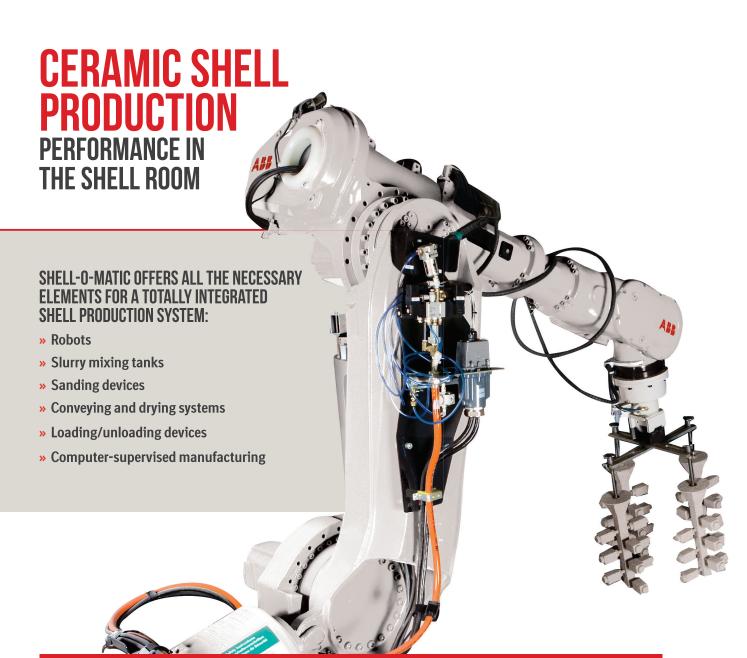
SHELLROOM PRODUCTS

shellomatic.com

SHELL-O-MATIC

+1.514.323.0868

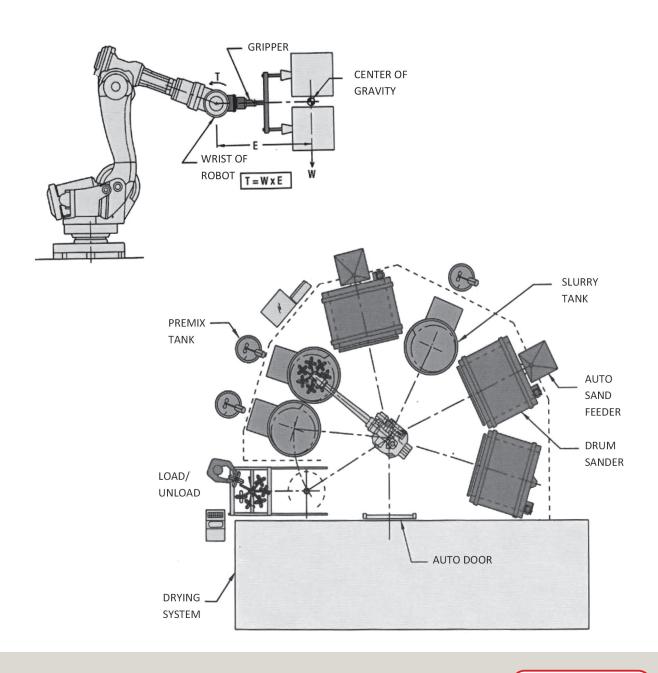


TYPICAL COMPLEX CASTING PRODUCED ON SHELL-O-MATIC EQUIPMENT

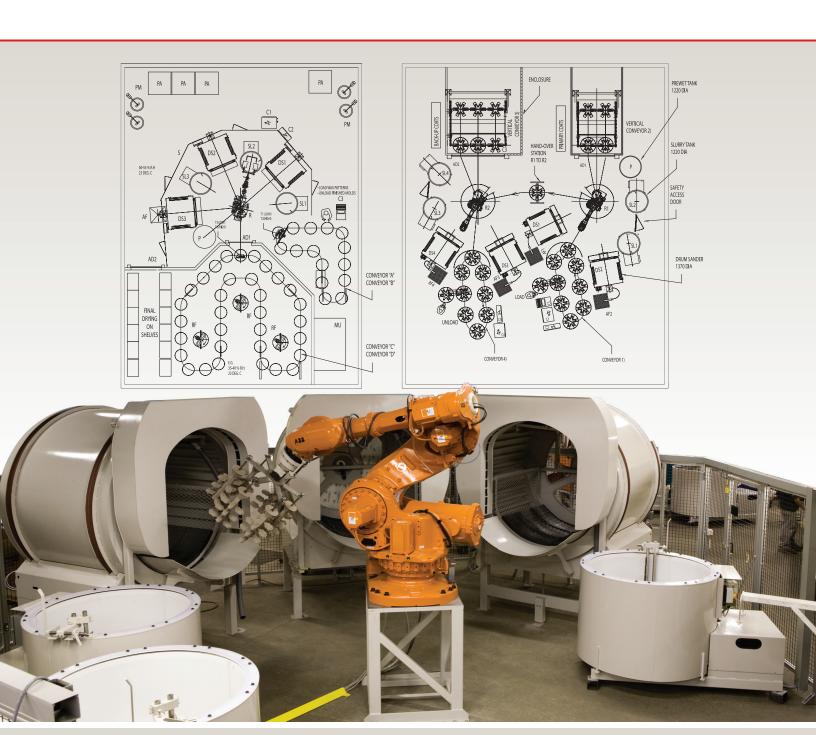


EXAMPLE OF A ROBOT BUILDING SYSTEM

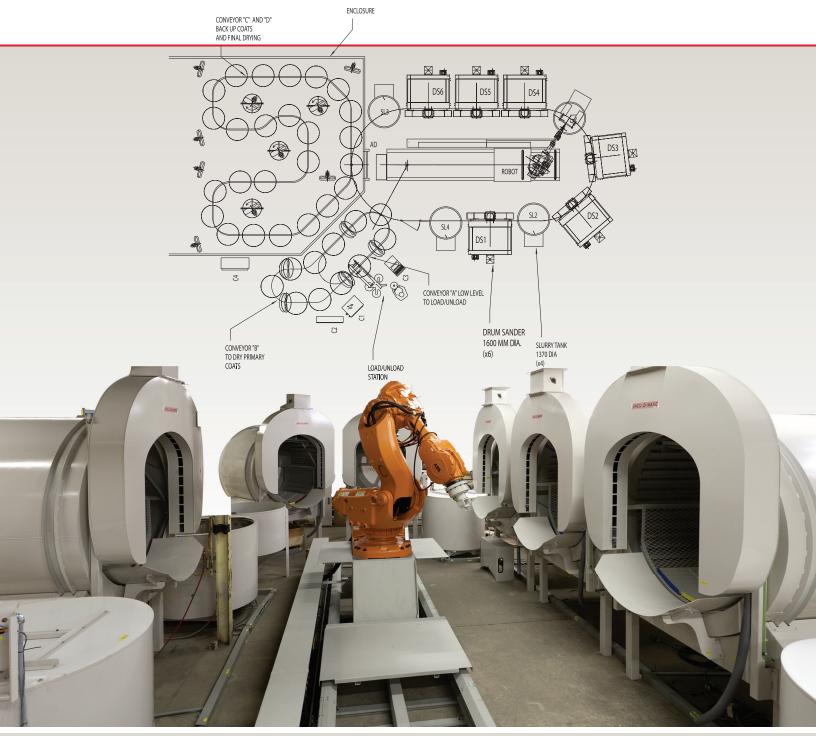
The 6 axis articulated robots are offered with a range of load capacities and physical "reach", depending on the application. Careful consideration must be given to the torque "T" so that the robot's wrist can resist the effect of load and distance.



SYSTEM WITH 6 AXIS ROBOTS



SYSTEM WITH A 7TH AXIS TRAVERSE MODULE



SHELL MANAGEMENT SUPERVISORY SYSTEM

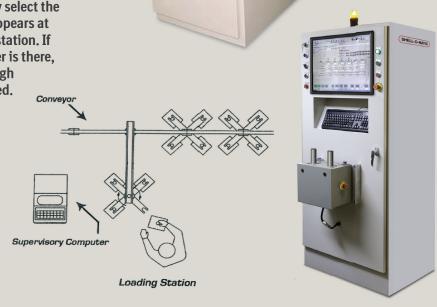
DESCRIPTION

At loading point: Using a bar code scanner, the operator will enter the part number/recipe at the mini console when a cluster is loaded into the system.

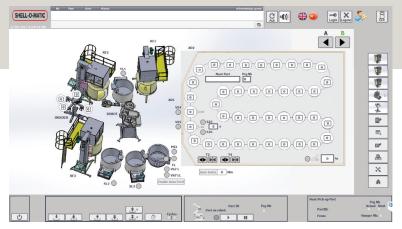
Supervisory Computer: Will automatically select the proper program for a certain part which appears at the pickup point of the conveyor transfer station. If the part is not yet dry or if an empty hanger is there, the computer will index the conveyor at high speed to the next hanger ready to be dipped.

The recipe is the manufacturing instruction on how to build a ceramic shell for a certain part. The system can be configured for single or multiple robots and conveyor lines.

At unloading point: When a hanger with finished dipped molds appears at the unloading point, a light will flash. Once removed from the conveyor, the operator presses the acknowledgement button to erase the parts from the computer. At that moment, a dipping report is generated.

