

NEWSLETTER

DECEMBER
2022

2030 ALUMINUM OUTLOOK

The aluminum industry is keeping its foot on the pedal, developing solutions aimed squarely at addressing automakers most pressing needs to offset mass given added content and weight from new features, additional safety needs, and the move to electrification. Aluminum will record relentless year-over-year growth through 2030," said Abey Abraham, managing director, DuckerFrontier

After weathering 2020 and 2021 fairly well, Castool has had a very challenging 2022. Work was disrupted by Covid infections and booster shots, supply chain issues, logistics and inflation for the past 9 months, but we appear to have recovered. Our attendance and deliveries are now both relatively stable.

We took advantage of this period of time to develop a much-needed new dummy block HPR (High Pressure Ring) and plunger tip CRP (Conformal Ring Plunger) to meet our customer needs. We have also completed Castool 90 plant in Kenitra, Morocco, a heat treat facility in Newmarket, Canada and will complete Castool 25 plant in Queretaro, Mexico prior to the end of 2022. Castool heat treat is expected to be certified by most automakers for heat treating large H-13 inserts to the highest standards this winter.

Castool is ready to meet the needs of the aluminum industry for the next decade in terms of quality, size, volume and technology.

Paul Robbins
General Manager





The market environment was very difficult in 2022 as lingering implications from COVID shut-downs and Russia's invasion of Ukraine reverberated through the global economy. These events contributed to elevated inflationary pressures, labour shortages, logistical hurdles, rising energy costs and many other supply chain challenges.

We nonetheless had many accomplishments during the year. We grew our sales through market share gains and greatly enhanced our own productivity, finding numerous ways to do more, with less. Moreover, we advanced several new operations that will underpin our growth for many years. Castool 90 in Morocco is steadily gaining traction, our new heat treatment operation in Newmarket is ramping up, and Castool 25 in Mexico is taking shape. Importantly, we welcomed many new employees to Castool during the year who have joined our exciting mission – to make better castings and profiles faster.

Looking forward, there is lots of talk about an impending recession, however there are many reasons to be optimistic. Vehicle production volumes are expected to increase as access to microchips improve, supply chains appear to be easing, demand for our products remains strong and we are extending our global reach with new facilities. We are very well positioned to thrive in 2023 no matter what the market has in store for us.

Sustainable Marketplace

Our business directly supports the electric vehicle revolution and worldwide movement towards reducing emissions. An increase in the use of aluminum across many industries is a key driver of this tailwind, especially in the automotive industry. But aluminum ultimately touches on virtually every end market as the application for its use in an environmentally friendly manner is extremely diverse. As well, Castool's products are key enablers of efficiency in both the die-cast and extrusion processes globally. Consequently, as our customers push environmental sustainability goals through their entire supply chain, there is tremendous opportunity for us to do right, and do well.

ESG Strategic Priorities

We commit to being socially conscious, and above all, to taking great care of our people. We aim to run our facilities as safe and efficiently as possible, delivering innovative, high-quality products with less energy, fewer materials and lower waste. Castool has achieved ISO 14001 certification, the international standard that specifies requirements for an effective environmental management system. Meanwhile, our growing multi-plant footprint gives us proximity to our customers while also reducing our own carbon footprint. Looking ahead, as ESG initiatives continue to intensify across all industries, I am pleased to say that our strategic priorities are clear. We are very well positioned to not only grow profitably but to contribute positively to the global sustainability movement in the years ahead.

Our People Are Our Greatest Strength

Since Exco's inception some 70 years ago, our company has become not just global, but world class. This statement is a direct reflection of the committed, talented and high performing people we have. I thank you for your hard work, shared belief in our core values, entrepreneurial spirit, and commitment to always working safely.



*Darren Kirk
President and
Chief Executive Officer*

CASTOOL TEAM

We welcome all our new employees



CASTOOL - CANADA

Harwinder Singh
QUALITY INSPECTOR

Shan Ali
CLEANER

Cooper Rovo
CLEANING

Cole Fox
CLEANING

Shandy Noel
PANEL BUILDER

Janarathanan Vinayakommorthy
PANEL BUILDER

Darshitbhai Surti
ELECTRICAL CONTROLS DESIGNER

Gregory Jenkins
PACKAGING

Michael Kimmerer
SHIPPING & RECEIVING

Arsheep Gill
SHIPPING & RECEIVING

Ryan Burtch
MILLING & HONE OPERATOR

James Gregg
CNC OPERATOR

Dale Beckford
WELDER

CASTOOL180 - THAILAND

Kittisak Thepso
MANUAL LATHE OPERATOR

Chotika Rintawong
INSIDE SALES

CASTOOL 90 - MOROCCO

Halima Krikiba
OFFICE MAID

Allal el Moussaoui
TECHNICIEN MAINTENANCE

Yassine Taki
VTL BULLARD OPERATOR

Noureddine Jouied
AGENT DU SERVICE EXPEDITION

Mouhsine Ghazouli
VMC MILLING OPERATOR

Jaouad Ei Ghedyouy
DUMMY BLOCK ASSEMBLY OPERATOR

Tarik Sadik
VTL BULLARD OPERATOR

Soufiane Ait Benkhaiy
QUALITY CONTROLER

Jaouad Ei Ghedyouy
DUMMY BLOCK ASSEMBLY OPERATOR

Justin Gamage
TECHNICAL MANAGER

CASTOOL 25 - MEXICO

Hugo Manuel Lopez Gonzalez
FINANCE MANAGER

Heriberto Mejia Rojas
PRODUCTION MANAGER

Jorge Humberto Avila
PROCESS MANAGER

CASTOOL HEAT TREAT - CANADA

Akbar Abdoullahi Kharati
MATERIAL HANDLER

Sergio Sosa
MATERIAL HANDLER

CASTOOL TEAM

We would like to introduce



Mohammed's experience includes a variety of Accounting, Audit and Management Control. His first Experience was with SNOP Tangier, Automotive company producing stamped and assembled parts delivered directly to Renault and Stellantis Group. Then he worked with AGC Automotive who are producing Glass for cars, and developed his skills and experience to analyze the monthly reports and to help on making new decisions and performance. Mohammed joined Castool last year as Finance Manager. He has been developing skills into a new position, new activity and with a very good Team. Mohammed's aim is to integrate his individualized approach to help the team achieve the objectives and increase the Sales and Profit of Castool 90



Salma graduated from ISCAE business school since 2020, and has a master's degree of Marketing and Communication. She worked as Sales & Operations support in VIVO ENERGY, the distributor of Shell and Engen branded fuels and lubricants to retail and commercial customers in Africa. Next she occupied the position of Customer Support in INTELICIA Call Center, and then the position of Leader Sport Manager in DECATHLON, the sporting goods retailer. Salma is happy to work in inside sales for Castool 90 – Morocco. Salma can easily tell that, "it will be a long journey within this family, to learn, grow together and develop my career. Couldn't be more grateful !"



Justin Gamage joined Castool 90 as Technical Manager in June 2022. He is originally from the UK, and has worked across Europe, Asia and the Middle East, and lived in Morocco for the last 4 years with his wife and 9 year old daughter. Justin is technical professional with 25 years experience in the aluminum and special metals industries. Most recently he worked as Technical Director for Aluminium Du Maroc, leading the operational objectives, the implementation of a 3.5 million investment plan, and driving the operations team towards achieving company KPI's. "Every successful company is a team of committed and talented individuals, inspired by their leadership and fulfilled by their work". He looks forward to being a part of the Castool team.



Chotika (Mim) joined Castool180 in June 2022. She holds BA in Logistics and Supply Chain Management. She is working in Inside Sales. Mim enjoys reading books to improve herself, exercises regularly and has a dream to be a good business executive in all aspects and grow with the company.

Changing of the guard, hiring sons and daughters to make our business model sustainable



ANK Ltd (Korea)

Sangwook graduated Korea University of Foreign language with a degree in Japanese and English language. After two years military service, he joined Alcan's Seoul office and worked for sales mainly dealing with Japanese customers.

Sangwook moved to ANK in 2009, and has managed Castool business and also manganese & aluminum alloy business from South Africa and Bahrain as a sales manager of ANK.

He loves new experiences of various foreign culture/history/technology, that is why he studied in multiple languages in university. He has fully enjoyed his career as a sales manager with various partners.

Castool gave him a great impression and motivation during his visit to Canada and Thailand, and he feels a satisfaction from working for Castool in Korea. He hopes this will be a much better relationship and wants to contribute more to Castool.



