

INSIDER

NEW EMPLOYEES - CASTOOL:

- Henry Adam
Cleaner
- George Benny
Inspector
- Casey Deplaa
Inspector
- John Bennett
Equipment Supplies
- Mohammad Sistar
Lathe Operator
- Fred Jordan
General Labour
- Gurvinder Pannu
Drill Operator

NEW EMPLOYEES - CASTOOL 180:

- Jaruwan Daengchart
QA/Inventory

ARTICLE ALERT:

- Billet Geometry (*LMA and Alutopia*),
- Long Billet (*Aluminium Times*),
- Benchmarks (*LMA*),
- Modularity (*Die Cast Engineer*)

PARTNER PROFILES

In this issue we take a closer look at our partners, starting on page 6.



The Castool Story: Evolving Tooling Technology

In the 1980s, ‘Castool Precision Turning and Honing’ was a very small division of the Exco Technologies group of companies. At that time, Castool specialized in turning hardened tool steels, and made containers, liners and stems for aluminum extruders. It had no proprietary products.

Today, Castool Tooling Systems is recognized as one of the leading tooling and equipment suppliers to light metal extruders and die casters. It is a respected player in the global market. Castool was the first supplier in its field to qualify for ISO 9000, and again, the first to meet stringent requirements of QS9000. How did a small job shop evolve into a world-class supplier in a relatively short period of time?

Castool’s origins begin with Harry Robbins, a toolmaker who specialized in making high quality dies for aluminum extruders out of his basement. In 1952, he opened the Extrusion Machine Corporation. By the early 1970s, the company was split into two entities: Exco (extrusion dies) and Exco Engineering (die cast molds). In the early 1980s, Castool was broken off as another separate entity and in 1986, Paul Robbins took over the sales, marketing and product development.

At that time, Castool was not specialized, but with the relationship to Exco and Exco Engineering – now recognized industry leaders in extrusion and die casting – Castool had a close association with these two industries, and the company realized that no single supplier provided a comprehensive range of support tooling for either.

Realizing that loose dummy blocks would eventually become a thing of the past, the first major project tackled by Castool was to analyze the features of all the fixed dummy blocks then available, and develop a better one. Meanwhile, a small engineering design

company in Switzerland called Allper, had apparently patented a unique die cast plunger tip that was getting outstanding results. Castool soon obtained the exclusive rights to manufacture and market it in North and South America.

Around the same time, the company name changed to Castool Precision Tooling, and put its newly patented two-piece expanding dummy block on the market. It was soon adopted by several major U.S. extruders. These two products – the fixed dummy block and the Allper plunger tip – really established Castool as a significant presence in the light metal extrusion and die casting industries.

Castool’s Process

Castool’s single most important contribution is likely its introduction of the System Approach to production. Maximum productivity can only be achieved when all components of the process are operating at, or close to, optimum efficiency. “Anything that can be measured can be improved,” says Robbins. “It is in this field that knowledge-based companies such as Castool excel, and pioneer innovative technology that benefits the industries they serve.”

Global Presence

Today, Exco Technologies Limited, Castool’s parent corporation, is a multinational group of 17 companies with more 6,600 employees. It is a major technology provider serving the extrusion, die casting and automotive industries in the global market. Castool is now known as Castool Tooling Systems and employees 168 employees at its two locations in Canada and Thailand.

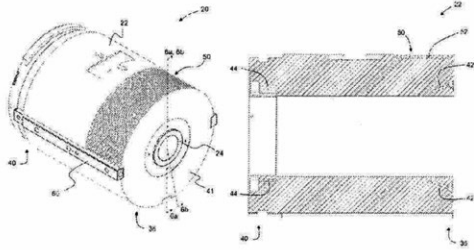
Castool’s newest plant in Thailand – aptly named Castool 180 because of its location half way around the world from the plant in Canada – has allowed them to efficiently service the global market.

