Dedicated to Diecasting Industry

ALUCAST®

PARTNER IN PROGRESS FOR ALUMINIUM AND DIE CASTING INDUSTRY

Official Journal of Aluminium Caster's Association

Issue 129 - April 2021

DIE DESIGN AND MATERIALS

Inside

Case Study on Conformal Cooling – Application of Additive Manufacturing technology in HPDC Dies and benefits
- Rajesh R. Aggarwal

Webinar on Aluminum Industry: Challenges and Opportunities in Quality and Productivity
- Rahat Bhatia

TOOL ENGINEEERING - Aluminium Die Casting Creative, Innovative, Attractive Engineering
- C. Surianarayanan

www.alucast.co.in

IMPRINT

EDITOR

N. Ganeshan | natganesan72@gmail.com

EDITORIAL COMMITTEE

B. B. Lohiya | bblohiya@compaxindia.com

R. A. R. Prasad | rarprasad@gmail.com

Rajesh Aggarwal | aggarwalrajesh 1972@gmail.com

Veena Upadhye | alucastindia@alucast.co.in

PUBLISHER

Aluminium Casters' Association (ALUCAST)

www.alucast.co.in

ALUCAST Membership Status (as on 31 Mar 2021)

Zonal Center	Corporate	SSI	Individual	Total Members
Bangalore	7	26	8	**41**
Chennai	9	11	9	**29**
Coimbatore	2	8	2	**12**
Delhi	15	32	9	**56**
Others	5	13	3	**21**
Overseas	8			**8**
Pune	20	46	29	**95**
Total	**66**	**136**	**60**	**262**

INDEX

Editorial - N. Ganeshan	**Page 03**
Case Study on Conformal Cooling – Application of Additive Manufacturing technology in HPDC Dies and benefits - Rajesh R. Aggarwal	**Page 04**
Webinar on Aluminum Industry : Challenges and Opportunities in Quality and Productivity - Rahat Bhatia	**Page 08**
ALUCAST News	**Page 12**
TOOL ENGINEERING - Aluminium die casting Creative, innovative, attractive engineering - C. Surianarayanan	**Page 17**
ALUCAST Snippets	**Page 24**

ALUCAST®

PARTNER IN PROGRESS FOR ALUMINIUM AND DIE CASTING INDUSTRY

EDITORIAL

Dear Readers,

The Indian economy at present looks relatively positive. Green shoots are visible across various sectors and our nation is looking at a quick recovery to match the pre-COVID pandemic times. Power consumption grew by almost 16% in the first two weeks of March. Rise in power demand and consumption shows that the impact of pandemic induced lock down and sluggish economic conditions are tapering off. Foreign Private Investment inflows are also strong. After two straight quarters of contraction, the country's gross domestic product has entered in to positive territory with a growth of 0.4% in the third quarter of current 2020-21 fiscal. Apart from this, country's foreign exchange had touched all time high in the month of January 2021. Direct tax collection for the current financial year has exceeded the revised estimates presented by the Finance Minister recently - yet another indication of improving economic activities. According to the India Rating and Research Agency, the outlook for Auto Sector is coming out of the red and improving for the financial year 2022. They further expect a year-on-year rebound in auto volumes in the range of 16 to 20% as against an estimated year-to-year decline of 14 to 16% during current financial year 2021. The report states that overall outlook is stable and sales of Commercial Vehicles are likely to achieve 2019 (pre-Pandemic) levels by second half of 2022.

The vehicle scrappage policy announced in the recent budget will further boost the sales volumes of commercial vehicles as all these vehicles that are older than 15 years and personal vehicles older than 20 years have to be scrapped. Driven by preference for personal mobility and demand across urban and rural markets, personal vehicles, both four and two wheeler sale volumes are likely to go up by 20% in the year 2021-22. The expected growth in the commercial vehicle segment is around 30% aided by robust growth in industrial output and increased activities in infrastructure and construction industries. Nevertheless, the rising prices of petrol and diesel added with projected price increase by OEM may act as dampener. The raising trend in COVID-19 infections across the country and sign of looming second wave of the pandemic is causing concern, which could derail or slow down the pace of economic recovery.

The entire manufacturing sector and micro, small and medium enterprises (MSME) are spearheading economic growth in the country after the outbreak of COVID-19 while many contact-intensive services and sub-sectors remain severely affected by the crisis. At the moment, the MSME sector has emerged as the growth engine of economy with a vast network of 6.33 crore enterprises contributing 30 per cent to nominal GDP and around 48 per cent to exports. This sector employs about 11 crore people, second only to agriculture in country's employment opportunities. Though affected to some extent, the agriculture sector continues to do well and demand for equipment and accessories like tractors and transport vehicles are growing considerably. According to a leading tractor manufacturing company, they are facing an unprecedented post-pandemic demand for tractors in the domestic market because of the strong rural growth, favorable unlocking conditions, healthy water reservoir levels and good price realisation of crops. Further, India's exports grew marginally by 0.67 per cent to $27.93 billion in February while imports rose by 6.96 per cent to $40.54 billion in the month, according to official data released recently, which clearly indicates that economic activities are moving forward.

As a part of our main thrust to assist aluminum casting industries, during the last one month, we at ALUCAST, have organized training programs at no cost to participants by the way of digital platforms. We had five such programs covering about seven different topics connected mainly with Die Development and Maintenance in the die casting industry. We acknowledge the efforts put in by the ALUCAST Chennai Center and especially Mr. N. Prabakaran of Die-Tech India for organising some of these well attended training events. More than 450 persons attended these training sessions.

In the months of April, May and first week of June, this year, ALUCAST in co-ordination with NADCA (North American Die Casting Association) is arranging a series of webinar for Aluminium Die Casting Industry. The trainer from USA is well experienced in the field of Aluminium Die Casting. Elsewhere in this journal, you can see the more details of this program. There will be some small fee payable to attend these workshops, but it will be well worth the expense. We strongly recommend all those who are connected with the casting industry to join.

N. Ganeshan
Editor

Case Study on Conformal Cooling – Application of Additive Manufacturing technology in HPDC Dies and benefits

- Rajesh R. Aggarwal, Founder, TechSense Engineering Services, Pune, India

Introduction

Additive Manufacturing is a process in which digital 3D design data is used to build up a component in layers by depositing material. The term '3D printing' is increasingly used as a synonym for AM. However, the latter is more accurate in that it describes a professional production technique which is clearly distinguished from conventional methods of material removal.

AM has evolved rapidly from Rapid prototyping over the years and is further growing very fast as more and more materials are being developed for different applications to be able to use with these machines.

This case study focusses on the use of AM technology in Die casting industry. With the availability of special steel alloys which are equivalent to HDS used in Die casting dies, it has become easier to use the AM technology in die casting dies.

Problems faced in Die Casting

There are various problems faced in Die casting foundries and one of the most common is soldering in dies which is detrimental to casting quality in addition to die life and continuous running of dies in production. The major root cause of this problem is continuous high die temperature (~400OC) in some regions of dies which leads to sticking of aluminum on the die steel surface as the die coat layer could not be formed to high die temperature.

The soldering in dies leads to various related defects in casting like; shrinkage porosity, Leakage, sink marks, shrinkage cracks as the liquid metal in these regions does not solidify at the same as compared to other regions due to high die temperature. In other words, the heat transfer from liquid metal to die becomes slow and the solidification is delayed.

It is required to achieve uniform solidification time within the casting hence required to remove the heat from different regions of the die at the same time to get the sound casting without internal hot defects. Most of the time for a critical complex casting it is not feasible to provide internal cooling in the die due to geometry constraints and / or thin die sections. This is compensated on shop floor by additional external spray to remove this excessive heat from these hot regions which then cool down the "not so hot" regions of the die also. This process again has a negative impact on the overall die performance, productivity, casting quality and mainly on die life.

Application of AM technology

AM technology can be used in die casting dies to provide internal cooling in the dies where conventional cooling like Spot cooling, line cooling is not feasible and / or not so effective. With AM, internal cooling can be provided along the die profile to maintain uniform distance from the die surface and provide effective cooling to remove the heat from the die at much faster rate than with normal cooling. Below is an example of the similar application. The die temperature in the center region of the die is much higher as compared to other regions of the die as internal cooling is not effective due to geometry of the casting. This leads to soldering on the die surface despite applying special PVD coating on the die surface, hence porosity and leakage defects.

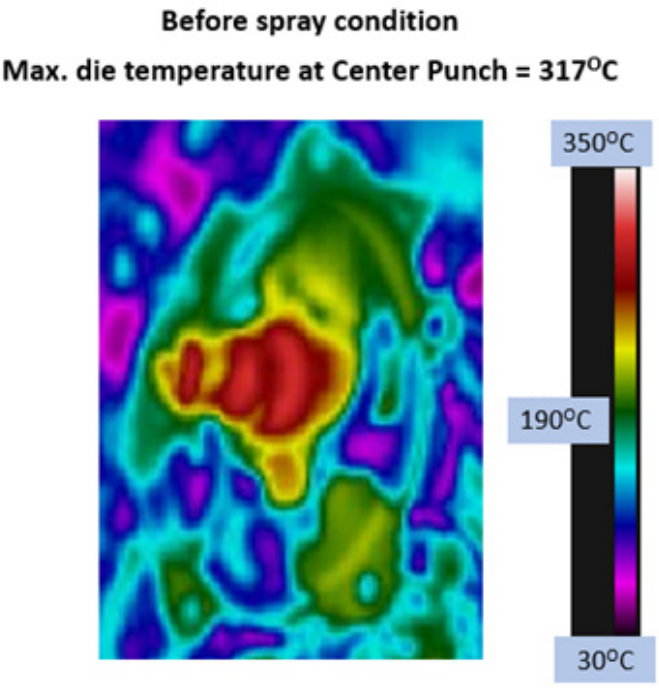


Figure 1: Actual die temperature thermograph indicating the problem faced in die casting

To avoid soldering in the hot regions, excessive external spray is applied leading to overall die temperature going

down as low as 125OC in some regions. In such conditions, it is mandatory to run the die at much higher second phase speed and cast pressure to achieve lower cavity fill time and good casting quality.

The application of AM in the center punch is the idle solution as other solution like spot cooling does not provide uniform cooling to the punch. The center Punch is redesigned with internal 3D profile cooling or Conformal cooling to make it more effective by reaching the casting area and remove the heat during solidification as fast as possible.

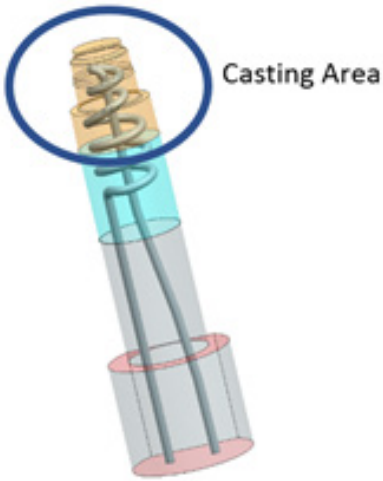


Figure 2: Design and application of 3D profile internal cooling in the problem area

Simulation were run with and without cooling in the center punch to understand the impact of the internal conformal cooling. The maximum temperature without internal cooling at the center punch is raised up to 420OC at the end 20th production cycle in virtual simulation.

