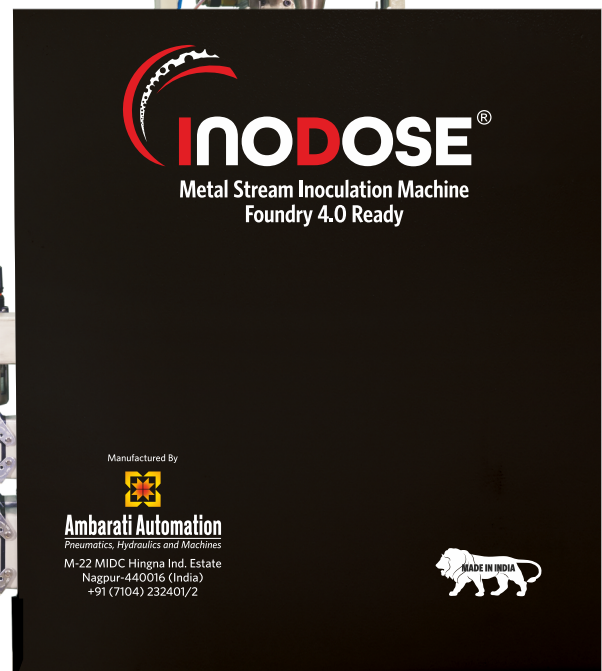


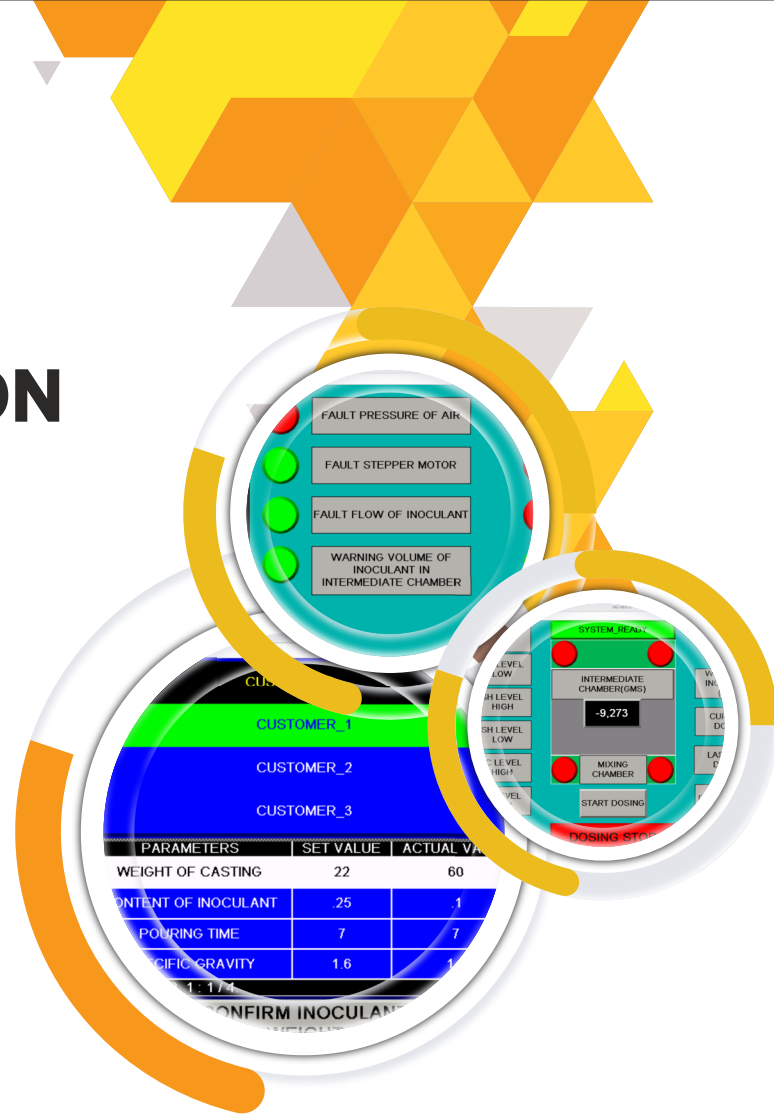
Metal Stream Inoculation Machine Foundry 4.0 Ready