DID YOU KNOW...

that Castool holds the patents for:

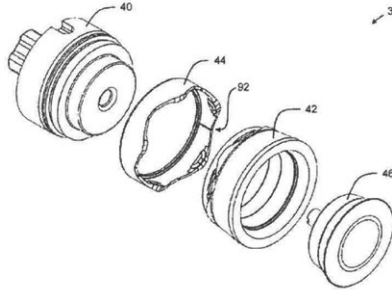
Extrusion Press Container and Mantle for same (2017)

Inventor: Paul H. Robbins



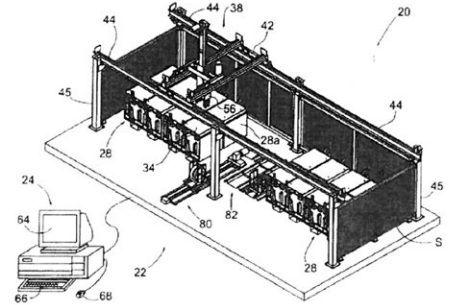
Dummy Block for Extrusion Press (2017)

Inventor: Paul H. Robbins



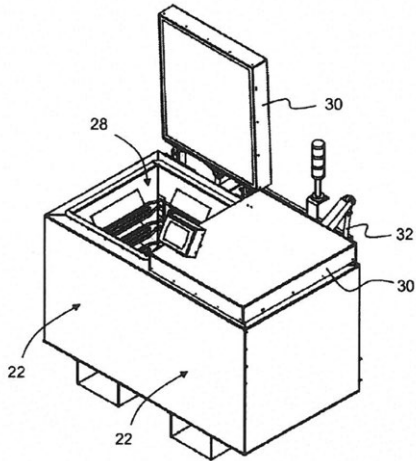
Extrusion Die Pre-Heating System, Apparatus and Method (2016)

Inventor: Paul H. Robbins



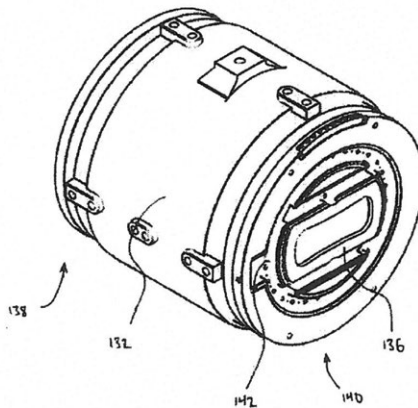
Extrusion Die Pre-Heating Device and Method (2014)

Inventor: Paul H. Robbins



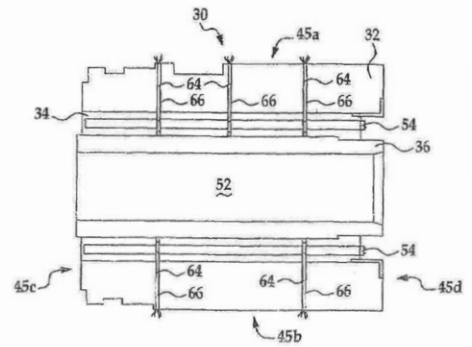
Extrusion Press Container and Liner for same (2013)

Inventor: Paul H. Robbins



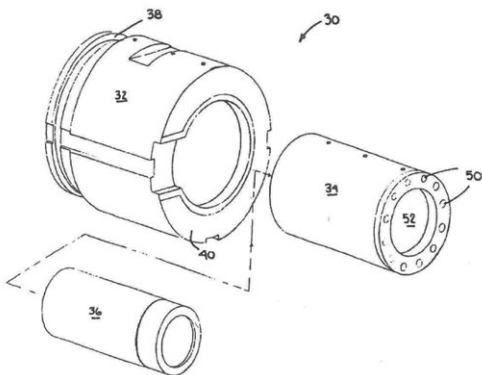
Thermal Control Extrusion Press Container (2009)

Inventor: Paul H. Robbins



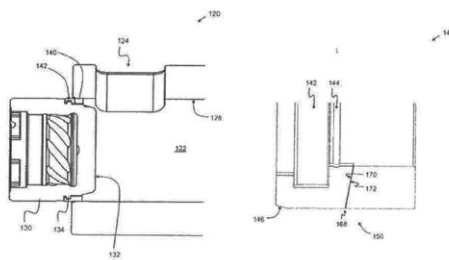
Thermal Control Extrusion Press Container (2007)