Shiny Lee (Taiwan)

Wan-Han Lee has her BSc from National Chung Hsing University, Taiwan. She completed her MBA in marketing from California State University in 2004. She works with her father Jack Lee supporting Castool's business and their customers in Taiwan.



OEA Bridge Link (China)

Long Shun graduated from Chemical Engineering at the University of Waterloo. He has been participating in various investment and marketing projects in China, in association with business partners from North America and Europe. One of Long Shun's main responsibilities at OEA is to represent Castool for its business activities and interests in China, which includes promoting sales development and technical service as well as administration of marketing networks and credit/logistic control, through the strong support of and close communication with colleagues of Castool in Thailand and Canada.



Siam Anglo Alloy Co.Ltd (Thailand)

Prior to joining the Castool team in October 2022, Nattapat began his career in financial advisory services with over 4 years of experience in investment banking in Thailand. During such period, he has been heavily involved in assisting corporate clients, specifically within the oil and gas industry, in numerous large-scale and award-winning capital market transactions (e.g. the THB 54,000 million Initial Public Offering (IPO) of PTTOR – the largest IPO in Thailand and the largest Oil & Gas IPO in Southeast Asia). Nattapat completed his Undergraduate degree in Manufacturing Engineering (First Class Honors) and Master's degree in Investment & Wealth Management (Distinction) from Imperial College London. Nattapat is highly enthusiastic and exudes strong interest in health and fitness, where he can be seen playing tennis or working out at the gym during the weekend and in his free time.

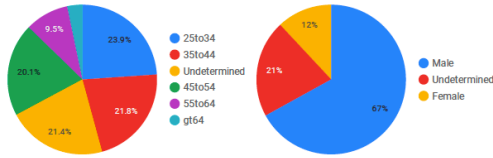
UPDATED WEBSITE AND GOOGLE ADS



Website engagement metrics were generally up. Average pages per session was down slightly by 3%, page session duration was up 23% and bounce rate was increased by 13%. Ad-generated visits were up 50% to 9,000 and page views were up 46% to over 12,600.

Performance Max Ads
 Impressions: 502,776 (↑ 72.7%)
 Clicks: 37,440 (↑ 53.6%)
 Spend: \$996 (↑ 6.7%)
 CPC: \$0.03 (↓ 34.2%)
 Email & Phone Contacts: -
 PDF Downloads: -

Demographics



Country/Territory	Impressions	Clicks	Conversions
1. China	400,667	27,302	626
2. Morocco	101,714	10,091	47
3. Mexico	1,445	123	6
4. United States	2,019	80	23
5. Canada	964	71	10
6. Thailand	1,013	61	4
7. Italy	825	31	1
8. South Korea	775	30	9
9. Taiwan	668	27	5
10. Japan	399	25	3
Grand total	514,380	37,958	753



Ad Campaign Performance

1 Nov 2022 - 30 Nov 2022

New campaigns launched Jan 27, 2021

Overview of your advertising campaign's performance.

SUMMARY

Percentages are a comparison to previous time period

Impressions

369,703

↑ 28.1%

How many times your ads appeared

Clicks

33,054

↑ 12.9%

How many times your ads were clicked on

Spend

\$1,464

↑ 2.1%

Cost per click

Avg. CPC

\$0.04

↑ 12.4%

Cost per click

Conversions

Ad Phone Calls

2

↑ N/A

Phone calls directly from your Google Ads

PDF Downloads

1,228

↑ 0.6%

Email Contacts

29

↑ 20.8%

Phone Calls

5

↑ 66.7%

Total Conversions

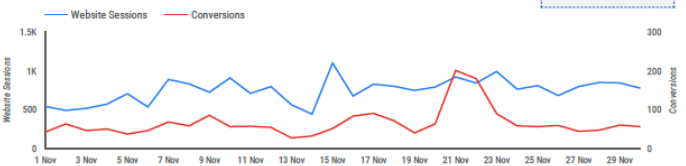
1,264

↑ 1.3%

Cost/Conversion

\$1.16

↑ 3.3%



UPDATES:

- ▶ Nov 3: We shifted budget from the Search campaigns over to Performance Max based on performance.
- ▶ Nov 3: We created new campaigns specifically for China. We gave 25% of the total budget to them to limit how much of the spend was going to China.
- ▶ Our overall costs per click were up slightly, but remain outstanding at \$0.04 on average.
- ▶ Total conversions and cost per conversion were slightly improved this month.
- ▶ We saw a handful more phone calls and email contacts, which is nice.
- ▶ Most of our top search terms included 'castool' (i.e. were branded searches).
- ▶ Now that we're able to better control how much of the budget is going to China, we saw Morocco as our top country, with Mexico, Thailand and Canada rounding out the top 5.
- ▶ The ad campaign was responsible for 73% of all website traffic, and 63% of all conversions.

ISO 45001:2018, 14001:2015 & 9001:2015

During July 2022, Castool Heat Treat Certification was successfully completed for: ISO 45001:2018, ISO 14001:2015, ISO 9001:2015

As per schedule of surveillance audit on 1-2 Dec 2022, Castool 180 was successfully completed.

Audit Criteria standard Ref. "ISO9001:2015 ISO14001:2015 ISO45001:2018"
 The result of audit not have NC .

Minor case = 0

Major case = 0



Congratulations to all.

CASTOOL GROUP UPDATE



Castool has always endeavored to lead the industry through education. We are constantly creating presentations, articles and webinars based on our research. Our goal is to gain knowledge for ourselves, while educating our customers.



HEAT TREAT

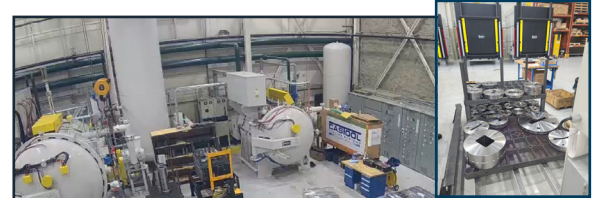
NEWMARKET, CANADA

Castool's heat treatment facility has been operating for several months. October and November will see 170,000 lbs of quality heat treated products being delivered per month.

The Nitrex nitriding oven has arrived and large vertical Ipsen vacuum oven in Feb 2023. We will have the largest and most up to date heat treat facility for hot work tool steels in North America.

We are ready for your Giga-Press Tooling!

We are in the process of being certified by GM, and plan to follow with Ford, Nematik and Sellantis in the coming months.



KENITRA, MOROCCO

Castool Morocco has been operating for more than 6 months. The plant is fully equipped and staffed to manufacture extrusion and die cast tooling for Europe and the Middle East.

Our partner heat treatment facility, located less than a km from our plant is also fully operational, with large vertical vacuum ovens and Nitrex nitriding.

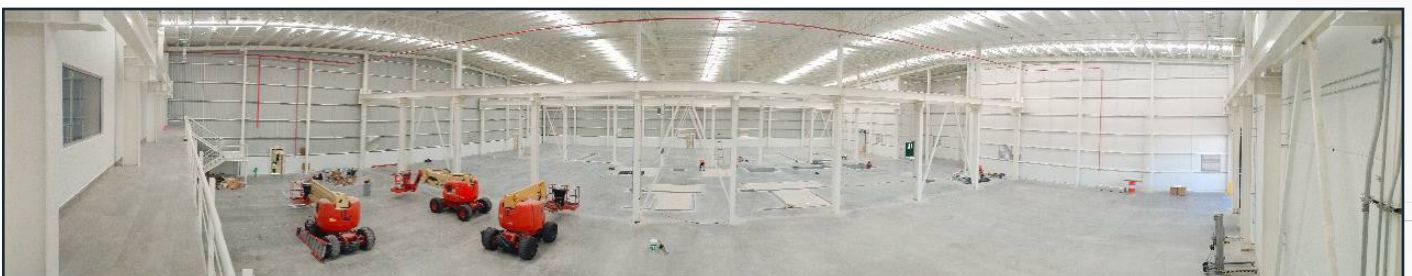


QUERETARO, MEXICO



Castool's Mexico facility is well underway. We expect the factory and offices to be completed in December 2022. Equipment will start to arrive in Jan/Feb through spring 2023. We expect to ship the first product manufactured in Mexico in March 2023.

We have hired a production manager, a finance manager and a process manager. We plan to hire staff and machinists in Feb/March. The official opening will be planned late spring.



CASTOOL GROUP UPDATE

Castool has always endeavored to lead the industry through education. We are constantly creating presentations, articles and webinars based on our research. Our goal is to gain knowledge for ourselves, while educating our customers.



