



APT

TemperBox

**Journal of the Institute
of Sheet Metal Engineering**

Oracle

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Principle Officers

President

Mr Alan Shaw



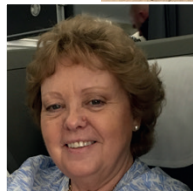
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Skills Competition Report - P20

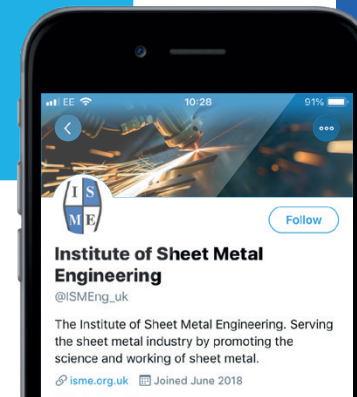
Much has been made of Brexit's impact on British exports, but manufacturing in Britain relies heavily on its ability to import. Almost half of the UK's imports are goods that are made into a final product.

Barry Smith, Chairman of the Council

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The Oracle published in association with the Metalforming Machinery Makers Association Ltd. ISME & MMMA working together for the benefit of the Sheet Metalforming Industry.

The Oracle, mouthpiece of the Institute, speaks for and to the world of Sheet Metal Forming & Pressworking by way of featuring New, Views and Topics around the Industry.

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Cover photo courtesy of AP&T

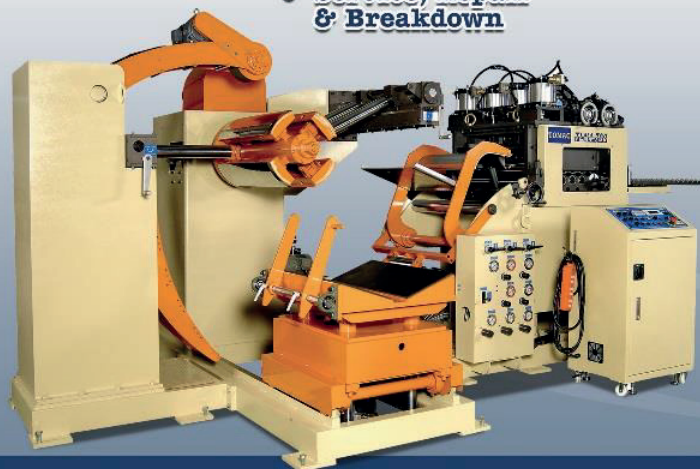


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From the President

Alan Shaw -
President



Dear Member,

Whilst pondering possible subject matter for my President's notes for this edition, I decided to check my understanding of the meaning of the word "Oracle".

Wikipedia has the following entry, which I have edited in the interests of brevity,

"The Oracle of Delphi, as the ancient Greek Goddess Pythia came to be known, was widely credited for her prophecies over a period spanning 8th to 4th Centuries BC - inspired as she was by being filled by the spirit of the god, Apollo. During this period the Delphic Oracle was the most prestigious and authoritative oracle among the Greeks, and she was without doubt the most powerful woman of the classical world."

However, Wikipedia goes on to explain that there are conflicting stories as to exactly how Pythia delivered her prophecies. One suggestion being that she "became in a frenzied state induced by vapours from a chasm in the rock, and that she spoke gibberish which priests interpreted as the enigmatic prophecies."

Regrettably, to my knowledge, ISME is not blessed with priests endowed with interpretive powers, so let's just hope that this edition's content is as clear, erudite, concise and informative as we have all come to expect.

Alan Shaw - President

From the Chairman

Barry Smith -
Chairman of Council

Much has been made of Brexit's impact on British exports, but manufacturing in Britain relies heavily on its ability to import. Almost half of the UK's imports are goods that are made into a final product.

Therefore, supply chain management is critical for UK companies that want to successfully navigate through Brexit and beyond. In some cases, it could determine their survival.

Some companies have been forced into making the decision to increase their stock levels by their customers and by introducing stocking policy puts increased pressure on cash flow. This is yet another burden that the manufacturing sector face who can ill afford it.

Even by putting new stock levels in place, this may not eradicate the bottle necks relating to the transportation and export of these manufactured items.

