



PARTNER IN PROGRESS  
FOR ALUMINIUM AND  
DIE CASTING INDUSTRY

# Evolution of the Aluminium High Pressure Die Casting in India



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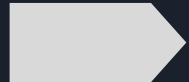
**INDIA - A VIBRANT ECONOMY**



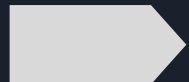
HISTORY OF INDIAN DIE CASTING INDUSTRY



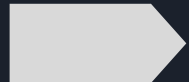
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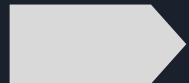
AUTOMOTIVE - THE LARGEST CUSTOMER OF DIE CASTING IN INDIA



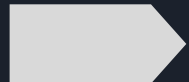
CUSTOMER EXPECTATIONS



TECHNOLOGY IN INDIAN DIE CASTING INDUSTRY TO MEET CUSTOMER EXPECTATIONS



FUTURE OF DIE CASTING IN INDIA



ABOUT ALUCAST

# INDIA - A VIBRANT ECONOMY



World's Largest Democracy -  
1.3 billion people with Growing  
Middle Class

2<sup>nd</sup> largest pool of Certified Professionals  
& Highest number of Qualified Engineers  
in the world



3<sup>rd</sup> Biggest economy in terms of  
PPP (Purchasing Power Parity)

3<sup>rd</sup> Largest Investor base in the World



India's average GDP growth  
rate: 7.3% over past 10 years

# INDIA - A VIBRANT ECONOMY



Political Stability under the Leadership of  
**Prime Minister Mr. Narendra Modi**



India's ranking has improved by over 30 places in past one year in 'Ease of Doing Business'



Implementation of GST Regime



Target is to break into Top 50 by 2020



Protection of minority investors



'Make in India' not merely a slogan but a driving force for economic development.

