

INSIDER

We welcome all our new employees

Castool – Canada

Jeevagas Gunasingam
Accounting

OCCUPATIONAL HEALTH AND SAFETY



Our Joint Health and Safety Committee have discussed all accidents and reported incidents to conclude Risk Assessments and Training to reduce the risk of worker injury. During winter 2020, we have concluded an Environmental Assessment including annual Waste Audit to further improve an environmentally conscious workplace.

In February, Occupational Hygiene Air, Noise and Office IAQ Monitoring Survey was conducted as recommended every 3 years.

Finally during February, ISO 2020 re-certification was successfully completed for :

ISO 45001: 2018

ISO 14001: 2015

ISO 9001: 2015

There were no medical or lost time accidents during March. Another great accomplishment from a collective effort from all employees!

The late shipments have also improved. More than normal customer late pickups due to COVID-19 during these difficult times.

Our continued awareness, improvement and on-going collective efforts will make Castool an environmentally healthy and safe workplace for all Castool employees.

Jim Birnie
Health and Safety Coordinator

“IT’S GOING TO BE HARD, BUT HARD IS NOT IMPOSSIBLE”

Paul Robbins

These are challenging times and we are all very concerned for our family, friends, and other loved ones.

As the worldwide impact of Covid-19 continues to spread, I want to assure you, Exco remains focused on maintaining the health and safety of all our employees, continuing with our operations to the fullest extent possible, and positioning ourselves for the eventual recovery, which will inevitably take hold.



Darren Kirk
President & CEO

Events are fast-moving and we may not immediately have all the answers. However, we are actively monitoring the changing conditions and will do what’s right now for our employees, our communities and our businesses. Customers across many industries depend on our products and I firmly believe continuing to meet their requirement, safety, is the best course of action to get us through the formidable challenges we are now facing.

We have implemented several measures to reduce the risk to both our employees and our operations. These measures include enhanced promotion of personal hygiene, social distancing, increased cleaning of facilities, travel restrictions, limiting visitors and working remotely. Countless other measures are being implemented throughout our organization on a daily basis. I want to thank you for your commitment to these efforts and working together to keep us all safe.

Fortunately, Exco’s financial position remains solid. We have no debt, ample cash reserves, and large untapped credit facilities. This gives us significant strength to weather this storm, just as we’ve done with many others in the past. There are undoubtedly some difficult days ahead, but we will tackle them head-on together, as we have always done. Stay safe. Stay healthy



Darren Kirk
President and Chief Executive Officer
Exco Technologies Limited

ESSENTIAL CRITICAL INFRASTRUCTURE

Castool has been deemed an essential workplace, being a supplier of products and services necessary to maintain the continuity of our customer's operations.

Our customers, such as Kaiser Aluminum, Alexandria Industries, Anderton Castings, Le Sueur Incorporated, Kohler Company, Bocar Group, Bonnell Aluminum, Magnode Company and many others supply products related to essential functions, including part used in Medical Equipment, Electrical Energy Infrastructure, Airport Operations Infrastructure, Military Operations, Construction Engines and Generators for Mission-critical Applications, Food and Agriculture, etc

Because these companies depend on their suppliers to support their manufacturing operations, they consider Castool critical to their operation, and therefore exempt from stay at Home orders"

Notice

The Government of Canada introduced temporary special measures that extend the maximum duration of Work-Sharing agreements from 38 weeks to 76 weeks across Canada for those business affected by the downturn in business due to COVID-19 and for the forestry and steel and aluminum sector.

Castool Tooling Systems has modified the working shifts for all employees to add space between employees and reduce the chance of spreading the virus. Working-Sharing (WS) is an adjustment program designed to help employers and employees avoid layoffs when there is a temporary reduction in the normal level of business activity that is beyond the control of the employer. The measure provides income support to employees eligible for Employment Insurance benefits who work a temporarily reduced work week while their employer recovers. Work-Sharing is a three-party agreement involving employers, employees and Service Canada. Employees on a Work-Sharing agreement must agree to a reduced schedule of work and to share the available work over a specified period of time.

Our Customer

Like so many of you, we have spent the last several days and weeks learning about the coronavirus (COVID-19) and how it is impacting our world. For Castool, that means understanding how it affects our employees, customers and communities, and then making the necessary adjustments to our work and operations.

We have one simple objective that guides us; keeping you and our employees safe. This has been at the centre of our conversations every step of the way.

We are closely following the Government of Canada guidelines and recommendations on the steps we can take to help prevent the spread of the virus.

Employees and Visitors

We have shared specific instructions with our employees on the importance of washing their hands and staying home if they feel sick or are returning from an area of the world identified as posing a coronavirus-related risk.

We have asked Castool employees and visitors who have traveled internationally or have been exposed to others who have traveled to such locations, to self-quarantine for 14 days.

Additionally, we are taking steps to prepare those that are able to work remotely should circumstances arise that dictate this need. A strict travel policy for our employees is in place, and we have cancelled meetings and large gatherings, again to do what we can to help prevent the spread of the illness.



Paul Robbins

General Manager
Castool Tooling Systems/
Castool 180

Orders in Process

We know that many of you have orders in process. Currently we are seeing limited impact to project schedules. Please note in the near future this could change and previously committed ship dates may have to be adjusted. In the coming weeks we will provide regular updates with the latest information available to us.

Scheduled Visits

For those of you who have scheduled visits from our Field Service or Sales Team. If you have any concerns, please contact us to reschedule these appointments, if needed.

We will continue to closely monitor the situation and do all we can to protect you and our employees.

We kindly ask that you keep in contact with our Sales Team members in the coming weeks.

Regards,

Paul Robbins
GM Castool / Castool 180 Co Ltd

GETTING CASTOOL READY

HELP REDUCE THE SPREAD OF COVID-19!



We are taking extraordinary steps to prevent the spread of COVID-19. For workplace, this may mean changing or limiting their hours of operation, or even closing for a period of time. Many employees have been told to stay at home, and others have been asked to work from home, while still others are asked to continue to go to work because their jobs are essential to keeping functioning during this outbreak.

Essential workers are considered critical to preserving life, health and basic societal functioning. This includes, but is not limited to, first responders, health care workers, critical infrastructure workers, hydro and natural gas, and workers who are essential to supply society by critical goods such as food and medicines. While all employees should continue to practice physical distancing and hygiene in their personal lives, we also need to take additional measures to protect important workplaces and employees, who are providing essential services.

Employers and employees will need to work together to protect the health of employees and clients, and to keep the workplace delivering its essential services.



FOR ALL EMPLOYEES

All employees should ensure they understand and comply with infection prevention policies and practices in place in their workplace

Keep your hands clean

- ▶ Wash your hands often with soap and water for at least 20 seconds.
- ▶ If soap and water are not available, use an alcohol-based hand sanitizer.
- ▶ Avoid touching your face.
- ▶ Cough or sneeze into the bend of your arm.
- ▶ Avoid touching surfaces people touch often.
- ▶ Instead of a handshake, give a friendly wave or elbow bump.
- ▶ Use any necessary personal protective equipment, as directed.

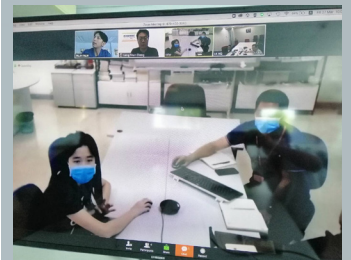
Keep your environment clean

- ▶ Use appropriate products to clean and disinfect items like your desk, work surface, phones, keyboard and electronics, cash registers, keypads, elevator buttons, customer service counters and restaurant tables more often, especially when visibly dirty. If they can withstand the use of liquids for disinfection, frequently touched electronics such as phones, computers and other devices may be disinfected with 70% alcohol (e.g. alcohol prep wipes).

Keep your distance

- ▶ Keep a distance of 2 metres between you, your coworkers, and customers.
- ▶ Increase distance between desks, tables and workstations.
- ▶ Reduce activities that require close physical proximity or contact with people, such as team meetings.
- ▶ Limit any contacts closer than 2 metres to the shortest time possible.

Castool follows the advice of local public health authorities and is taking action to contain the COVID-19 outbreak. However, long term success cannot be taken for granted. All sections of our society, including businesses and employees must play a role if we are to stop the spread of this disease.