The increase in customs costs and traffic jams at key points of entry and exit stemming from Brexit will have impact to the UK automotive manufacturers. The just-in-time parts delivery, that we are all familiar with, which was designed to minimise inventory costs and keep factories humming efficiently will be affected. Every company currently trading is facing concerns as to the future trading conditions and how this could affect them.

I believe that we all represent an important part of the supply chain network and the sooner everyone knows what the final outcome of Brexit is the better for us all.

I don't think anyone knows what is going to happen in regards to the outcome of Brexit, one thing for sure is, whatever the outcome, we all will have to adapt and do whatever is necessary in the traditional British true grit approach.

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From the Secretary

Bill Pinfold -
Honorary Secretary 2019

Another busy 6 months for the Institute with the Metal Bashers Ball, Skills competition and HSG236 meeting. At the September Council Meeting it was agreed that ISME and MMMA will hold the 2020 Metal Bashers Ball on Friday 15th May at the Copthorne Hotel, Dudley. Further details will appear on the ISME web site and the Twitter feed.

John Davis, Council Member, Past President and Past Chairman has decided that the time is right to leave Council to make way for younger members to take up the baton to move the Institute forward. John was ISME Chairman 2002-2004 and ISME President 2010-2014 and even had a short spell as Oracle editor when the previous editor left at short notice. His company Davis Decade always supported the Institute's activities and with his wife Jan attended all our social functions. John's wise guidance will be much missed by his colleagues. In recognition of John's service to the Institute he was made

an Honorary Member at the September Council Meeting.



After eleven years of very efficiently organising ISME's events, Adrian Nicklin has decided to stand down as Events Officer. His expertise will still be available to us as he will be joining Council but we are looking for ways of replacing his leadership either by one individual or splitting the job up. Anyone interested, please contact me at ismesec@gmail.com for further details.

New Member

We would like to welcome the following new member to the Institute:

Peter Grant

Peter Grant has joined as a Member. Peter is Managing Director of Hitherbest Sheet Metal Fabrications Ltd. in Telford. Peter brings a wealth of business experience to the Institute.



AGM Report

Report on ISME 73rd AGM held on Thursday 19th May 2018

The meeting was kindly hosted by Company Member Regent Engineering and was attended by 8 members.

The Hon. Treasurer, Josie Stevenson reported a loss for 2018 of £6,774 with reserves decreasing to £19,239. The figures were due to a change in accounting period which had inflated the 2017 results at the expense of 2018. The Chairman, Barry Smith gave his report on a year where several successful events had been held.

The following officers were elected:

- Chairman Barry Smith • Hon. Treasurer Josie Stevenson
- Hon. Secretary Bill Pinfold • John Yarnall was co-opted to Council.

Member News

Skillcraft products have continued their investment program with the purchase of an Amada EM3612 punch press and a Hypertherm XPR170 Plasma cutting machine.

AP&T launching TemperBox®

A new cycle time neutral production solution that enables tailored properties in press hardened components.

AP&T is introducing a patented solution for partial press hardening of structural parts for passenger cars. TemperBox® allows hard and soft zones to be combined in a single part, paving the way for innovative body designs and cost-efficient production. TemperBox® can be integrated with AP&T's new and existing Multi-Layer Furnaces as well as with any other type of heat treatment equipment.

With over 100 press hardening line installations for customers all over the world, AP&T is now taking an important step in the development of its press hardening technology. The company's most recent product innovation — TemperBox® — offers entirely new opportunities to design and produce structural parts cost efficiently.

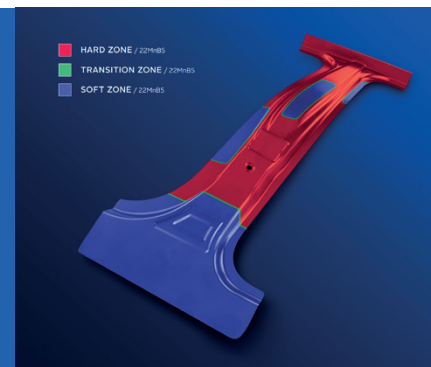
The patented invention TemperBox® is based on what was originally developed by Agim Ademaj, (Metakus Automotive, Kassel, Germany). In 2013 a cooperation initiative between AP&T and GEDIA Automotive Group (Attendorn, Germany) was launched for the further development and industrialization of the technology, which has now resulted in a fully commercial solution.