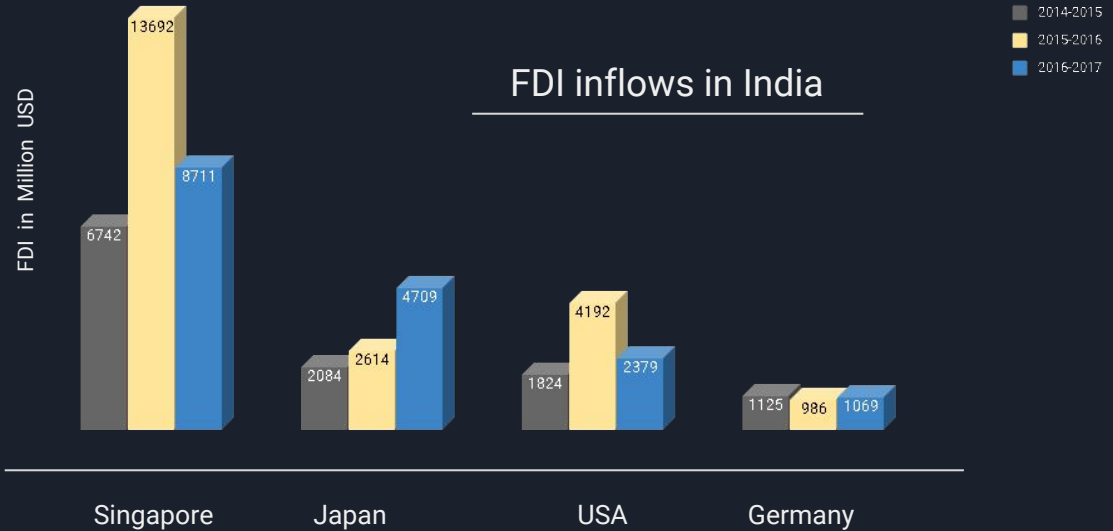
# INDIA - A VIBRANT ECONOMY



## FDI Inflows in India for the past 3 yrs

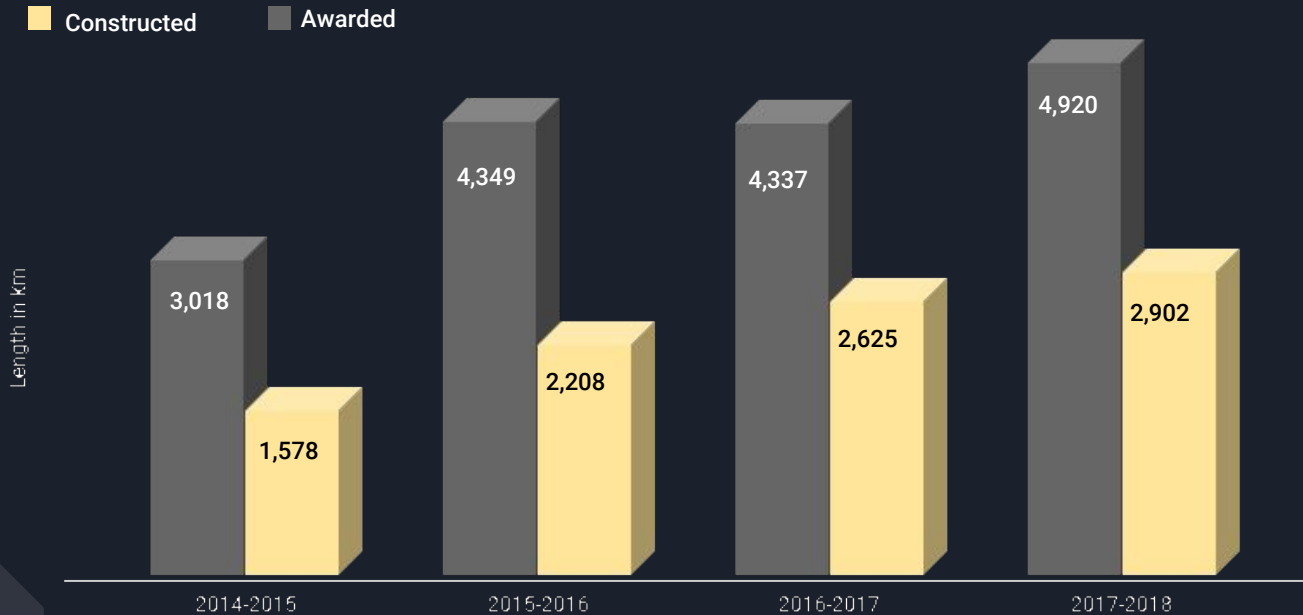
- Singapore → 29 Bn USD
- Japan → 9 Bn USD
- USA → 8 Bn USD
- Germany → 3 Bn USD

FDI Inflows in India



# INDIA - A VIBRANT ECONOMY

## Infra - Development National Highway

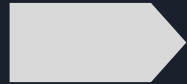


17.2 KM Roads per day were built In 2015-16.

22 KM Roads per day were built In 2016-17.

Now the target is to go to 40 km/day

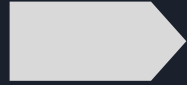
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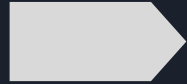
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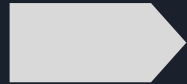
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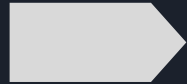
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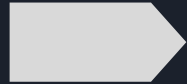
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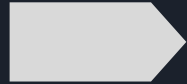
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ABOUT ALUCAST



# History of Indian Die Casting Industry



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1954 (63 yrs ago) → First PDC machine installed (at Jalandhar, North India)

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Make → POLAK (Czech)

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Hydraulic System → Water Hydraulics

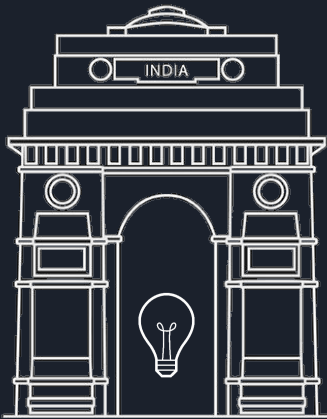
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Company → Graem & Co.

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Parts Made → Castings for Loudspeakers

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**Exactly 20 years later, in 1974, the first indigenous PDC machine was built at Delhi.**

# History of Indian Die Casting Industry

1965



HMT - a government of India undertaking started manufacturing of PDC machines with license from Buhler-Switzerland.



HMT was using design which was already 10 - 15 years old.

1990-91



The government declared liberalisation of Indian economy and made sweeping changes in policies.

# Liberalization



1991 - opening up of  
The Indian Economy



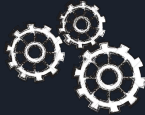
Private enterprises got  
incentives for new projects