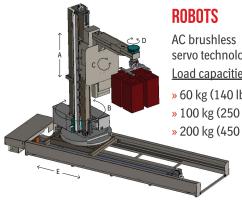


SHELL-O-MATIC



CERAMIC SHELL PRODUCTION EQUIPMENT

FROM SINGLE UNITS TO COMPLETELY ENGINEERED PROJECTS

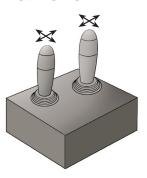


servo technology **Load capacities**

- » 60 kg (140 lbs)
- » 100 kg (250 lbs)
- » 200 kg (450 lbs)
- » 360 kg (800 lbs)
- » 675 kg (1500 lbs)

JOY STICK

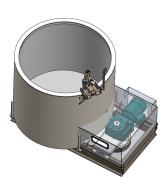
With this option, you can add manual operations in the middle of an otherwise automatic robot program.



SLURRY MIXING TANKS

Ta	1	١l	<	Ø	

Idilik W			
610 mm	(24")	1370 mm	(54")
760 mm	(30")	1525 mm	(60")
812 mm	(32")	1700 mm	(68")
915 mm	(36")	1905 mm	(75")
1040 mm	(41")	2232 mm	(88")
1090 mm	(43")	2540 mm	(100")
1220 mm	(48")		



MOLD TRACKING SYSTEM

BAR CODING of part number helps you avoid operator errors.

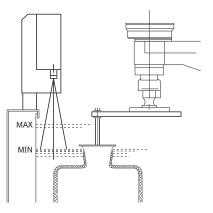


MINI CONSOLE contains supervisory computer and printer. Enclosure is dust protected and ventilated.



SLURRY LEVEL SENSING SYSTEM

The robot follows the slurry level and coats every mold to the same height.



PART DIPPING REPORT

	PART #: 12345 ON HANGER #: 35									
COAT	PROGRAM #	START DIPPING TIME	TEMP. (C)	REL. HUMIDITY (%)	ACTUAL DRYING TIME (MIN)					
1	9	11:11 23-10	25	45	147					
2	11	13:38 23-10	25	45	153					
3	3	16:11 23-10	25"	46	145					
4	3	18:36 23-10	25	45	176					
5	7	21:32 23-10	25	45	165					
6	90	00:17 23-10	25	45	212					

When a mold or a cluster of molds has received all coats and has been removed from the coating system, a report is automatically printed showing all the vital parameters of the shell-building process.