"The patented solution enables several material properties to be combined in a single finished part. Some sections can be hardened to maximize strength while others are made softer to achieve the desired ductility and to facilitate post processing such as a joining or mechanical cutting," says Dr. Christian Koroschetz, CTO at AP&T.



AP&T's patented furnace module for partial hardening, TemperBox®, can be installed in AP&T's new and existing Multi-Layer Furnaces, and is also available for any other type of heat treatment equipment.

The process involves precision-controlled heat treatment, which takes place in a special furnace module known as TemperBox®. After being heated up to 930 degrees Celsius in a conventional austenization furnace, e.g. AP&T's Multi-Layer Furnace, the blank is moved to the TemperBox®, where selected sections are blocked from radiation and cooled down while the rest of the part is kept hot. The blank is subsequently formed and quenched to produce the finished part.



Precision-controlled heat treatment allows hard and soft zones to be combined in a single part.

The final result is a part with tailored properties, customized to the required performance of the component. This means designers and manufacturing engineers can work more freely without considering costly reinforcements or cycle time intensive processes such as tailored tempering in press hardening tools, which are frequently implemented to improve the collision safety of body parts. The new method offers clear production-related advantages compared to today's press hardening such as easy integration in new and existing press hardening lines. The TemperBox® production solution enables short cycle times in the same range as the industry is accustomed to today when producing press hardened components with monolithic properties over the cross section.

"Not only new possibilities in crash performance design are possible, post processing is also much easier since specific areas of the component, such as flanges, can be kept soft, enabling them to be punched or trimmed using conventional methods — which is much less expensive than laser cutting, for example."

TemperBox® can be installed in AP&T's new and existing Multi-Layer Furnaces, and is also available for press hardening lines that have any other type of heat treatment equipment.

"This means the new technology can be used with basically any press hardening line in the market, regardless of brand," says Christian Koroschetz

Facts

The first full capacity TemperBox® production line will be installed at GEDIA Automotive Group in Attendorn, Germany, where it will be used for production of press hardened components with tailored properties for various European OEMs. Production is planned to start by the end of 2019. GEDIA has also had a TemperBox® prototype line in use since 2017.

In Europe, GEDIA and AP&T closely cooperate on the TemperBox® technology. AP&T is the owner of the patent rights and GEDIA is the owner of an exclusive production license for the European market.

Using Forming Simulation to Compensate for Springback



Simulation of sheet metal forming processes has been in use for more than 25 years. The method requires input data including the geometry and material specification for the blank, CAD models of the tool geometry and process conditions such as blankholder force. Within a couple of hours a great deal of knowledge about the feasibility of the proposed process and tool design can be obtained. The results reveal potential problems with splits, wrinkles or excess thinning (figure 1) as well as allowing optimisation of the process to determine the optimum blank size and number of operations – many toolmakers now rely on simulation to confirm the process before physical try out.

Besides splitting and wrinkling, one of the major forming defects facing the design engineer is springback – the unavoidable change in shape due to the recovery of elastic strain in the blank after removal from the tool. This leads to a variety of distortion modes including doming, wall curvature and incorrect flange angles (figure 2). The main problem caused by this distortion is poor part fit in assembly especially where mating surfaces are out of tolerance, as well as other issues such as panels becoming stuck on the tooling and cosmetic defects in skin panels, sometimes referred to as “teddy bear’s ears”. Manually correcting for springback distortion creates costly delays late in the development programme and may even lead to tools being scrapped.

The amount of elastic strain in a pressing is a function of the elastic stiffness or Young’s

Modulus (E value) of the material which directly influences the amount of springback (figure 3). All ferritic steel have approximately the same Young’s Modulus, but high strength steels will exhibit more elastic strain than mild steels simply because of the higher stress levels reached; and Aluminium will tend to show more springback relative to steel simply because it has a Young’s Modulus three times lower (~70GPa cf. ~210GPa).

One of the more advanced capabilities of forming simulation is the ability to calculate springback distortion. International benchmarks such as the NUMISHEET conferences (figure 4) have focussed on this challenge leading to the development of advanced techniques and more sophisticated material models. These improvements mean that today’s simulation engineers are increasingly confident in their springback calculations.

