PKI

- Phone: 951.697.4422
- Fax: 951.697.4442
- info@pacifickiln.com
- www.pacifickiln.com