Make sure Castool workplace is clean and hygienic

CORONAVIRUS DISEASE (COVID-19)

TAKING CARE OF YOUR MENTAL HEALTH

FEELINGS OF FEAR, STRESS AND WORRY ARE NORMAL IN A CRISIS

The covid-19 pandemic is new and unexpected. This situation can be unsettling and can cause a sense of loss of control. It is normal for people and communities to feel sad, stressed, confused, scared, or worried. People may react in different ways. Some common feelings may include:

- ▶ Fear of becoming ill or infected with COVID-19, or infecting others
- ▶ A sense of being socially excluded or judged by others
- ▶ Fear of being separated from loved ones due to isolation of physical distancing
- ▶ Feelings of helplessness, boredom, loneliness and depression as a result of isolation or physical distancing

CORONAVIRUS DISEASE (COVID-19) CLEANING AND DISINFECTING PUBLIC SPACES WHAT YOU SHOULD KNOW

- ▶ Surfaces frequently touched with hands are most likely to be contaminated. These include doorknobs, handrails, elevator buttons, light switches, cabinet handles, faucet handles, tables, countertops and electronics.
- ▶ It is not yet known how long the virus causing COVID-19 lives on surfaces, however, early evidence suggests it can live on objects and surfaces from a few hours to days.

CHOOSE A PRODUCT THAT CLEANS AND DISINFECTS

- ▶ When cleaning public space, choose products that clean and disinfect all at once (e.g. premixed store-bought disinfectant cleaning solutions and/or wipes when available).
 - Cleaning products remove germs, dirt, and impurities from surfaces by using soap (or detergent) and water. Cleaning does not necessarily kill germs, but by removing them, it lowers their numbers and the risk of spreading infection.
 - Disinfecting products kill germs on surfaces using chemicals.

- ▶ Use only approved hard-surface disinfectants that have a Drug Identification Number (DIN). A DIN is an 8-digit number given by Health Canada that confirms the disinfectant product is approved and safe for use in Canada.

- ▶ Fear of losing your job or not being able to work and struggling financially

- ▶ Concern about your children's education and well-being

CARE FOR YOUR MENTAL AND PHYSICAL WELLBEING

- ▶ Stay informed but take breaks from social media, watching, reading, or listening to news stories
- ▶ Practice physical distancing, but stay connected. Talk to friends or family about your feelings and concerns through email, phone calls, video chats and social media platform
- ▶ Practice mindfulness. Take deep breaths, stretch or meditate
- ▶ Try to eat healthy meals, exercise regularly, and get plenty of sleep
- ▶ Consider how to take advantage of any unexpected flexibility in your daily routine

CREATE A CLEANING PROCEDURE

- ▶ Operators of community settings should develop or review protocols and procedures for cleaning public spaces. This will help determine where improvements or additional cleaning may be needed.
- ▶ Read and follow manufacturer's instructions for safe use of cleaning and disinfection products (e.g. wear gloves, use in well-ventilated area, allow enough contact time for disinfectant to kill germs based on the product being used).
 - ▶ Wash hands with soap and water or use alcohol-based hand sanitizer after removing gloves.
 - ▶ Use damp cleaning methods such as damp clean cloths, and/or a wet mop. Do not dust or sweep which can distribute virus droplets into the air.
 - ▶ Contaminated disposable cleaning item (e.g. mop heads, cloths) should be placed in a lined garbage bin before disposing of items can be washed using regular laundry soap and hot water (60-90°C). Clean and disinfect surfaces that people touch often
 - ▶ In addition to routine cleaning, surfaces that are frequently touched with hands should be cleaned and disinfected more often, as well as when visibly dirty.
 - ▶ Shared spaces such as kitchens and bathrooms should also be cleaned more often.

- ▶ Focus on the positive aspects of your life and things you can control

- ▶ Be kind and compassionate to yourself and others

- ▶ If you can, minimize substance use. If you do use substances, practice safer use and good hygiene

WHO IS AT HIGH RISK?

- ▶ People with medical conditions including:

- Heart disease
- Hypertension (high blood pressure)
- Lung disease
- Diabetes
- Cancer

- ▶ People with weakened immune systems from a medical condition or treatment, such as chemotherapy

- ▶ Older adults

Vulnerable populations may include

- An older adult
- At risk due to underlying medical conditions (e.g. heart disease, hypertension, diabetes, chronic respiratory diseases, cancer)
- At risk due to a compromised immune system from a medical condition or treatment (e.g. chemotherapy)
- Anyone who has:**
 - Difficulty reading, speaking, understanding or communicating
 - Difficulty accessing medical care or health advice
 - Difficulty doing preventive activities, like frequent hand washing and covering coughs and sneezes
 - Ongoing specialized medical care or needs specific medical supplies
 - Ongoing supervision needs or support for maintaining independence
 - Difficulty accessing transportation
 - Economic barriers
 - Unstable employment or inflexible working conditions
 - Social or geographic isolation, like in remote and isolated communities
 - Insecure, inadequate, or non-existent housing conditions

Annual Meeting & Leadership Conference

March 12-14, 2020 • San Antonio, Texas USA

AEC.org/2020AnnualMeeting



ALUMINUM
EXTRUDERS
COUNCIL

Shaping the Future of Our Industry



Dan Dunn
Sales Director
Castool Tooling Systems



"WE
congratulate
Danny on his
achievement"

The Aluminum Extruders Council is heading to the scenic Texas Hill Country for the 2020 Annual Meeting & Leadership Conference.

The event provides extrusion industry executives with business information, industry intelligence and Council updates to aid in planning for the rest of the year.

AEC recognizes one or more individuals for their outstanding service and achievements as an AEC volunteer most years.

Dan Dunn, Sales Director of Castool Tooling Systems was presented with the award this year on March 29 in Texas. Dan has served on many committees including the die and technical services committees, as well as presented in many workshops in person and online. It is a coveted award by anyone who is or has been a member of AEC.