RAINFALL SANDER

RAINFALL

Model Sand rain Ø

100 760 mm (30") 960 mm (38") 140 1220 mm (48") 250 1470 mm (58") 350 1670 mm (64") 550 1980 mm (78") 600

Also available: Combined rainfall/ fluidizer

FLUIDIZED BED AND HIGH PRESSURE BLOWER

Fluidizer Ø

570 mm (22.5") 760 mm (30") 915 mm (36") 1015 mm (40") 1145 mm (45")

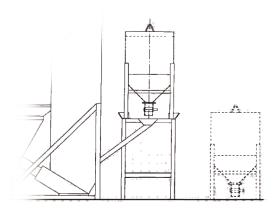
1270 mm (50") 1350 mm (53") 1525 mm (60")





SAND FEEDING SYSTEMS

For rainfall sanders and fluidized beds. Floor based or mezzanine based. Combined with level sensor allows fully automatic operation.



Conveyor

LOADER

Permits the efficient assembly of clusters from individual wax trees away from the conveyor line. Can also be used for the unloading of finished coated parts.

AUTO ROLLING DOOR

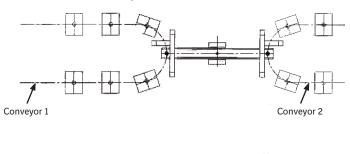
(Vertical)

AUTO SLIDING DOOR

(Horizontal)



This linear handling device automatically moves molds from one conveyor to another.





ELEMENTS AND SYSTEMS for drying rooms and tunnels. Control relative humidity, temperature and air speed.

Floor based and mezzanine based systems.



SLURRY MIXING TANKS

HEAVY DUTY, BELT DRIVEN MODEL

SINCE THE CREATION OF SHELL-O-MATIC, WE HAVE BUILT NEARLY 1000 SLURRY TANKS SO WE KNOW THERE IS MUCH MORE TO IT THAN A SIMPLE ROTATING DRUM WITH A PADDLE.

First, we pay attention to providing our customer with rugged and reliable driving mechanisms to ensure their tanks never stop. Second, we know that slurry material is expensive and probably the most important and sensitive component of the shell building system, so we provide you with all available options to measure, control and maintain the slurry quality.

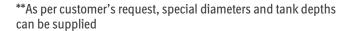


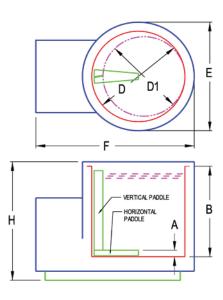
This includes:

- » Level sensing and control of the robot to maintain constant dipping depth
- » Rotating speed adjustment
- » Real-time viscosity sensing
- » Temperature sensing and control through a water-cooled paddle
- » Automatic cover that opens only when parts need to be dipped
- » Vacuum slurry tanks if needed

To ensure ease of cleaning we can also provide a variety of plastic covers and liners, including one-piece plastic liners for the tank interior. Furthermore, all wetted parts of the tank are made of high-quality stainless steel.

We can also provide turntables that can hold many tanks and position the one needed for the robot area, thus allowing a smaller envelope robot to access a plurality of tanks. If you need to move the tank around, we can build it on an air cushion, making it easy for an operator to displace it.





744W 0175 B	24			_	_		SLURRY	SLURRY VOLUME		
TANK SIZE D	D1	A	В	E	F	Н	LITER	US GAL		
36" 915 mm	31" 785 mm	3" 75 mm	33.12" 840 mm	40" 1016 mm	58" 1475 mm	44" 1118 mm	540	142		
41" 1040 mm	36" 915 mm	3" 75 mm	33.12" 840 mm	45" 1140 mm	63" 1600 mm	44" 1118 mm	700	185		
43" 1090 mm	38" 965 mm	3" 75 mm	33.12" 840 mm	46" 1170 mm	63" 1600 mm	44" 1118 mm	772	204		
48"-L 1220 mm	42" 1067 mm	3" 75 mm	33.6" 854 mm	51" 1295 mm	63" 1600 mm	44" 1118 mm	960	254		
48"-H 1220 mm	42" 1067 mm	3" 75 mm	37.4" 950 mm	51" 1295 mm	75" 1905 mm	44" 1118 mm	1070	281		
54"-L 1370 mm	48" 1220 mm	3" 75 mm	31.5" 800 mm	57" 1448 mm	78" 1980 mm	44" 1118 mm	1111	293		
54"-H 1370 mm	48" 1220 mm	3" 75 mm	36" 915 mm	57" 1448 mm	78" 1980 mm	49.2" 1250 mm	1295	342		
60"-L 1525 mm	54" 1370 mm	3" 75 mm	31.5" 800 mm	63" 1600 mm	81" 2060 mm	44" 1118 mm	1370	361		
60"-H 1525 mm	54" 1370 mm	3" 75 mm	40.2" 1021 mm	63" 1600 mm	81" 2060 mm	49.2" 1250 mm	1597	422		
62" -L 1575 mm	56" 1425 mm	3" 75 mm	34" 865 mm	66" 1675 mm	98" 2475 mm	46" 1175 mm	1529	402		
62"-H 1575 mm	56" 1425 mm	3" 75 mm	47" 1195 mm	66" 1675 mm	98" 2475 mm	59" 1500 mm	2172	572		
67" 1700 mm	60" 1525 mm	3.5" 90 mm	42.5" 1080 mm	71" 1803 mm	102" 2590 mm	59.25" 1504 mm	2160	568		
72" 1830 mm	64" 1625 mm	7" 180 mm	52" 1320 mm	80" 2030 mm	109" 2770 mm	74.5" 1890 mm	3274	862		
75"-L 1905 mm	66.5" 1670 mm	4" 100 mm	48.5" 1232 mm	81" 2057 mm	105" 2667 mm	54.75" 1390 mm	2700	710		
75"-H 1905 mm	66.5" 1670 mm	4" 100 mm	60" 1525 mm	81" 2057 mm	105" 2667 mm	71.8" 1825 mm	3700	975		
88" 2235 mm			米米	95" 2415 mm	125" 3175 mm					
100" 2540 mm			**	106" 2695 mm	138" 3505 mm					