Inventor: Paul H. Robbins



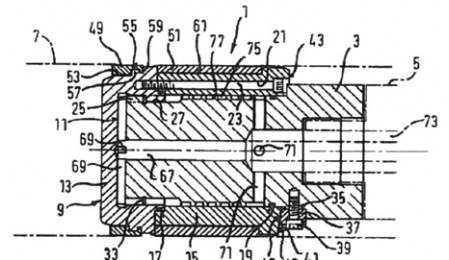
Wear Ring for Die-Casting Piston, Die-Casting Piston incorporating same, and Method of Forming Same (2017)

Inventor: Paul H. Robbins

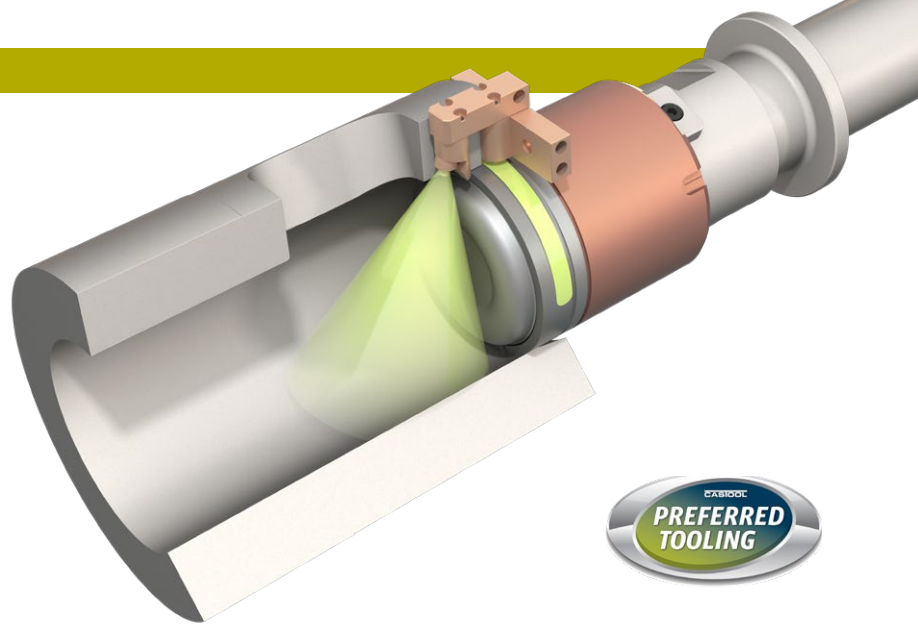


Multi-piece Piston for a Cold Chamber Casting Machine (2012)

Inventors: André Müller, Frédéric Müller



LUBRICANTS – DIE CASTING



| LUBRICANT | DESCRIPTION | USAGE | BENEFITS & FEATURES | LIMITATIONS |
|-----------|--|--|--|--|
| ALS 192 | Synthetic boron nitride designed for aluminum casting with superior surface finishing. A relatively-soft, washcoat-type of coating with a lower BN content which still provides excellent non-wetting and release with aluminum, magnesium, zinc and other non-ferrous metals and alloys. | Plunger tip lubricant formulated for lubrication of all types of plunger tips: Beryllium copper, bronze, steel and all diameters. | <ul style="list-style-type: none"> - Thermally/chemically stable up to 1050°C with molten aluminum decreased volume of lubrication - Reduced chance of contamination of casting - Reduced coefficient of friction, longer component life and constant shot velocity - Cleaner, safer environment - Reduced cost per casting | <ul style="list-style-type: none"> - Needs to be constantly agitated - Needs to be kept at higher temperatures as the viscosity gets affected at lower temperatures - Higher cost than CLS200 due to BN content |
| ALS 196 | Mineral oil based lubricant maintains an unusually low friction coefficient at high temperature | Plunger tip lubricant formulated for lubrication of all types of plunger tips: Beryllium copper, bronze, steel and all diameters | <ul style="list-style-type: none"> - Decreased volume of lubrication - Reduced chance of contamination of casting - Reduced coefficient of friction, longer component life and constant shot velocity - Cleaner, safer environment - Reduced cost per casting | <ul style="list-style-type: none"> - Needs to be constantly agitated - Needs to be kept at higher temperatures as the viscosity gets affected at lower temperatures - Higher cost than CLS200 |
| CLS 200 | Vegetable ester based Lubricant | - Plunger tip lubricant formulated for lubrication of all types of plunger tips: Beryllium copper, bronze, steel and all diameters | <ul style="list-style-type: none"> - Highly Economical - Biodegradable - Does not contain graphite - Blue in color - Good adherence to tip and sleeve - Excellent thermal stability - Easily applied by automatic or manual spray equipment, supplied ready-for-use - High flashpoint - Very good anti-wear properties - High load capacity - High viscosity Index - Minimal smoke | |