INODOSE[®]

AUTOMATIC MOULD STREAM INOCULATION SYSTEM OVERVIEW

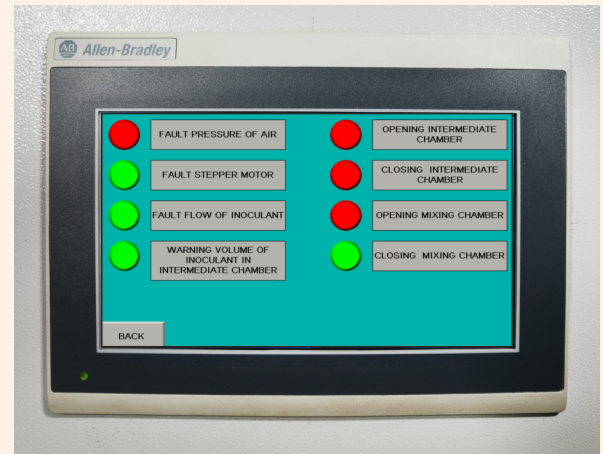
Introducing **INODOSE[®]**: Precision Stream Inoculation Dosing Machine for Ferrous Castings **INODOSE[®]** is an advanced, late stream inoculation dosing machine designed specifically for inoculation of ferrous castings. Built on a principle of volumetric dosing technology by air-fluidisation technology which delivers precise inoculation in grams/second, this fully automatic system offers unparalleled precision in inoculant delivery. With **INODOSE[®]**, foundry operators can achieve consistent and reliable results in their casting processes.



Following is an overview of the features of the INODOSE[®] system:

- 1. Precision Dosing:** INODOSE[®] leverages a volumetric dosing mechanism to achieve remarkable precision in inoculant delivery. This accuracy is crucial for obtaining the desired metallurgical structure in the finished casting. INODOSE[®] maintains an accuracy level within +/- 3%, ensuring the efficient utilization of expensive inoculants. (this is also dependent on the sieve distribution of the inoculant)
- 2. Automatic Operation:** The INODOSE[®] Automatic Stream Inoculation machine is fully automated, reducing the need for manual intervention. This feature enhances process efficiency and minimizes the risk of human error.
- 3. Synchronisation with the pouring System:** INODOSE[®] is equipped with mechanical/limit switch based signal based sync capabilities for matching the start of the ladle/metal pour. The start and stop of the inoculation can also be configured to match the pouring.
- 4. Safety and system protection features:**
 - INODOSE[®] has safety stop switch on the cabinet door to prevent accidental operation and unauthorised access.
 - In-built Vortex cooling system for the machine chamber.
 - If there is approximate 50% block in dispensing pipe, the system will shut down with alarm (if connected)
 - Self - cleaning feature of dispensing pipe.
 - Quick change of dispensing pipe tip to avoid costly time-consuming downtime.

5. **Comprehensive Monitoring:** INODOSE® is equipped with several advanced monitoring facilities that provide early warnings for low inoculant levels or system malfunctions. These early alerts empower operators to take immediate corrective actions, minimizing downtime and ensuring consistent production quality.
6. **Size Range Handling:** With the ability to handle inoculants in the size range of 0.1 to 01.0 mm, INODOSE® accommodates various casting requirements, providing versatility in foundry operations.
7. **Metallurgical Consistency:** INODOSE®'s precision dosing capability ensures a uniform level of inoculation, which is critical for achieving the desired metallurgical properties in finished castings.
8. **Alarms:** the operating system has several alerts which will trigger an alarm if so connected to one:
 - a) On variations beyond tolerance limits of final dosage weight of inoculant.
 - b) On variations beyond 15% upper and lower control limits if gms/sec control is activated on customer choice.