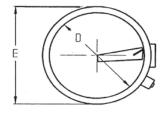
SLURRY MIXING TANKS DIRECT DRIVEN MODEL

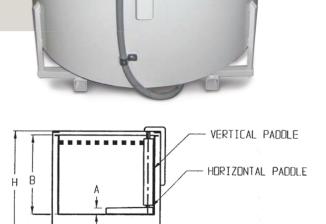
STANDARD FEATURES

- » Removable, L-shaped paddle
- » On/off switch
- » Overload protection

Options

- » Variable speed
- » Slurry level sensing
- » Remote start/stop
- » Automatic cover
- » Water cooling
- » Plastic liner
- » Temperature controls
- » Full plastic tank
- » Zero speed detection (alarm)





SHELL-O-MATIC

TANK SIZE D	TANK SIZE D E A B		н	SLURRY	VOLUME	
IANN SIZE D	E.	A	D	n	LITER	US GAL
24" 610 mm	28" 710 mm	2.5" 64 mm	27" 685 mm	37.75" 960 mm	185	49
30" 760 mm	34" 870 mm	2.75" 70 mm	28" 710 mm	38.75" 985 mm	300	78
32" 810 mm	36" 910 mm	2.75" 70 mm	29" 735 mm	40" 1015 mm	353	93
36"-L 915 mm	40" 1016 mm	3" 75 mm	25" 635 mm	38.75" 985 mm	380	100
36"-H 915 mm	40" 1016 mm	3" 75 mm	30" 762 mm	43.5" 1104 mm	465	122
47.5" 1200 mm	52.7" 1340 mm	3.8" 96 mm	41.6" 1056 mm	57.5" 1460 mm	1085	285

SLURRY MIXING TANKS OPTIONS/VARIANTS

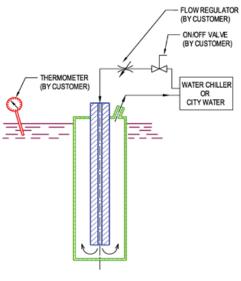
VERY LARGE TANK

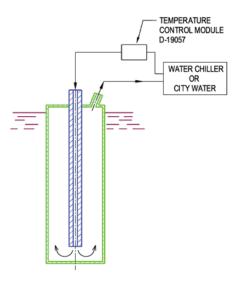
88"-2235 mm dia.
Mobile unit with on-board drive





SLURRY TANK





WATER COOLING MANUALLY CONTROLLED

WATER COOLING AUTOMATICALLY CONTROLLED

SLURRY MIXING TANKS

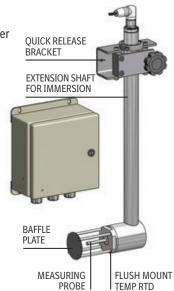
OPTIONS/VARIANTS

VISCOMETER

The AST-100IPRI Viscometer is inserted into the slurry and outputs continuous measurement of viscosity and temperature. The instrument enables automatic viscosity control and improved quality assurance over cup method.

Benefits:

- » Correlates with lab viscometer and cup measurement
- » Enables continuous logging of viscosity and temperature
- » Alarms for "off-spec" slurry condition
- » Improves stucco coverage and optimizes drying time
- » Reduces cracking, excess metal, burn in and penetration
- » Minimizes operator involvement



Features:

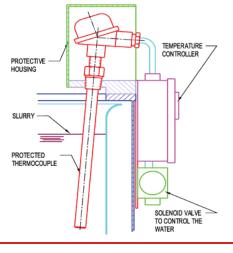
- » 316SS construction with baffle plate for abrasion protection
- » Easy cleanable design with no moving parts
- » Internal RTD eliminates slurry build up
- » Viscosity & temperature outputs as 4-20mA, RS-485 & RS-232
- » Fully tested for future QC checks

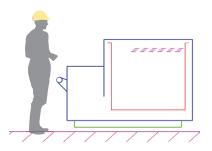
Options:

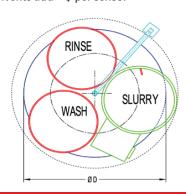
- » AST-310SY-420 controller for closed loop viscosity control
- » Quick release bracket for inspection and cleaning
- » Manual and wireless data logging options
- » 115VAC, 230VAC or 24vdc power input options

SLURRY PH SENSOR

- » RADEL with double O-ring front end 3/4" back end MNPT
- » -5 °C to 105 °C
- » Immersible and submersible
- » Double junction
- » High capacity KYNAR reference
- » Acid/fluoride resistant
- » Ammonia, chlorine and sulphide gas resistant
- » Proprietary toughened glass
- » 6 m cable
- » Plug & Play sensor has a quick connect fitting
 - · Teflon silicon sealing option
 - For dealing with solvents add \$ per sensor





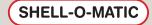


Water Cooling Control Module D-19057

Mobile Slurry Tank
On Air Cushions

Turntable, Powered

- » Size 1 90"
- » Size 2 100"

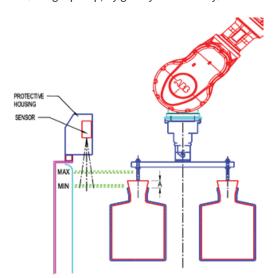


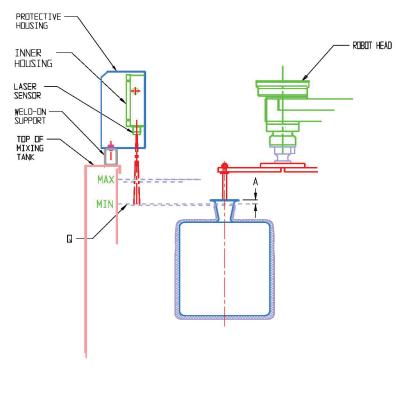
AUTOMATIC SLURRY LEVEL SENSING

The robot follows the slurry level and maintains a constant shell dimension "A".

When the minimum slurry level "Q" is reached, the robot will stop at the end of the cycle and give an alarm signal.