Production capacity  
restrictions removed



Foreign Exchange Restrictions  
minimised



Manufacturing  
Activities given fillip



Imports delinked from Export  
commitments

# Effects of Liberalization



Creation of competitive  
Market Economy



Rapid up-gradation in  
manufacturing competence



Manufacturers create newer  
& better parts to acquire &  
sustain new customers



Improved utilization of capacity

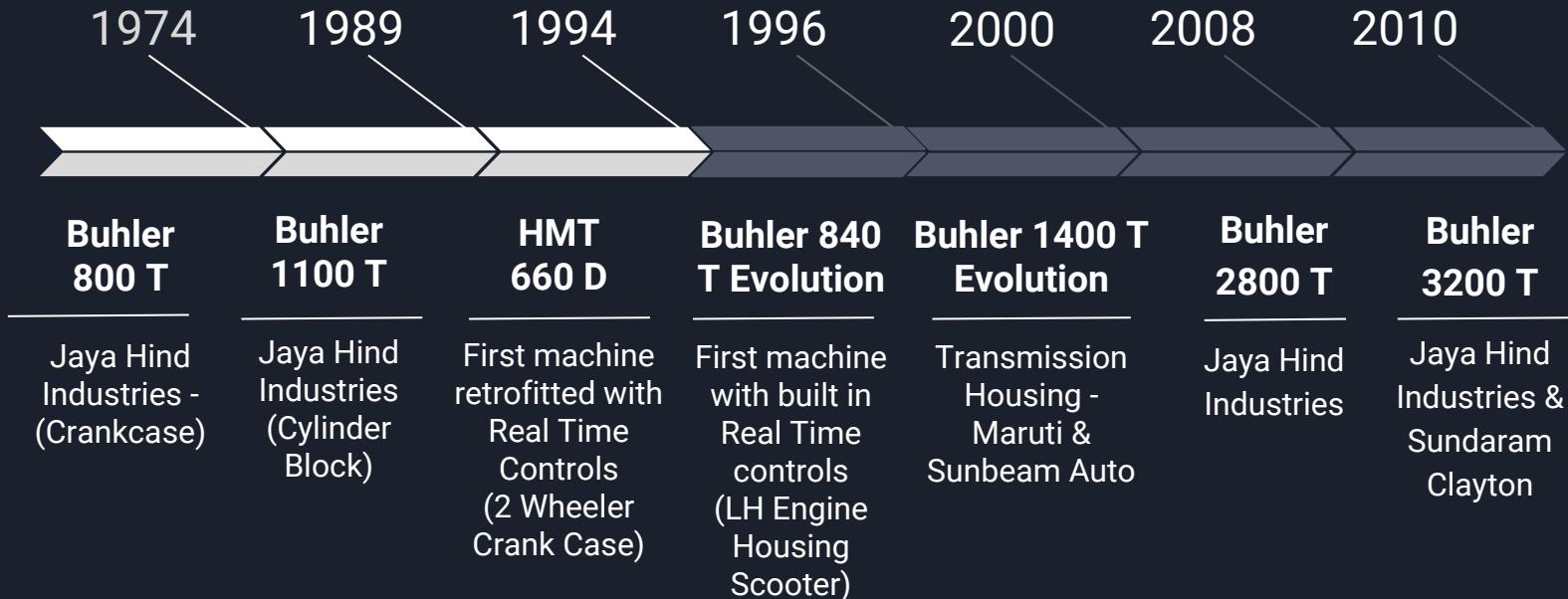
# History of Indian Die Casting Industry



## Largest Size of Machine in Use

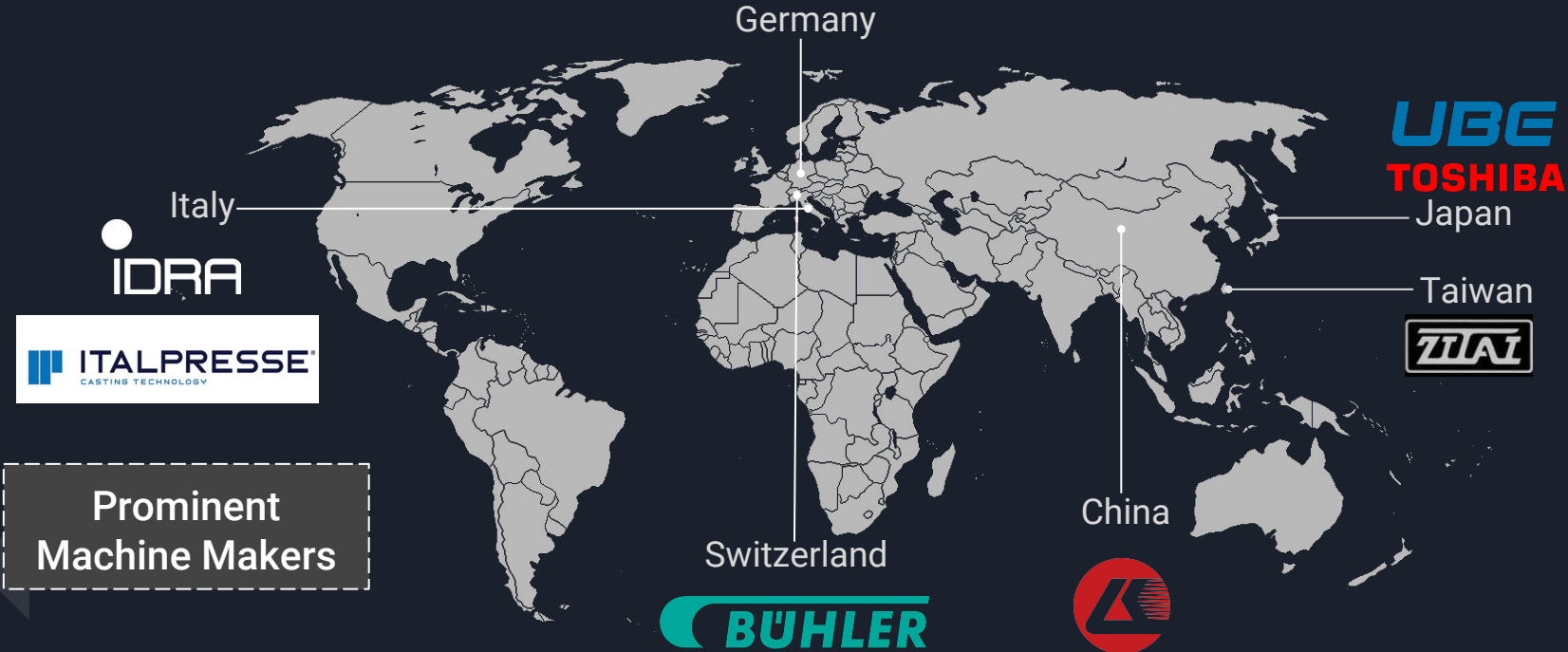
It took 26 years for Machine Tonnage to increase from 800T in 1974 to 1400T in 2000