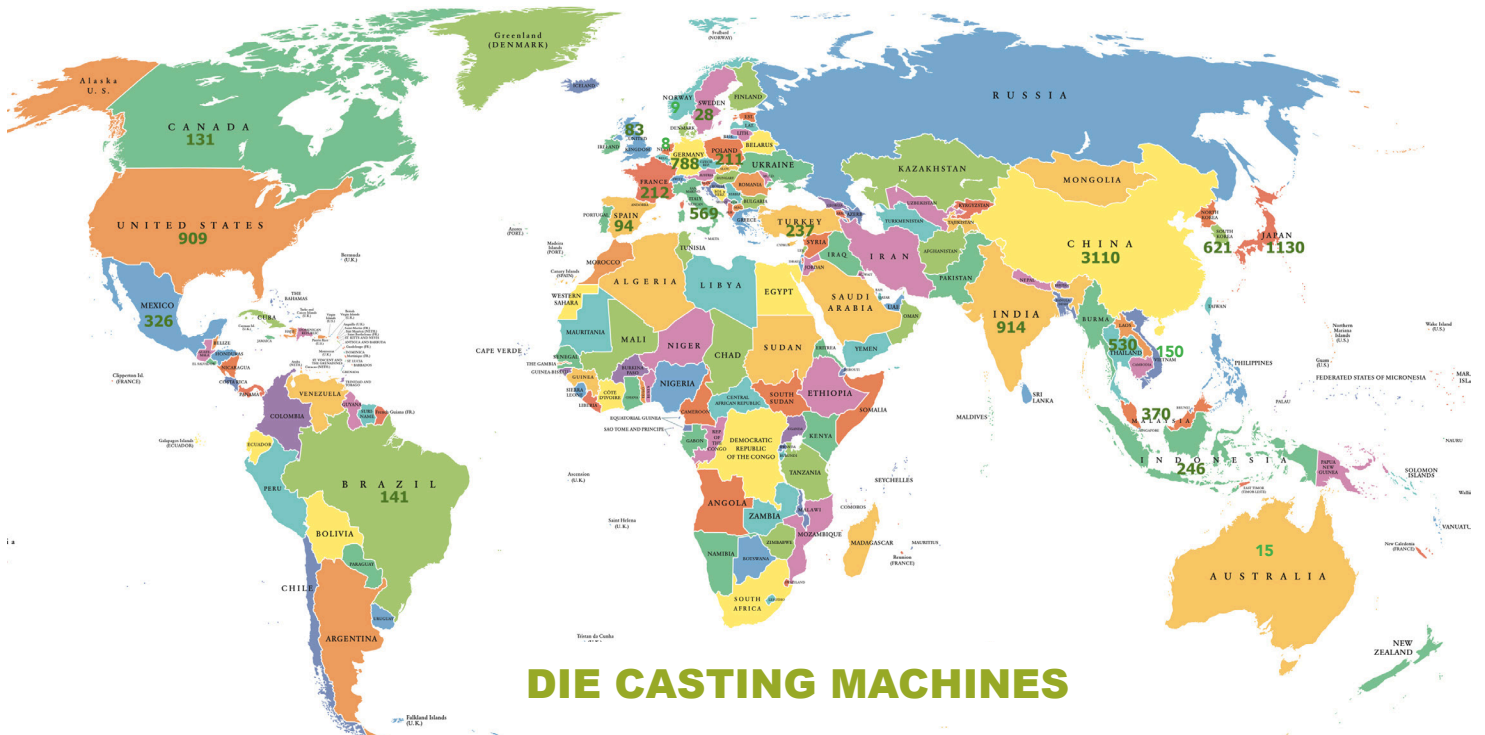


MARKETING



EXTRUSION PASSES

Canada = 47	Norway = 8	Romania = 17	Greece = 44	Russia = 187	Japan = 190
United States= 474	Sweden = 9	France = 47	Turkey = 219	China = 2566	Taiwan = 276
Mexico = 65	Finland = 8	Spain = 110	Egypt = 40	India = 144	Philippines = 39
Cuba = 2	Unite Kingdom=25	Austria = 17	Saudi Arabia=48	Thailand = 115	Indonesia = 208
Venezuela = 20	Germany = 97	Hungary = 5	Pakistan = 30	Vietnam = 145	Australia = 27
Colombia = 19	Poland = 43	Ukraine = 20	Iran = 40	Malaysia = 99	New Zealand=11
Brazil = 83	Italy = 101	Morocco = 9	UAE = 45	South Korea= 98	
Argentina = 38			South Africa= 20		

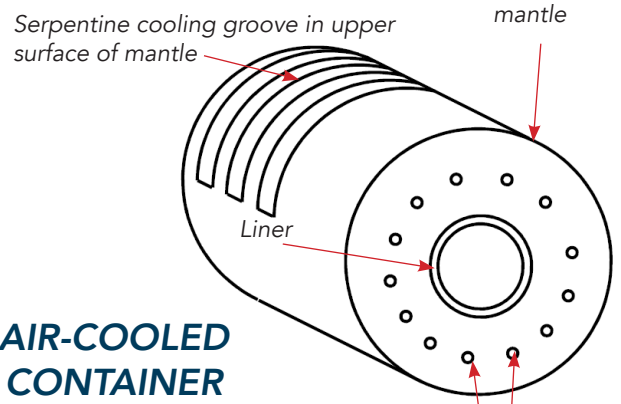


DIE CASTING MACHINES

Canada =131	Norway = 9	Italy = 569	China = 3110	Japan = 1130
United States=909	Sweden =28	France = 212	India = 914	South Korea= 621
Mexico =326	Unite Kingdom=83	Spain = 94	Thailand = 530	Indonesia = 246
Brazil =141	Germany =788	Turkey = 237	Vietnam = 150	Australia = 15
	Poland =211		Malaysia = 370	



This outlines what to look for when identifying products or technologies that possibly overlap with **CASTOOL** patents.



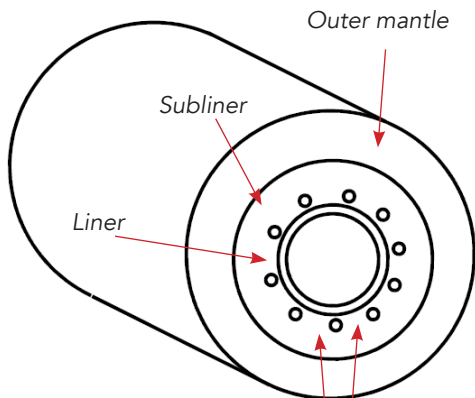
Longitudinal heating elements in mantle

What we are looking for:

ANY Metal Extrusion Press Container having:

- Outer mantle
- Liner having passage for receiving billet
- Longitudinal heating elements in mantle
- Serpentine cooling groove in upper surface of mantle

QR CONTAINER



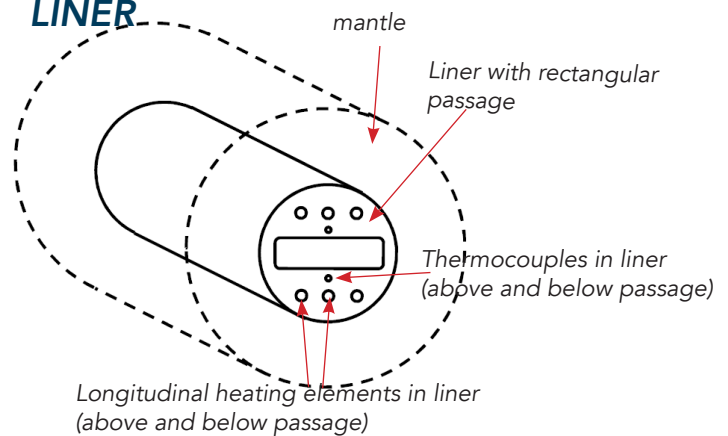
Longitudinal heating elements in subliner "in close proximity" to liner

What we are looking for:

ANY Metal Extrusion Press Container having:

- Outer mantle
- Subliner
- Liner accommodated inside of subliner and having passage for receiving billet; and
- Longitudinal heating elements in subliner in close proximity to liner

RECTANGULAR LINER



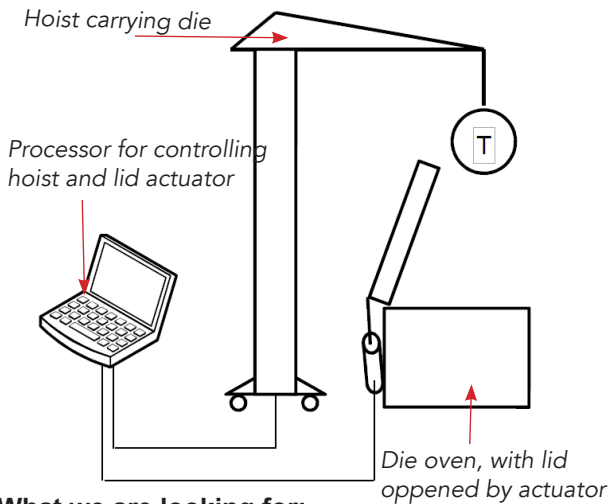
What we are looking for:

ANY Metal Extrusion Press Container having:

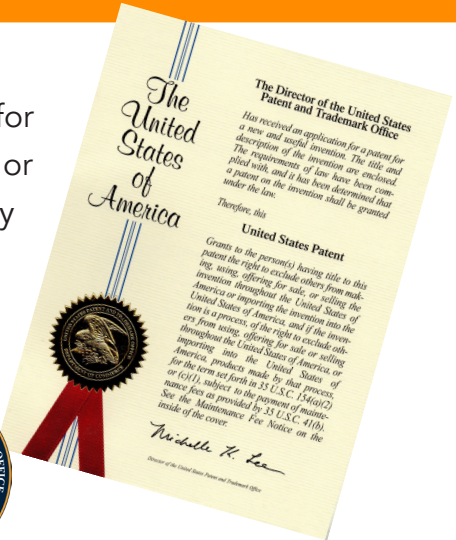
- Outer mantle
- Liner having passage for receiving billet
- Longitudinal heating elements in mantle
- Serpentine cooling groove in upper surface of mantle

If you see any product or technology that has ALL of the features identified by a checkmark, please contact PAUL ROBBINS

DIE PRE-HEATING SYSTEM



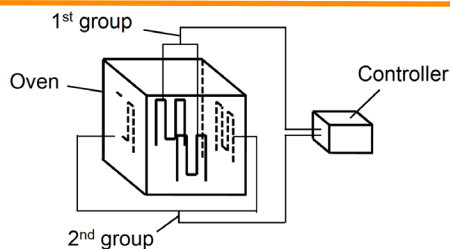
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What we are looking for:

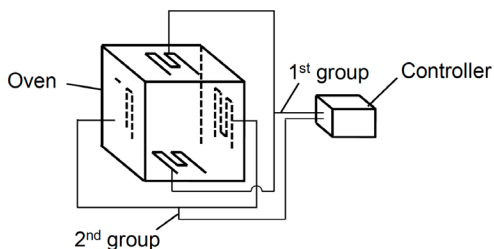
ANY Die Pre-Heating System having:

- One or more die ovens
- Robotic Hoist
- Processor for controlling
 - the hoist
 - the lid actuator of the die oven(s)