If we can accurately predict springback then the next logical step is to use the prediction to correct for the problem in the first place. This capability has been added to a number of specialist forming simulation solutions, including eta/DYNAFORM based on the LS-DYNA solver (figure 5). The initial analysis is done with tooling design to the nominal CAD for the part to obtain a baseline springback result. Then, the difference between target geometry and the initial springback shape are used to generate a new tool shape. A scale factor is used – rather than take the full difference it is generally found that an amount less than 100% will get closer to the desired

result – 100% usually goes too far the other way. A new simulation is then run from the updated tool shape and the result checked again; further iterations may be necessary depending on the material and of course the required tolerance in the result. With eta/DYNAFORM this entire process can now be automated by specifying a target tolerance and allowing the software to iterate until this is achieved (or the maximum number of iterations is reached).

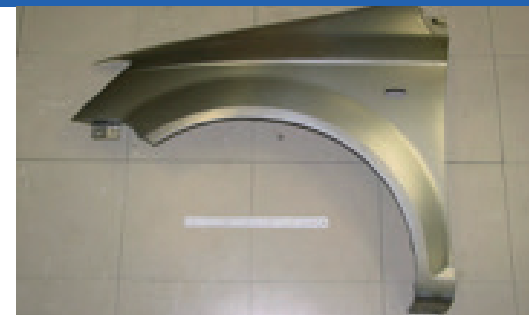
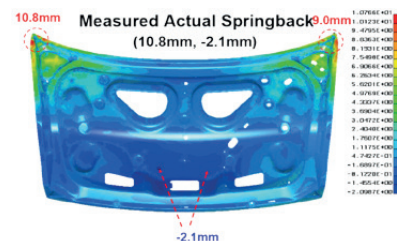
Dutton Simulation has been applying this method for over a decade and the results have been extremely encouraging. One of the first applications was an automotive side impact beam pressed in 1180MPa steel (figure 6). It required a number of iterations but the final outcome proved to be acceptable, saving considerable time and materials at tool try out.

There are a number of other considerations needed to get a compensated springback result. Trimming, especially with a draw die process, releases certain regions of the part

and can lead to a further change in shape; compensation can be applied to the initial drawn shell, the trimmed panel or potentially both. The user should also consider how the part is fixed for checking as the clamping process may alter the relative movement in the panel; it may even be necessary to consider gravity in some cases and check the geometry with the panel oriented as it would be in the final assembly.

If a panel has already been produced from an initial try out tool then it is also possible to use this result for the compensation method. By scanning the geometry of the formed panel, e.g., using a white or blue light method, we can determine the difference between actual and target geometry and use this as the basis for the compensation process. This also offers an opportunity to validate the predicted springback from the model, checking sensitivity to inputs such as material properties, friction and blankholder force.

One of the more advanced capabilities of forming simulation is the ability to calculate springback distortion.





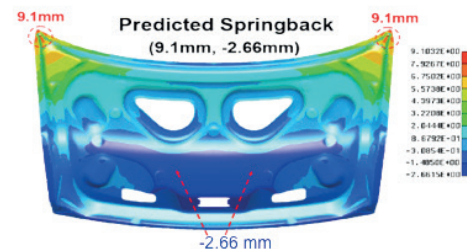
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It should be noted that there are a number of limitations to the springback compensation method. Firstly, the result is generated using a single set of material data whereas in reality properties will vary within the range allowed by the specification – and this can be considerable; springback is particularly sensitive to material yield strength for example. So the compensation needs to consider what values to use – worst case, mid-range or something else? Other limitations include possible confusion over wrinkling – the process may attempt to change the tool shape creating “inverse” wrinkles; the method does allow regions to be omitted to avoid this. And undercut, i.e., die-lock conditions, can result from applying compensation where bend angles beyond 90° can be accidentally created; again, the LS-DYNA method has options to avoid this.



About the author: Trevor Dutton, C Eng MIMechE MISME, is Director of Dutton Simulation Ltd, now in its 17th year. The company provides a range of forming simulation software from leading suppliers from around the globe, as well as offering a tool process analysis service for customers. Dutton Simulation also present technical training courses to enhance understanding of metal forming.