UXBRIDGE, CANADA

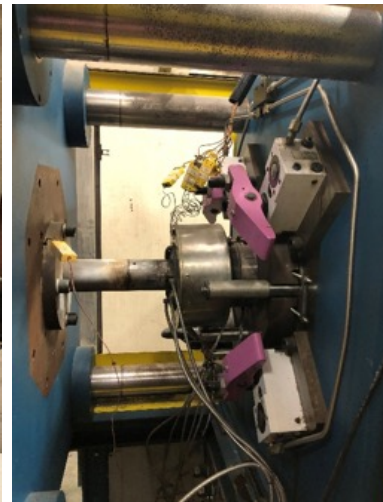
New equipment for Castool Laboratory

Lab Scale Extrusion Machine

Castool Tooling Systems received a 150 ton extrusion machine from University of Waterloo. The machine is originally made to extrude 3" billets. Castool is making new container, stem and dummy block to accommodate 2" billets to increase the face pressure for extrusion of hard aluminum alloys.

The machine is equipped with thermocouples and sensors to record ram location, extrusion load, and temperature of different locations of the container, die and dummy block.

The container and die have separate heating systems that are being controlled during the process.



Three companies reached out to Castool Tooling Systems regarding using the machine in near future:

1. Quebec Metallurgy Centre: to produce small extrusion profiles out of a hard aluminum alloy.
2. A research centre in USA: to collaborate with Castool on a research project on seam weld quality in thick extrusions. The project is financially supported by US Department of Energy (DOE).
3. University of Waterloo: use the machine for research project.

In addition, there are several other companies in extrusion industry interested in collaboration with Castool and perform extrusion trials for industrial R&D projects.

CASTOOL GROUP UPDATE

Castool Laboratory: Metallurgical Capabilities and Equipment

Castool Lab. is now well equipped with necessary tools to monitor the quality of incoming material, heat treatment and nitride. The lab works closely with Castool Heat Treat to verify and monitor our heat treatment process regularly.



Here is the list of metallurgical services Castool can provide:

1. Alloy composition verification (Steel, Copper, Nickel, and Aluminum based alloys)
2. Microstructure analysis
3. Hardness and Microhardness tests
4. Nitride layer thickness measurement
5. Material toughness measurement (Charpy Impact Energy)

Equipment



Optical Emission Spectrometer (OES): Hitachi's portable OES analyser (model PMI-MASTER Smart) with complete calibration databases for: Iron base, Copper base, Nickel base and Aluminum base alloys.



Metallography sample preparation equipment:

- a. Hot mounting press: Struers ProntoPress
- b. Cold mounting molds and materials: Buhler
- c. Polishing Machine: Bohler EcoMet



Optical inverted metallography microscope (Leica DM ILM LED): equipped with camera and software for report generation purposes.



Automatic Microhardness tester: Struers DuraScan



Pendulum Impact tester: Rockwell Superficial Tinus Olsen Model 84 : This instrument is used to evaluate the toughness of material.



Rockwell Superficial hardness tester: WILSON

CASTOOL GROUP UPDATE

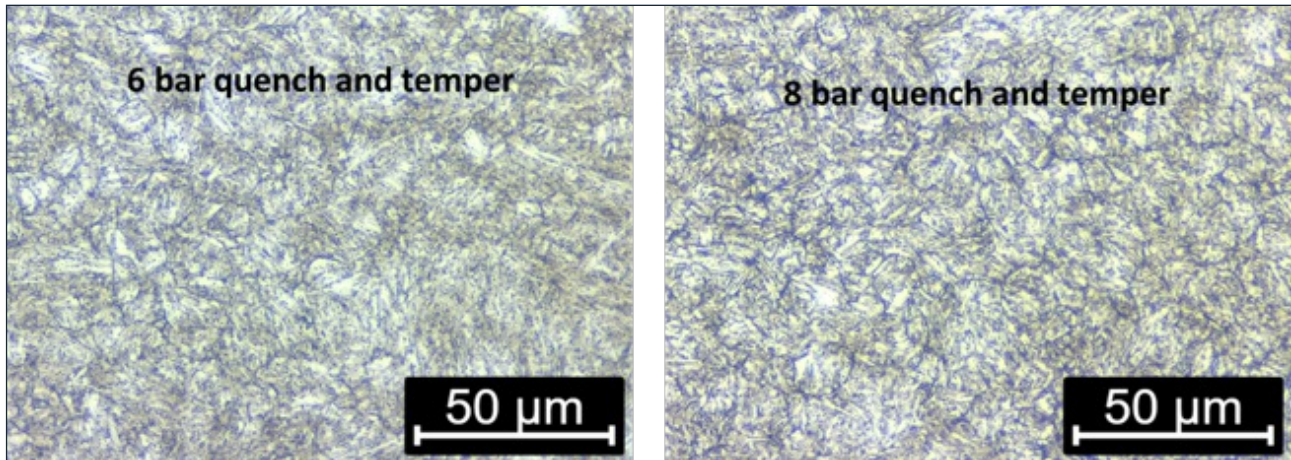
Pendulum Impact tester: Tinius Olsen Model 84

This instrument is used to evaluate the toughness of material.

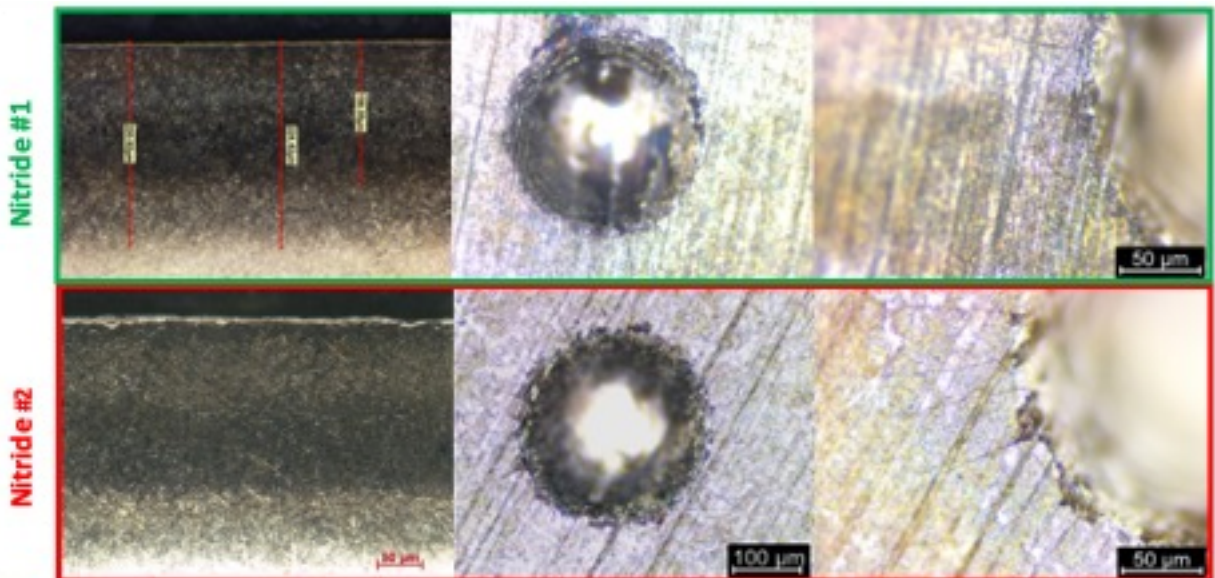


Heat treatment and metallurgy

Castool Laboratory works closely with Castool Heat Treat to optimize the heat treatment recipes for different products. The figure below shows the microstructure of H13 after heat treatment with two different quench pressures.