Key Elements:

1. **Storage Hoppers:** INODOSE® features two storage hoppers, each serving a unique purpose.

Hopper H1 (10- 25 Kg): in SS304 Construction

This primary storage unit is equipped with a low-level sensor alarm (which can be customised for the volume setting) , which can also send a signal to main feed hopper. This arrangement is separate add-on (INODOSE®) to the main system at an extra cost. If the add-on is not opted for, when the material in the H1 hopper reaches a pre-defined critical level, an audible buzzer signal alerts operators to refill the hopper.

Hopper H2 (5 - 8 Kg): in SS304 Construction

This secondary storage hopper also features high and low-level sensor alarms, ensuring precise control over the inoculant supply. Hopper H2 stores inoculants with particle sizes ranging from 0.1 to 0.9 mm (normally 0.2-0.7mm) It incorporates a suitable sieve to prevent particles larger than that pre-defined mm from entering this secondary hopper.

- PLC-based fully automated control system with Human Machine Interface (HMI) display for various control and parameter setting functions.
- Automatic pipe cleaning after every shot.
- Shot Capacity: 20 gms to 150gms per shot.
- Power supply: 230Vac (+/- 5%), 50 Hz
- Air Pressure: Maintain between 4-6 bar.
- The system recommends dry air to be used.

* Under beta development

2. Software and Industry 4.0 features

1. Included Software:

INODOSE® comes with a complementary User data base and interface that shows all the crucial information of the inoculant dosing parameters. This is besides the HMI where the inoculant dosing for the current pattern can also be configured/set.

The Customer/ Component number can be predefined and selected from a dropdown list (pre-defined by user during implementation) and the dosing and other vital information will be auto configured for the current pattern.

2. Optional Industry 4.0 Software

INODOSE® can be integrated optionally with SANDMAN software to provide software based controls with many enhanced features of optimising and viewing the inoculation dosing and optimisation. When connected to the SANDMAN software whether as a standalone product (*INOPTIMISE®) The system can truly integrate with the metal quality evaluation process with *INOPTIMISE® as an end to end metal preparation process solution with the integration of the spectrometer, the CE interface (where digitally available) and the digital microscope if the equipment offers suitable patching access. Please ask us for more details.

Introducing INOLOAD

INOLOAD:

INOLOAD is an optional system which is compressed air based, to auto load inoculant from ground level hoppers/bags to the **INODOSE®** hopper with pre-configured upper and lower limit sensors.

1. This reduces worker stress
2. Reduces dust from the manual loading operations
3. Automates the system completely end-to-end.
4. Suitable alarms for critical levels of inoculant volumes into the feed hoppers can be built in.

“INODOSE® represents the culmination of extensive research and development in foundry applications. It is engineered to deliver the utmost reliability and efficiency in late stream inoculation dosing. It is not just an inoculation delivery/dosing machine, it also future ready and configurable for data analytics-based decision making/automation. By choosing INODOSE® as a system, foundries can integrate and optimize some of their crucial metal preparation processes, reduce costly input material waste, and consistently produce high-quality castings.”



CHARGE MIX DETAILS

CHARGE MIX DETAILS

C.I.ADAPTOR 1.5" BOTTOM (M)

Metal:

FG-260

Furnance No:

C

Capacity:

1500 Kg

C.C (Kg)

100

C.P (Kg)

2.5

CRC (Kg)

50

Act Carbon (Kg)

10

M.S. Scrap (Kg)

160

Pig Iron (Kg)

60

Returns (Kg)

150

Ferro Si (Kg)

1.2

Ferro Mn (Kg)

0.6

S.G. Iron (Kg)

50

Ferro Ph (Kg)

0.6

Ferro S (Kg)

0.5

Ferro Mo (Kg)

0.2

Ferro Ni (Kg)

0.5

Ferro Cr (Kg)

0.3

Ferro Ti (Kg)

0.2

Cu (Kg)

