



MATRIX CASTING

H I G H P R E S S U R E C A S T I N G

WORLD LEADERS IN PRESSURE CASTING TECHNOLOGY



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INTRODUCTION

Customer demand for fully automated high pressure casting system with almost zero labour and total flexibility has been recognised and now delivered by PCL. The new simple Matrix Casting system can be either a single or multiple independent high pressure casting modules grouped together into a fully automated robot loading, piece de-moulding and change over storage system.

PCL has designed, developed and installed a number of matrix casting systems that are currently in operation. These systems are producing solid and hollow cast products including covers and washbasins in a variety of slip formulations.

A matrix casting cell will independently cast a full range of different styles of product at the same time. Each module within the cell may be turned on or off to produce the required volume of products without effecting other modules within the cell. When integrated with a robotic handling system any excessive

downtime and lengthy complex mould replacement becomes a thing of the past.

We can supply a turnkey package including a fully integrated casting cell, robotic piece handling, slip and wash water supply, control systems and conveyors to suit.

A simple reliable design with low cycle times our Matrix high pressure casting system provides an efficient alternative to current casting processes.



MATRIX PRODUCTS & KEY FEATURES

PCL's Matrix casting cells produce a range of Sanitaryware, Technical and Tableware products including; Tanks, covers, basins, clay inserts for complex products and a range of 2-Part technical ceramic items. Features include:

- Factory space saving
- Low cost frameless mould options
- Production plan programmable
- Cast optimisation & minimum down time software control
- Rapid automatic robot mould change (< 2mins)
- RFID mould recognition with auto program parameter change
- In cell auto mould cleaning and storage systems
- Make to order system flexibility
- Minimal labour requirements
- Rapid product prototyping & development
- PCL microporous mould technology
- IMSC (Individual Mould Station Control)
- A proven concept for over 11 years.

THE MATRIX CELL

Our range of modular casting cells have been developed and designed to be simple and easy to operate and only require minimal servicing and maintenance. In most cases the moulds are frameless or have simple removable frames. These moulds can be changed in minutes.

Matrix Casting can be supplied to a standard specification or designed to your specific requirements including variations to suit the following:

- Size of piece and number of mould cavities
- Casting environment and conditions
- Demoulding techniques and piece handling
- Integration into current casting process and facilities
- Slip formulation

Matrix Casting can be used independently or in conjunction with another casting system, i.e. for the casting of clay inserts or bowl rims in the production of more complex bowls.

RMS / MODULAR / MATRIX

The first multi modular casting system developed by PCL was the RMS casting system in 2007. This casting system had multiple independent casting modules and a revolutionary mould handling and demoulding system. It was designed and manufactured for the production of a range of hollow cast tanks and covers and has now evolved for the casting of other products. The Matrix unit comprises of independently cast moulds typically made up of the following items:

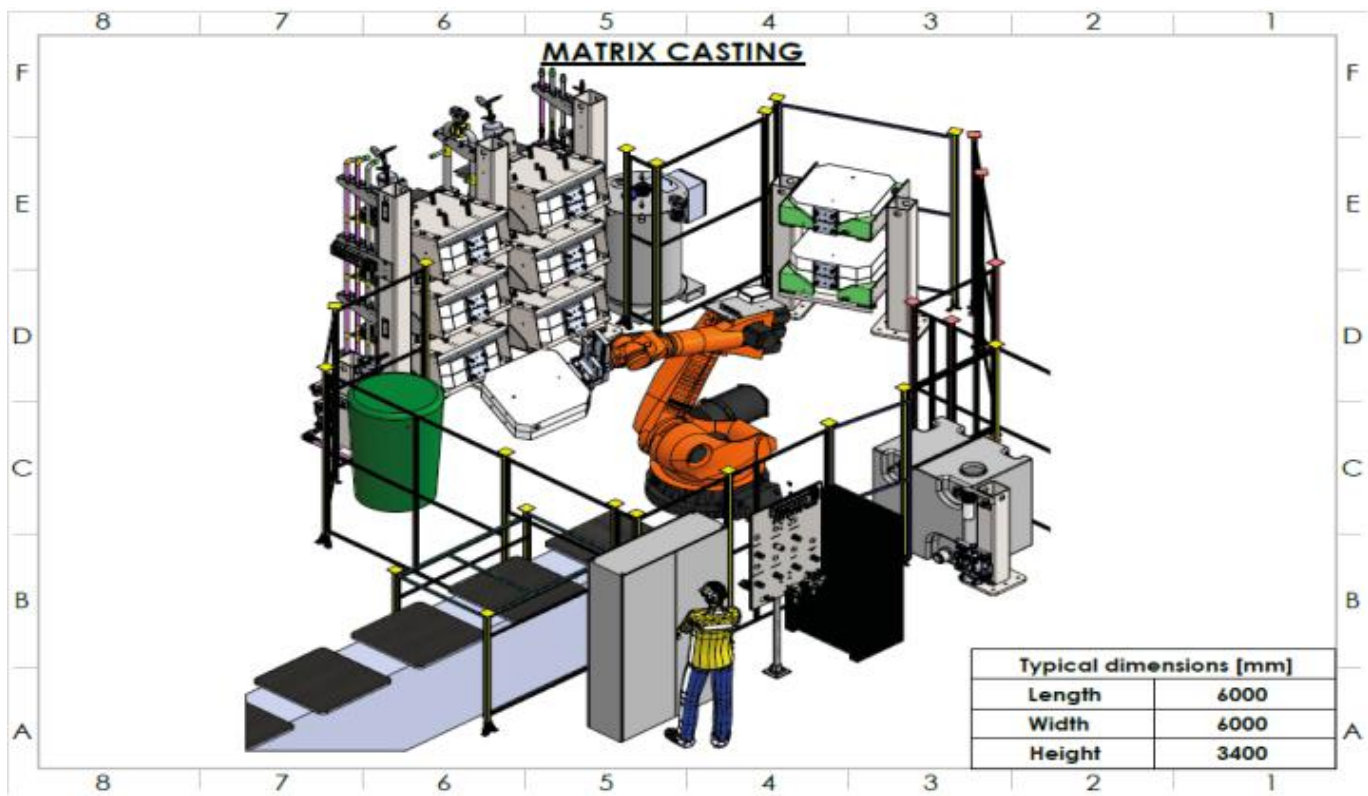
- Mould casting modules
- Service modules
- Main service centre and workstation
- Robotic demould/mould handling unit
- Mould storage racking
- Mould cleaning station

Following the success of the RMS casting system PCL developed the Rotobowl, a modular casting cell for the casting of open and box rim bowls. PCL has also developed a Multi-Modular two part mould casting

system for the production of up to 12 different large ceramic products including Large Tanks & BBQ Grills.

The Matrix design has since led to the development of more compact multi module systems for the production of a range of two part sanitaryware. With the integration of robotic mould and piece handling systems PCL can provide a unique casting system with total flexibility of casting and rapid mould change.





TYPICAL CYCLE OPERATION

- Select module styles on HMI
- Select production plan on HMI
- Press the start button
- Machine automatically casts and places finished pieces onto setter or discharge conveyor
- Machine automatically changes mould styles when number of pieces is produced
- Production moulds automatically cleaned, stored and rewash-maintained in cell daily
- FiChor mould maintenance, inspection and long term storage conducted manually outside cell.

TYPICAL OUTPUTS FOR MATRIX CASTING CELLS

Based on the following assumptions: 350 days per year, 24 hours per day, 95% utilisation & *typical figures.

Typical Cycle Time (minutes)	Type of Matrix Casting System	No. of Moulds	Cavities per Mould	Casts per year
*18	Solid Cast Cover	8	2	425,600
*20	Drain Cast Cover	8	2	383,040
*25	Basin	6	1	114,912

These cycle times are for a typical vitreous slip. The number of moulds and modules per cell and cavities per mould is variable. For other specific slip formulations the cycle times may vary. PCL can assist with the testing and review of your current slip.

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