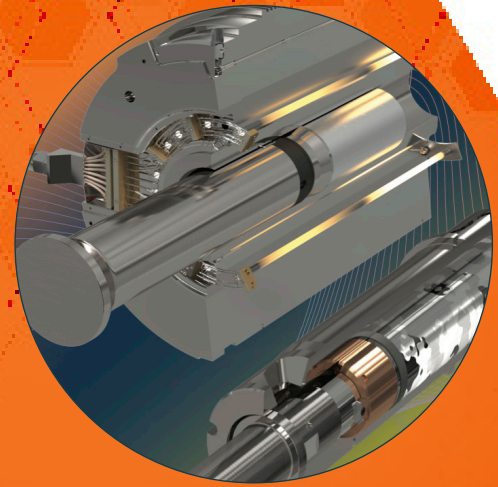
Castool laboratory also works with our heat treaters around the world to optimize nitriding recipes and evaluate different methods. Figures below show two samples nitrided with two different methods showing better nitride quality at Nitride #1 than Nitride #2. The nitride quality is evaluated by microscopic observations of nitride layer and mechanical reaction of nitride surface to indentation



RESEARCH CORNER
LABORATORY



BY YAHYA

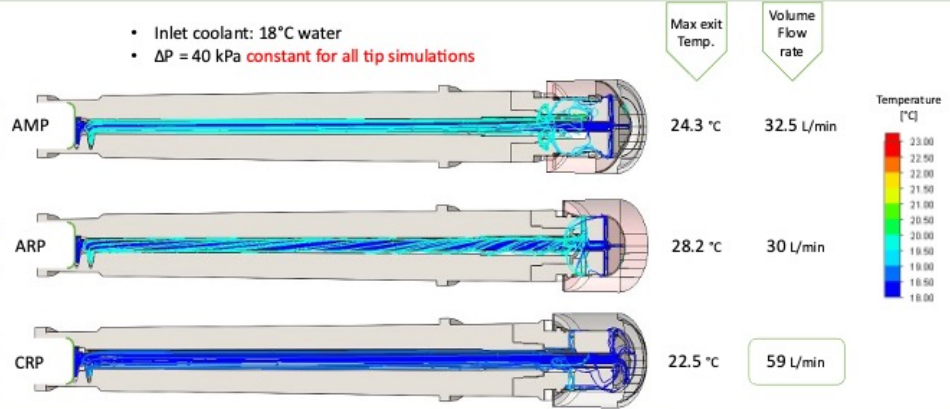


DIE CAST SIMULATION

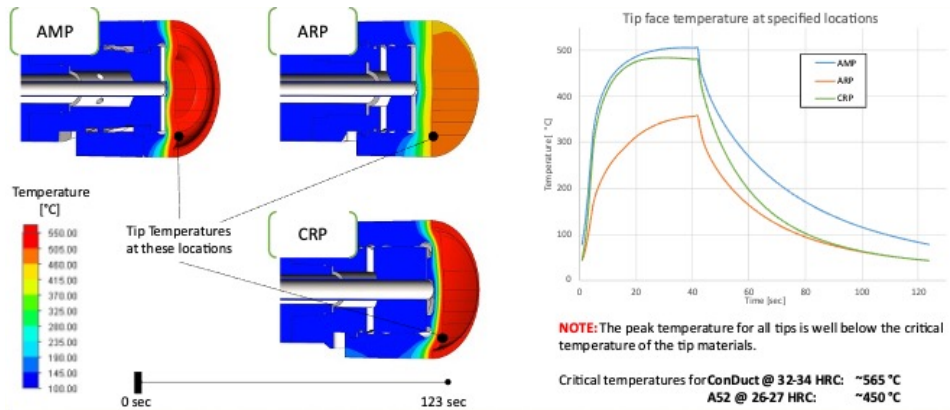
Die Cast - Plunger Tip comparison (Thermal and deformation)

Coolant Flow

- Inlet coolant: 18°C water
- $\Delta P = 40$ kPa constant for all tip simulations



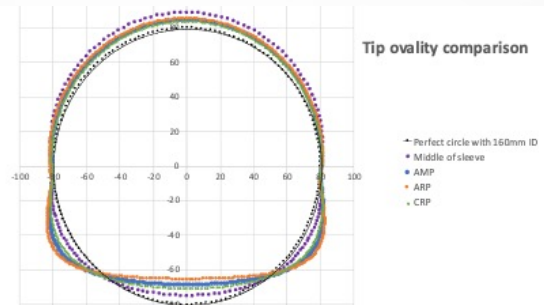
Temperature Distribution



Static Analysis @15 sec (during shot)

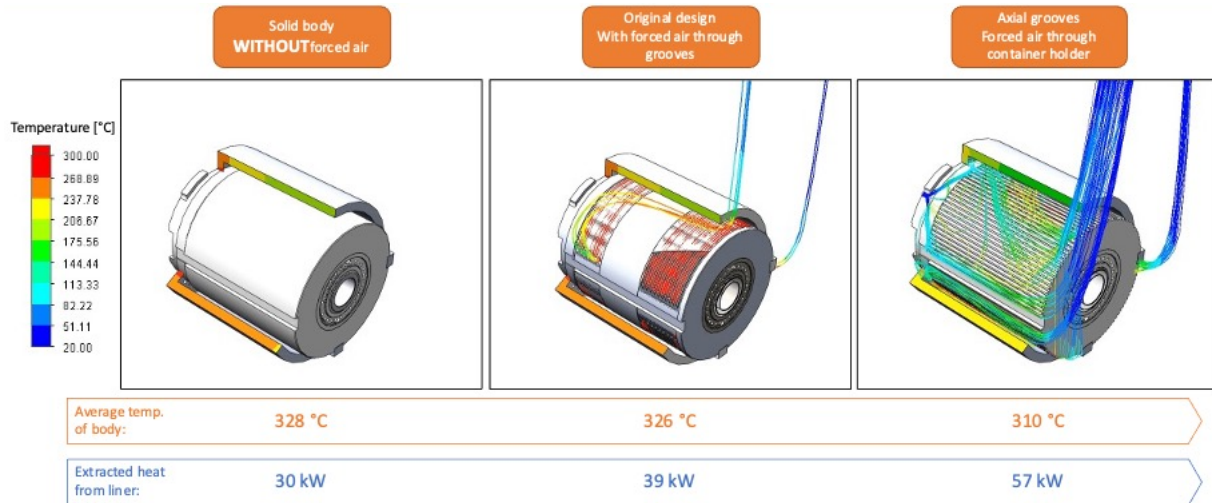
Graph deformation scale: 50 X

- CRP ovality plot is the closest the sleeve ID @ shot. So that:
 1. Better and smoother shot acceleration
 2. Less wear on sleeve ID
 3. Better sealing



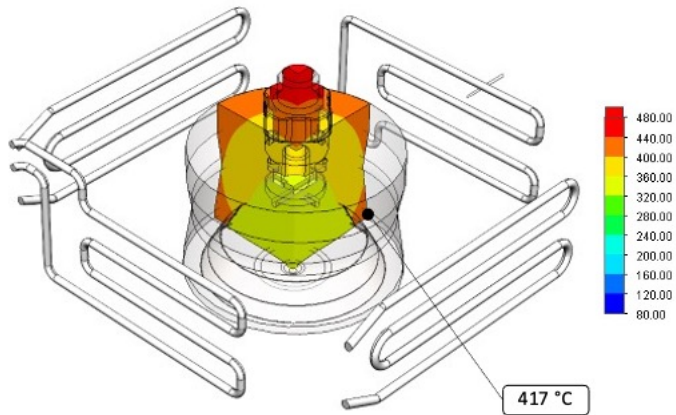
Extrusion - Comparing air cooling methods

Air Flow (around the container)



4 - Side Heating

- The simulation result shows well distributed temperature.
- Time to heat up to 350 °C inside: 55 minutes

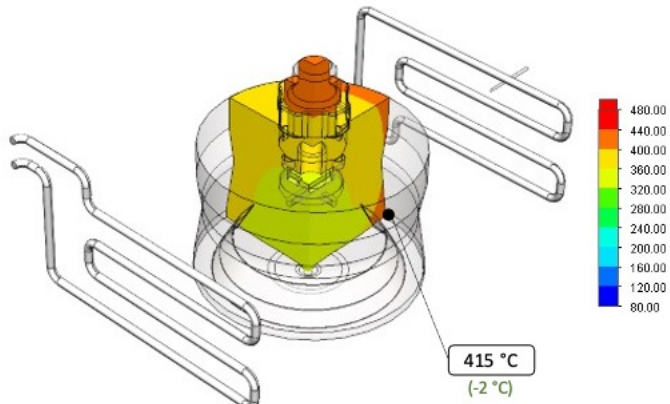


2 - Side Heating

Scenario #1:

Same power per each element

- Temperature distribution is not symmetric along the heating component
- Time to heat up to 350 °C inside: 73 minutes (+18 mins)



Summary

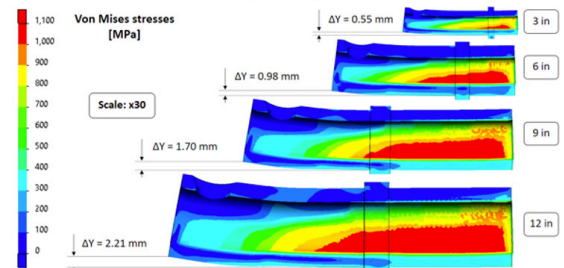
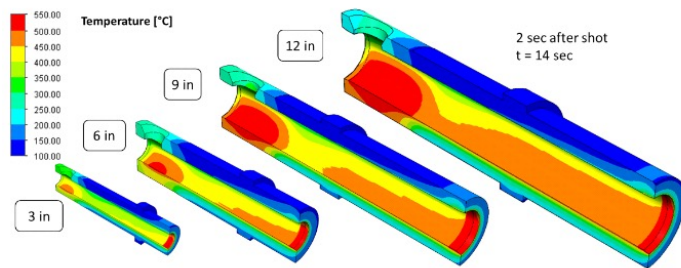
	Heating time [min]	Approximate Element Temperature [°C]	Temperature at dummy block ring [°C]
4-side heating	55	800	417
2-side heating	73	800	415
2-side heating (higher power)	55	900	445