0.5

Pure Tin (Kg)

0.5

Sic (Kg)

0.7

Capacity (Kg)

1500

Base Chemistry-Updated on 14:16:00

Final Chemistry-Updated on 16:48:00

Component:

C.I.ADAPTOR 2" BOT

Component:

C.I.ADAPTOR 2" TOP (S)

STREAM INOCULATION

Component : C.I. ADAPTOR 2" TOP (S)

Line : Arpa 450

Date : 16-Apr-2024

Inoculation Type :-

Shift : A Time : 16:52:55

SG: 2.10

Heat No.:1

Furnance No.:1

Heat No.:1

Furnance No.:1

CE (%)

(2.5 - 4.5)

3.9000

C (%)

(2.3 - 3.45)

3.2000

Si (%)

(0.7 - 1.9)

1.6900

Cr (%)

(0.21 - 0.6)

0.7500

Cu (%)

(0.01 - 0.5)

0.5000

Mn (%)

(0.001 - 0.6)

0.5800

Mg (%)

(0.001 - 0.005)

0.5500

Mo (%)

(0.001 - 0.02)

0.2500

Ca (%)

(0.001 - 1)

0.1200

Al (%)

(0.001 - 0.002)

0.3500

Ni (%)

(0.001 - 0.03)

0.2500

Pb (%)

(0.001 - 0.0.6)

0.2500

CE (%)

(2.5 - 4.5)

4.5305

C (%)

(2.3 - 3.9)

3.6697

Si (%)

(0.7 - 1.65)

2.5146

Cr (%)

(0.03 - 0.6)

0.0866

Cu (%)

(0.01 - 0.5)

0.1163

Mn (%)

(0.03 - 0.6)

0.3585

Mg (%)

(0.001 - 0.005)

0.0050

Al (%)

(0.001 - 0.01)

0.0030

Ni (%)

(0.001 - 0.6)

0.0150

P (%)

(0.001 - 0.8)

0.1033

S (%)

(0.001 - 0.05)

0.0528

Sn (%)

(0.001 - 0.05)

0.0070

Bunch weight of Casting (kg)

80

% Inoculation

0.10

Pouring Time (secs)

10

Target (gms)

80.00

Final Dosage (gms)

0.00

Inoculant Flow Rate (gm/s)

8.00

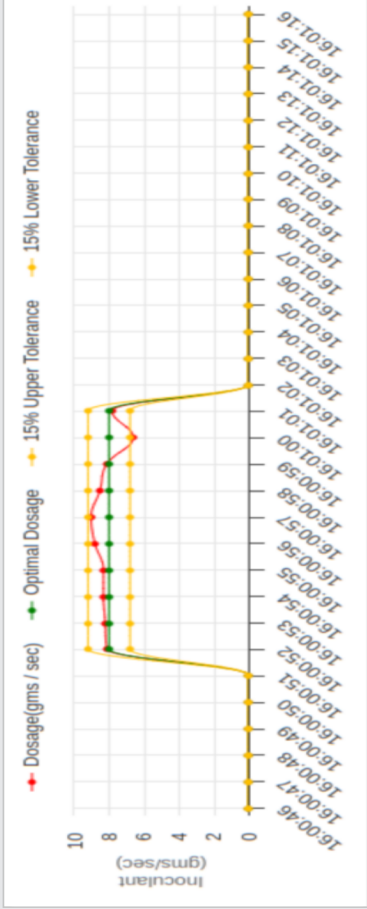
Current Dose (gm/s)

0.00

Dosage Count (Cumulative)

1281.00

Component : C.I. ADAPTOR 1.5" BOTTOM (M)



Within Specification Above the Specification Below the Specification

Dosage (gms) per sec (line chart)

Cumulative dosage (step up chart)



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URL : www.ambarati.com



For inquiries, pricing, or to arrange a demonstration of the **INODOSE®** system, please contact our dedicated sales team. We look forward to partnering with you to enhance the performance and profitability of your foundry operations.