LUBRICANTS – EXTRUSION



| LUBRICANT | DESCRIPTION | USAGE | BENEFITS & FEATURES | LIMITATIONS |
|----------------------------|--|--|--|---|
| Alu-Ject Liquid | A non-pigmented, water based lubricant designed for billet end coating. It is formulated using organo-metallic compounds which apply a boundary film to prevent welding of the billet to the dummy block; providing excellent release characteristics. Capable of wetting temperatures as high as 1112° F (600° C). | <ul style="list-style-type: none"> - Hot Billets (unoxidized surfaces) - Shear Blade - Container sealing surface - Hot Dummy Block | <ul style="list-style-type: none"> - Does not contain graphite or Boron Nitride - Highly economical - Easy to mix and dilute 1:1 with water - Easily applied by automatic or manual spray equipment - Stable solution; no settling or splitting - Safe to use | <ul style="list-style-type: none"> - The spray head requires weekly maintenance |
| ToolRelease Liquid | A relatively-soft, washcoat-type of coating with a lower BN content which still provides excellent non-wetting and release with aluminum, magnesium, zinc and other non-ferrous metals and alloys. | <ul style="list-style-type: none"> - Cold billets - Shear Blade | <ul style="list-style-type: none"> - Easy to mix and dilute - Easily applied by automatic or manual spray equipment - Safe to Use | <ul style="list-style-type: none"> - Due to leidenfrost effect, the lubricant is not effective on hot billets - The spray head requires weekly maintenance - Higher cost than Alu-Ject due to BN content |
| ToolRelease Powder | The crystal structure of hexagonal Boron Nitride leads to plate-like crystal grains that provide excellent lubrication for BN powders. The powder can be negatively charged and applied using an Electrostatic Powder coating gun. | <ul style="list-style-type: none"> - Hot Billets (unoxidized surfaces) - Hot Dummy Block | <ul style="list-style-type: none"> - Very low maintenance - Easy to apply using an Electrostatic gun | <ul style="list-style-type: none"> - Hard to contain overspray as the BN particles are tiny and can float long distances in air; Safety concern for inhalation - Only dry air or Nitrogen can be used for spraying - Higher cost than Alu-Ject due to BN content |
| ToolRelease Aerosol | A convenient aerosol can for applying thin, uniform, quick-drying layers of BN to most any substrate. Allows the creation of a dry-film lubricant and provides the great properties of BN that is easy-to-use with low electrical conduction; high thermal conduction; prevents reactions between materials; and has superior release. | <ul style="list-style-type: none"> - Cold billets - Dummy Block - Extrusion Dies bearing surface | <ul style="list-style-type: none"> - Easily applied | <ul style="list-style-type: none"> - Cannot be applied on hot surfaces - Higher cost than Alu-Ject due to BN content - Only for manual application |
| Alu-Ject PB Tablets | A non-pigmented, lubricant in tablet form designed for billet end coating. It is formulated using Organo-metallic compounds which apply a boundary film to prevent welding of the billet to the dummy block; providing excellent release characteristics. Capable of wetting temperatures as high as 1112° F (600° C). | <ul style="list-style-type: none"> - Hot Billets (unoxidized surfaces) - Shear Blade - Container sealing surface | <ul style="list-style-type: none"> - Minimal packaging - Less inventory/less space - Ensure good dilution ratio - High lubricating/parting properties - Safe to use - Less carbon dioxide - No waste - Low energy consumption in initial manufacturing | <ul style="list-style-type: none"> - Higher cost than Alu-Ject Liquid per billet |
| Alu-Ject Stick | A cream colored, sodium-based soap, supplied in the form of solid soap bars. No graphite, excellent lubricity, good adherence. | <ul style="list-style-type: none"> - Shear Blade - Container sealing surface - Hot Dummy Block | <ul style="list-style-type: none"> - Minimal smoke - Does not contain graphite or Boron Nitride - Good flow characteristics | <ul style="list-style-type: none"> - Only for manual application |