DIE CAST

DIE CASTING ENGINEER, September 2022

Bigger Castings, Bigger Problems: A thermo-mechanical simulation study with a focus on the effect of shot sleeve size

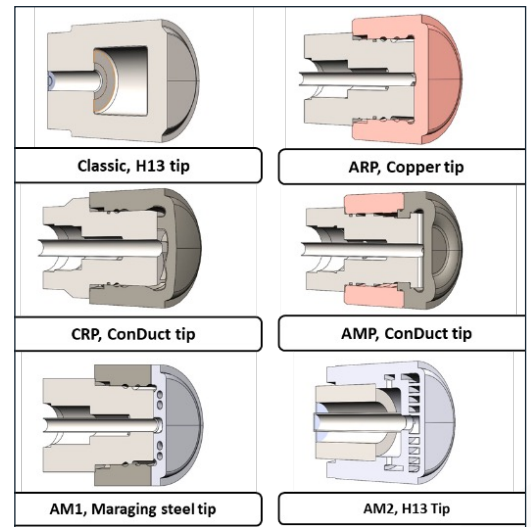
Thanks to ground-breaking innovations, the automotive industry is increasingly interested in manufacturing massive structural parts through cold-chamber diecasting techniques. This introduces new opportunities and challenges to the diecast industry by pushing the limits of tooling and material and decreasing the effective life span of tooling. The more pressing problem becomes managing the critical gaps and tolerances, which remain constant even though parts and tools are getting bigger. This paper will focus on the shot sleeve as the primary tool for feeding molten aluminum into a mould. Computer simulation methods will analyze thermal and mechanical responses in the shot sleeve and its interaction with other tools, specifically the plunger tip. In addition, thermomechanical effects of shot sleeve size will be studied by calculating the temperatures, stresses, and deformations in the shot sleeve during the process



DIE CASTING ENGINEER, May 2022

Plunger Tip Evolution in the Die Casting Industry : Material, Design, and Lubrication.

This paper reviews the evolution of water-cooled plunger tips and discusses available design improvements, optimizations, material selection, and manufacturing methods. Overall performance is evaluated by utilizing computer simulation based on water flow, cooling rate and biscuit formation. Computational Fluid Dynamics (CFD) is used to calculate the cooling performance of plunger tips. Considerations are also made for the often-ignored Leidenfrost effect, as the phenomenon affects plunger tip cooling performance: specifically, when the water flow is low or thermal conductivity of the tip material is high. Thermomechanical simulation is used to estimate stresses and deformations in the plunger tip, which can evaluate the plunger tip's thermal stability and life span. Lubrication of plunger tip and proper lubricant selection are also discussed in this paper with presenting measurement of key physical properties of some popular lubricants in the industry.



FOUNDRY TRADE JOURNAL, April 2022

Material Selection for Diecast Tooling: Decision Theory and Practice

A wide range of engineering materials is available to manufacture diecast tooling. However, only a handful of them get used due to many parameters. This paper outlines a decision theory for material selection that considers key parameters such as tooling life, cycle time and cost. It notes the main reasons for tooling failure, which are the harsh conditions of the diecast process, and how tooling life is improved by using proper materials and designs. Simulation is an effective tool to evaluate new materials and designs, and examples of practical simulation results are supplied to support the decision theory.

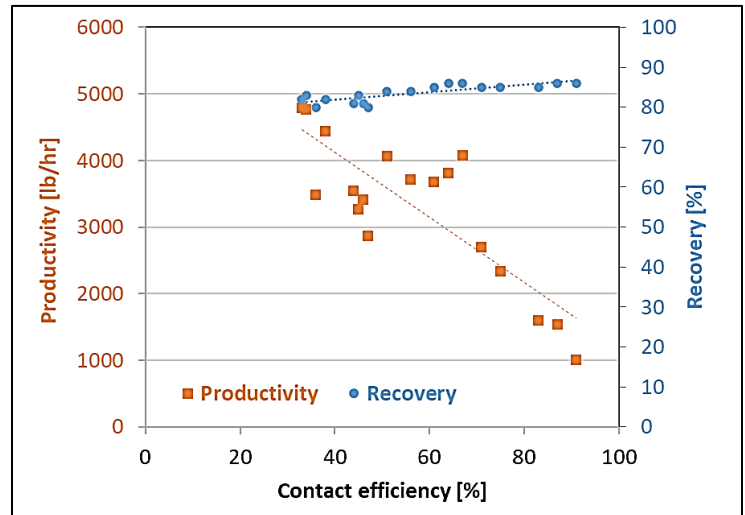


EXTRUSION

LIGHT METAL AGE, June 2022

The Effect of The Billet Geometry, Container, and Die on Extrusion Productivity

Extrusion is a balancing act between many parameters; it is full of trade-offs and is highly dependent on the physical realities of the tooling, equipment, and processes. Excellence in extrusion results not from doing extraordinary things, but from doing ordinary things extraordinarily well, such as controlling the temperature of every single component of the process. Superextruders (those who are capable of achieving an above average net productivity of 50% or more) have existed for more than three decades and have achieved significantly better productivity than a good extruder nowadays. They did this simply by paying extra attention to the most important details of the process rather than being creative and trying new methods. This article summarizes three papers presented at the ET '22 seminar in May 2022, focusing on how to maximize extrusion productivity by balancing the process and tooling parameters. The first paper dealt with the effect of billet geometry on extrusion and explained how the processing of shorter billet can improve productivity, as well as

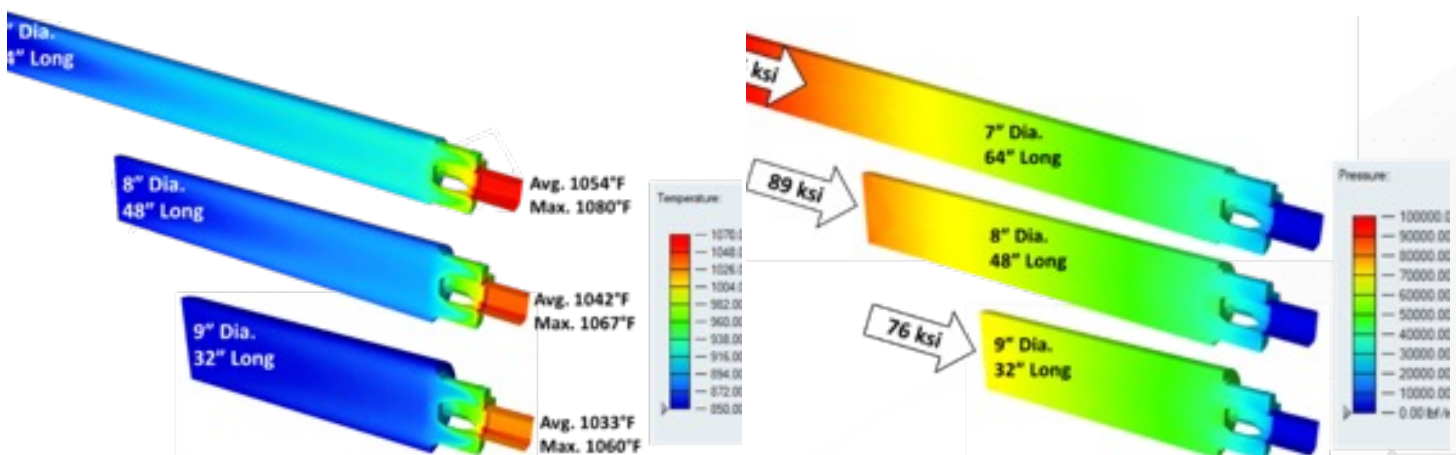


providing some tooling solutions for extruders using long billets. The second paper discussed ram speed as being the primary measure of productivity and looked at the effect of die design and container parameters (such as container material and air cooling) on ram speed. The third paper brought together the technical information from the first two papers to talk about how to balance different parameters and overcome management issues to create optimum productivity.