4-SIDED DIE OVEN

OR

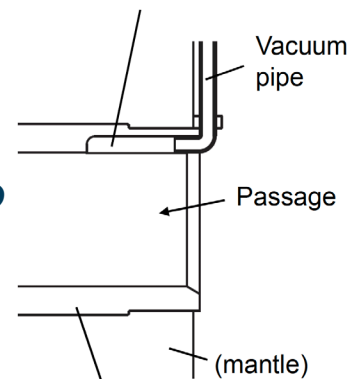


What we are looking for:

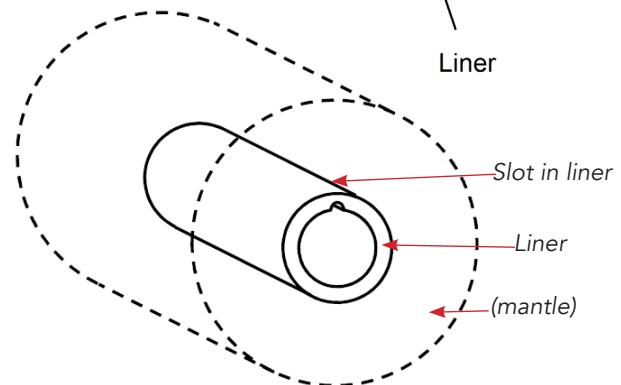
ANY Extrusion Die Pre-heating Device having:

- Oven, with
 - 1st group of heating elements on 1st pair opposing walls
 - 2nd group of heating elements on 2nd pair opposing walls
- Controller for operating the groups of heating elements independently

Slot in liner



VACUUM ASSISTED EXTRUSION



What we are looking for:

ANY Extrusion Die Pre-heating Device having:

- Oven, with
 - 1st group of heating elements on 1st pair opposing walls
 - 2nd group of heating elements on 2nd pair opposing walls
- Controller for operating the groups of heating elements independently

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This outlines what to look for when identifying products or technologies that possibly overlap with **CASTOOL** patents.

TOOL STEEL COMPOSITION

TOOL STEEL COMPOSITION

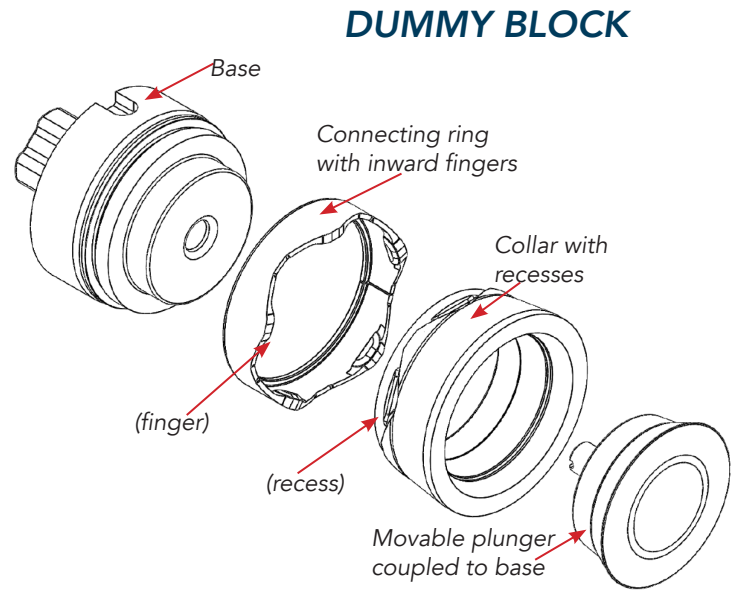
0.35%	< C	< 0.40%
0.32%	< Si	< 0.50%
4.50%	< Cr	< 5.50%
3.75%	< Mo	< 4.75%
0.80%	< V	< 1.00%

What we are looking for:

ANY Tool Steel Composition used in either :

- a die-casting apparatus or
- a metal extrusion press,

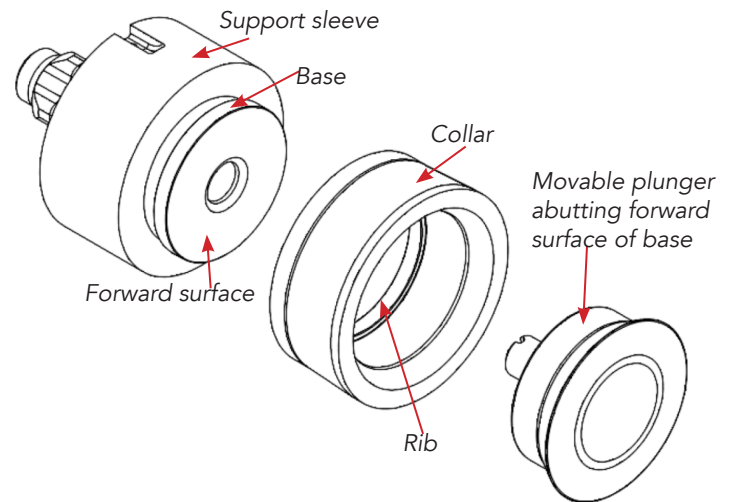
having the composition (wt%) :



What we are looking for:

ANY Dummy Block for a Metal Extrusion Press having:

- Base
- Collar having inner outer recesses
- Moveable plunger coupled to base
- Connection ring coupling collar to base, with inward fingers engaging recesses on collar



What we are looking for:

ANY Dummy Block for a Metal Extrusion Press having:

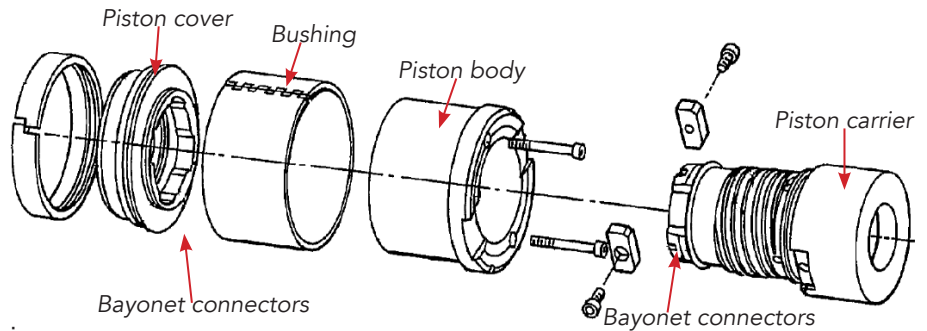
- Base having forward surface
- Collar having inner rib coupled to base
- Support sleeve mounted to base and abutting collar
- Moveable plunger abutting forward surface of base

If you see any product or technology that has ALL of the features identified by a checkmark, please contact PAUL ROBBINS

This outlines what to look for when identifying products or technologies that possibly overlap with **CASTOOL** patents.



ALLPER PISTON



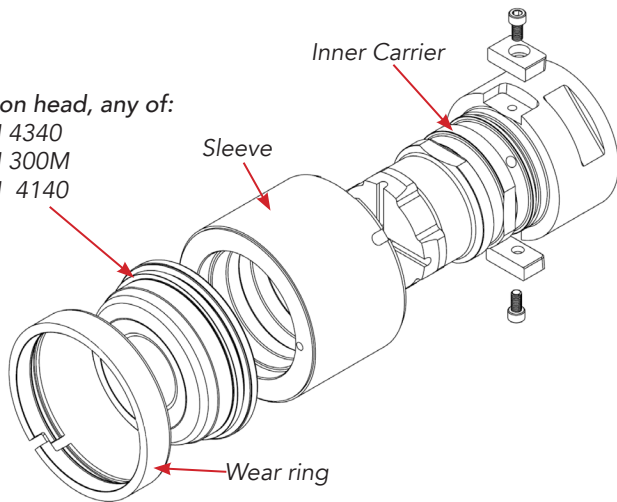
What we are looking for:

ANY Die-Casting Piston having :

- Piston cover
- Piston body supporting bushing
- Piston carrier
- Bayonet connectors on piston cover and on piston carrier