NEW PRODUCT

Castool introduces **ALU-CLEAN**, a heavy-duty liquid cleaner designed to remove residues, oil, dirt and grease that typically build up on machinery. **ALU-CLEAN** is readily dilutable and has high detergency for the most demanding cleaning processes. It is especially recommended to clean billet end coating residues such as metallic soaps, acetylene black, graphite and boron nitride based products. Low concentrations of **ALU-CLEAN** provide an economical and safe solution.

Product benefits and features

- Safe for most painted surfaces
- Highly economical
- Easy to mix and dilute
- Can be used on ferrous and most non-ferrous materials
- Stable solution – no settling or splitting
- Safe to use
- Can be applied with a brush or swab

Safety

- **Eye/face protection** – chemical respirator with organic vapor cartridge and full facepiece
- **Skin/hand protection** – protective gloves made of Nitrile or PVC
- **Other** – Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended

**CASTOOL MAKES
EXTRUSION BETTER**

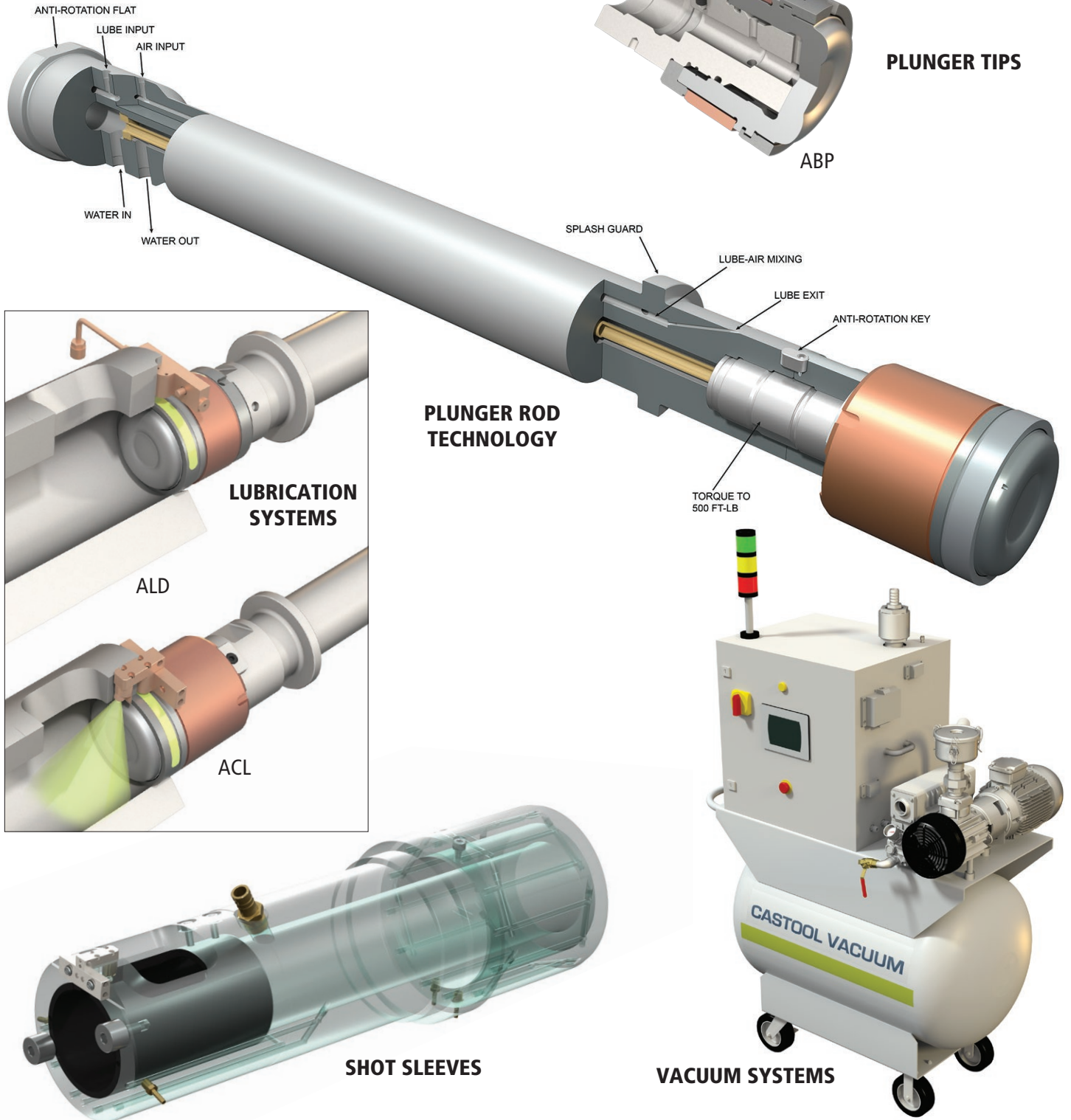
**CASTOOL MAKES
DIE CASTING BETTER**

COMMON RULES OF THUMB



- $\Delta 5^{\circ}\text{C}$ is $\Delta 1\%$ metal flow for aluminum
- Increase billet length by 50% increases heat generated by 100%
- Increase billet length by 50% requires 15% more force
- Steel expands .000011 mm/mm/ 1°C
- BeCu expands .000017 mm/mm/ 1°C
- Steel loses 5°C for each minute in air
- Steel loses 10°C for each minute through conduction
- 650°C aluminum will penetrate a gap greater than .1 mm
- 460°C 6000 aluminum will penetrate a gap greater than .5 mm; 1000/3000 aluminum will penetrate a gap greater than .25 mm; and 7000 aluminum will penetrate a gap greater than 1.0 mm