The operator then adds slurry to max level (using a pump, by gravity or manually).









SLURRY LEVEL SENSOR

SLURRY TRANSFER PUMP

SLURRY PREMIX TANK ROTATING TANK MODEL

Shell-O-Matic premixing tanks are available in a rotating and non-rotating version (water drop shape).

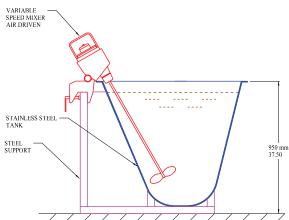
The wetted parts of these tanks are all made of high-quality stainless steel to ensure tank longevity and to prevent foreign material contamination. Depending on your needs, we can offer an air-driven or electric propeller mixer.

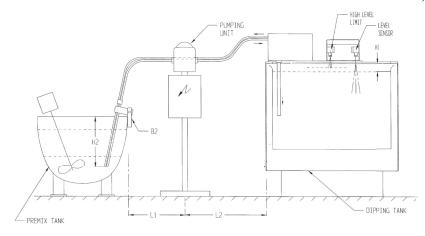
If you need to save time on the slurry preparation while making sure of a proper ingredient suspension, we can also propose a high-shear mixer. This new mixing technique reduces the mixing time to a minimum. Just give us your slurry parameter requirements and we will offer you a premixing tank you can depend on.

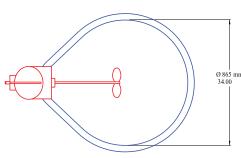
We can also provide slurry transfer pumps to facilitate the replenishment of your slurry tanks.

- » All wetted parts are made of high-quality stainless steel.
- » Various mixers are available to match your process or save on your preparation time.
- » Robust and reliable tanks made to the highest standards.









LARGE SCALE SLURRY TANKS

BECAUSE SHELL-O-MATIC'S ORIGINAL ROBOT PRODUCT LINE ALWAYS INCLUDED A 680 KG CAPACITY ROBOT, WE NATURALLY DEVELOPED A SPECIALTY IN MAKING OVERSIZE EQUIPMENT.

So far our record is a 100"/2540 mm diameter slurry tank and a 83"/2100 mm drum sander. If you are dealing with heavy parts or plan on doing so, call a Shell-O-Matic specialist that will most likely have interesting solutions for you.

- » Shell-O-Matic can design custom slurry tanks to match oversize part requirements.
- » Rainfall sander and drum sander design can be sized to match your needs.
- » We have the expertise to ship and install oversize equipment around the world.







DRUM SANDERS

THERE ARE MANY SMALL DETAILS THAT MAKE OUR DRUM SANDERS DIFFERENT FROM OUR COMPETITION, STARTING WITH THE FACT THAT WE HAVE THE EXPERTISE TO TWEAK IT TO YOUR NEEDS.

Give us your sand specs and rain flow requirements and we will tailor the sand rain to your spec, making sure you can adjust the rain flow within a desired range.

Furthermore, we can integrate your sander with automatic sand feeding system so you never run out of sand, thus improving your productivity. We can also offer sand exchange systems, making it easy in your process to switch from one sand type to another. Finally, since most sands used in the investment casting industry create toxic dust, we engineered a dust collection system tested to make sure your workers are safe.

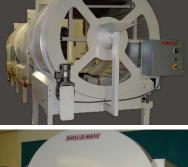
Standard features

- » Variable speed drive
- » Local start/stop switch
- » Remote start/stop
- » Manual sand feeding

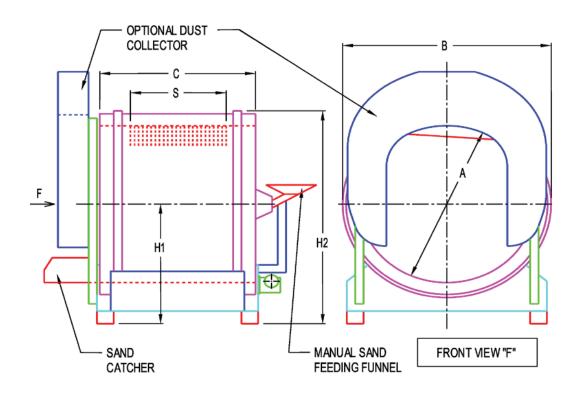
Optional features

- » Dust collection ring
- » Sand feeding hopper
- » Pneumatic sand feeding
- » Sand weighing system with load cell
- » Rear view window
- » Sand changeover unit (use one drum sander with several sands)

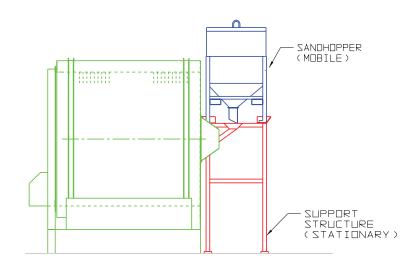






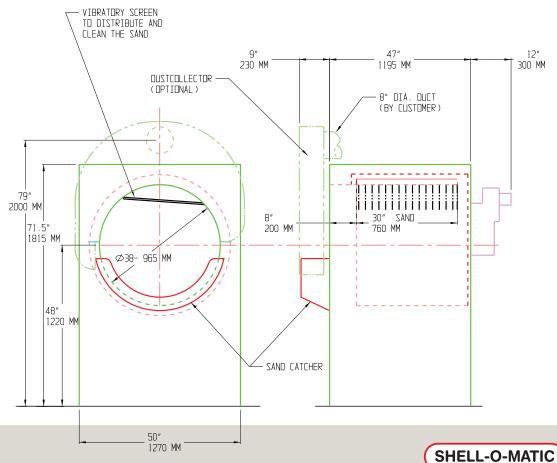


SIZE Inside dia. A	48.0" - 1220 MM	54.0" - 1370 MM	63.0" - 1600 MM	72.0" - 1828 MM	83.0" - 2108 MM
В	64.5" - 1640 mm	69" - 1750 mm	79.5" - 2020 mm	86.0" - 2185 mm	100.75" - 2560 mm
S (Sand Rain)	36.0" - 915 mm	39.0" - 990 mm	42.0" - 1067 mm	50.0" - 1270 mm	57.0" - 1450 mm
С	54.0" - 1370 mm	57.25" - 1455 mm	60.5" - 1540 mm	71.5" - 1815 mm	88.0" - 2185 mm
H1 (Minimum)	39.5" - 1005 mm	41.0" - 1040 mm	45.0" - 1143 mm	46.75" - 1190 mm	51.25" - 1302 mm
H2 (Minimum)	71.5" - 1815 mm	75.5" - 1920 mm	85.0" - 2160 mm	91.0" - 2315 mm	101.5" - 2580 mm