DIE-CASTING PISTON WITH IMPROVED TOUGHNESS

Piston head, any of:
AISI 4340
AISI 300M
AISI 4140

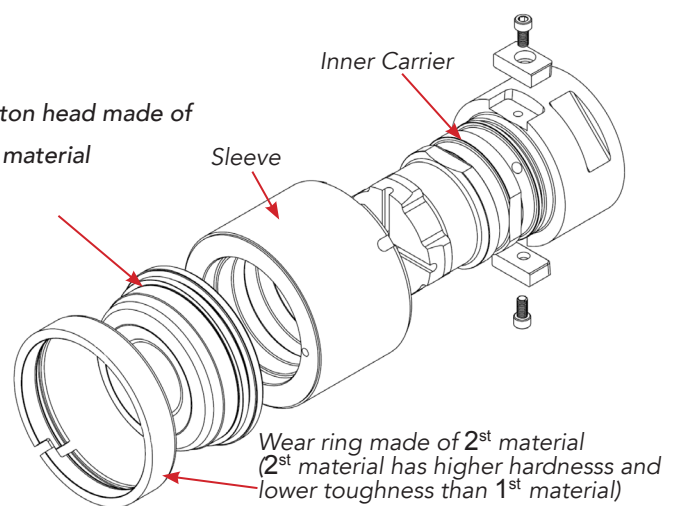


What we are looking for:

ANY Die-Casting Piston having :

- Piston head, made of any of AISI grade 4340, 300M or 4140 steel
- Inner carrier coupled to piston head
- Sleeve on inner carrier
- Wear ring mounted on piston head

Piston head made of 1st material



What we are looking for:

ANY Die-Casting Piston having :

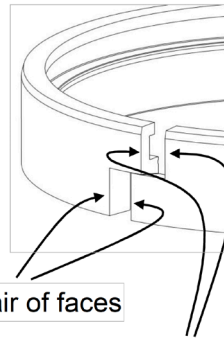
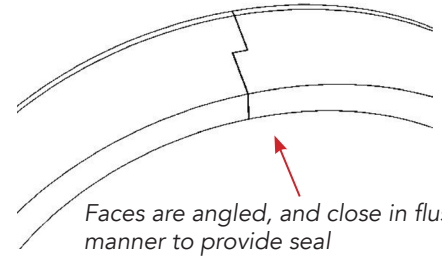
- Piston head, made of 1st material
- Inner carrier coupled to piston head
- Sleeve on inner carrier
- Wear ring mounted on piston head and made of 2nd material with higher hardness and lower toughness than 1st material

If you see any product or technology that has ALL of the features identified by a checkmark, please contact PAUL ROBBINS



WEAR RING FOR DIE-CASTING PISTON

This outlines what to look for when identifying products or technologies that possibly overlap with **CASTOOL** patents.



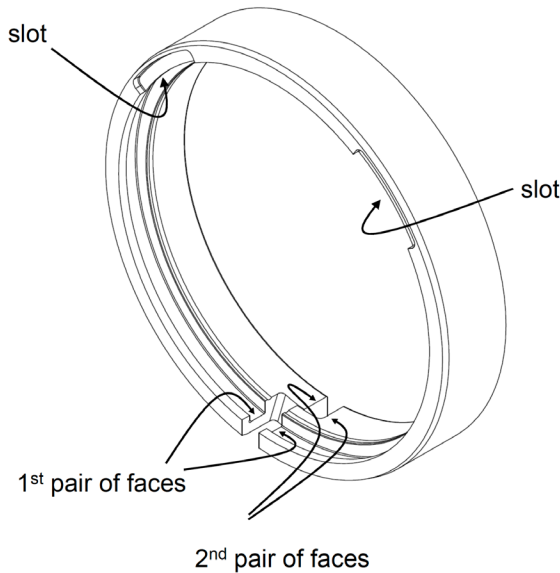
1st pair of faces

2nd pair of faces

What we are looking for:

ANY Wear Ring for a Die-Casting Piston having :

- Ring-shaped body with cut having 2 pairs of opposing faces
- Opposing faces are angled to allow faces to contact each other flush manner when ring is compressed



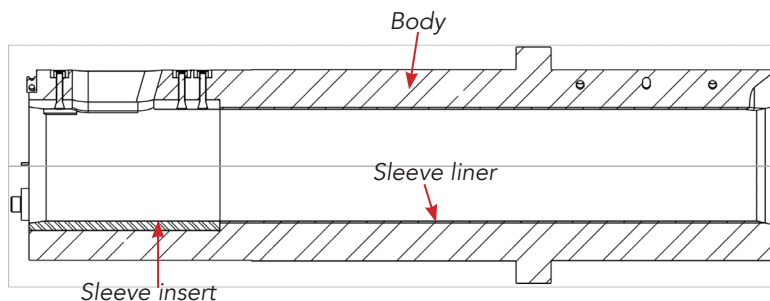
IMPROVED WEAR RING WITH SLOTS

What we are looking for:

ANY Wear Ring for a Die-Casting Piston having :

- Ring-shaped body with cut having 2 pairs of opposing faces
- One or more slots on face of body

SHOT SLEEVE WITH LINER



What we are looking for:

ANY Die-Casting Shot Sleeve having :

- Body having an axial bore
- Sleeve liner formed on bore surface
- Sleeve insert abutting the liner

If you see any product or technology that has ALL of the features identified by a checkmark, please contact PAUL ROBBINS

Flow Simulation Analysis Plunger Tip Assemblies

Most of the heat produced from the fluid, is being transferred via the Plunger head, whilst very little heat is being transferred via the plunger body. A flow simulation analysis was performed on numerous Plunger Tip assemblies, in an objective of determining the average fluid velocity at the Plunger Head. With this determined average velocity, heat can more effectively be dispersed throughout the assembly.

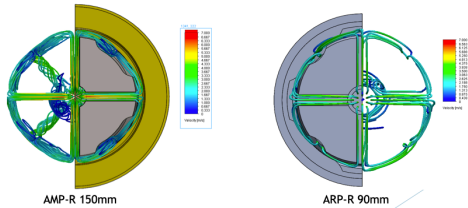
AMP and ARP

AMP and ARP assemblies, were utilized in order to determine an average approximation velocity

An average velocity of 4 m/s was determined for both AMP-R 150mm; 45L/min and ARP-R 90mm;26L/min

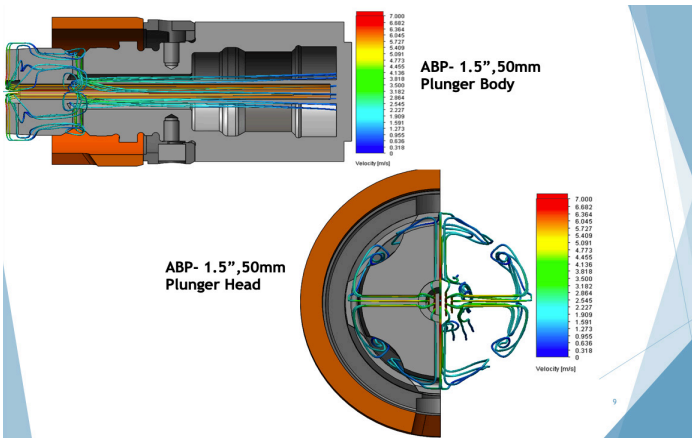
These results were compared to 6 other plunger tip assemblies, consisting of ABP, ARP and AMP plunger tip assemblies

A set velocity range was determined to be 0 to 7 m/s for all simulations



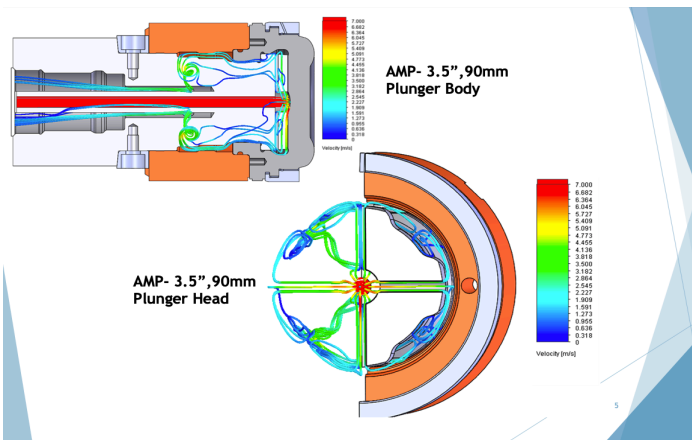
AMP #1

- ▶ 3.5", 90mm
- ▶ Outlet Waterflow (L/min): 18-21 L/min
- ▶ Differing the flow rate did not have a great impact on the average velocity at the tip
- ▶ When differing waterflow from 18-21L/min, the average velocity fluctuated by 0.2m/s
- ▶ Flow rate of 18L/min, was the chosen flow rate as it provided an average velocity of 4.3 m/s, which was most consistent with the results determined by the initial AMP and ARP assembly simulations