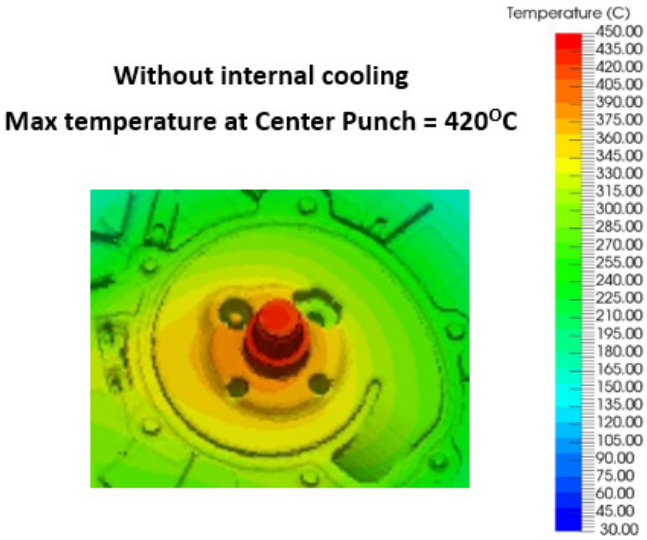


Figure 3: Virtual Simulation of the solidification process to analyze the die temperature without internal cooling in the problem area

The maximum temperature with 3D profile internal cooling at the center punch is raised up to 211OC at the end 20th production cycle in virtual simulation. The internal cooling is considered with water Jet cooling at a very high pressure of 15 bar.

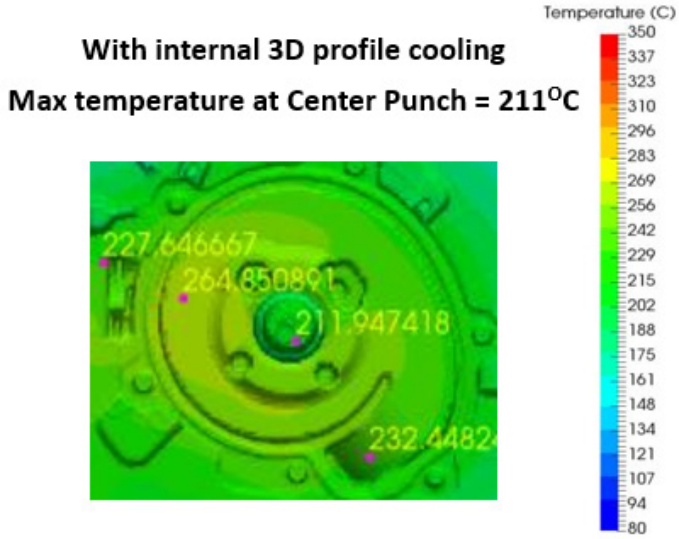


Figure 4: Virtual Simulation of the solidification process to analyze the die temperature with 3D profile internal cooling in the problem area

The core pin was made using additive manufacturing process with 3D profile internal cooling. The material used in AM is equivalent to HDS grade and has very good mechanical properties. It is hardened to 44~46 HRC and finish machined after manufacturing with very high precision.

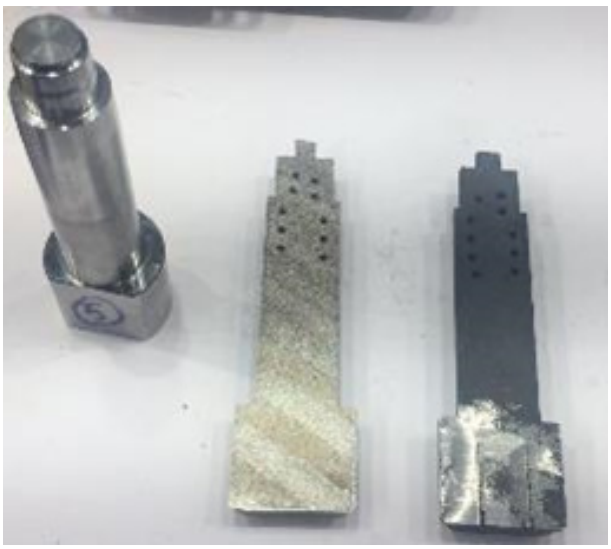


Figure 5: Actual core pins made with AM process with 3D profile internal cooling

The actual die temperature at the center punch area with the 3D profile cooling with water Jet cooling application is raised up to 168OC as shown in the below image. This shows the effectiveness of internal 3D profile cooling with high pressure Jet cooling at 15 bar. The die temperature can be further optimized by setting the Jet cooling time.

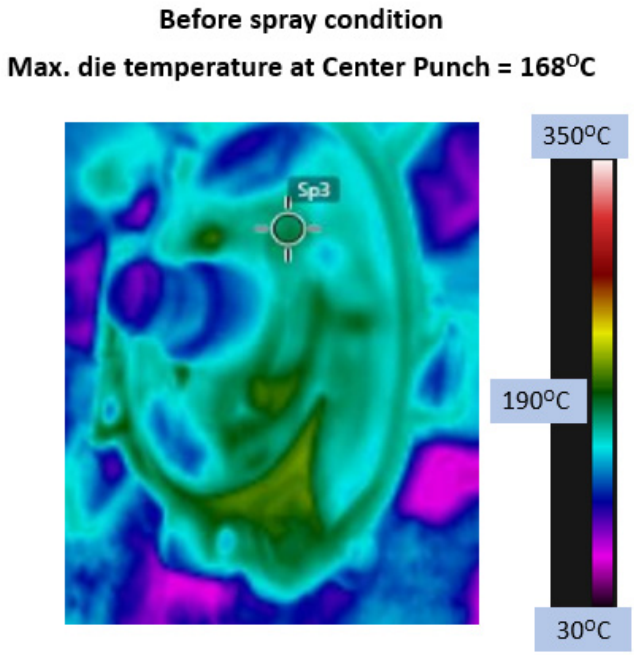


Figure 6: Actual die temperature thermograph indicating the balanced die temperature after using 3D profile internal cooling with Jet cooling

Summary

Additive Manufacturing opens up a wide range of applications in the die casting for internal cooling and get rid of the defects like soldering, internal leakages, high injection speeds and casting pressures and higher cycle times due to extended spray cycles.

All these improvement steps lead to many indirect benefits like productivity improvement by cycle time reduction, consistent and sustained reduced rejections and increased die life.

The application of AM and Jet cooling for effective internal die cooling is evident from the above case study which has resulted in giving consistent good casting quality and better die life.

The author is continuously working on various improvement and development projects to optimize the die thermal balance by conformal internal cooling, Jet cooling, Cyclic interval cooling and use of thermoregulations units.

Author:

Rajesh R Aggarwal
Founder
TechSense Engineering Services
Pune, India

Advertisement Tariff for Non-Members

Revised w.e.f. 01 April 2021

Advertisement Placement	Six Issues				Single Issue			
	Basic (₹)	Total with GST (₹)	Basic (US $)	Total with GST (US $)	Basic (₹)	Total with GST (₹)	Basic (US $)	Total with GST (US $)
Back Cover Page	110000	129800	2420	2856	-	-	-	-
Inner Front Cover	88000	103840	1980	2336	-	-	-	-
Inner Back Cover	77000	90860	1705	2012	-	-	-	-
Inside Pages	38500	45430	847	999	8000	9440	192.5	227

Advertisement Tariff for Members

Revised w.e.f. 01 April 2021

Advertisement Placement	Six Issues				Single Issue			
	Basic (₹)	Total with GST (₹)	Basic (US $)	Total with GST (US $)	Basic (₹)	Total with GST (₹)	Basic (US $)	Total with GST (US $)
Back Cover Page	104500	123310	2299	2713	-	-	-	-
Inner Front Cover	83600	98648	1881	2220	-	-	-	-
Inner Back Cover	73150	86317	1622.5	1915	-	-	-	-
Inside Pages	36575	43159	803	948	7628.5	9002	183	216

Advertisement Size & File Format

Full Page	Width 210mm X Height 297mm + 3mm Bleed all sides
Half Page	Width 210mm X Height 145mm
Quarter Page	Width 105mm X 145mm
File Format	PDF in CMYK color space. No spot colors. All fonts embedded & images at 300 dpi resolution.

Please send cheques in the name of Aluminium Casters' Association (ALUCAST) payable at Pune to:

ALUCAST®
PARTNER IN PROGRESS
FOR ALUMINIUM AND
DIE CASTING INDUSTRY

Aluminium Casters' Association (ALUCAST)
702, AMar Neptune, Baner Road, S. No. 6/1/1
Plot No. 45, 46A, 46B Pune 411045
T: +91 20 27290014
E: alucastindia@alucast.co.in

Webinar on Aluminum Industry held on 19 February 2021: Challenges and Opportunities in Quality and Productivity

- Extract of Presentation by Mr. Rahat Bhatia, Organised by Ministry of Mines, Government of India along with Quality council of India and National Productivity Council.

Good evening,

I am Rahat A Bhatia, founder Raga Group, leaders in consumables and technologies for die casting. Raga has been a forefront company delivering technologies and consumables for Indian & Global die casting companies that produce critical parts for engines and now electric vehicles.

I also represent Aluminum Casters Association of India called Alucast as Vice Chair North India and am part of various international organisations like NADCA and others in US and Europe

#Tesla #ElonMusk

Elon Musk and his Tesla & SpaceX are commonly known across sectors, organisations, industries, age groups, ethnicity and across the world.

Tesla is the fastest growing brand worldwide and the leading producer of electric vehicles. Globally, Tesla's vehicle deliveries reached almost 500,000 units in 2020. Concurrently, Tesla's Model 3 has become the world's best-selling plug-in electric vehicle model.

Why & how Elon Musk is spearheading the biggest revolution in automotive and space? And what is it to do with Aluminum?

Lets understand it through some basics of what differentiates Elon & Tesla from others. First, Elon carries a thought process that disrupts and others find difficult to believe in.

Second, He executes his ideas at a speed that most can't imagine. So two things that matter clearly are Disruptive ideas and Disruptive Speed of execution.

Recently created one of the biggest innovations in Aluminum High Pressure Die Casting.

Tesla's Giga factory in Fremont, California, USA built a car rear under body in one part replacing 70+ parts which needed to be assembled and welded. Also making over 300 robots redundant. And this is just 10 days back. The part is getting produced on the biggest die casting machine in the world.

This is interesting to know but what's the point.

The patent for this new process was done in July 2019 and today in February 2021, Tesla is producing parts. This is just and mere 1.5 years from concept to design to building the largest machine to its mold to prototyping to finally producing parts for the cars.