ALLPER AG was purchased by Castool in 2010. ALLPER products are marketed and sold globally by Castool. ALLPER developed the patented RING-PLUNGER system, the MULTI-VAC® vacuum system and the ALLPER-SPRAY® lubrication system.





SCHMOLZ + BICKENBACH is a partner with Castool in hot work tool steel. They are numbered amongst the leading manufacturers of tool steel on the global market.

Their tool steel satisfies the requirements of each application, which can include cost-effective machinability, high resistance to wear, good thermal conductivity and good hardenability, as well as excellent polishing and acid-treatment properties.

Production takes place at four plants in Germany:
 Witten – 1,820 employees Krefeld – 640 employees
 Hagen – 400 employees Siegen – 1,140 employees

With Sales & Services Divisions around the world.



| Witten | Krefeld | Siegen | Hagen |
|---|--|--------------------------------------|--------------------------------------|
| 130t Electric-Arc-Furnace | Electro-Slag-Remelting (ESR) Vacuum-Arc-Remelting (VAR) | 120/140 t Electric-Arc-Furnace | Rolling mill for wire and steel bars |
| Vertical Continuous Casting / Ingot casting | 33-MN-Forging press | Continuous casting plant Bow type | Pickling lines |
| Forging machine LSX 25 | Forging machine RF 70 | Electro-Slag-Remelting (ESR) | Heat treatment |
| Rolling mill | Heat treatment | Ingot casting | Drawing |
| Heat treatment | Peeling | Rolling mill | Peeling |
| Peeling | Machining | Single bar heat treatment unit | |
| Machining | | Heat treatment | |
| | | Peeling | |



FORGING



SHOT BLASTER



SHIPPING AREA

Schmelzmetall is a partner with Castool in forged alloys, specifically beryllium copper and copper alloys.