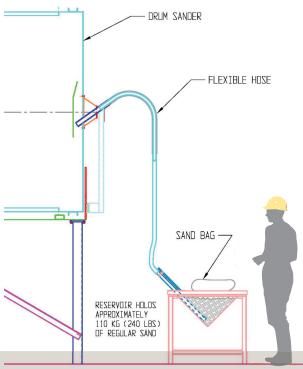
AUTOMATIC SAND FEEDING SYSTEM FOR DRUM SANDER

DRUM SANDER 38" DIA - 965 MM \emptyset FOR MANUAL OPERATION



PNEUMATIC Sand Feeder





RAINFALL SANDER APPLYING STUCCO THE EASY WAY

FEATURES

- » Dense and uniform sand distribution over a large area ensures fast stuccoing.
- » Rapid change-over from one stucco to another; fine or coarse sand.
- » Automatic, continuous sand cleaning is built-in.
- » Clamshell-type swing doors contain dust and sand during stuccoing operation.

The investment casting industry uses fluidized beds or rainfall sanders for the stuccoing of wax patterns.

In many cases it is advantageous to use a rainfall sander:

- » For delicate wax pattern structures which can break in a fluidized bed.
- When the sand movement in a fluidized bed is too abrasive and thins or removes the ceramic slurry coats.

The previously available rainfall sanders, however, were characterized by several problems, such as:

- » Lean sand rain; slows production time.
- » Creation of additional dust, by using high velocity air systems to elevate the sand.
- » Change-over from one stucco to another is very time consuming or impossible.
- » Lack of an effective sand cleaning system.

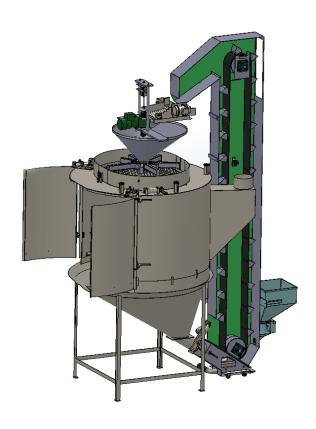


SHELL-O-MATIC HAS DESIGNED A UNIT THAT EFFECTIVELY RESOLVES THE ABOVE MENTIONED PROBLEMS AND LETS YOU USE ANY NUMBER AND GRADE OF SAND ON A SINGLE MACHINE.

VERTICAL RAINFALL SANDERS WITH RAPID SAND-CHANGE SYSTEM

- » Six sizes
- » Equipped with Rapid Sand Change System





SANDER WITH VERTICAL DOORS



CHANGE-OVER FROM ONE STUCCO TO ANOTHER:

Switch sander on purging cycle and discharge stucco into receiving bin.

- » Disconnect (Quick Coupling) receiving bin from elevator and roll away.
- » Connect another receiving bin with other stucco.

ADDITIONAL FEATURES:

- » Three settings for sandflow, low medium high.
- » All logic for automatic operation with robot is built in.
- » Adaptor for dust collector is incorporated.
- » Low power consumption.

POWER REQUIREMENTS:

APPROX. 2KW, 440, 3, 60 HZ.

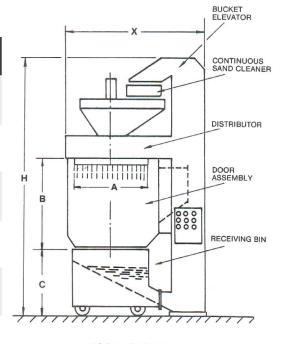
550, 3, 60 HZ.

380, 3, 50 HZ.

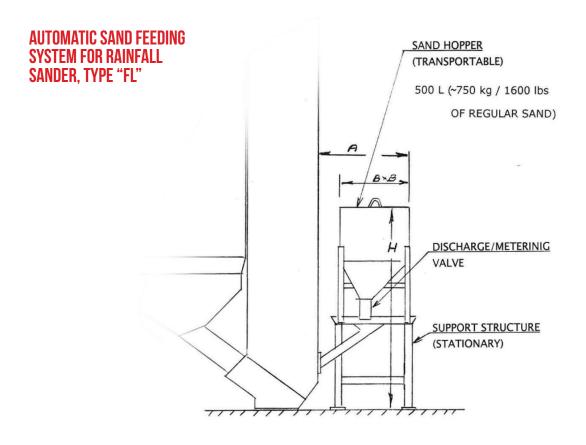
COMPRESSED AIR 80 PSI, (6 BAR) 1/2 " LINE.