Using aluminum die casting technology to make the unibody frame of an automobile, a process that has been done using metal stampings for 50 years could eliminate many of the steps in the traditional assembly process, saving time and cutting costs

#Quality #Productivity

Since today's topic covers quality as a backbone, the broader question that has been asked numerous times is "What and how do you define quality in the changing times?" We have heard of the quality of products, processes and services.

As Elon believes. "Your product or services are of good quality if it ends up improving the quality of human life in the value chain"

So the paradigm and meaning of Quality and Productivity has changed.

If and when any intervention can alter or improve the quality of human life in the whole value chain, that's when it is QUALITY improvement.

Similarly productivity only meant producing more parts or services in a time frame. Today's productivity goes beyond. Productivity is the Speed of execution of an idea and in the time frame to create a difference in the quality of life of a commoner.

Aluminum in Automotive

How is Aluminum contributing to improving the quality of life of a commoner. How is the use of Aluminum castings impact quality of life of the user?

If i talk of die casting and automotive, the typical value chain consists of:

• Producer of raw aluminum alloys, let's say ingots
• Producer of aluminum castings, the companies who cast through either High Pressure or Low pressure or gravity
• Producer of automotives
• User of automotives

The whole value chain that i just mentioned worked to produce parts so that vehicles became fuel efficient. Now why was fuel efficiency required? First to reduce the use of a depleting natural resource called diesel or petrol. Second, to reduce the cost of running an automotive for a commoner. The secondary theoretical benefit was to reduce the impact of carbon emissions and environment pollution. Well this became the primary objective in the last decade.

This impacted and improved the quality of life to a great extent. Last 2 decades or more, the whole focus in automotive was to go for light weighting and therein Aluminum played a larger role. Slowly but steadily aluminum had more content in the automotive.

For example a typical passenger vehicle will have 65 Kgs of Aluminum inside, a typical commercial vehicle will have close to 80 Kgs. Similarly a three wheeler will have 50 Kg and a two wheeler will have 25 Kgs. Since aluminum is 1/3rd the weight of steel, imagine the kind of light weighting that was done in the last 20 years.

As per a report reducing 10 % weight of Vehicle will reduce 5-6 % of fuel consumption. For lightweight either have to go for carbon polymer or Aluminium. Some of its unique properties like lightweight, recyclability, conductivity, non-corrosiveness and durability have helped establish it as a metal of choice.

There are many differential benefits for applications in the auto sector which are linked to Aluminium's mechanical properties like light weighting, resistance to impact, resistance to corrosion, design flexibility and production efficiency.

Aluminum in Electric Vehicles

To make electric vehicles more efficient it is necessary to replace steel with light metals.

For electric vehicles Significantly lighter than steel, aluminium is now the metal of choice in a range of parts - from the chassis which uses a good 186 Kgs of Aluminum in Tesla's Model S, structural components such as the shock tower and internal panels to housing for motors and the batteries that power electric cars.

Many multinational players are trying to invest in the country due to the increasing demand for electric automotive in the country. For instance:
• Suzuki Motor is planning to manufacture electric cars at its factory in Gujarat
• Ola Cabs is expected to introduce a fleet of one million electric cars in partnership with an electric vehicle maker and the Government of India. As many companies are entering the electric vehicle market, the die casting companies need to upgrade there technologies and processes to cater to the increasing demand

• Tata is already out with its range of EVs
• Mahindra is an old timer with its original EVs

Aluminum Die Casting in India

Let me give you some figures as per Alucast (Aluminum Casters Association of India). The 2019 annual consumption of aluminum in India was 5.3 million metric tons. Out of this 5.3 MMT, the total aluminum castings used were close to 1.4 MMT. This is over 26% of total aluminum consumed. And when it comes to aluminum castings only for automotives, this figure was 1 MMT which is good 19%.

The global die casting market is projected to touch US $80 billion by 2022. The market is poised to grow at a CAGR of over 6.60 per cent during the forecast period from 2017 to 2022. Of Course things have gone topsy and turvy in the last 10 months. Automobiles and auto components are two of the significant sectors that the die casting industry caters to.

The Indian automotive parts aluminum die casting market was valued at USD 1,691.17 million in 2018, and is expected to project a CAGR of 8.88% during the forecast period, 2019-2024.

• India has over 400 die casting companies, making it one of the major suppliers of die cast parts in the global market. Of these, over 25 units produce around 12,000 ton of die cast parts per year.
• The die casting market is highly correlative to the automobile industry. India has a low per capita car ownership of 20 vehicles per 1,000 citizens, as compared to 800 vehicles per 1,000 citizens in the United States and 85 per 1,000 citizens in China. Thus, there exists a huge potential in the Indian automobile and ancillary industry.
• Some of the major factors driving the growth of the market are growing demand for and sales of cars and commercial vehicles, and enactment of stringent emission and fuel economy norms.

The Indian automotive market is transforming, and the rising automobile production and the emergence of electric vehicles are expected to aid the aluminum die casting market's growth over the forecast period.The Indian die casting industry is now matured and has started catering to both domestic and international customers. As for future development, ALUCAST projected the die-casting industry to grow by 35% by 2025, compared to 2020 and by 45% or so by 2030. Growth areas will be primarily high pressure die-casting in end use sectors like automotives, aerospace and electrical industry.

Challenges & Opportunities

Challenges

Introduction of electric vehicles has brought forward new challenges for the die casting industry. The die casting industry is at cross roads in India. Being a leader in the manufacturing space for the auto industry, it is experiencing a few obstacles owing to the uncertain future of gasoline vehicles. The challenge is if the die casting industry can maintain its prominence and viability in the electric vehicle (EV) era. There will be more aluminium content (on kilogram basis) in the EVs but the big question to be worried about is will all the required parts be produced only through the die casting process?" For this purpose, new capabilities need to be developed and mastered for developing new types of die cast products that help in creating vehicles of the future.

Thin wall castings for light weighting of vehicles and structural parts to take the load by providing the best weight to strength ratio also need to be mastered to remain in the competition.

Strength of steel: To replace steel in place it is necessary to enhance mechanical properties of Aluminum. If we talk about making structural parts, the main barrier to replace steel with aluminium is die casting defects like Porosities.

So we have to adopt new technologies which can reduce shrinkage porosity.

New local technologies like Vacuum casting, Mold thermal balancing. Here i am referring local because these local technologies are not only cheaper but also competitive in functionally.

R&D Labs: Designing for proper strength in a product depends on two main factors: strength of the material selected and configuration of the part.

Pure aluminum is rather weak and malleable on its own. But mixed with other metals such as silicon, iron, copper, magnesium, manganese, or zinc strengthens and brings other benefits to the metal. Adding silicon and magnesium to aluminum, for example, results in an alloy that is extremely resistant to corrosion. There are 530 different alloy compositions with more compositions being created and registered every year.

To define composition of aluminum alloys and better configuration of parts design require flow simulation softwares & better testing labs. Die casting making prototypes also require a huge setup cost for die making. So require 3D Printing to make prototyping fast and cheap.

To make R&D labs with these facilities require huge investment.

To facilitate MSMEs and SMEs for this Government & OEMs have to come forward. Governments have to collaborate with research institutes and create labs to facilitate.

Expertise and Skill Work force: In India no special institute which is making Expertise and skill manpower for Aluminium die casting. There is a severe shortage of skilled manpower.
Governments have to start different skilled programs and graduate and post graduate programmes in specialization Aluminium Die casting.

Productivity: To increase productivity the Die casting industry has to adopt Automation.As we are in the era of industry 4.0. To implement a huge investment .Government have to subsidise to implement industry 4.0

Low cost part producer: Considered as a low cost part producer prohibiting investment in technological upgradation by promoters.

High Import Content: The die making industry is facing challenges in the form of high import content of raw material that makes them in-competitive with currency fluctuation and supply irregularity. The government should undertake policies that promote and ease the hurdles of this sector.

Companies should also be encouraged to engage in R&D and substantial tax breaks extended to those effectively entrenched in this regard. Having die-casting technology parks with a cluster approach to manufacturing, testing and research would be extremely beneficial. Getting universities to offer degree courses in die-casting would further help.

Opportunities

The Government of India has introduced 100 % Foreign Direct Investments (FDI) into the auto and auto component sector. Due to this, many global companies have started establishing facilities in the country for manufacturing vehicles for the local and global markets. Korean company Kia Motors with an investment of $1.1 billion has set up a greenfield car plant. For Indian markets, BMW has plans to manufacture a local version of below-500 CC motorcycle, the G310R, in TVS Motor's Hosur plant in Tamil Nadu.
The government policy has also benefited the industry as now there is an influx of proprietary sub-assembly suppliers to OEMs such as transmission majors, fuel injection systems, filtration systems and braking systems, thus bringing in more opportunity to the die casting industry.

In the electric vehicle segment too, many players have shown interest to invest in the Indian market. For instance, Suzuki Motor has plans to make electric cars at its factory in Gujarat. Hero MotoCorp also joined the EV space by investing to take 35% per cent stake in Ather Energy, a start up firm that specializes in manufacturing smart elec-

tric scooters. With so many opportunities in store, there is a need for the die casting industry to upgrade its technologies and processes in order to ride high on the growth wave.

The global pain of over-reliance on China

Post novel coronavirus crisis that the world is now coming to terms with the fact that they had put all their eggs in one basket with China becoming the sole source of raw materials and manufactured products around the world. China held a monopoly for many years and the supply chains were severely disrupted. Japan has become the first country to acknowledge this over-reliance and has announced a package of 2.2 billion dollars to Japanese manufacturers to help them relocate their overseas factories, including bringing them back home.

Trade wars

Up until recently China has been entangled in a fierce trade war with the United States which has led to a steep rise in the price of its goods in the US. India being the trusted partner of US for so many years, must capture this opportunity of inviting American companies (many of whom have also been hit hard due to recent supply chain disruptions) to manufacture in India

Cheap Labour

Chinese workers have seen a massive increase in their wages. Consequently, the cost of making products in China has become a lot more expensive than it used to be which has significantly shrunk the profit margins of the companies. Today, India has extremely low cost of labour compared to China and its highly skilled working population can be instrumental in turning its manufacturing sector upside down.

Decline in working age population in China

China has seen a steep decline in its working age population in recent years thanks to the social engineering carried out by its one child policy over the years. China is now looking towards robotics and industrial automation to retain its position and India, riding on its large young workforce must grab the opportunity at hand as soon as possible.

WAY FORWARD for Indian Aluminium Die Casting Industry post COVID-19 scenario:

In order to spur up growth in Aluminium Die Casting Industry a revival plan extending stimulus package covering tariff and non-tariff issues have been suggested as under:

• Higher Emphasis on Essential End-use Sectors like automotive, lighting & construction.

• Multiple supply chain alternatives for shipments: Create strategic marketing tie-ups with competitors to utilize their marketing base in less-affected COVID-19 regions. Producers should consider alternative sales channels, such as traders, new potential end-users, e-retailers, spot auctions, etc.

• Ramp up Recycling Initiatives: Recycling should be given due importance for long-term sustainability of the industry. Secondary recycling should be promoted to contribute 30-35% of domestic metal requirements.