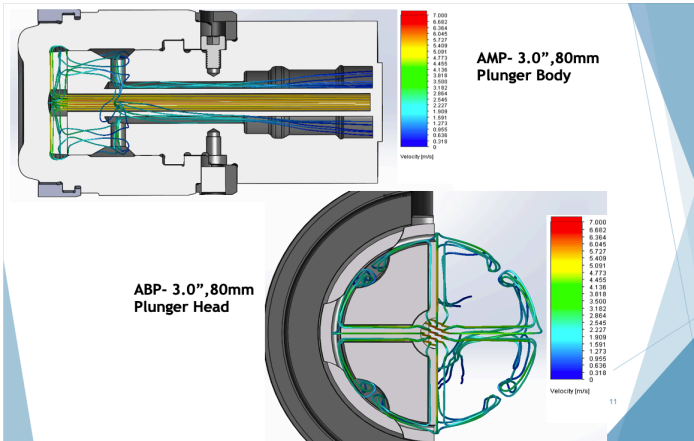
AMP #2

- ▶ 7.0", 180mm
- ▶ Outlet Waterflow: 55-60L/min
- ▶ Differing the flow rate did not have a great impact on the average velocity at the tip
- ▶ When differing waterflow from 50-60L/min, the average velocity fluctuated by 0.3m/s
- ▶ Flow rate of 55L/min, was the chosen flow rate as it provided an average velocity of 4.8 m/s, which was most consistent with the results determined by the initial AMP and ARP assembly simulations



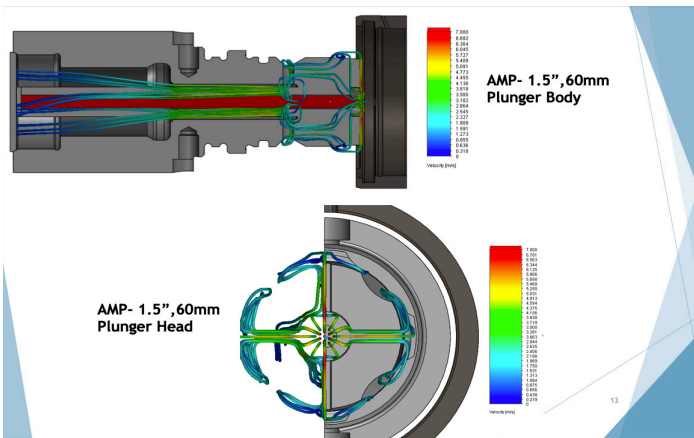
ABP

- ▶ 3.0", 80mm
- ▶ Outlet Waterflow: 15-18L/min
- ▶ Differing the flow rate did not have a great impact on the average velocity at the tip
- ▶ When differing waterflow from 15-18L/min, the average velocity fluctuated by 0.3m/s
- ▶ Flow rate of 15L/min, was the chosen flow rate as it provided an average velocity of 4.4 m/s, which was most consistent with the results determined by the previous AMP and ARP assembly simulations



ARP

- ▶ 1.5", 60mm
- ▶ Outlet Waterflow: 8-10L/min
- ▶ There was visible change when increasing the flow rate
- ▶ When differing waterflow from 8-10L/min, the average velocity increased by 1 m/s
- ▶ Flow rate of 8L/min, was the chosen flow rate as it provided an average velocity of 4.6m/s, which was most consistent with the results determined by the previous AMP and ARP assembly simulations



ARP

- ▶ 7.0", 180mm
- ▶ Outlet Waterflow: 50-60L/min
- ▶ There was visible change when increasing the flow rate
- ▶ When differing waterflow from 50-60L/min, the average velocity increased by 0.5m/s
- ▶ Flow rate of 60L/min, was the chosen flow rate as it provided an average velocity of 4.0m/s, which was most consistent with the results determined by the previous AMP and ARP assembly simulations

Analysis of Results

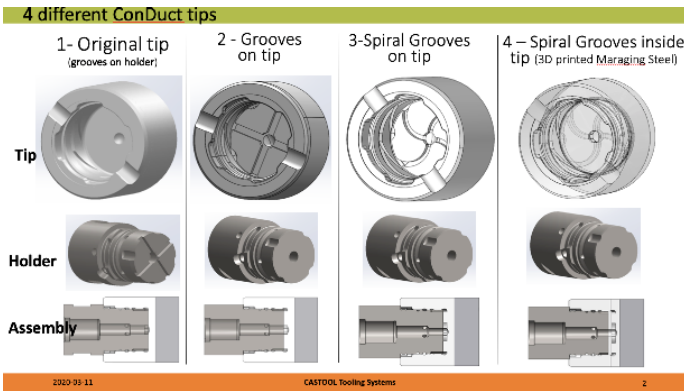
The plunger tip assemblies had average velocities within a range of approximately 4-5m/s, demonstrating consistent results with the initial AMP and ARP simulations.

Analysis of Results

The plunger tip assemblies had average velocities within a range of approximately 4-5m/s, demonstrating consistent results with the initial AMP and ARP simulations.

Effect of location of cooling grooves in Plunger Tip

- ▶ Grooves on holder
- ▶ Grooves on tip
- ▶ Spiral grooves on tip
- ▶ Conformal cooling channels (spiral)

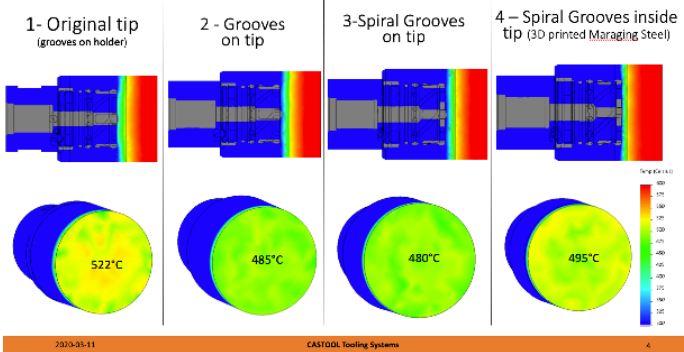


Simulation conditions

- ConDuct tip 5.5"
- 2" aluminum biscuit of 700°C gets in contact with plunger tip
- Heat only dissipates through the tip (cooling affects of sleeve and die are not considered here).
- Transient thermal simulation + biscuit solidification
- Initial temperatures:
 - Plunger: 50°C
 - Aluminum biscuit: 700°C
- Cooling:
 - Convective media of 27°C

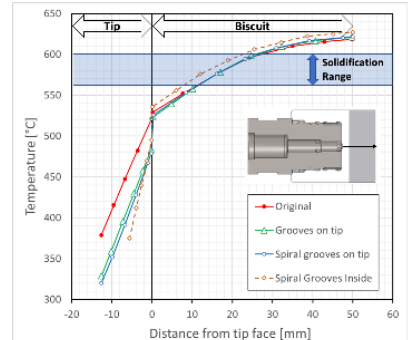
2020-03-11 CASTOOL Tooling Systems 3

Temperature distribution after 30 seconds in contact



Temperature distribution after 30 s

Tip design	Temperature at the centre of tip face [°C]
1-Original	522
2-Grooves on tip	485
3-Spiral grooves on tip	480
4-Spiral grooves inside	496



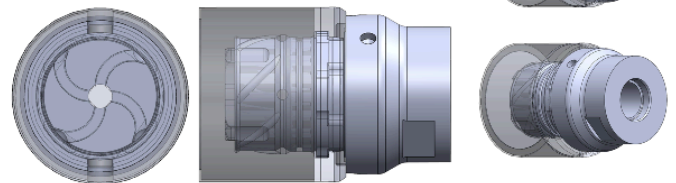
Conclusions

- The conduct tip with spiral grooves on the tip gives the best results in terms of tip face temperature.
- 3D printed Maraging steel tip results in hotter tip face due to lower conductivity of Maraging steel compared with conduct
- Another positive effect of adding grooves into the tip (rather than holder) is more material to act as heat sink in the tip which is in direct contact with hot aluminum.

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Proposed design

Spiral grooves on the tip (ConDuct material) with additively manufactured hard surface around it for wear resistance purposes



EVENTS COMING UP

20th INTERNATIONAL Aluminum Extrusion Technology Seminar & Exposition



We will continue to keep you updated as new details become available.