It took only 10 years to increase from 1400T in 2000 to 3200T in 2010

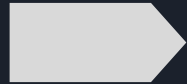


# History of Indian Die Casting Industry

- Till 1990 only 2 machine builders were in India. Imports were difficult due to policy restrictions.
  - Today we can freely import from the World's Best Manufacturers.



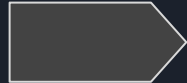
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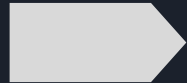
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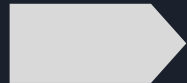
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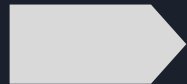
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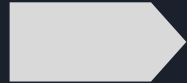
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FUTURE OF DIE CASTING IN INDIA



ABOUT ALUCAST



# Present Status of Die Casting in India



The Indian Die Casting industry has now matured and is catering to both global and domestic customers



Machines and Equipment built with latest technologies are being used



India is now producing critical parts like engine blocks, bed plates / ladder frames & other thin wall castings



Availability of educated & skilled labour and a large and growing domestic market



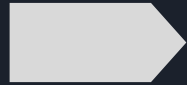
Support services and material suppliers have also kept pace with die casting process in India



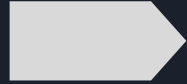
Companies like FOSECO International, Magmasoft, Buhler and many others played prominent role in development of die casting industry in India.



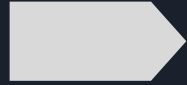
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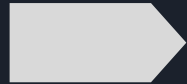
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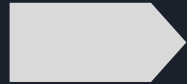
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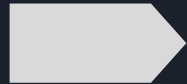
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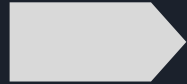
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FUTURE OF DIE CASTING IN INDIA



ABOUT ALUCAST



# AUTOMOTIVE - THE LARGEST CUSTOMER

INTERNATIONAL  
MANUFACTURERS



7

Maruti Suzuki

Mercedes Benz
Ford
Toyota
Honda
GM
Fiat
Hyundai
Maruti Suzuki

BMW
Volkswagen
Skoda
Renault Nissan
Mercedes Benz
Ford
Toyota
Honda
GM
Fiat
Hyundai
Maruti Suzuki

BMW
Volkswagen
Skoda
Renault Nissan
Mercedes Benz
Ford
Toyota
Honda
GM
Fiat
Hyundai
Maruti Suzuki

Volvo
MAN
Scania
JLR
Audi
Bharat Benz
KTM
Triumph
Ducati
Harley Davidson
Piaggio
TVS
Honda