• Develop Data analytics to monitor the price movements of raw materials to fine tune demand-supply and procurement cycle. Inventory and management of raw materials and consumables will be key factors.

• Enter new market territories to have a wider base to mitigate the short-term risk of COVID-19.

• Focus and expand R&D during next few years for development and facilitation of localized sourcing. Primary producers to play hand holding role for development of ancillary and downstream industry segment.

• Build strategic organizational structures with a commitment to investing in automation, continuous improvement efforts and industry 4.0 with target to keep up the cost to company low..

• Core industry status should be given to the Aluminium Die Casting industry.

• There should be introduction of National Aluminium Casting Policy

I must thank the Ministry of Mines, DPIIT, QCI and NPC for organising this webinar on one of the most important topics.

The government has noted key points as challenges, opportunities and takeaways from this presentation. And has published in their official page.

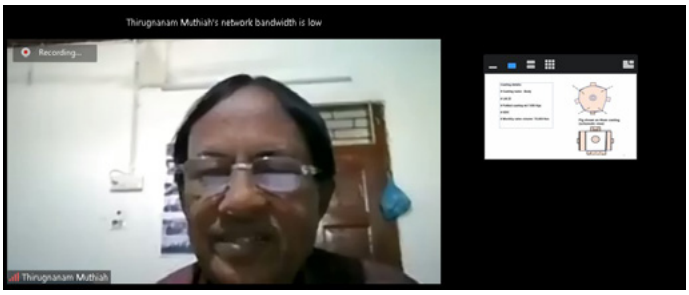
ALUCAST NEWS

Mr. Zubin Kabraji, who was working with ALUCAST as Executive Secretary from April 2016 has left our Association in the month of April 2021. Many of you may know him as very active and dynamic person, who utilized the wealth of his earlier experience for the effective functioning of our organization. The trustees and president of ALUCAST appreciate his dedication and efforts put in by him for the advancement of this association.

Mr. D. Nath, founder member and founder Trustee of Aluminum Casters' Association (ALUCAST), in view of his advanced age, has decided to release himself from the responsibilities and other curricular activities connected with our Trust and association. Mr. Nath is a doyen of Casting Industry with active contribution extending to more than 54 years. Currently, he is still functioning as the Chairman of Ultraseal (India) Pvt Ltd. He had extended his advice and assistance in setting up this Aluminum Casters' association way back in early 1995. Later when the trust was formed to take care of the activities in the year 2005, he joined as one of the trustees to guide and helped steer this association to the current level. The President and other trustees warmly appreciate his active participation and valuable contribution over the years.

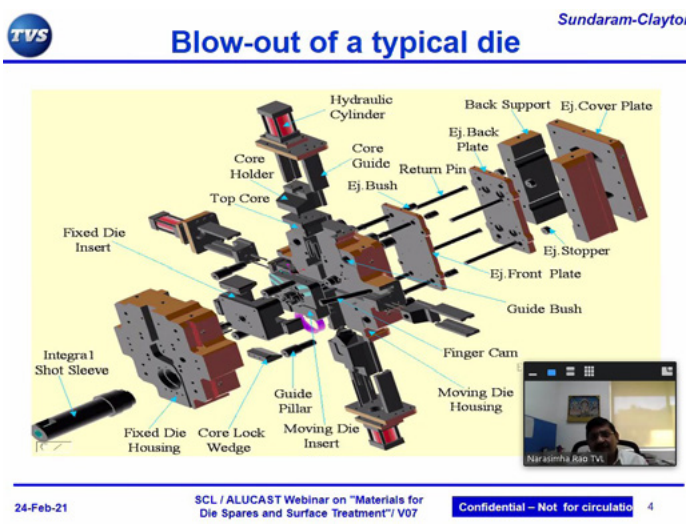
WEBINAR DETAILS : FEBRUARY 2021

Following are the details of Webinar conducted by ALUCAST in the month of February'21 : **Maintenance of Aluminium Gravity and LPDC dies**



Speaker: Mr. M. Thirugnanam, Consultant
Samurai Aluminium Foundry, Chennai
Program Date: Thursday, 11 February 2021
Time: 2:30 pm to 5:00 pm
Participants attended: 100

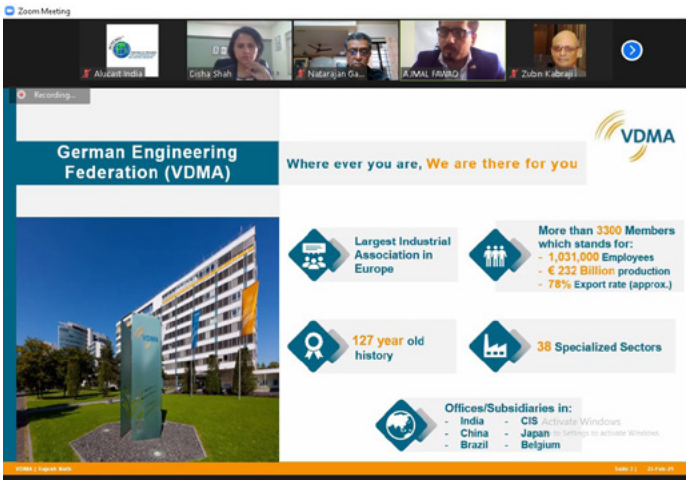
Materials for Die Spares and Surface Treatment

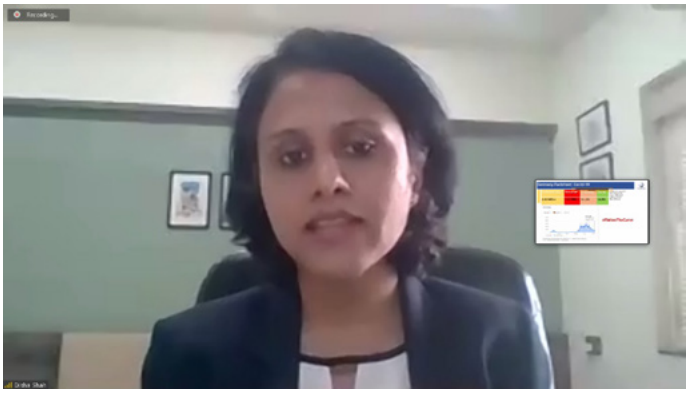


Speaker: Dr. Narasimha Rao TVL,
Vice President R&D, Sundaram Clayton Ltd.

Program Date: Wednesday, 24 February 2021
Time: 3:00 pm to 4:30 pm
Participants attended: 100

ALUCAST in cooperation with FrankfurtRheinMain web seminar on: Business Opportunities in German Metropolitan Region FrankfurtRheinMain





Setting-Up Business in FrankfurtRheinMain, Germany
Speaker: Mrs. Disha Shah, Director India,
FrankfurtRheinMain GmbH

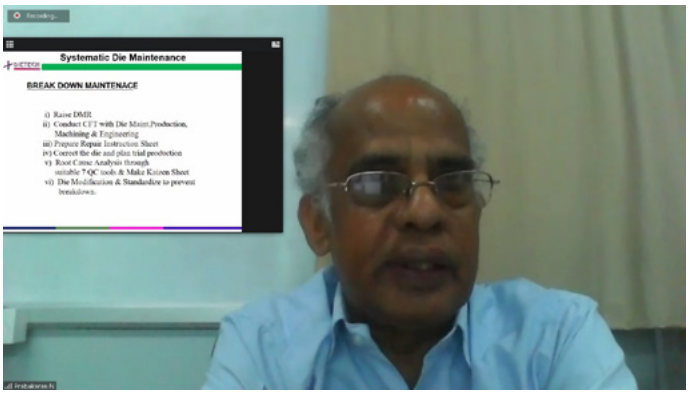
Casting Industry in Germany & Europe
Speaker: Mr. Ajmal Fawad, Regional Manager - North
German Engineering Federation (VDMA India)

German Mittelstand
Speaker: Mr. Manoj Barve, President,
BVMW Representative Office, Federal
Association of German SMEs &
Director, Kontakt India Advisory Services LLP

Program Date: Thursday, 25 February 2021
Time: 3:30 pm
Participants attended: 99

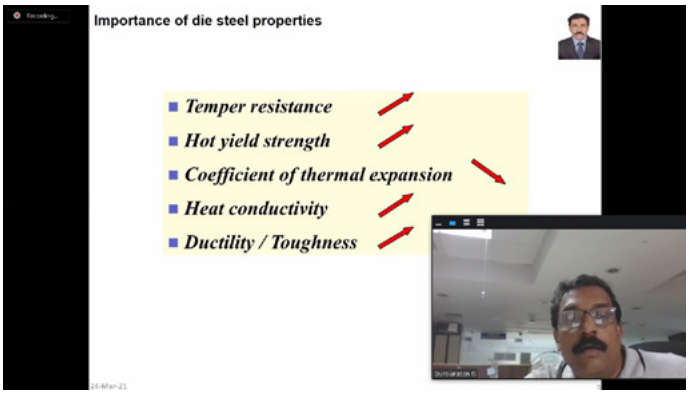
WEBINAR DETAILS : MARCH 2021

Equipment's and Machineries for Die Maintenance



Speaker: Mr. N. Prabakaran,
Dietech India (P) Limited, Chennai
Program Date: Wednesday, 10 March 2021
Time: 3:00 pm to 4:30 pm
Participants attended: 80

Maintenance of Aluminium HPDC dies



Speaker: Mr. G. Duraiarasan, Sr. GM-Operations
Ashley Alteams India Limited
Program Date: Wednesday, 24 March, 2021
Time: 3:00 pm to 4:30 pm
Participants attended: 65

ALUCAST JOURNAL SUBSCRIPTION

Bi-Monthly Journal of Aluminium Casters' Association (ALUCAST) - These prices are revised w.e.f. 01 April 2016

Subscription	1 year	2 years	3 years
Domestic (₹)	1000	1800	2500
Overseas (US $)	75	150	175

Please send cheques in the name of Aluminium Casters' Association (ALUCAST) payable at Pune to:

Aluminium Casters' Association (ALUCAST)
702, AMar Neptune, Baner Road, S. No. 6/1/1, Plot No. 45, 46A, 46B Pune 411045
T: +91 20 27290014 / E: alucastindia@alucast.co.in

Note: Please mention your mailing address with pincode and email-id along with the cheque.

ALUCAST-NADCA Series of Webinars

ALUCAST in co-ordination with NADCA has arranged a series of webinar for Aluminium Die Casting Industry.

Date	Topic
06/04/2021	Productivity improvements Part 1
07/04/2021	Productivity improvements Part 2
04/05/2021	Mechanical properties of aluminium die casting alloys Part 1
05/05/2021	Mechanical properties of aluminium die casting alloys Part 2
01/06/2021	New technologies in die casting Part 1
02/06/2021	New technologies in die casting Part 2
03/06/2021	New technologies in die casting Part 3

Trainer: Dr. Steve Midson, President, MIDSON Group, Denver, USA

Dr. Steve Midson is empanelled with NADCA. He has authored books on die casting dies, with special emphasis on improving die life. He conducted two & three day training programs at different Centres (Pune, Delhi, Bangalore & Chennai) in 2017 and 2019, on behalf of ALUCAST. Dr. Midson is associated with research groups in USA and China (where he is also a consultant).