SPRINGBACK

Control of springback is a major challenge – it is inevitable, though more severe in some materials than others, so we need an approach to deal with it. Good practice in part design, process engineering and tool design should not be overlooked, helping to limit the problem with stiff geometry and sufficient plastic strain during forming. However, now that we have the ability to accurately predict springback shape, engineers can address this most challenging of issues in sheet metal forming using an analytical approach.

Compensation using a simulation model has been shown to get tools much closer to “right first time”. This has resulted in reduced time required in try out, saving money and materials and allowing Job 1 production to be achieved on time and budget.



download the full presentation from
isme.org.uk/isme-resources

ISME Member Trevor Dutton and his wife Julie headed off in September on a trek in the remote highlands of Iceland, traversing mountains, rough terrain, hot springs and lava fields, all in support of The Love Hope Strength Foundation. A report and pictures will appear in the next Oracle. Further details can be found on “Trevor and Julie’s Iceland Rocks” page on Just Giving.



Events

July 2019 HSG236

Steve Garrett, Engineer Surveyor Power Press, Allianz Engineering gave an update on HSG236 Power Press maintenance and thorough examination to over 40 ISME members and guests at the event which was hosted by MPPS Ltd at their Tipton assembly shop.

Steve gave a briefing for all users of Power Presses on the requirements to conform to current regulations.

As background Steve said that in 1943 there over 500 reportable accidents due to Power Presses.

In 1965 the Power Press Regulations were introduced later incorporated into the H&S at Work Act and PUWER in 1998. By this time reportable accidents were down to 20. At the same time the number of Power Presses in the UK had fallen by 60% from the post war peak.

PUWER contains a number of regulations with Reg 31 covering Power Presses working hot metal and those be operated with "Safe Strokes" less than 6mm. Regs 32-35 cover Power Presses on matters such as Thorough Examination, Regular Guard Inspections, Competent Persons and the keeping of records.

ACOPS or codes of practice give guidance on use, have special legal status and can be used in prosecutions.

There are numerous BS and ISO standards and Guidance Notes. Guidance Note HSG236 introduced in 2005 is of particular importance to users. The main changes it brought in affected electrical testing and the need to have complete circuit diagrams. Any movement or modification of a press requires reinspection to HSG236. It also gave the need for the Competent Person to ask for the exposure of critical



parts such as clutches and brakes and for visual or NDT tests to be performed by a suitably qualified person. HSG316 covers light guards.

SAFEd Guidance Notes for Competent Persons are also useful.

A lively Q&A session followed with the definition of a Competent Person and the Guarding of presses used for hot working amongst the subjects discussed. Steve was joined for the questions by his colleague, Roland Zumpe, Specialist Engineer Hazardous Machines also from Allianz Engineering.

The evening was completed by a demonstration by Steve of the Magnetic Particle Inspection Process which involves a strong magnetic field being applied to a component which has previously been sprayed with a solvent containing iron filings. If there is a crack in the component it is revealed by a line of filings gathering round its length.

A very informative evening much appreciated by the attendees as was the excellent buffet provided by MPPS Ltd.



HSG316



HSG236



The main changes it brought in affected electrical testing and the need to have complete circuit diagrams.