1990

2000

2011

2017



DOMESTIC  
MANUFACTURERS

Tata Motors
Mahindra
Hindustan Motors
Premier
Force Motors
Ashok Leyland

Tata Motors
Mahindra
Hindustan Motors
Force Motors
Ashok Leyland

Tata Motors
Mahindra
Force Motors
Hindustan Motors
Ashok Leyland

Tata Motors
Mahindra
Force Motors
Hindustan Motors
Ashok Leyland

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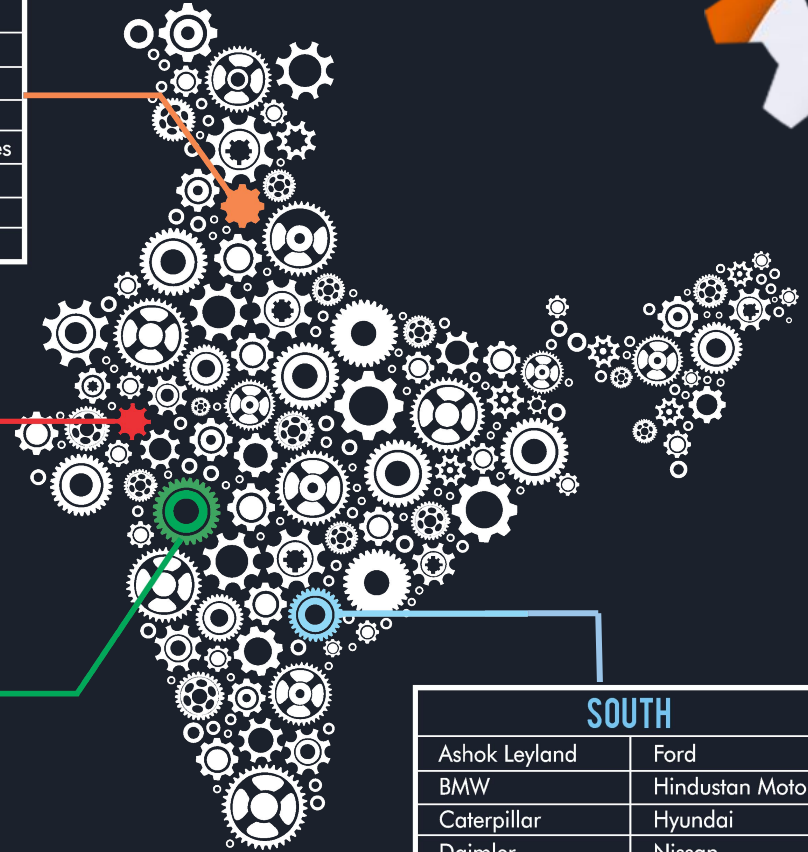
# Automotive Clusters in India

NORTH	
Eicher	Maruti Suzuki
Escorts	New Holland
Hero Moto Corp	Mahindra
Honda Motorcycle	Suzuki Motorcycles
Honda SIELCars	Swaraj Mazda
ICML	Tata Motors
JCB	Yamaha

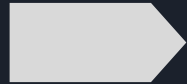
*NEW HUB: SANAND		
Tata Motors	Maruti	Ford India

WEST	
Bajaj Auto	Mercedes Benz
Fiat	PSA
Force Motors	Skoda
GM	Tata Hitachi
John Deere	Tata Motors
Mahindra	Volkswagen
MAN	Volvo Eicher

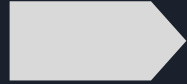
SOUTH	
Ashok Leyland	Ford
BMW	Hindustan Motors
Caterpillar	Hyundai
Daimler	Nissan



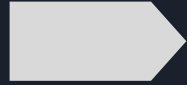
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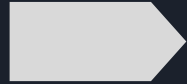
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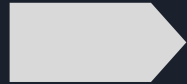
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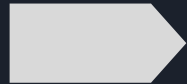
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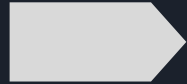
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FUTURE OF DIE CASTING IN INDIA

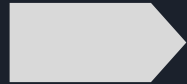


ABOUT ALUCAST





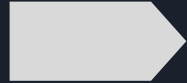
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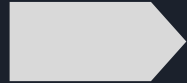
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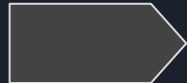
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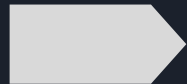
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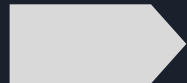
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FUTURE OF DIE CASTING IN INDIA