BLOWER AIR 0.5 PSI, 300 CFM 0.03 BAR, 500 NM³/H

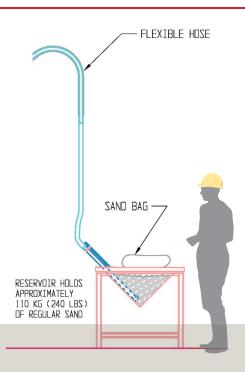
	NO. 140		NC	NO. 250		NO. 350		NO. 550		NO. 600	
A	38"	965 mm	48"	1220 mm	58"	1470 mm	64"	1625 mm	77"	1956 mm	
В	49"	1255 mm	56"	1422 mm	63"	1600 mm	77"	1956 mm	89"	2260 mm	
C	45.5"	1156 mm	51"	1295 mm	60"	1525 mm	76"	1930 mm	82"	2083 mm	
Н	13'6"	4115 mm	14'6"	4420 mm	16'5"	5000 mm	19'5"	5918 mm	21'4"	6503 mm	
X	78"	1960 mm	84"	2134 mm	102"	2600 mm	110"	2794 mm	138"	3505 mm	



U.S. Patent Nº 4440806 Other Patents Pending



PNEUMATIC SAND FEEDING SYSTEM FOR RAINFALL SANDER



FLUIDIZED BEDS

FOR GENEROUS AND PRODUCTIVE STUCCO APPLICATION THAT REQUIRES A LOT OF SAND MOVEMENT A FLUIDIZER BED IS JUST WHAT YOU NEED

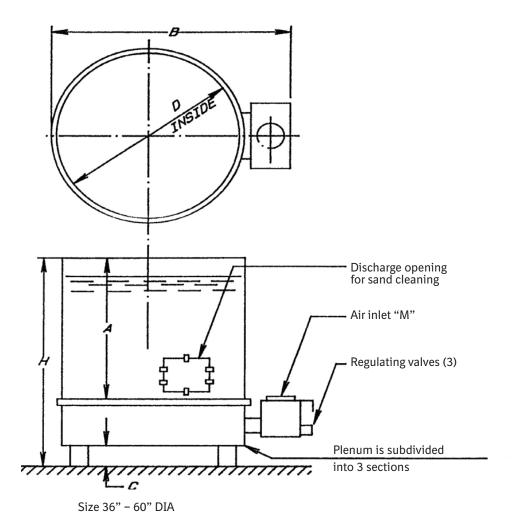
When it is time to fluidize your sand, attention to detail is very important. At Shell-O-Matic we have a database of over 140 sand types of various granulometry with recorded proper and tested blower arrangement to ensure perfect sand fluidization. Just give us your sand parameter and the chances are good that we have experience in making a fluidizer with similar if not identical sand.



We have also engineered a dust collection system to ensure toxic sand dust does not contaminate your environment. So far, Shell-O-Matic has delivered over 330 fluidized beds. With such experience we have engineered every little detail, like using the right porous material at the bottom of the fluidizer to ensure a uniform sand fluidization.

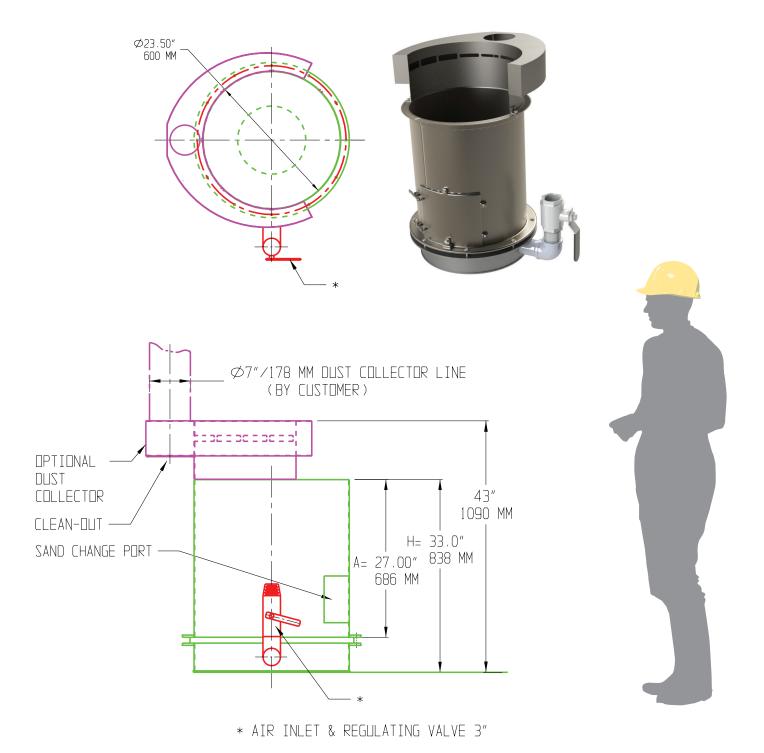
- » Perfect sand fluidization all the time.
- » Dust collection system.
- » Turnkey package with properly sized fluidized bed and blowers for your application.



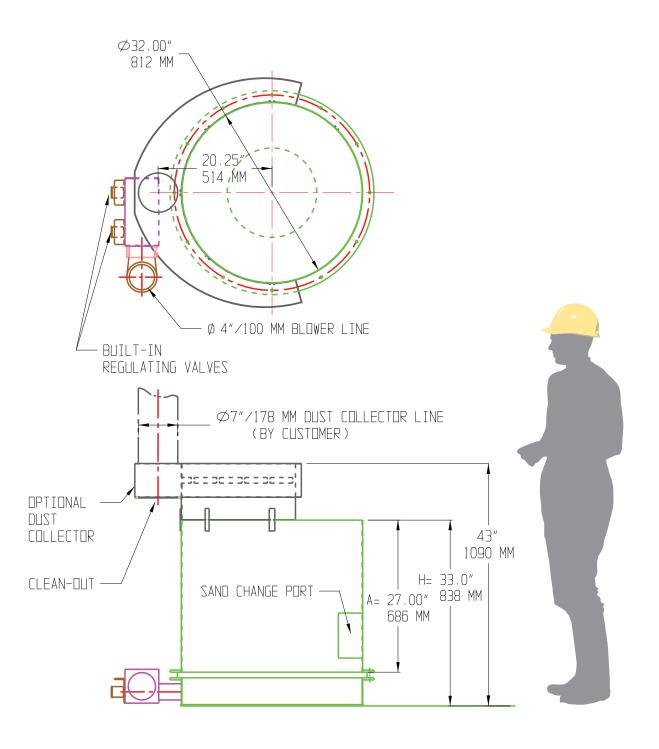


D	Н	A	M	В	C
36" 915 mm	40" 1020 mm	32" 815 mm	4"	50.25" 1275 mm	-
40"	44"	32"	4"	54.5"	4.5"
1015 mm	1120 mm	815 mm		1385 mm	115 mm
45"	44"	32"	5"	59.5"	4.5"
1145 mm	1120 mm	815 mm		1510 mm	115 mm
50"	51"	37"	6" (8")	68.5"	6.5"
1270 mm	1295 mm	940 mm		1740 mm	165 mm
53"	51"	37"	6" (8")	71.5"	6.5"
1350 mm	1295 mm	940 mm		1815 mm	165 mm
60"	51"	37"	6" (8")	78.5"	6.5"
1525 mm	1295 mm	940 mm		1995 mm	165 mm