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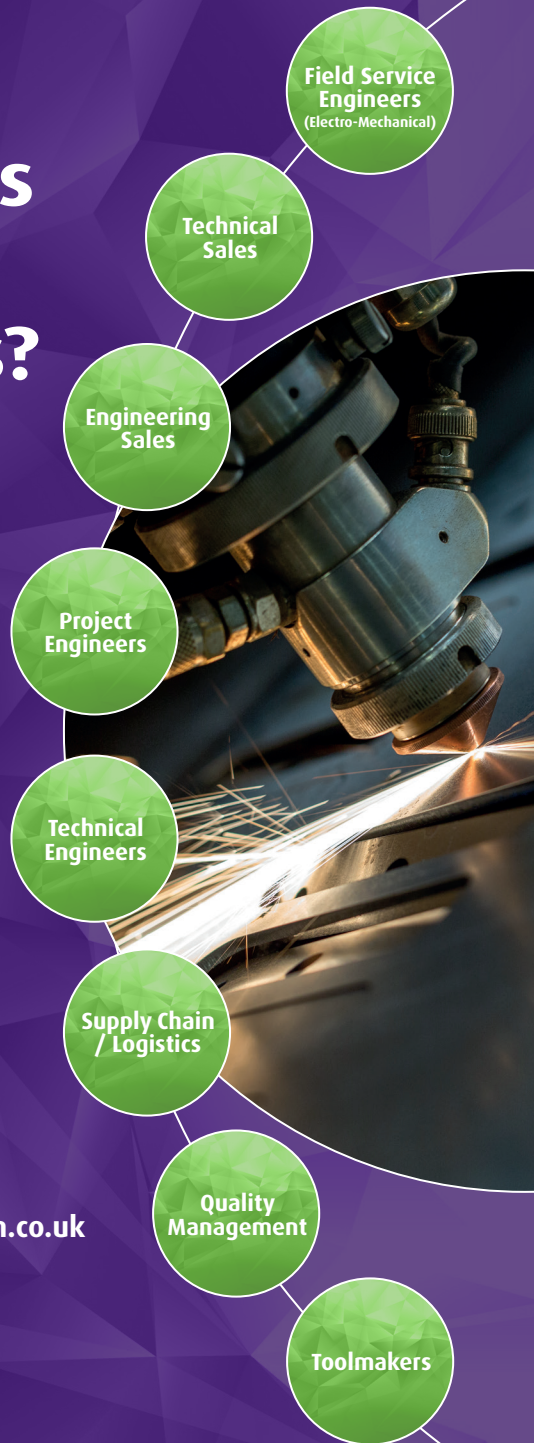
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Metal Bashers Ball Report



Together, we should all celebrate what we in the UK are good at!

May 17th saw the second annual Metal Bashers Ball dinner dance, hosted jointly by the MMMA and the ISME at the Copthorne hotel, which saw over 160 guests from over 25 member companies join together and celebrate contributions to UK Manufacturing.

To ensure this event was a success takes a lot of careful organisation to ensure everything from the venue, food, drinks etc are all up to scratch. Many thanks to those involved in the organisation, Adrian Haller Chairman of the MMMA & Bill Neal also of the MMMA, and Bill Pinfold, Adrian Nicklin and Josie Stevenson of ISME. We are sure everyone who attended will agree it was great evening and a good chance to catch up with colleagues and peers, new and old alike.

A very Special thank you to our sponsors this year Schuler Presses, the MTA, eleven10creative and Close Bros Asset Finance, who's much valued contribution to this years event helped it to be such a big success. As those of you who attended will know, this years special guest was Carl Chinn MBE, a local historian who gave us all a great insight into local gangsters, the real Peaky Blinders. Many thanks to Carl for taking time to join us on the night. And lastly but by no means least, a big thank you to everyone who attended the Metal Bashers Ball and here's looking forward to the next event!

As always, these events are not only a members-only affair, they are open to non-members as well and indeed not only from metal forming industries, but to the wider manufacturing fraternity as well. If you would like to join us next year, or to find out more about the MMMA and ISME organisations, we'd love to hear from you.

Together, we should all celebrate what we in the UK are good at!



Special guest was Carl Chinn MBE

CBM H&S Group Meeting

The main topic of the meeting was the HSE safety bulletin issued early this year about the change in enforcement expectations for control of weld fume. All weld fume (including mild steel) is now classified as a carcinogen which can cause lung cancer and has the potential to cause kidney cancer. This is based on the outcome of recently published research by the International Agency for Research on Cancer (IARC).

Consequently, there is a strengthening of the HSE's enforcement expectation for exposure control for all welding fume including mild and stainless steels, high chrome steels, armour plating and exotic materials.

Scott Blacklock of 3M Healthcare gave a presentation on the subject saying there estimated to be 190k people employed on welding in the UK of whom 70k were skilled. The fatal accidents reported in the work place each year only represented 1% of total industrial deaths with the rest due to chronic illnesses.

Dust and fumes from the welding process were a hazard with very small particles remaining in the air for up to 42 hours. This presents a potential hazard to supervisory staff and third parties who are not wearing protection.

The HSE have been criticised in some quarters for not giving full guidance on particle sizes and exposure levels. A new note containing guidance is awaited.

Scott completed his talk with a demonstration on the latest ventilated welding helmets.

Colin Bennett of Sertec talked about the problems and risks associated with turning steel coils.