Time	10:00 am to 11:30 am IST
Platform	Zoom Meetings
Participant Fees	Group Sponsors – Rs 75,000 + GST @18% extra (Total Rs 88500) Individuals – Rs 5,000 + GST @18% extra (Total Rs 5900)

Group Sponsors will get 5 Zoom Links where they can display the proceedings at their locations for their personnel. Group Sponsors will also get their Logo on the Opening Slide for each event. The Bank details are as follows:

Bank Name	IDBI Bank
Address	Baner Road, Pune 411045
Bank Account Number	0670102000006088
Bank Account Name	Aluminium Casters Association (Alucast)
Bank Account Type	Current
IFSC Code	IBKL0000670

Please inform us as soon as the RTGS/NEFT is done with reference no. if any so that we can check with the Bank. Forward your registrations with payment details (online bank transfer only) to ALUCAST
(Email: rushikesh.bhange@alucast.co.in)

Name of Participant	
Company Name	
Cell Number	
E-mail ID	
GST No	
Billing Address	

After sending us the above details, you will receive actual registration link for the webinar. **Registrations can only be accepted after full payment has been received. No registrations will be accepted without payment.**

If you have missed registering for the series of Webinars, you can still register for the May and June Webinars (with the course fee remaining the same i.e. Rs.5000 + 18% GST=Rs.5900 for the complete series)

Looking forward to your support.

Best regards,

Rushikesh Bhange
Webinar Co-ordinator, Aluminium Casters' Association (ALUCAST)
T: +91 20 2729 0014
E: rushikesh.bhange@alucast.co.in
W: www.alucast.co.in

Brief Description of the topics covered in each webinar:

Productivity Improvements

The objective of this 2-part webinar series is to describe methods to allow the production of more castings per hour, not only looking at faster cycle rates, but also by minimizing downtime.

The webinar series will cover the following information:

Die related
- Improved thermal control
- High thermal conductivity die materials
- Improved cooling
- Bi-metallic cores

Process related
- Better control of cooling water
- Low temperature casting process
- Ladling while die is still open
- Minimize lubricant spraying
- Changing ejection criteria

Mechanical Properties of Aluminum Die Cast Alloys

The objective of this 2-part webinar series is to document in an organized manner the large amount of data has recently been published by NADCA regarding mechanical properties of conventional aluminum die castings.

The webinar series will cover the following information:

• Document handbook mechanical properties
• Describe the impact of chemical composition on properties
• Discuss the change in die cast mechanical properties over time
• Show the impact of porosity and defects on mechanical properties of die castings
• Impact of changing composition within the specification range for alloy 380
• Properties of low-iron, strontium-modified aluminum die castings
• Heat treated properties of conventional and low-iron aluminum die castings
• Mechanical properties of cast-to-size samples versus samples cut from actual die castings

New Technologies in Aluminum Die Casting

The objective of this 3-part webinar series is to documents recent advances in aluminum die casting technology

The webinar series will cover the following information:

• Part 1
- Advances in aluminum die casting alloys

• Part 2
- High integrity die casting processes
- Additive manufacturing of dies

• Part 3
- Advances in die materials
- Pulsed spray

***

SIAM - Summary Report: Cumulative Production, Domestic Sales & Exports data for the period of Apr'20-Jan'21 with % Change									
Report I - Number of Vehicles									
Category	Production			Domestic Sales			Exports		
Segment/Subsegment	April - January			April - January			April - January		
	2019-20	2020-21	%Change	2019-20	2020-21	%Change	2019-20	2020-21	%Change
Passenger Vehicles (PVs)*									
Passenger Cars	18,42,125	13,52,405	-26.58	14,46,280	11,81,345	-18.32	4,28,108	2,15,603	-49.64
Utility Vehicles(UVs)	9,50,303	8,75,253	-7.90	8,06,881	7,88,601	-2.27	1,46,588	1,11,748	-23.77
Vans	1,12,441	82,092	-26.99	1,13,599	84,482	-25.63	2,340	1,009	-56.88
Total Passenger Vehicles (PVs)	**29,04,869**	**23,09,750**	**-20.49**	**23,66,760**	**20,54,428**	**-13.20**	**5,77,036**	**3,28,360**	**-43.10**
Three Wheelers									
Passenger Carrier	8,87,429	3,99,002	-55.04	4,70,894	93,959	-80.05	4,27,657	3,07,983	-27.98
Goods Carrier	1,02,948	68,446	-33.51	97,263	62,977	-35.25	5,669	4,010	-29.26
Total Three Wheelers	**9,90,377**	**4,67,448**	**-52.80**	**5,68,157**	**1,56,936**	**-72.38**	**4,33,326**	**3,11,993**	**-28.00**
Two Wheelers									
Scooter/ Scooterettee	52,01,050	35,42,493	-31.89	48,80,446	35,57,427	-27.11	3,16,122	1,75,202	-44.58
Motorcycle/Step-Throughs	1,25,36,057	1,04,73,098	-16.46	98,26,125	81,15,517	-17.41	26,60,595	23,74,685	-10.75
Mopeds	5,50,138	5,22,420	-5.04	5,48,202	5,21,114	-4.94	12,601	7,019	-44.30
Electric Two Wheelers	247	1,772	617.41	27	1,658	6040.74	0	0	-
Total Two Wheelers	**1,82,87,492**	**1,45,39,783**	**-20.49**	**1,52,54,800**	**1,21,95,716**	**-20.05**	**29,89,318**	**25,56,906**	**-14.47**
Quadricycle									
Quadricycle	5,242	2,707	-48.36	1,018	-27	-102.65	4,631	2,629	-43.23
Total Quadricycle	**5,242**	**2,707**	**-48.36**	**1,018**	**-27**	**-102.65**	**4,631**	**2,629**	**-43.23**
Grand Total	**2,21,87,980**	**1,73,19,688**	**-21.94**	**1,81,90,735**	**1,44,07,053**	**-20.80**	**40,04,311**	**31,99,888**	**-20.09**

* BMW, Mercedes and Volvo Auto data is not available and Tata Motors data is available for April - December only

SIAM - Summary Report: Cumulative Production, Domestic Sales & Exports data for the period of Apr'20 - Feb'21 with % Change									
Report I - Number of Vehicles									
Category	Production			Domestic Sales			Exports		
Segment/Subsegment	April - October			April - October			April - October		
	2019-20	2020-21	%Change	2019-20	2020-21	%Change	2019-20	2020-21	%Change
Passenger Vehicles (PVs)*									
Passenger Cars	20,19,152	15,33,652	-24.04	15,94,821	13,36,473	-16.20	4,58,281	2,38,833	-47.89
Utility Vehicles(UVs)	10,47,940	10,04,626	-4.13	8,85,556	9,02,951	1.96	1,66,391	1,23,639	-25.69
Vans	1,23,887	94,227	-23.94	1,25,006	96,384	-22.90	2,598	1,233	-52.54
Total Passenger Vehicles (PVs)	**31,90,979**	**26,32,505**	**-17.50**	**26,05,383**	**23,35,808**	**-10.35**	**6,27,270**	**3,63,705**	**-42.02**
Three Wheelers									
Passenger Carrier	9,61,936	4,59,329	-52.25	5,03,317	1,12,473	-77.65	4,69,527	3,48,570	-25.76
Goods Carrier	1,11,233	78,111	-29.78	1,06,140	71,794	-32.36	6,225	4,599	-26.12
Total Three Wheelers	**10,73,169**	**5,37,440**	**-49.92**	**6,09,457**	**1,84,267**	**-69.77**	**4,75,752**	**3,53,169**	**-25.77**
Two Wheelers									
Scooter/ Scooterettee	56,95,031	40,38,003	-29.10	53,02,614	40,22,171	-24.15	3,47,197	2,04,089	-41.22
Motorcycle/Step-Throughs	1,35,68,842	1,17,72,876	-13.24	1,06,42,804	90,25,840	-15.19	29,40,337	27,10,092	-7.83
Mopeds	6,06,853	5,86,083	-3.42	6,04,004	5,72,559	-5.21	13,543	7,371	-45.57
Electric Two Wheelers	375	2,158	475.47	165	2,011	1118.79	0	0	-
Total Two Wheelers	**1,98,71,101**	**1,63,99,120**	**-17.47**	**1,65,49,587**	**1,36,22,581**	**-17.69**	**33,01,077**	**29,21,552**	**-11.50**
Quadricycle									
Quadricycle	5,642	3,500	-37.97	1,073	-19	-101.77	4,969	3,259	-34.41
Total Quadricycle	**5,642**	**3,500**	**-37.97**	**1,073**	**-19**	**-101.77**	**4,969**	**3,259**	**-34.41**
Grand Total	**2,41,40,891**	**1,95,72,565**	**-18.92**	**1,97,65,500**	**1,61,42,637**	**-18.33**	**44,09,068**	**36,41,685**	**-17.40**

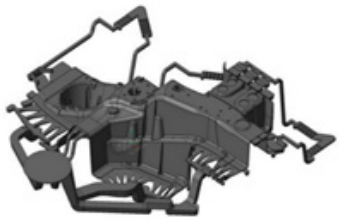
* BMW, Mercedes and Volvo Auto data is not available and Tata Motors data is available for Apr-Dec only

Society of Indian Automobile Manufacturers (10/03/2021)

TOOL ENGINEEERING - Aluminium die casting Creative, innovative, attractive engineering

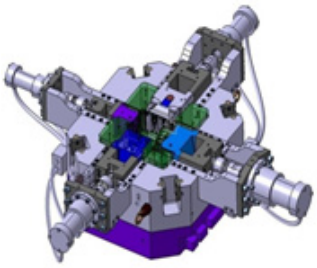
- C. Surianarayanan

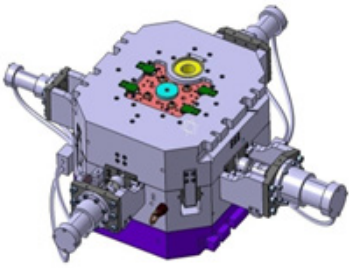
High Pressure (Cold chamber)



Success of good casting is based on:

- Perfectly designed product
- Well-engineered die design
- Best steel used for the Die
- Perfectly heat-treated Die elements
- Robust built Die
- Well prepared Aluminium alloy
- Well-built Die casting machine
- Perfect process engineering practices