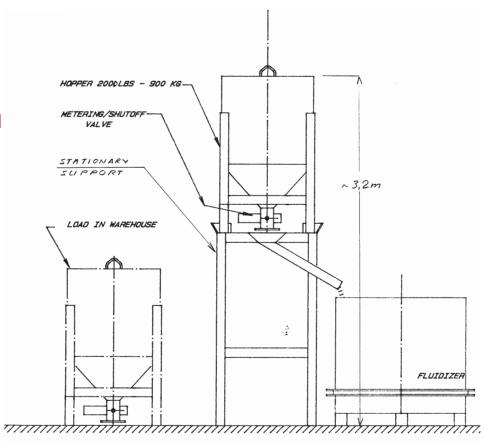
FLUIDIZED BED 23.5"/600 MM DIA.



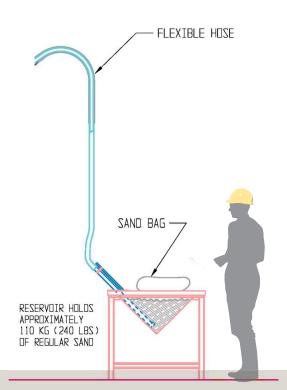
FLUIDIZED BED 2-ZONES, 32"/812 MM DIA.



AUTOMATIC HOPPER FEEDER FOR SAND WITH LEVEL CONTROL SYSTEM



PNEUMATIC HOPPER FEEDER FOR SAND WITH LEVEL CONTROL SYSTEM



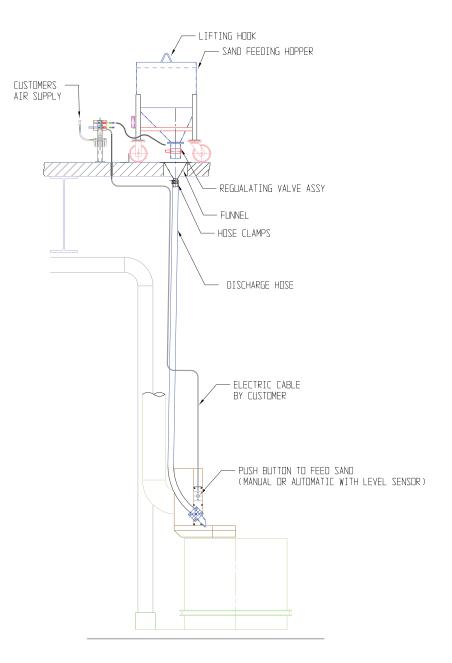
MEZZANINE SAND FEEDING SYSTEM A-22964

When an automated shell-building line is producing, nobody likes to see it stop because a sander is out of sand.

This is why we can offer you many automatic replenishment solutions for your sanders. From the well-known gravity-fed system to more sophisticated pneumatic sand feeder, we can offer you standard systems or custom solutions for your more complex needs.

We have one goal in mind: maximize your equipment productivity.

- » Pneumatic or gravity-fed systems available
- » Solution can be tailored to your needs
- » Our specialists can adapt the systems to your specific sands
- » Can be fully automated



BLOWERS FOR FLUIDIZED BEDS

WHEN IT COMES TO FLUIDIZING SAND, SHELL-O-MATIC HAS THE EXPERIENCE AND EXPERTISE TO HELP YOU.

We go beyond just calculating the air pressure and flow required to fluidize your sand since we have a database of over 140 successful test results recording the proper combination of blower to sand type to ensure proper sand fluidization.



At Shell-O-Matic there is no surprise: you get the right blower to fluidize your sand with proven performance all the time. The blowers we use are high speed, compact and high flow systems that have passed the test of time.

- » Compact design/energy efficient.
- » Reliable solutions that have passed the test of time.
- » Perfect sand fluidization all the time.
- » Dust collection system.
- » Turnkey package with properly sized fluidized bed and blowers for your application.



SMALL MOLD HANDLER

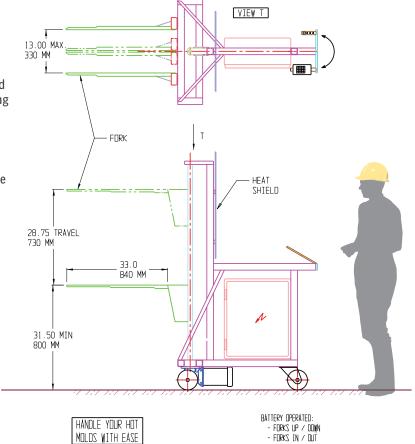
MAX. CAPACITY 70 KG - 160 LBS

AS PARTS, WAX CLUSTERS OR HANGERS BECOME BIGGER AND HEAVIER. HANDLING THEM BECOMES MORE AND MORE OF A CHALLENGE.



This is why Shell-O-Matic created convenient mold handlers that can:

- » Lift the molds up and down like a lift truck
- » Have the forks come closer or apart from each other with a motorized motion
- » Provide assisted forward/backward wheel motion to ease mold carrying
- » Assist wheel motion
- » Lift parts up and down like a lift truck
- » Forks' opening motion controllable to ease mold pick-up



LARGE MOLD HANDLER

MAX. CAPACITY 120 KG - 270 LBS

AS PARTS, WAX CLUSTERS OR HANGERS BECOME BIGGER AND HEAVIER, HANDLING THEM BECOMES MORE AND MORE OF A CHALLENGE.