ET 2022 Proceedings, May 2022

Extrusion Productivity – Billet Geometry/Container/Dummy Block (Best of Track paper)

This paper studies the impact of process parameters on press productivity. In particular, 3D simulations have been performed to determine the effect of billet geometry (that is primarily billet length and diameter) on press load, extrusion temperature and mode of deformation in the billet. Such simulations are shown to be invaluable to the extruder to allow him to optimize the container dimensions, tooling and die design which leads to maximizing productivity.

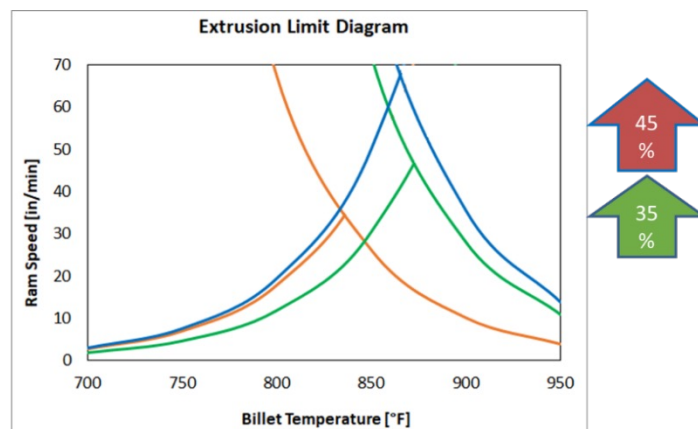


EXTRUSION

ET 2022 PROCEEDINGS, May 2022

Extrusion Productivity – Ram Speed /Die Design/Container

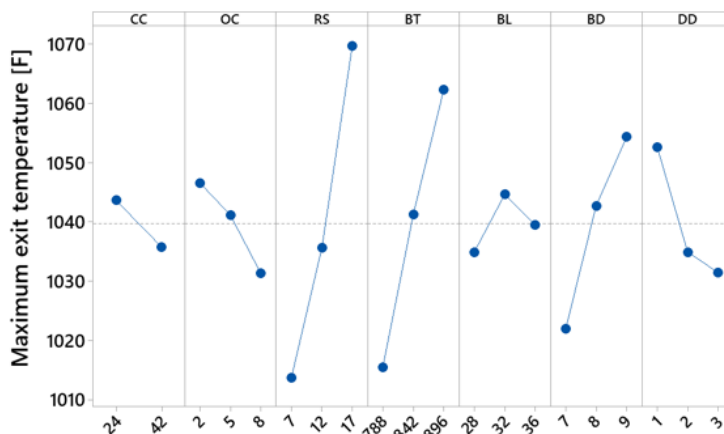
Often, we see extruders who are producing very similar profiles with conventional die designs with well-known alloys and all that they can do is guess based on previous performance and experience. Ram speeds are often very different. Performance and productivity become a measure of confidence rather than scientifically based numbers. Our hope is that first we can predict maximum ram speed based on the current billet, available press load and tooling, in particular the container design and materials and the die parameters. Then, we can suggest to extruders to use the right container design and material, container set temperatures and billet temperatures to further improve their productivity. In this paper a combination of statistical design of experiments,



finite element simulation, regression analysis is used to find the maximum ram speed (maximum productivity) for any given combination of process parameters by looking at the effect of those parameters on exit temperature and extrusion loads. Then the optimized combination is found within the defined range of parameters. Several parameters are considered including; container set temperature and taper, container conductivity, outside cooling rate of the container, billet preheat, billet dimensions and die design. The results show that the optimum productivity can be achieved with better cooling and container conductivity, larger billet dimensions and easy to push die design. In the optimum case both exit temperature and extrusion load are at the maximum set limit. It is interesting that the lowest productivity is achieved with the same combination of parameters except with a hard to push die design where the press load capacity is the limit and extrusion exit temperature is far below the defined limit. With a conservative process parameters such as insulated container, low conductivity (high strength) container, short billet and hard to push die, the optimum productivity is 25 percent less than the global optimum, but the worst productivity with a conservative recipe is most probably higher than the global minimum.

A Fine Balance: the Difference between Excellence and Mediocrity

Extrusion management teams often ask similar questions: “We have great equipment. Why can’t our dies produce a profile within tolerance? Why can’t our die correctors get our dies running faster? Why do we struggle to achieve mechanical properties sometimes? Why is it so hard to be successful in this business?” Extrusion is a balancing act between people and technology systems; it is full of trade-offs and highly dependent on the physical realities of the tooling, equipment and processes. Excellence seldom results from doing excellent things, but rather from doing ordinary things with an excellence mindset. Certain key parameters, if left uncontrolled, will inhibit progress, irrespective of the effort put into the rest of the processes. Some extruders have cycled upwards



through learning and development toward world-class results, only to drop to, or below, average industry levels. The authors use their decades of differing extrusion experience to highlight which focus areas result in performance growth or decline. It takes both technical expertise and exceptional management, working together, to succeed. The paper will NOT cover every element of an extrusion company but will provide key insights and recommended areas of focus.

DIE CAST

DIE CASTING CONGRESS AND TABLETOP, September 2022, Lexington KY, USA

Material Selection for Diecast Tooling: Decision Theory and Practice

Paul Robbins
Yahya Mahmoodkhani



North American Die Casting Association
Die Casting Congress & Tabletop - September 13-15, 2022 Lexington, KY USA

Plunger Tip Evolution in Diecast Industry: Material and Design

Yahya Mahmoodkhani, Pouyan Rahnama, Paul Robbins



North American Die Casting Association
Die Casting Congress & Tabletop - September 13-15, 2022 Lexington, KY USA

EXTRUSION

ET SEMINAR, May 2022, Orlando FL, USA

Twelfth International Aluminum Extrusion
Technology Seminar & Expo
May 3 - 5, 2022
Orlando, Florida USA

Extrusion Productivity

Billet Geometry / Container / Dummy Block

Paul Robbins, Yahya Mahmoodkhani, Chris Jowell, Richard Dickson

Twelfth International Aluminum Extrusion
Technology Seminar & Expo
May 3 - 5, 2022
Orlando, Florida USA

Extrusion Productivity

Ram Speed / Die Design / Container

Paul Robbins, Yahya Mahmoodkhani, Chris Jowell, Richard Dickson

Twelfth International Aluminum Extrusion
Technology Seminar & Expo
May 3 - 5, 2022
Orlando, Florida USA

A Fine Balance

The Difference between Excellence and Mediocrity

Paul Robbins, Richard Dickson, Yahya Mahmoodkhani

ALUMINUM
EXTRUDERS
COUNCIL

High Pressure Dummy Block Design Evolution

Paul Robbins
Castool Tooling Systems

AEC Management Conference 2022
September 13-15, Arlington VA

*AEC MANAGEMENT CONFERENCE,
September 2022, Arlington VA, USA*

TRADE SHOW UPDATE



Euroguss - International Trade Fair for Die Casting Nuremberg, Germany June 8-10, 2022

Castool and Exco Engineering co-exhibited for a very well attended show. The first show in several years. We were visited by all the major die casters in Europe, and made appointments to follow up and provide quotations for many projects.



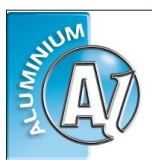
ET2022 Orlando Florida May 3-5, 2022

The show and congress was delayed for 2 years, and a huge success. Castool presented 3 papers, which were all well received. One paper won Best Paper in Track. The trade show was also very well attended.



NADCA Lexington, Kentucky September 13-16, 2022

Castool and Exco Engineering co-exhibited. Working together increases traffic, and provides more solutions to our customers. We also presented two papers in the congresses to very good audiences.



Aluminum Dusseldorf September 27-29, 2022

Castool exhibited with Comexale. The show again was very well attended by extruders from all over the world.



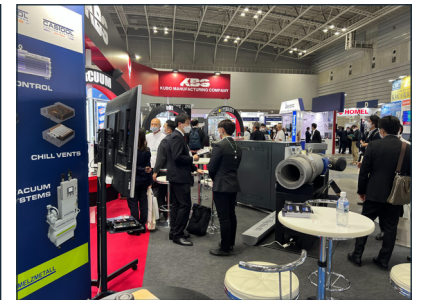
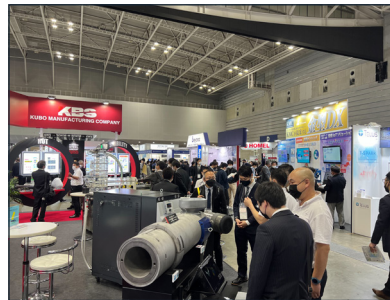
TRADE SHOW UPDATE



J-dec 2022 - Japan Die casting Exposition Yokohama, Japan November 10-12, 2022

Castool shared the booth with KBS and Exco Engineering in Yokohama. The shared booths creates more interest and traffic, and reduces costs.