100% Schmelzmetall quality ...
from casting to assembly groups



CASTED ALLOYS



FORGED RINGS
+ DISKS



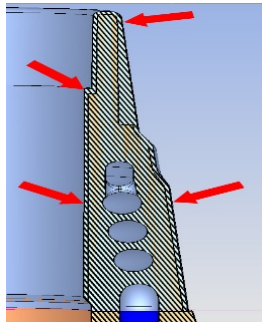
FORGED BARS
+ PLATES



DRAWN
PROFILES



MACHINED
PARTS



NEW
TECHNOLOGY

PLANTS:

Schmelzmetall AG – Gurtellen UR

- Established in 1959
- 25 employees
- Production/ Casting / Heat Treatment

Schmelzmetall Deutschland GmbH – Steinfeld-Hausen

- Established in 1997
- 60 employees
- Stock / Cutting Center / CNC Machining / Sales

Schmelzmetall Hungária Kft. – Budapest

- Established in 2001
- 27 employees
- Production / Sales

- production process
- melting and casting under vacuum
- pre machining
- forging / rolling / extrusion / drawing

- heat treatment
- quality inspection (ultra sonic)
- stockholding
- machining



InterGuss is a partner with Castool in the design and development of chill blocks.

Here are some key dates in history which they are particularly proud of:

1993: First-time Adoption of ventilation blocks and Gießkammerabsaugung to produce T6 heat-treated Al structural components in vacuum die casting

2003: Launch of OptiVent® ventilation blocks

2006: Launch of MiniVent® series

2009: Delivery of the 1000th block ventilation in Germany

In die casting, their focus is on mold venting. Gas porosity, caused by trapped air or reaction products of the release agents, is responsible for a high proportion of the casting scrap in the die casting process. Avoiding this reject requires optimized mold venting.

Castool incorporates InterGuss VENTING BLOCKS as part of their Vacuum System.

OptiVent®
THE solution for mold venting

MiniVent®
THE optimal mold venting for small molds

SVent®
Excellent value for money



MATERIALS

Extrusion and die cast processes can vary widely. Alloy types, pressures, cycle times, size and lubrication can all play a role. Choosing the best material for each component of the tooling system can be challenging, at the same time as being cost competitive.

The following chart lists the thermal conductivity, wear properties, temperature range and cost factor for several of the materials Castool uses.

| For Extrusion | | | | |
|-----------------|-------------------------------|-----------------------|------------------|-------------|
| | Thermal Conductivity(W/mk) | Toughness (J) | Temp Range (C) | Cost Factor |
| Con-Duct | 42 | 100 | 25 - 550 | 150 |
| L6/SKT4/1.2714 | 36 | 40 | 200 - 570 | 250 |
| H11/1.2343 | 26 | 30 | 250 - 585 | 200 |
| H13/1.2344 | 24 | 25 | 250 - 585 | 200 |
| Q10 | 30 | 35 | 250 - 595 | 600 |
| For Die Casting | | | | |
| | Thermal Conductivity (W/mk) | Wear Property (HRc) | Temp Range (C) | Cost Factor |
| Tuff-Temper | 30 | 40 | 250 - 605 | 300 |
| Dievar | 30 | 38 | 250 - 595 | 600 |
| H13 | 24 | 38 | 250 - 585 | 200 |
| Con-Duct | 42 | 35 | 25 - 550 | 150 |
| Stainless Steel | 18 | 30 | 25 -450 | 400 |
| A45 | 240 | 19 | 25 - 300 | 1000 |
| A52 | 230 | 21 | 25 - 300 | 2000 |
| A25 | 150 | 29 | 25 - 300 | 3000 |