We looking forward to seeing you at Hyatt Regency Orland - Florida USA

Castool Tooling Systems
Booth # 509

ET '20 Postponed Due to Coronavirus Threat

March 13, 2020; Chicago, Illinois -- The Aluminum Extruders Council (AEC), the organizer of the Twelfth International Aluminum Technology Seminar & Exposition – ET '20, has been closely monitoring the COVID-19 outbreak and the information and direction issued by the World Health Organization (“WHO”), U.S. Center for Disease Control (“CDC”) and various states, including the State of Florida, in handling this crisis and addressing the potential health risks to our attendees and employees. As we know, the WHO declared the novel coronavirus disease a global pandemic on Wednesday, March 11, 2020. In addition, President Trump acted this week to ban incoming European travelers, and the CDC (as well as other authorities) advise against large gatherings. In addition, we recently have been informed that a significant number of ET'20 attendees, speakers, and exhibitors are prevented from traveling to the event due to travel bans imposed by their employers and countries.

As a result of the ongoing issues, the AEC Board of Directors and the ET Steering Committee have decided to postpone ET '20. The search will begin at once to find a new date, ideally for later this year. AEC will keep stakeholders up to date on these developments as event space and dates will need to be secured very quickly. For those that have already registered for ET'20, reserved exhibit space, or provided a sponsorship, please be aware that those investments will be applied to the rescheduled event. So, current exhibitors, sponsors, authors and attendees will not need to do anything at this point to reserve their position at ET'20.

“After hearing from the members over the last few days, and watching these unprecedented events unfold at alarming speeds, it simply made no sense to go forward with ET'20 in May of this year. The ET brand is one of the most cherished assets of the Council, and we aim to do everything possible to keep in good standing with the global aluminum extrusion market during these difficult times,” said the President of the AEC, Jeff Henderson. He added, “We ask for all sponsors, presenters, attendees, and exhibitors to be patient with us over the coming days as we reset the schedule and begin focusing on delivery the best ET ever!”



EP: Extrusion/Die Practical Track

EP7

Extrusion Productivity-Billet Geometry/Container/Dummy Block

Paul H. Robbins and **Yahya Mahmoodkhani**, **Castool Tooling Systems**; **Chris Jowett**, Rio Tinto Aluminium, Canada;

The best billet geometry for achieving high extrusion productivity is presented that minimizes press force, allowing minimized billet temperature and maximized extrusion speed. Blindly increasing billet length or diameter and expecting improved productivity may create other process problems: dummy block functioning; extrusion dimensions; butt shearing; metal flow; etc. Increasing billet weight may increase contact utilization, but not increase productivity. These subjects are addressed to better understand how billet geometry affects extrusion productivity.

TH: Extrusion/Die Theoretical Track

TH8

Extrusion Productivity-Ram Speed/Container/Die

Paul H. Robbins and **Yahya Mahmoodkhani**, **Castool Tooling Systems**; **Chris Jowett**, Rio Tinto Aluminium, Canada; and **Richard Dickson**, Hydro Aluminum, USA

predicting maximum ram speed is proposed, based on current billet, available press load and tooling, particularly container design/materials and die parameters. Correct container design and material, container set and billet temperatures are suggested to improve productivity. The impact of billet temperature, container set temperature, container temperature taper and container steel conductivity is examined. Studying what happens inside the container before metal reaches the die, and studying profile geometry, extrusion ratio and die design are presented.

MI : Management Issues Track

MI 163

A Fine Balance, the Difference between Excellence and Mediocrity

Richard F. Dickson, *Hydro Aluminum USA*, and **Paul H. Robbins** and **Castool Tooling Systems**, Canada

Management team's extrusion performance questions are addressed. Extrusion is highly dependent on tooling, equipment and processes. Certain key parameters, if uncontrolled, inhibit toward world-class results, and why they drop at/below average industry levels is assessed. Focus areas resulting in performance growth or decline are highlighted. Technical expertise and exceptional management successfully working together are outlined. Key insights and recommended focus areas are presented.

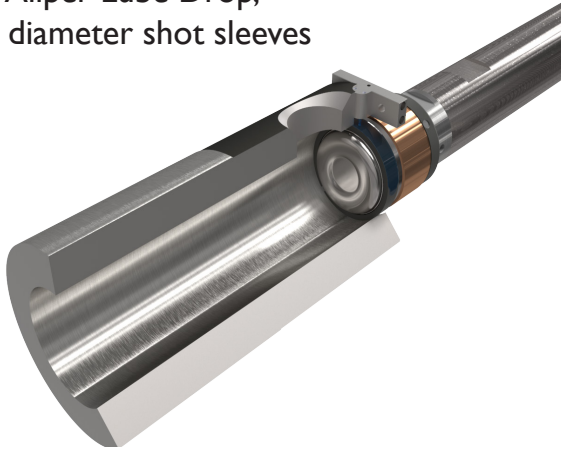
Technical Sessions
3 Abstracts
accepted for ET'2020

Recent Technical Sessions
in ET'20 : A Clear vision for the
Future

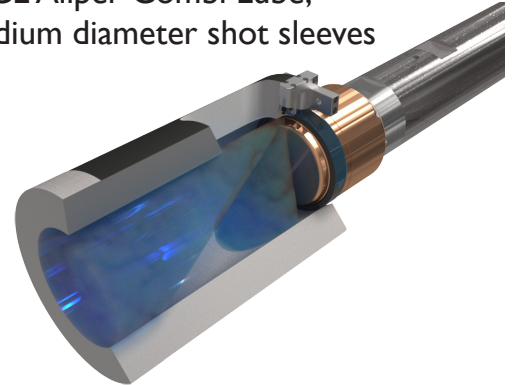
DIE CASTING UPDATES

The lubrication system has been developed in conjunction with the ALLPER-Plunger systems to reduce the friction between the sleeve and the plunger; to ensure the smooth passage of the plunger through the sleeve and the resulting high quality casting. This is essential for consistent shot velocities and to extend the operating life of both the shot sleeve and the plunger trip. Bigger and longer shot sleeves and larger castings are making this more difficult than ever.

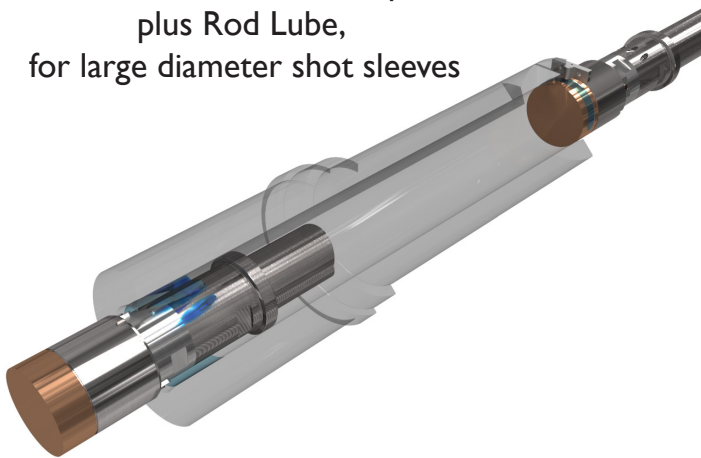
ALD Allper Lube Drop,
for small diameter shot sleeves



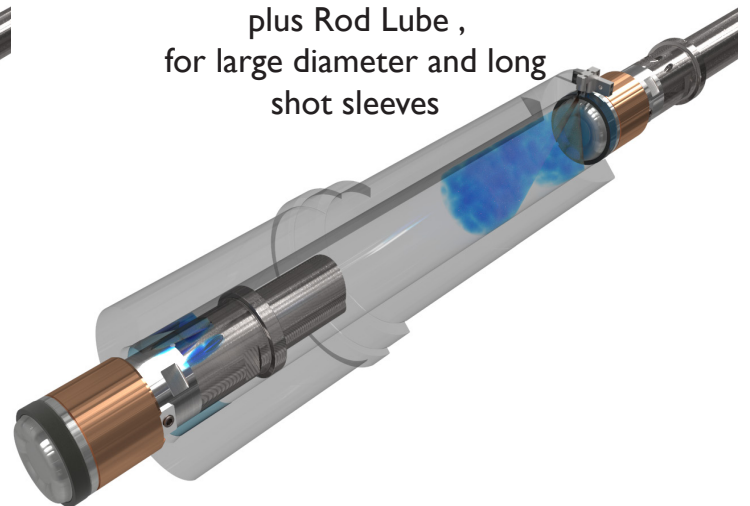
ACL Allper Combi Lube,
for medium diameter shot sleeves



ALD + CRL Lube Drop
plus Rod Lube,
for large diameter shot sleeves



ACL + CRL Combi Lube
plus Rod Lube,
for large diameter and long
shot sleeves



CLS-200 Vegetable based ester lubricant that is biodegradable. It is blue in colour, remains in solution and has a high flashpoint. It also has low smoke, and is very well priced.