The show was well attended by the Japanese global die casters and automotive company personnel. It is necessary to reach out to these companies head quarters to be successful working with their global divisions.

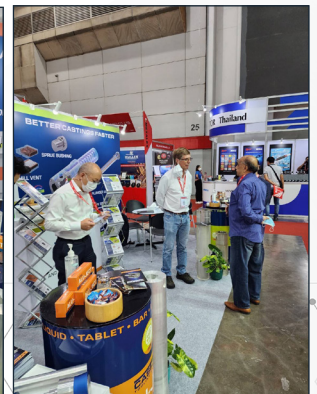
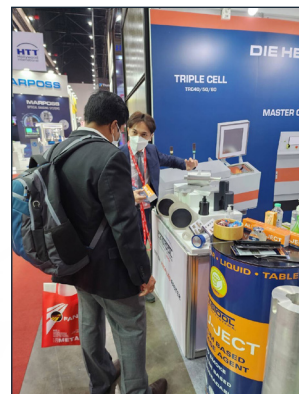
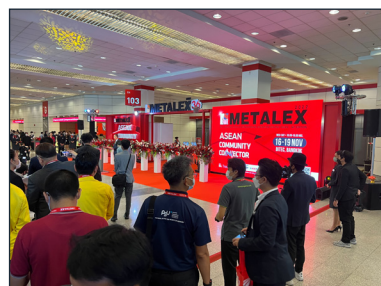


Metalex 2022 - Bitec Bangkok, Thailand November 16-19, 2022

Metalex has been postponed several times due to Covid-19, so most people are excited to attend. We are presenting both extrusion and die cast tooling systems in our booth.

The show was very good with several die casters and extruders visiting us. We were visited by several existing customers and new customers each day.

The economics trade shows are easily calculated.



NEW DIE CASTING DATA SHEETS NOW AVAILABLE

PLUNGER TIPS

ABP

Allper Bush Plunger

PURPOSE

- Provide alloy flow penetrating between the die and plunger during plunger stroke.
- Allow easy removal of plunger with a minimum of friction through the die.
- Maximize alloy flow and reduce the amount of alloy necessary for an effective stroke in the die.

FUNCTION

- The function of the plunger is to remove the alloy from the die cavity.
- To prevent a seal with the die sleeve wall and prevent alloy from being drawn into the die when the plunger is retracted.
- To create a barrier between the plunger and the die sleeve wall.
- To create a barrier between the plunger and the die sleeve wall.




PLUNGER TIPS

CRP

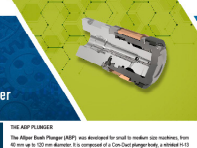
Castool Ring Plunger

PURPOSE

- Provide alloy flow penetrating between the die and plunger during plunger stroke.
- Allow easy removal of plunger with a minimum of friction through the die.
- Maximize alloy flow and reduce the amount of alloy necessary for an effective stroke in the die.

FUNCTION

- The function of the plunger is to remove the alloy from the die cavity.
- To prevent a seal with the die sleeve wall and prevent alloy from being drawn into the die when the plunger is retracted.
- To create a barrier between the plunger and the die sleeve wall.
- To create a barrier between the plunger and the die sleeve wall.




PLUNGER TIPS

AMP

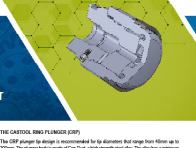

Allper Modular Plunger

PURPOSE

- Provide alloy flow penetrating between the die and plunger during plunger stroke.
- Allow easy removal of plunger with a minimum of friction through the die.
- Maximize alloy flow and reduce the amount of alloy necessary for an effective stroke in the die.

FUNCTION

- The function of the plunger is to remove the alloy from the die cavity.
- To prevent a seal with the die sleeve wall and prevent alloy from being drawn into the die when the plunger is retracted.
- To create a barrier between the plunger and the die sleeve wall.
- To create a barrier between the plunger and the die sleeve wall.

PLUNGER TIPS

AMP

Allper Modular Plunger

PURPOSE

- Provide alloy flow penetrating between the die and plunger during plunger stroke.
- Allow easy removal of plunger with a minimum of friction through the die.
- Maximize alloy flow and reduce the amount of alloy necessary for an effective stroke in the die.

FUNCTION

- The function of the plunger is to remove the alloy from the die cavity.
- To prevent a seal with the die sleeve wall and prevent alloy from being drawn into the die when the plunger is retracted.
- To create a barrier between the plunger and the die sleeve wall.
- To create a barrier between the plunger and the die sleeve wall.




SHOT SLEEVES

PURPOSE

- Provide alloy flow penetrating between the die and plunger during plunger stroke.
- Allow easy removal of plunger with a minimum of friction through the die.
- Maximize alloy flow and reduce the amount of alloy necessary for an effective stroke in the die.

FUNCTION

- The function of the plunger is to remove the alloy from the die cavity.
- To prevent a seal with the die sleeve wall and prevent alloy from being drawn into the die when the plunger is retracted.
- To create a barrier between the plunger and the die sleeve wall.
- To create a barrier between the plunger and the die sleeve wall.




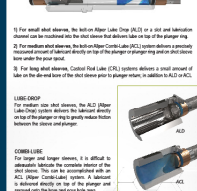

LUBRICATION

PURPOSE

- Provide alloy flow penetrating between the die and plunger during plunger stroke.
- Allow easy removal of plunger with a minimum of friction through the die.
- Maximize alloy flow and reduce the amount of alloy necessary for an effective stroke in the die.

FUNCTION

- The function of the plunger is to remove the alloy from the die cavity.
- To prevent a seal with the die sleeve wall and prevent alloy from being drawn into the die when the plunger is retracted.
- To create a barrier between the plunger and the die sleeve wall.
- To create a barrier between the plunger and the die sleeve wall.

PLUNGER /SHOT SLEEVE LUBRICANTS LIQUID

PURPOSE

- Provide alloy flow penetrating between the die and plunger during plunger stroke.
- Allow easy removal of plunger with a minimum of friction through the die.
- Maximize alloy flow and reduce the amount of alloy necessary for an effective stroke in the die.

FUNCTION

- The function of the plunger is to remove the alloy from the die cavity.
- To prevent a seal with the die sleeve wall and prevent alloy from being drawn into the die when the plunger is retracted.
- To create a barrier between the plunger and the die sleeve wall.
- To create a barrier between the plunger and the die sleeve wall.




VACUUM SYSTEM CHILL BLOCK

PURPOSE

- Provide alloy flow penetrating between the die and plunger during plunger stroke.
- Allow easy removal of plunger with a minimum of friction through the die.
- Maximize alloy flow and reduce the amount of alloy necessary for an effective stroke in the die.

FUNCTION

- The function of the plunger is to remove the alloy from the die cavity.
- To prevent a seal with the die sleeve wall and prevent alloy from being drawn into the die when the plunger is retracted.
- To create a barrier between the plunger and the die sleeve wall.
- To create a barrier between the plunger and the die sleeve wall.