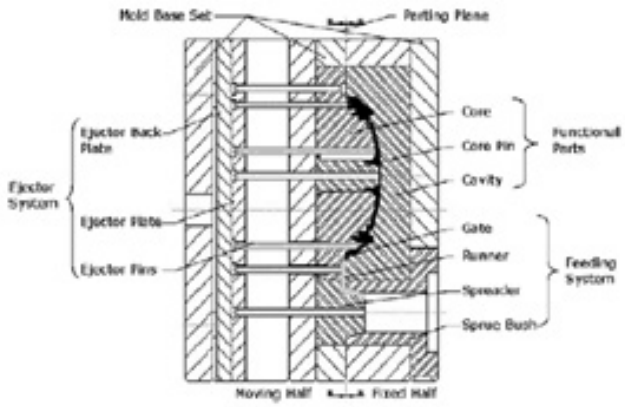


Product design validation (DFM):

1) Part profile wall thickness & mass distribution
2) Undercuts & average wall thickness
3) Profile intricacy and internal quality requirements
4) Possibility for fixing the ejection pin for balanced ejection
5) Gate location required to fill and parts final requirement
6) Projected area for locking tonnage selection
7) Mass to select the Plunger diameter to achieve Fill ratio
8) Die placement on the Machine platen
9) Injection centre to Platen relation

Well-engineered die Design

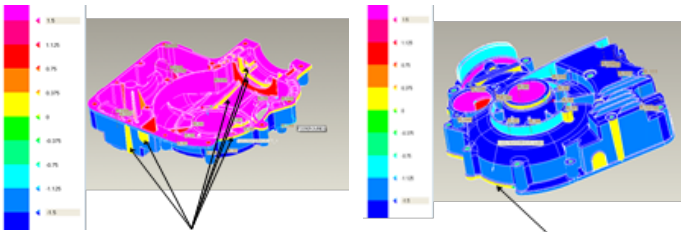
1. Die design
2. Die material
3. Heat treatment
4. Coatings
5. Operation/maintenance



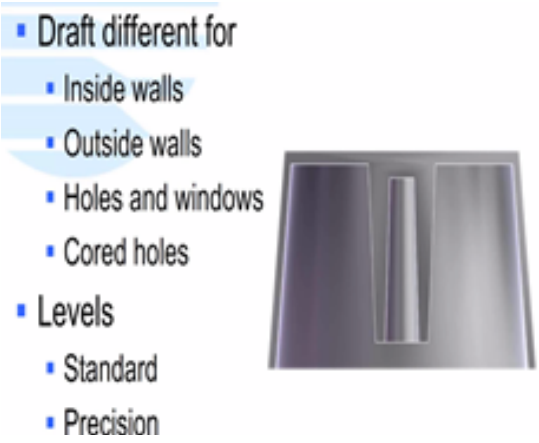
Draft Angle

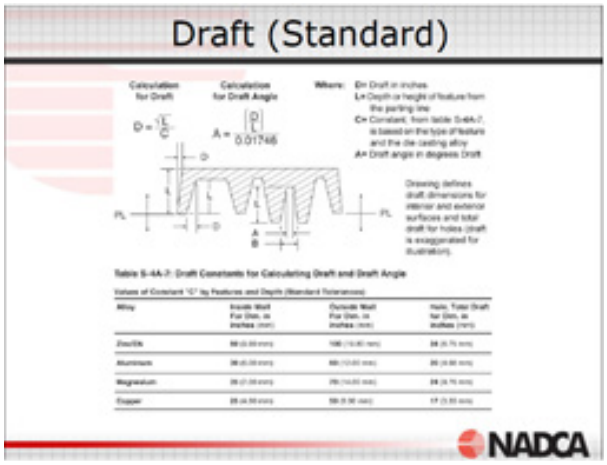
Important factor for the stress-free casting removal from the die

- If the profile is longer and slender, it is better to consider enough draft angle up to 3°
- But in some cases, can consider draft angles from 0.5° to 1°
- where the height or length is approximately equal or below 2 times the diameter / height to travel out of the die.
- Thin wall sectioned ribs should be of above 1.5 deg



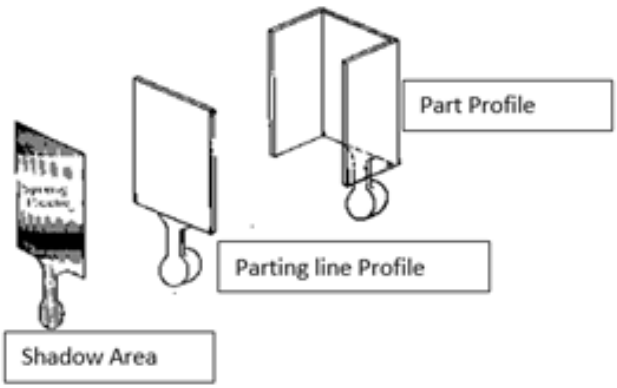
This model has no drafts available in the Yellow coloured surfaces.





Locking Tonnage Calculation

Tonnage required= Shadow Area* Specific Pressure*N



Specific Pressure is considered as per the product QA requirements:

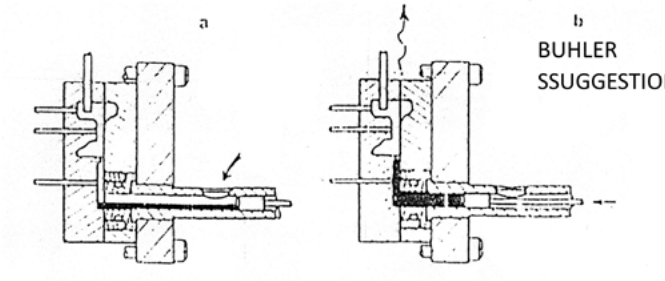
600 Bar for conventional parts
800 Bar for airtight parts
>1000 Bar for high precision parts with high task load or pressure

Factor of Safety

N = 1.5 for castings of premium grade with high strength and surface treatments
N = 1.25 for castings requiring high mechanical strength during field function
N = 1.10 for castings for low engineering and high aesthetic performance

Where "N" Denotes the factor of machine safety according to the casting QA needs.

Fill ratio of the cold chamber is an important factor for the result of the casting.



Fill ratio suggestion:

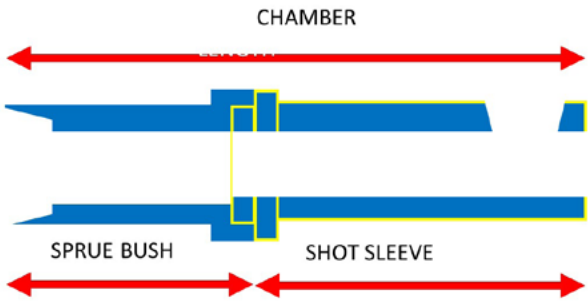
Scientific	70:30
Practical	60:40
thicker sections	50:50

There are likely chances of flash/ non filling/ air trapped high to name some are caused by the improper selection of the fill ratio.

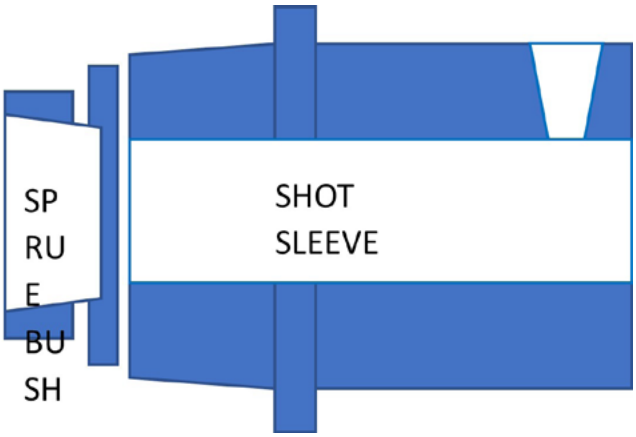
Cold chamber is the cumulative length of the Shot sleeve and the sprue bush.

Fill ratio is the cumulative mass of:

cast part+ metal before part +metal after part



Split design pf the cold chamber can have shift in the axis and can shear the plunger. This will not be noticed by the operator but this can be the culprit for casting filling defects. It is suggested to have the design as given in the picture



This design ensures the free travel as well the alignment of the plunger inside the cold chamber. It is suggested to have the Fitment as H7 g6 to accommodate the heat expansion of the sleeve as well the plunger.

Percentage of Cold Chamber Fill, Myth or Method? (Is this the primary process parameter?)
By: Bob McClintic, Die Casting Consultant

% fill	50%	30%
Casting vol. cu.in./(cc):	25, (409.7)	25, (409.7)
Target fill time Milliseconds:	50	50
Cold chamber diameter, inches (mm):	2.00, (50.8)	2.60, (66.04)
Fast shot velocity To accomplish fill time:	170 IPS (4.32 M/S)	100 IPS (2.54 M/S)

Table 1

As shown in the table above, as the percentage of fill is reduced the fast shot velocity required to accomplish the target fill time of 50 milliseconds is reduced also. Depending on the vintage of the machine, it may be impossible to accomplish the 170 IPS (4.32 M/S) fast shot velocity necessary at 50% fill. Machines that have a maximum fast shot capability of 90 (2.28) to 110 IPS (2.79 M/S) are not uncommon. Therefore, it is often imperative that a larger cold chamber be used in order to accomplish the target fill time. At 30% fill most machines could accomplish the 100 IPS fast shot velocity required to perform the same work.

Other problems associated with using too small cold chamber diameters can include excessive cavity pressure from the impact spike and/or uncontrolled intensifier pressure. The impact spike is often the cause of uncontrolled flash in slides and on die faces. When the accumulator is mounted remote from the shot cylinder as is the case on older machines, this problem is exaggerated. Impact spike pressures can be as much as 3 to 4 times system or intensified pressure.

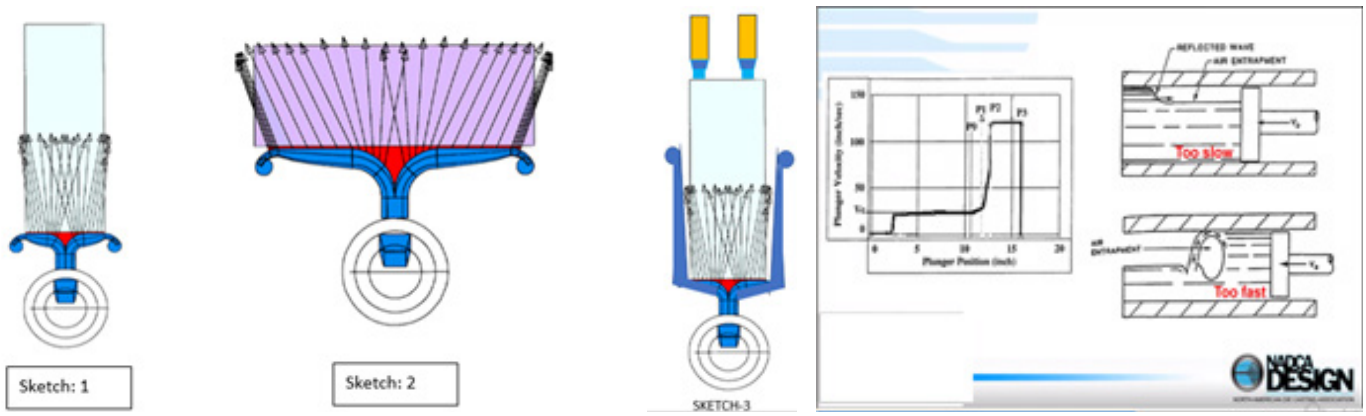
INJECTION POINT / GATE POSITION:

1)This is an important feature and related to the part engineering and filling pattern of the cavities.