CLS-200 has been formulated for application on all types of plunger tips and plunger rings : beryllium copper, bronze, steel and all diameters.

RDX SYSTEM

9 REASONS TO BUY AN AUTOMATED DIE PREHEATING SYSTEM

BY **CASTOOL**
TOOLING SYSTEMS®

TO EXPEDITE DIE SCHEDULING AND HEATING

The Castool RDX System is an innovative process designed to assist the operator in improving productivity.

The RDX is a robotic system which expedites the scheduling and heating of the die from the time of its arrival from the die shop until its installation on the press.

Although the die will be heated and moved according to a prepared formula, the press operator will continue to have complete control at all times, and will make all necessary decisions during every step in the process.

1. Finally, a fully automated die preheating system that monitors, measures and records all times and temperatures of each die from the moment it is selected by the operator until it is placed in the die slide, but allows the operator to intervene at any time.

2. After heating, the die is held at temperature until required.

3. If a heated die is sitting in the ambient air temperature of the shop floor it will cool at the rate of about 5 C (10 F) per minute, and twice that when in the die slide due to the heat sink effect of the mass of metal below it.

4. Time taken for the die to leave the oven and enter the press at operating temperature is scheduled and controlled. The human factor can never be completely eliminated, but the cost of unscheduled delays can be reduced to near zero by the Castool Automated Die Preheating System.

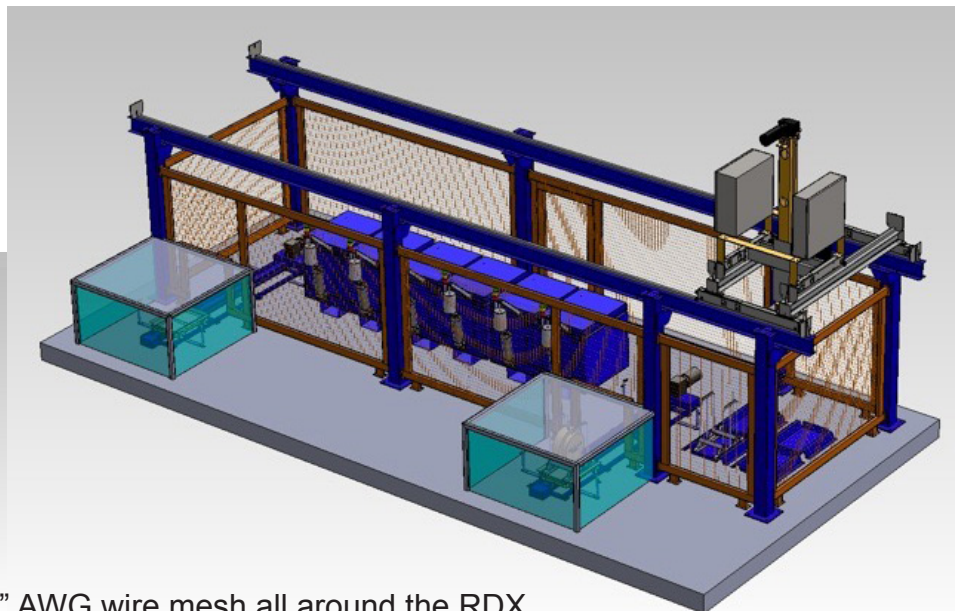
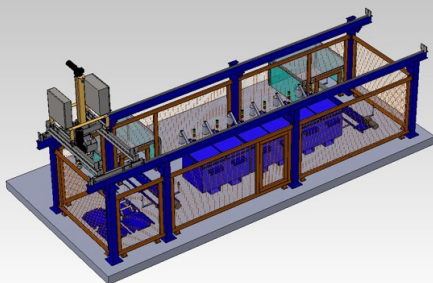
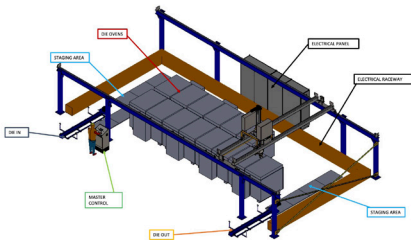
5. If a die is allowed to cool for more than 5 minutes, the operator is warned by an alarm and the incident recorded. If the die remains at temperature in the oven for more than 5 hours, the operator is also warned by an alarm and the incident recorded. It is a fact, that if a recurring negative incident is recorded and reviewed, improvement will be immediate and ongoing.

6. As time and temperature of each die is monitored and recorded, each time productivity of a die improves, its production "best yet" formula is updated.

7. It prevents the premature removal of the die from the oven.

8. It eliminates the danger of the operator working near an open oven.

9. Castool's Automated Die Preheating System is the ultimate tool for today's light metal extruder.



3"x3"x1/8" AWG wire mesh all around the RDX

TRADE SHOWS



Winter/Spring 2021

TBA

Hyatt Regency
Orlando, Florida, USA



Booth # 12L01

October 6-8, 2020
Messe, Dusseldorf
Germany



DIE CASTING
CONGRESS
& TABLETOP

Booth # 219

October 20-22, 2020
Rapids, MI, USA



Japan Die Cast Congress
& Exposition 2020
November 12-14, 2020
Pacifico Yokohama, Japan



BOOTH # BA-40
HALL 100

November 18-21, 2020
BITEC, Bangkok, Thailand

THE INTERNATIONAL TEAM

Dan Dunn
Krystean Rose

Sales Director
Sales Manager North America

Glenn Titmuss
Merih Marzari
Keattikhun Chaichana
Andre Iulianetti
Jean Dembowski
Tanmanun Tiantip
Christine Kaschuba
Sue Lotton
Sue Su
Keona Kirwan
Phudis Phollawan
Ploy Robbins

Sales Coordinator APAC
Sales Coordinator EMEA
Product Specialist Asia
Product Specialist North America
Commercial Manager
Commercial Supervisor
Customer Service
Customer Service
Customer Service
Customer Service
Marketing Director

CANADA/USA

Jon Veenstra
Sebastien Deroy
Ron Steininger
Sam Durbin
Tom Boyd
David Holder

JW Industries LLC
Sea Bass Outdoors
R-Bet Sales Inc
R-Bet Sales Inc
Boyd Screenprinting Technologies, Inc
DEH Consulting LLC

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Osvaldo Lomas
Alberto Forcato
Carlos Maciel

Kautec America
Casmet
Forcato Technologia
Carlos Alberto Maciel Garciduenas

EUROPE

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Olivier Druhen
Bertrand Schnell
Emmanuel Mandrelli
Pascal Schorung
Lars-Goran Nilsson
Luciano Pedrini
Jakub Jasiewicz
Edgar Seufert
Jurgen Barz

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KDO Komponenty Dla Odlewnictwa
Schemlmetall
Schemlmetall

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Emmanuel Mandrelli *Comexale*

ISRAEL

Tuvia Kornfield *NTK Plant Management*

TURKEY

Tuvia Kornfield *NTK Plant Management*

SOUTH AFRICA

Olivier Druhen *Comexale*

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Shigeyoshi Takagi
Tetsuya Ishida
Yasunori Ito
Nami Ito

Techno Consul Benchmarks
Tandem Technologies
KBS Kubo Manufacturing Co
KBS Kubo Manufacturing Co

KOREA

JH Song
SW Song
Tae Jean Hwang

ANK Ltd
ANK Ltd
GS Tech SOolutions

TAIWAN

Jack Lee

Shiny Lee

CHINA

Daniel Cheng
Long Shun Cheng
Tony Chein

OEA Bridge Link
OEA Bridge Link
OEA Bridge Link

THAILAND

Manu Mekdhanasarn
Patcharee Parkong

Siam Anglo Alloy Co.Ltd
Siam Anglo Alloy Co.Ltd

VIETNAM

Manu Mekdhanasarn
Patcharee Parkong
Tran Thi Thanh Thuy

Siam Anglo Alloy Co.Ltd
Siam Anglo Alloy Co.Ltd
Thang Long Mechanics Equipment Co

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Yovinus Krisananto

PT Willisindomas Indahmaktur

MALAYSIA

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Patcharee Parkong

Siam Anglo Alloy Co.Ltd
Siam Anglo Alloy Co.Ltd

SINGAPORE

Manu Mekdhanasarn
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Sachin Kumar

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Doug Loader
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Extrusion Machine Co New Zeland
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