ABOUT ALUCAST



# Die Casting Technology in use

## Tool Design and Engineering



### CAD SYSTEM



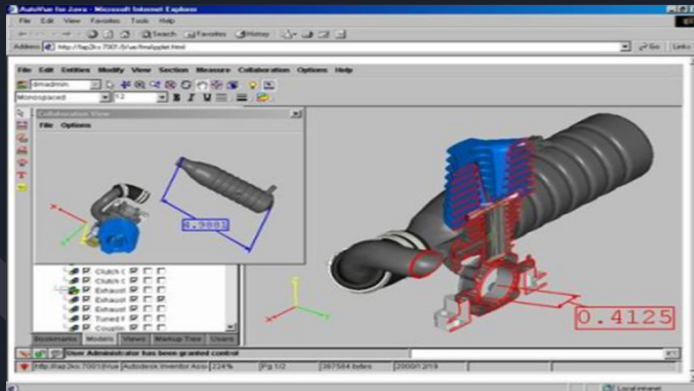
CAD SYSTEMS

- ➔ UNIGRAPHICS NX
- ➔ SDRC NX I-DEAS
- ➔ AUTOCAD INVENTOR
- ➔ PRO-E
- ➔ CATIA
- ➔



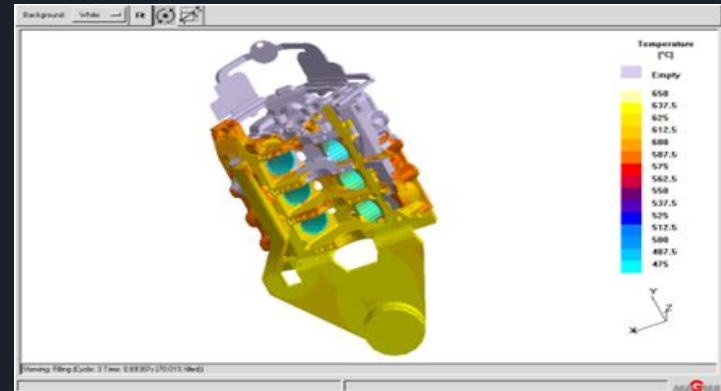
CAD SYSTEMS

- ➔ AUTOCAD



### COMPUTER SIMULATION

- ➔ PROCAST FLOW and SOLIDIFICATION
- ➔ MAGMA FLOW ANALYSIS
- ➔ MAGMA SOLIDIFICATION ANALYSIS
- ➔ FEA ANALYSIS: I-DEAS, ANSYS and NASTRAN

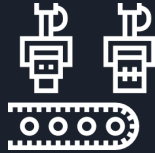


# Die Casting Technology in use



## UPGRADATION

Large Die Casting Units invested adequately in modern machines and equipment with latest technologies.



## AUTOMATION

High degree of automation of machines for production, inspection, material handling and traceability.



## ENHANCEMENT

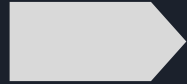
Enhanced manufacturing capacity.  
Capability to meet customer's requirements well established.



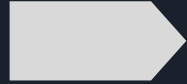
## QUALITY

Quality Management Systems in place, duly certified by International Agencies.

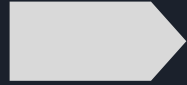
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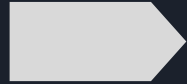
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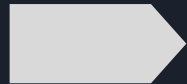
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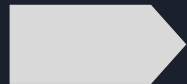
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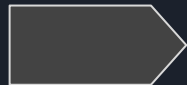
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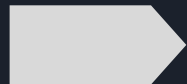
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**FUTURE OF DIE CASTING IN INDIA**



ABOUT ALUCAST



# FUTURE OF DIE CASTING IN INDIA



- The automobile and electrical industry in India consumes 70% of die cast Aluminium parts.

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- The recent past has seen the birth of many alternate sources of power to propel vehicles.

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- Most of these involve disruptive technologies and are in a nascent stage.

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- The future will demand lighter materials as compared to Steel & Cast Iron to compensate for the additional weight of lithium ion batteries.

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- Thus increasing the percentage of use of Aluminum and other composite materials.

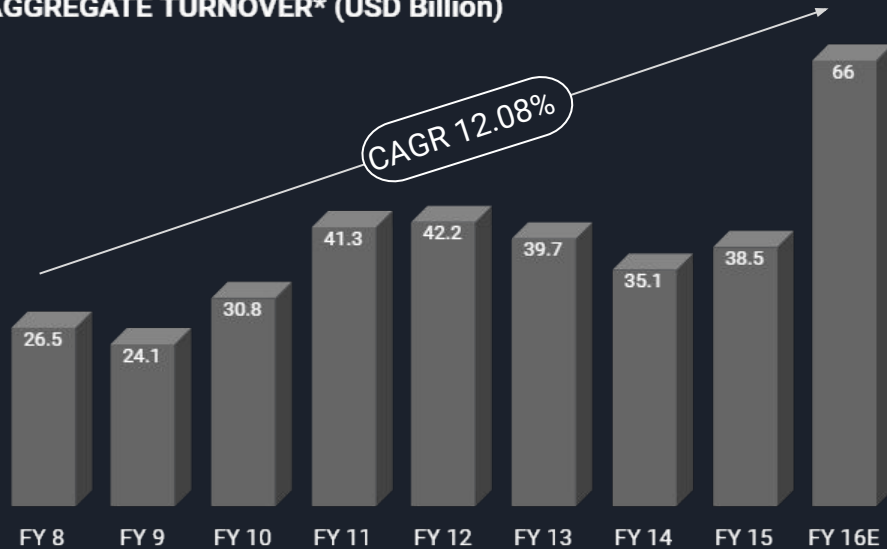
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- The future is still unclear on the way forward, if it is electric or hybrid and this will significantly change the dynamics of the Aluminum High Pressure Die Casting Industry.