2) Gating position has to be fixed to fill the volume of the material inside the die within the stipulated fill time.

Fill time is concidered in view with the thinnest section of the part to be filled it is allways advisable to concider the gate point from the thcker possible section

Runner and Gate guidelines
HPDC-It is better to select the flow in gates such that hot alloy flows shorter distance to reach the complete profile



Sketch :1 & 3

Here the runner design is selected to travel for the longer distance may be for the reason to save the die size as well the HPDC platen suitability in appropriate machine.

Here the flow distance is longer and alloy may reduce in the temperature as well the velocity. This has to be considered

and the runner volume to be enhanced to suite the requirement. To shift the final filling point far away from the casting profile it is suggested to have the chill vent as in the sketch 3

Sketch:2

This is the best lay out to take the liquid alloy with the appropriate velocity as well the temperature. But the die construction n may call for a bigger platen size which may be of a higher tonnage machine.

This will have the process cost enhanced hence it is suggested to think of the option as in the sketch 3

HPDC runner and gating system design consists of the following steps:

1. Analysis of the metal flow

2. Selection of the best place for the gate on one side of the casting and vents on the opposite side

3. Calculation of a maximum die cavity fill time and selection of a gate velocity

4. Division of the casting into gating segments

5. Calculation of overflow volumes per segment

6. Calculation of a total gate area and selection of a gate height

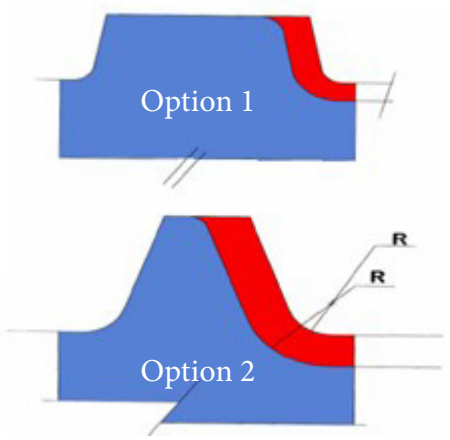
7. PQ2 analysis

8. Cavity fill time and gate area calculations by segment

9. Selection of a runner type and

Spreader defines the trouble-free flow of the liquid alloy inside the main feeder runners.

Itis suggested to have the best flow angle to have the volumetric flow happening from the spreader. Sketch here explains the details

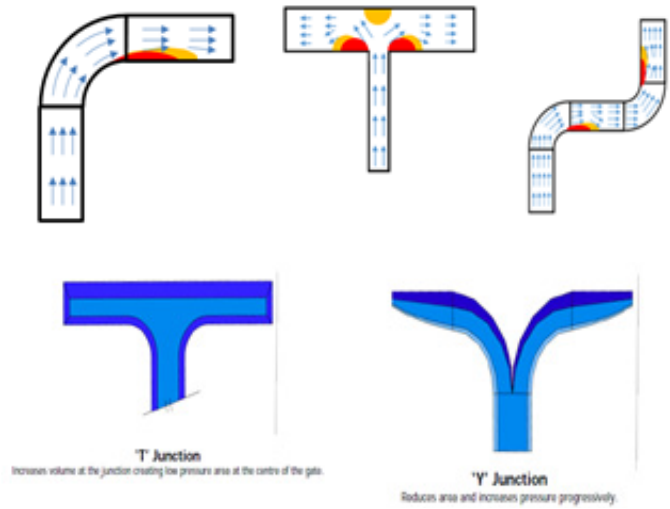


Option 1: Flow from the sleeve is suddenly restricted. This will cause high velocity by the squeezing of the liquid alloy being forced inside the main feeder runner in the spreader. This will influence to flow defects as well the die erosion.

Option 2: This will have best of flow with the support of the good gradient to reach the sub runners with the appropriate /adequate velocity to fill the part profile

Runner features and guidelines:

`Y' is better than `T' to avoid the vortex shedding



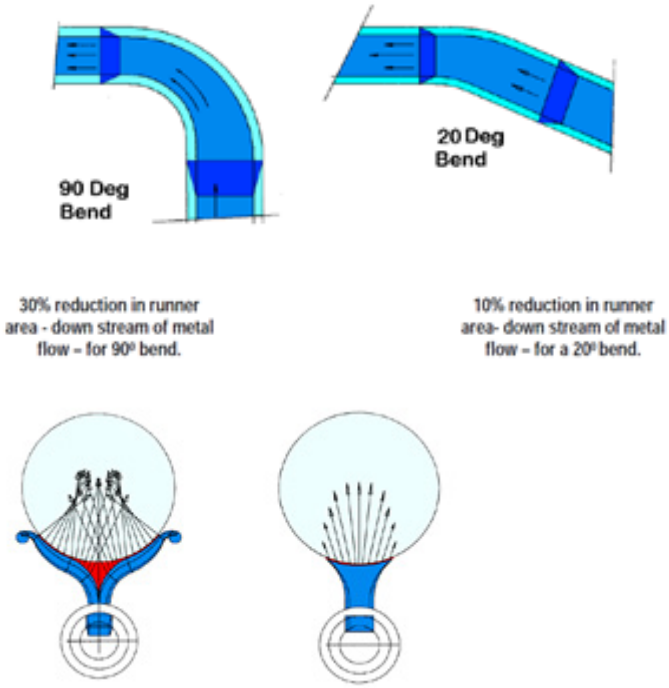
shaping the runner:

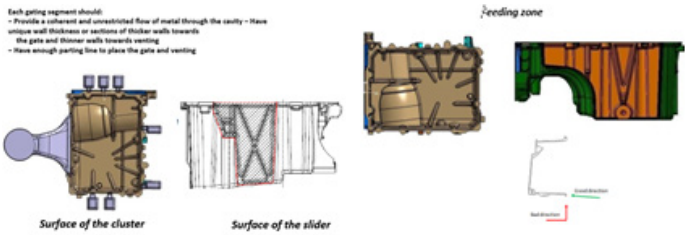
• Each gating segment should:

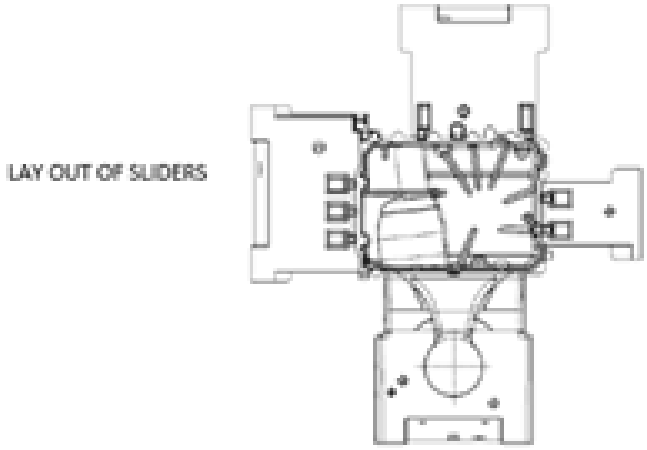
• Provide a coherent and unrestricted flow of metal through the cavity

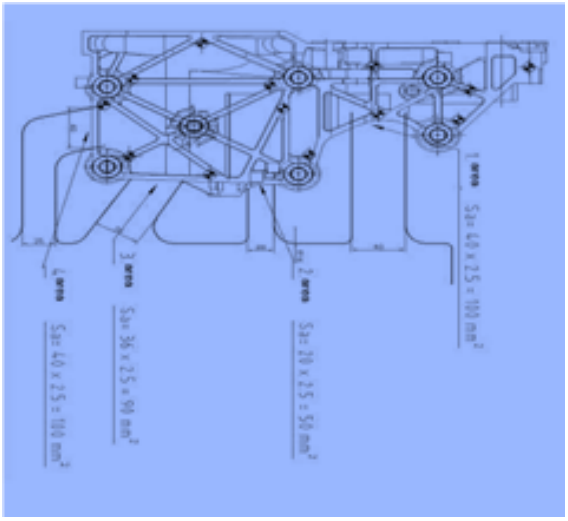
• Have unique wall thickness or sections of thicker walls towards the gate and thinner walls towards venting

• Have enough parting line to place the gate and venting









Guide Line to arrive the best shot weight??

Casting Weight is the base (Let us say A Kg)

Biscuit weight---8% TO 15% OF A (This need not be higher than this)

Runner weight----Minimum 25% A (this can be higher as required to match the fill ratio)

Overflow weight---- 8% TO 15% A (This need not be higher than this)

Segmental flow design:

Prepare the lay out for the best flow of the liquid metal into the part profile of the die.

Ensure the number of gates are located to balance the filling.

Maintain the same gate thickness only to have the gate velocity as same in all the gates.

Gate width & the runner width can be to the available space to flow the maximum possible volume of the liquid alloy to fill the part volumetrically.

Then prepare the matrix and study the weight of the segments to be filled by the respective runners. This will guide to decide the runner dimension to match the volumetric filling

Gate location are to be fixed for shortest travel of the hot alloy in to the profile.

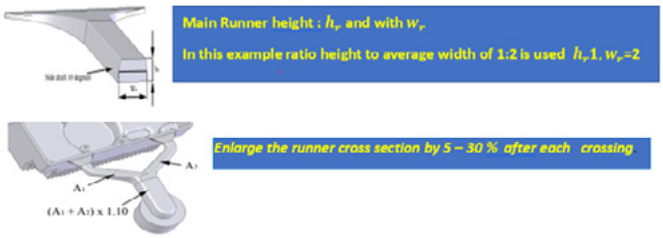
Gate thickness should be the same in all the gates

Width can be to the need of the segmental filling

Each gate should fill the weight of the segment covered with in the Fill time specified.

Calculated gate area is for the lowest and can be higher than this and never should be lower than this

Maintain This in the runner design for the best of flow results:



Tapering the runner profile as suggested is to create the flow velocity of the liquid metal as it comes out from the biscuit and the main runner. This is essential because the Plunger velocity with the machine hydraulic do not support this and the flow of alloy back pressure Can only support this.

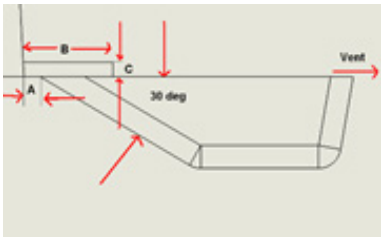
Overflows shapes for the best performance:

• The shape and dimensions of an overflow.

• A = Land length (2 – 5 mm);

• B = Overall length of the overflow gate (5 - 8 mm);

• C = Overflow gate height (Al 0,6 – 1,2 mm, Zn 0,3 – 0,8 mm, Ms. 0,8 – 1,5 mm). Vent height is as follows: Al 0,10 – 0,15 mm, Zn 0,06 – 0,10 mm, Ms. 0,1 – 0,15 mm.