BETTER CASTINGS FASTER

DIE CAST

ADDITIONAL MANUFACTURING

PERFORMANCE

Material	Part No.	Part Name	Part No.	Part Name
AL-10	100001	AL-10	100002	AL-10
AL-10	100003	AL-10	100004	AL-10
AL-10	100005	AL-10	100006	AL-10
AL-10	100007	AL-10	100008	AL-10
AL-10	100009	AL-10	100010	AL-10
AL-10	100011	AL-10	100012	AL-10
AL-10	100013	AL-10	100014	AL-10
AL-10	100015	AL-10	100016	AL-10
AL-10	100017	AL-10	100018	AL-10
AL-10	100019	AL-10	100020	AL-10
AL-10	100021	AL-10	100022	AL-10
AL-10	100023	AL-10	100024	AL-10
AL-10	100025	AL-10	100026	AL-10
AL-10	100027	AL-10	100028	AL-10
AL-10	100029	AL-10	100030	AL-10
AL-10	100031	AL-10	100032	AL-10
AL-10	100033	AL-10	100034	AL-10
AL-10	100035	AL-10	100036	AL-10
AL-10	100037	AL-10	100038	AL-10
AL-10	100039	AL-10	100040	AL-10
AL-10	100041	AL-10	100042	AL-10
AL-10	100043	AL-10	100044	AL-10
AL-10	100045	AL-10	100046	AL-10
AL-10	100047	AL-10	100048	AL-10
AL-10	100049	AL-10	100050	AL-10
AL-10	100051	AL-10	100052	AL-10
AL-10	100053	AL-10	100054	AL-10
AL-10	100055	AL-10	100056	AL-10
AL-10	100057	AL-10	100058	AL-10
AL-10	100059	AL-10	100060	AL-10
AL-10	100061	AL-10	100062	AL-10
AL-10	100063	AL-10	100064	AL-10
AL-10	100065	AL-10	100066	AL-10
AL-10	100067	AL-10	100068	AL-10
AL-10	100069	AL-10	100070	AL-10
AL-10	100071	AL-10	100072	AL-10
AL-10	100073	AL-10	100074	AL-10
AL-10	100075	AL-10	100076	AL-10
AL-10	100077	AL-10	100078	AL-10
AL-10	100079	AL-10	100080	AL-10
AL-10	100081	AL-10	100082	AL-10
AL-10	100083	AL-10	100084	AL-10
AL-10	100085	AL-10	100086	AL-10
AL-10	100087	AL-10	100088	AL-10
AL-10	100089	AL-10	100090	AL-10
AL-10	100091	AL-10	100092	AL-10
AL-10	100093	AL-10	100094	AL-10
AL-10	100095	AL-10	100096	AL-10
AL-10	100097	AL-10	100098	AL-10
AL-10	100099	AL-10	100100	AL-10

CASIOOL TOOLING SYSTEMS



BETTER CASTINGS FASTER
BROCHURES AND DATA SHEETS OF OUR PRODUCTS
AVAILABLE

www.castool.com

Scan me through your smart phone camera!

ALU-JECT



DESCRIPTION

- ALU-JECT is a new generation water based aluminum processing emulsion coating. It is suitable for all aluminum extrusion processes. It is available in two grades: ALU-JECT 1000 and ALU-JECT 2000. ALU-JECT 1000 is suitable for all aluminum extrusion processes. ALU-JECT 2000 is suitable for all aluminum extrusion processes.

PRECAUTIONS

- ALU-JECT should be stored in a cool place.
- ALU-JECT should be used within its shelf life.
- ALU-JECT should be used within its shelf life.

COLD CLEAN OUT BLOCK



PURPOSE

- The Cold Clean Out Block has been designed to remove efficiently in industry the last traces of aluminum from the extrusion line. It is used to clean the extrusion line after the last extrusion. It is used to clean the extrusion line after the last extrusion.

FUNCTION

- The Cold Clean Out Block is used to clean the extrusion line after the last extrusion. It is used to clean the extrusion line after the last extrusion.

QUICK RESPONSE (QR) CONTAINER




PURPOSE

- The Quick Response (QR) Container has been designed to provide a quick and efficient way of storing and transporting extrusion tools. It is used to store and transport extrusion tools.

FUNCTION

- The Quick Response (QR) Container is used to store and transport extrusion tools. It is used to store and transport extrusion tools.

SINGLE CELL DIE OVENS



PURPOSE

- The Single Cell Die Oven has been designed to provide a quick and efficient way of drying extrusion dies. It is used to dry extrusion dies.

FUNCTION

- The Single Cell Die Oven is used to dry extrusion dies. It is used to dry extrusion dies.

FIXED DUMMY BLOCK




PURPOSE

- The Fixed Dummy Block is used to simulate the extrusion process. It is used to simulate the extrusion process.

FUNCTION

- The Fixed Dummy Block is used to simulate the extrusion process. It is used to simulate the extrusion process.

BILLET LUBRICATION



PURPOSE

- The Billet Lubrication System has been designed to provide a quick and efficient way of lubricating extrusion billets. It is used to lubricate extrusion billets.

FUNCTION

- The Billet Lubrication System is used to lubricate extrusion billets. It is used to lubricate extrusion billets.

SHEAR BLADES



PURPOSE

- The Shear Blades have been designed to provide a quick and efficient way of shearing extrusion products. It is used to shear extrusion products.

FUNCTION

- The Shear Blades are used to shear extrusion products. It is used to shear extrusion products.

STEMS



PURPOSE

- The Stems have been designed to provide a quick and efficient way of supporting extrusion products. It is used to support extrusion products.

FUNCTION

- The Stems are used to support extrusion products. It is used to support extrusion products.



BETTER PROFILES FASTER
BROCHURES AND DATA SHEETS OF OUR PRODUCTS
AVAILABLE

www.castool.com

Scan me through your smart phone camera!

DIE CASTING & EXTRUSION

BOOTH D-10 **COMPLETED** 10-12 NOVEMBER 2022 **JAPAN DIE CASTING CONGRESS AND EXPOSITION 2022**
Pacifico Yokohama, JAPAN



METALEX METAL WORKING INDUSTRIES MACHINES-TOOLS, INDUSTRIAL ENGINEERING, 16-19 NOVEMBER 2022 **METALEX THAILAND 2022**
Bangkok International Trade & Exhibition Centre Bangkok, THAILAND **COMPLETED** **BOOTH BA-40**



16-18 MARCH 2023 **ANNUAL MEETING & LEADERSHIP CONFERENCE**
Desert Springs, California, USA



GIFA 12-16 JUNE 2023 **GIFA**
Messe Duesseldorf GERMANY **BOOTH 11B03**



19-21 SEPTEMBER 2023 **MANAGEMENT CONFERENCE**
Chicago, Illinois USA



2023 DIE CASTING CONGRESS & TABLETOP 19-21 SEPTEMBER 2023 **DIE CASTING CONGRESS & TABLETOP**
Grand Rapids, MI USA **BOOTH 430**



INTERNATIONAL TEAM

CASTOOL

Dan Dunn Sales Director
Krystean Rose Sales Manager Americas
Keattikhun Chaichana Technical Manager Asia
Justin Gamage Technical Manager Europe

Andre Iulianetti Product Specialist North America
Jean Dembowski Commercial Manager
Christine Kaschuba Customer Service
Sue Lotton Customer Service
Sue Biliu Su Customer Service
Chotika Rintawong Customer Service
Salma Benmassoud Customer Service
Ploy Robbins Marketing Director

NORTH AMERICA

Jon Veenstra JW Industries LLC
David Purdy DP Inc.
Tom Boyd Boyd Screenprinting Technologies, Inc

LATIN AMERICA

Valentin Meneses Kautec America
Alberto Forcato Forcato Tecnologia
Carlos Maciel Carlos Alberto Maciel Garciduenas

EUROPE

Emmanuel Bach Comexale
Olivier Druhen Comexale
Bertrand Schnell Comexale
Emmanuel Mandrelli Comexale
Pascal Schorung Comexale
Sascha Padovan HPDC Technology GmbH
Daniela Buda

UNITED ARAB EMIRATES

Emmanuel Mandrelli Comexale

ISRAEL

Tuvia Kornfeld NTK Plant Management

TURKEY

Tuvia Kornfeld NTK Plant Management

SOUTH AFRICA

Olivier Druhen Comexale

ASIA

JAPAN

Shigeyoshi Takagi Techno Consul Benchmarks
Tetsuya Ishida Tandem Technologies
Yasunori Ito KBS Kubo Manufacturing Co
Nami Ito KBS Kubo Manufacturing Co

KOREA

JH Song ANK Ltd
SW Song ANK Ltd

TAIWAN

Jack Lee Shiny Lee

CHINA

Daniel Cheng OEA Bridge Link
Long Shun Cheng OEA Bridge Link
Tony Chein OEA Bridge Link

THAILAND

Manu Mekdhanasarn Siam Anglo Alloy Co.Ltd
Patcharee Parkong Siam Anglo Alloy Co.Ltd

VIETNAM

Manu Mekdhanasarn Siam Anglo Alloy Co.Ltd
Patcharee Parkong Siam Anglo Alloy Co.Ltd
Tran Thi Thanh Thuy Thang Long Mechanics Equipment Co
Mike Luu Carbon Group

INDONESIA

Yovinus Krisananto PT Willisindomas Indahmakmur

MALAYSIA

Manu Mekdhanasarn Siam Anglo Alloy Co.Ltd
Patcharee Parkong Siam Anglo Alloy Co.Ltd

SINGAPORE

Manu Mekdhanasarn Siam Anglo Alloy Co.Ltd
Patcharee Parkong Siam Anglo Alloy Co.Ltd

INDIA

Sachin Kumar

AUSTRALIA/NEW ZEALAND

Doug Loader Extrusion Machine Co New Zealand
Glenn Titmuss GT Ex-Press Pty.Ltd