# FUTURE OF DIE CASTING IN INDIA



## AGGREGATE TURNOVER\* (USD Billion)



CAGR 12.08%

- ❑ The Auto Components sector has recorded robust growth over the years.
- ❑ Exports will account for as much as 26% of the market by 2021.
- ❑ The auto-component industry accounts for almost 7% of India's GDP and Employs as many as 19 million people.
- ❑ Global companies are now looking at India for Components & Part Designing.
- ❑ Almost all major Auto Companies have made India as their Design and backend Engineering works.

Source: ACMA, TechSci Research

Notes: CAGR - Compound Annual Growth Rate

Turnover data covers supplies to OEMs, aftermarket sales and exports.

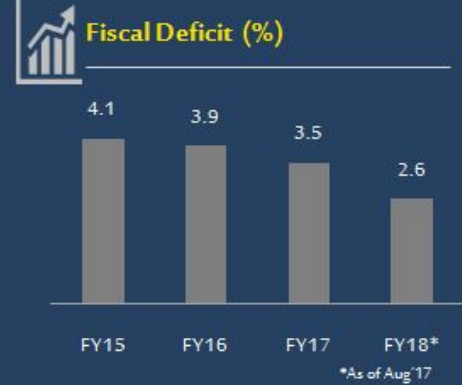
E - Estimates

# FUTURE OF DIE CASTING IN INDIA

## Robust Macro-Economic Indicators

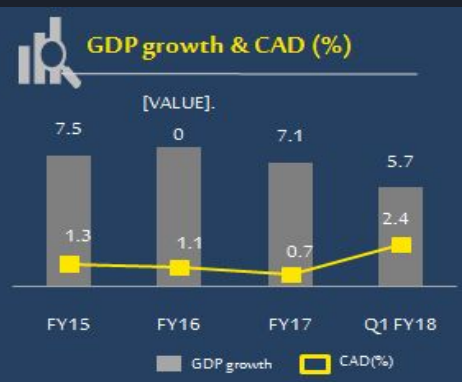
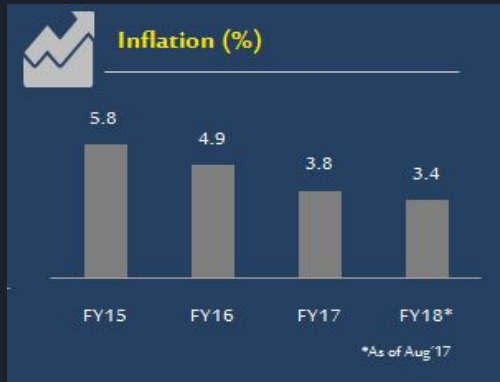