Calculation of the gate area:

Total -gate Area $A = \frac{w}{t \cdot v \cdot d}$ cm^2

Gate area: Gate thickness X width of the Gate.

Gate thickness should be the same in all the branches of the runner.

Width can be varied to accommodate maximum flow of the liquid metal

Weight (W) of the casting is either known or can be arrived from 3D data

For safety estimation it is suggested to consider (W) as shot weight.

Which can be estimated as Casting weight X 1.5

W= Weight of casting in grams.

d = specific gravity of liquid Aluminum (2.5)

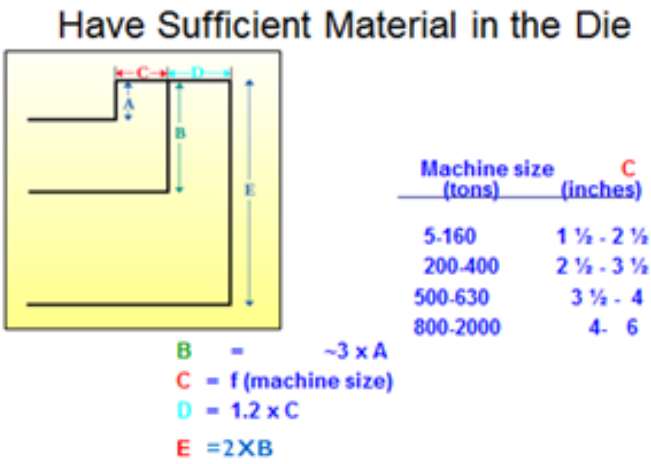
v= velocity of liquid metal at the gate (cm./sec) (35-50 meters/ second)

t= mold fill time (20 to 60 milliseconds)

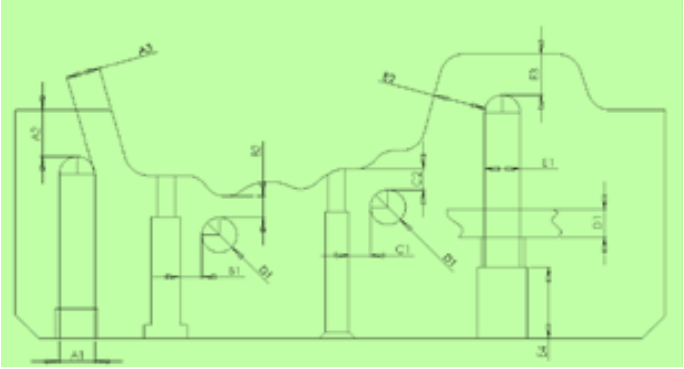
Recommendation of a steel mill

(Suggested to consider at least 70% to 80%)

`A' Cavity depth
`B 'Insert Thickness



Waterlines for the thermal management of the die:
This sketch is of guidelines need to be applied when adding waterlines to the cavity.



PL = Parting Line **WL=Water line**

Shot weight with Ø 70 mm Plunger: 880 grams

- Fill ratio is 27% of the cold chamber
- Runner weight should be 126 grams

Shot weight with Ø 60 mm Plunger: 559 grams

- Fill ratio is 24%
- Runner weight should be 63 grams
- Aluminium alloy saving will be 321 grams per shot
- Saving is higher in the Ø 60 mm Plunger design
- Fill ratio is also Ok for the best filling

Runner plays a major role to get the flow with perfection as well to take care of the filling of the profile

Side core construction guide line:

As far as possible avoid using mechanical cam design. In cases where it is to be used for cost purpose then also do not use it for the sliders traveling more than 20mm. Limit switches are a must for the safety of the die function. Try to use the Quick-change couplers self-locking valve hose couplers to avoid the leakage. As far as possible the sliders are to be taper matched for the better orientation and repeatability. Generally mechanical cores will enhance the cycle time, hence it is suggested to avoid

Tool Design is important

WHY??? Any development is successful only by implementing it in the field of public utilisation. How tool making services in this scenario? Commercial tool making in India has not flourished well but for few players. Actual needs are met by Imports to major volume facing lots of difficulties but compromising on the best timelines adhered by the suppliers. Available commercial tool rooms are not financially & technically competent to that of the import suppliers.

Author:
C. Surianarayanan
+919944133772

Aluminium Casters' Association (ALUCAST) - Membership Fee

Structure w.e.f 16 December 2016 (Tax updated w.e.f. 01 July 2017)

Membership Category	Admission Fees (₹)	Annual Fees (₹)	Total (₹)	Final Amount with GST (₹)	Admission Fee (₹)	Life Membership (₹) - Annual Fees X 15	Total (₹)	Final Amount with GST (₹)
Ordinary Member	500	1500	2000	2360	500	22500	23000	27140
Ordinary Member (MSME)	1000	3000	4000	4720	1000	45000	46000	54280
Corporate Member	1000	15000	16000	18880	1000	225000	226000	266680
Coporate Member (Overseas)	US $50	US $150	US $200	US $236	US $50	US $2500	US $2550	US $3009

Renewal Charges

Membership Category	For Renewal	Total with GST @ 18%
Ordinary Member (Individual)	1500	1770
Ordinary Member (MSME)	3000	3540
Corporate Member	15000	17700
Corporate Member (Overseas)	US $150	US $177

Please send cheques in the name of Aluminium Casters' Association (ALUCAST)
payable at Pune along with the membership form.
Membership form and details of membership are available on our website: www.alucast.co.in

Contribute Articles for ALUCAST Journal

Themes for the year 2021

Issue	Theme
June 2021	Recovery & Recycling of Aluminium Scrap
August 2021	Automation in Post Casting Operations
October 2021	Die Cast Products in E-Vehicles
December 2021	ALUCAST 2021 Special

Email : alucastindia@alucast.co.in

ALUCAST SNIPPETS

India's Hero Cycles to set up new global hub in London.

India's Hero Motors Company (HMC) Group on Tuesday announced plans to set up a new international headquarters, Hero International (HIT), in London as part of a push towards expanding Hero Cycles' overseas business and strengthening its global presence.The company said HIT is aimed at bringing HMC's European businesses under one umbrella and giving its electric bike business a major boost worldwide.

The new HQ will unify HMC-owned European businesses, including HNF GmbH in Germany and Insync Bikes in UK, as part of a long-term vision to grab an increasing share in the lucrative e-bike market growing at an exponential pace in Europe.

"With Hero International (HIT), the HMC Group now has an international headquarters in London to act as a catapulting agent to our global expansion plans," said Pankaj M Munjal, Chairman and Managing Director, HMC - a Hero Motor Company.

***

Govt offers sops to buy new vehicles, scrap old

India will offer tax breaks and financial incentives to encourage owners to scrap their old vehicles as part of a policy that seeks to promote the use of fuel-efficient and cleaner automobiles while driving sales of new vehicles.

Commercial vehicles older than 15 years and passenger vehicles more than 20 years old will have to be scrapped if they fail to pass fitness and emission tests, according to the country's first-ever vehicle scrappage programme unveiled on Thursday. The Centre will help set up vehicle 'fitness centres' across India to test old vehicles as well as scrap yards.

***

Scrappage policy will increase auto industry's turnover to INR 10 lakh cr

Union Minister of Road Transport and Highways Nitin Gadkari on Thursday said the vehicle scrappage policy will lead to an increase in India's automobile industry turnover to INR 10 lakh crore from the current INR 4.5 lakh crore.

While making a statement regarding the vehicle scrappage policy in the Lok Sabha, the minister termed it as a win-win situation and said, "The policy will help improve fuel efficiency and reduce pollution. The GST income also will rise by INR 30,000 crore – INR 40,000 crore, on account of higher vehicle sales."
"India has 51 lakh light motor vehicles which are older than 20 years, 34 lakh light motor vehicles which are older than 15 years, and 17 lakh medium and heavy commercial vehicles which are older than 15 years and without valid fitness certificates," Gadkari noted.

The minister said that the policy will be good for both the economy and the environment. "Scrapping centres will benefit automobile manufacturers and component makers. Vehicle recycling will reduce the cost of components for the automobile industry," he added.

Gadkari also advised OEMs (Original Equipment Manufacturers) to give a 5% rebate for those buying a new vehicle after producing a scrapping certificate.

He also urged government officials to switch to electric vehicles and biofuels.

"We are encouraging ethanol, hydrogen, CNG and bio-fuel also. Within a year, lithium-ion batteries will be 100% 'Made in India'. Within two years, the cost of electric two-wheelers will be equivalent to petrol two-wheelers," Gadkari said.

He also highlighted that the work is underway to introduce schemes that will make India an automobile hub in the next 5 years.

"Tesla is coming to India. India will be an automobile manufacturing hub in 5 years," Gadkari added.

***

Electric vehicle financing industry to be worth Rs 3.7 lakh cr by 2030

India's electric vehicle (EV) financing industry is projected to be worth Rs 3.7 lakh crore in 2030, about 80 per cent of the current retail vehicle finance industry, according to a new report. The report titled 'Mobilising Electric Vehicle Financing in India', prepared by Niti Aayog and Rocky Mountain Institute (RMI) India pointed out end-users currently face several challenges, such as high interest rates, high insurance rates, and low loan-to-value ratios.It said India's transition to electric vehicles (EVs) will require a cumulative capital investment of USD 266 billion (Rs 19.7 lakh crore) in EVs, charging infrastructure, and batteries over the next decade.

The report also identified a toolkit of 10 solutions that financial institutions such as banks and non-banking financial companies (NBFCs), as well as the industry and government can adopt in catalysing the required capital.

***

BÜHLER Page

Die casting trainings available from anywhere, anytime.

With lasting travel restrictions attending a practical training course keeps being difficult. Nevertheless, foundries might need to train somebody on a new equipment or wish for an introduction to die casting for someone who is new to the industry. Taking a look at our new web education format is worthwhile. Many of the known trainings are now available in webinar format.

Our online courses - What is it about?
To provide effective training, no matter where someone works, we developed a set of online courses. The training takes place over several days with a 3 hour learning session each day, by experienced trainers. If necessary the course can be complemented with a practical part directly at the attendees working site or in one of our training centers.

The range of trainings offered, stretches from an introduction to die casting to dedicated trainings on the different Bühler machine series and technological trainings on process optimization or die design.

Why attend?
Higher quality, faster and uninterrupted production are essential in die casting. In this, highly-trained personnel can make a significant impact. OEE is at the center of consideration for all our trainings – on-site as well as for the new online courses.

How to attend?
The online courses are available either at fixed dates or on request at any date enquired by the attendees.
An overview of the courses offered can be found on the below link/scan QR code:
https://www.buhlergroup.com/content/buhlergroup/global/en/stories/78---webinar-offering-in-die-casting.html

Contact our expert:
Peter Stalder
dc.training@buhlergroup.com
Gupfenstrasse 5
Uzwil 9240, Switzerland