2018



TRADE SHOWS

Our global presence is key to our success



**AUSTRALASIAN
ALUMINUM EXTRUSION
WORKSHOP**

September 10-11, 2018
Melbourne, Australia



**EXTRUSION
TABLE TOP EXHIBIT**

September 11 -13, 2018
Chicago, USA



**EXTRUSION
TRADE SHOW**

October 9 - 11, 2018
Düsseldorf, Germany



**DIE CAST TRADE SHOW
BOOTH # 514**

October 15 - 17, 2018
Indianapolis, USA



**DIE CAST
TRADE SHOW**

October 24 -26, 2018
Guadalajara, Mexico



**DIE CAST
TRADE SHOW**

November 8 - 10, 2018
Yokohama, Japan



**EXTRUSION & DIE CAST
TRADE SHOW**

November 21 - 24, 2018
Bangkok, Thailand



EXHIBITION & CONFERENCE - ALUMINIUM DIE-CASTING
6 - 8 DECEMBER 2018 | INDIA EXPO MART (IEM),
GREATER NOIDA, U.P. (DELHI-NCR), INDIA

**DIE CAST
TRADE SHOW**

December 6 - 8 2018
New Delhi, India

THE INTERNATIONAL TEAM

Dan Dunn
Jad Samra
Ken Chien

Extrusion Sales Director
Die Cast Sales Director
Product Director

Natalya Pieri
Keattikhun Chaichana

Product Specialist Europe
Product Specialist Asia

Jean Dembowski
Tanmanun Tiantip
Christine Kaschuba
Sue Lotton
Sue Su
Dan Phudis
Ploy Robbins

Commercial Manager
Commercial Supervisor
Customer Service
Customer Service
Customer Service
Customer Service
Marketing Director

CANADA / USA

Krystean Rose
Matt Binns
Andre Iulianetti
Jon Veenstra
Sebastien Derooy
Ron Steinenger
Sam Durbin
Tom Troxclair

Castool
Castool
Castool
JW Industries LLC
Sea Bass Outdoors
R-Bet Sales Inc
R-Bet Sales Inc
Troxclair and Associates

LATIN AMERICA

Valentin Meneses
Carlos Lima
Osvaldo Lomas
Alberto Forcato

Kautec America
KTC do Brasil
Casmet
Forcato Tecnologia

EUROPE

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

Comexale
Comexale
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Comexale
Comexale
TEL Nordic APS
Techno Moulds
KDO Komponenty Dla Odlewnictwa
Schmelzmetall
Schmelzmetall

UAE

Emmanuel Mandrelli

Comexale

ISRAEL

Tuvia Kornfield

NTK Plants Management

TURKEY

Cenk Sommez

BCM Makina Kimya

SOUTH AFRICA

Olivier Druhen

Comexale

JAPAN

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
Taek Jean Hwang

ANK Ltd
ANK Ltd
GS Tech Solutions

TAIWAN

Jack Lee

Shiny Lee

CHINA

Daniel Cheng
Long Shun Cheng

OEA Bridge Link
OEA Bridge Link

THAILAND

Manu Mekdhanasarn
Patcharee Parkong

Siam Anglo Alloy Company Ltd
Siam Anglo Alloy Company Ltd

VIETNAM

Manu Mekdhanasarn
Patcharee Parkong
Tran Thi Thanh Thuy

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

INDONESIA

Yovinus Krisnanto

PT Wilisindomas Indahmakmur

MALAYSIA

Manu Mekdhanasarn
Patcharee Parkong
Chek Tay

Siam Anglo Alloy Company Ltd
Siam Anglo Alloy Company Ltd
Lustre Specialty Materials

SINGAPORE

Manu Mekdhanasarn
Patcharee Parkong

Siam Anglo Alloy Company Ltd
Siam Anglo Alloy Company Ltd

INDIA

Sachin Kumar

AUSTRALIA/NEW ZEALAND

Doug Loader

Extrusion Machine Co New Zealand