Forex Reserves up to 400 Bn USD



Fiscal Deficit down to 2.6%

Inflation down to 3%

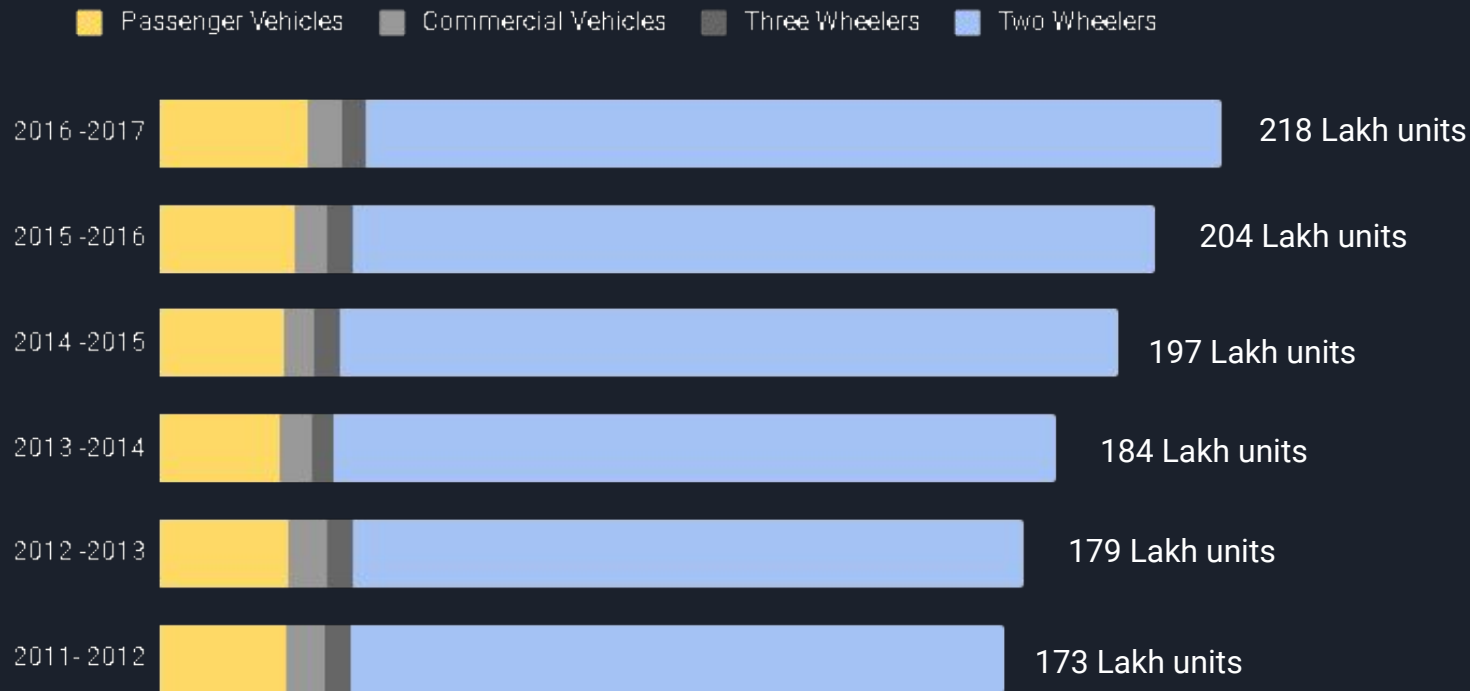


7% GDP growth Rate is expected

# GROWTH OF AUTOMOBILE INDUSTRY



## Auto Industry growing consistently



# CONCLUDING REMARKS



- Small scale single machine manufacturer to large scale multi-machine manufacturer.

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- Indian players have matured to International levels in terms of process, quality, systems & management.

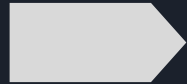
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- Global OEM's are now looking at India as a manufacturing hub especially for small compact cars.

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- Have developed in- house capability to design and manufacture dies for complex parts also.

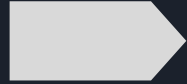
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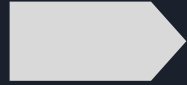
# CONTENTS



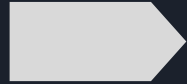
INDIA - A VIBRANT ECONOMY



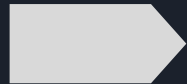
HISTORY OF INDIAN DIE CASTING INDUSTRY



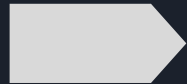
PRESENT STATUS OF INDIAN DIE CASTING INDUSTRY



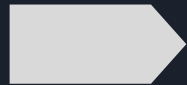
AUTOMOTIVE - THE LARGEST CUSTOMER OF DIE CASTING IN INDIA



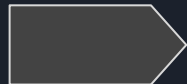
CUSTOMER EXPECTATIONS



TECHNOLOGY IN INDIAN DIE CASTING INDUSTRY TO MEET CUSTOMER EXPECTATIONS



FUTURE OF DIE CASTING IN INDIA



**ABOUT ALUCAST**



# ALUMINIUM CASTERS ASSOCIATION OF INDIA (ALUCAST)



- An Industry association and largest registered body representing Aluminium Die Casters in India.
- An interactive forum to acquire knowledge and expertise in die casting technologies.
- All activities channelizes towards creating programs where knowledge sharing is an integral part.
- Organizes training courses, workshops and seminars.
- Organizes every year national and international conferences and exhibitions.
- Collaboration with Nuremberg Messe for the International Events.

# ALUMINIUM CASTERS ASSOCIATION OF INDIA (ALUCAST)



PARTNER IN PROGRESS  
FOR ALUMINIUM AND  
DIE CASTING INDUSTRY

## ALUCAST 2018

UPCOMING INTERNATIONAL CONFERENCE AND EXHIBITION

VENUE	India Expo Mart (IEML), Greater Noida, Delhi-NCR, India
Dates	December 6-8, 2018
Theme	Emerging Trends in Aluminium Casting Technology
Conference	Technical Papers, Product Presentations and Panel Discussions
Exhibitors	150 (National and International)
Visitors Expected	3500+

**Thank You!**