A sub committee was set up to give feedback to the HSE on HSG236 which relates to Power Presses. The committee met in September along with representatives from the CBM.

ISME, MMMA and SAFED and an agreed document has been submitted to the HSE.



Dust and fumes from the welding process were a hazard with very small particles remaining in the air for up to 42 hours.

Investment in Black Country extension helps MPPS press forward

One of the UK's leading specialists in mechanical power presses has doubled its capacity after investing in a new building in Tipton.

Midland Power Press Services (MPPS), which provides repairs, spares, inspection and upgrades on over 100 different machines, now has over 10,000 sq ft of space split across dedicated machining and fitting shops.

The £300,000 investment on the expansion and the CNC machines comes on the back of a sustained period of growth, with new contracts from the metalworking, automotive and white goods sectors helping it push towards £3m turnover – the best 12 months in its near 30-year history.

In addition to the second site, the company has also bought a new Versa-Lift for £150,000, a unique forklift that has an extendable frame to help with the smooth and safe lifting of heavy machinery.

Josie Stevenson, Company Secretary at Midland Power Press Services, commented: "We have had an excellent 12 months as more manufacturers are looking at keeping their existing presses working longer and that's where we can really make a difference.

"Our team of engineers can refurbish, repair, service and upgrade over 100 different types of power press and this expertise has seen us win work for the likes of GKN, Glen Dimplex, Stadco, Tata Steel and Federal Mogul."

"The growth has also necessitated the need for five additional people, including a new Health and Safety Manager."

Established in 1980 in a small workshop in Wolverhampton, MPPS has grown from a one-man



operation to a business employing a 30-strong team of skilled engineers.

It has also signed an agreement to become the exclusive UK sales agent for OMERA, an Italian-based supplier of beading machines and presses.

This means for the first time that Midland Power Press Services can provide new equipment ranging from mechanical and hydraulic presses to fully automatic lines.

"The recent open day was a huge success, attracting over 100 people," continued Josie.

"There has been a lot of changes here and we wanted to show new and existing customers/suppliers exactly what we can offer, including the new machining shop and the state-of-the-art design software we are using to help identify issues for the customer."

She concluded: "If the order pipeline continues as it is, we'll enter our 30th year on course for £4m."

MPPS, which is working its way towards ISO 9001 accreditation, is a real family affair, with Josie's partner Bob Crow at the helm with her, alongside daughter Ruth Harper and sons Paul and Simon.

Skills Competition 2019 Report



View the full winners gallery
isme.org.uk/isme-2019-competition



The 2019 ISME Skills Competition was held on Thursday 13th June 2019 at Morgan Motors, Malvern.

With Thanks to Morgan Motor Company especially Angela Hymas and the helpful & knowledgeable staff, the event was a great success at the Malvern Plant that promotes UK Engineering hand working skills to the highest level.

This year's event brought in 26 apprentice competitors from the West Midlands and South Coast showing the need for the future to make all our metal commodities whether for aerospace, ship building, automotive, catering or retail sectors.

With Competitors from, Babcock Marine, Sertec & Warwickshire College we had a good mix of test pieces to judge.

The Categories were;

- Wall vent year 1
- Ducting year 2
- Tool Box
- Open class exhibit

We must praise the skills of the Apprentices for their workmanship and quality. Dimensional accuracy of the test pieces this year were to a very high standard with marking very close in all categories. The Open Class entries as normal gave the Judges a challenge to identify skills and originality.

ISME also judge their written technical document that accompanies the component they have made. We believe that the written word is an essential part in the planning of how they go about producing their exhibit.

Like all events in today's environment we are indebted to our event sponsors;

- Morgan Motor Company
- Institution of Mechanical Engineers (ImechE)
- Midland Power Press Services
- Confederation of British Metalforming (CBM)
- AP&T Group
- Bruderer
- Babcock Marine

Without their support there would not be a competition.

Overall Winner with the ISME Trophy Rhys Jones Babcock with ISME President Alan Shaw

THIS YEARS AWARD WINNERS

While Judging took place the Contestants, Trainers & Guests enjoyed the very interesting Factory tour noting the skills of the Morgan Workforce in production. As previously mentioned the ISME judges thought the quality standard was exceptionally high with the following awards given;

Wall Vent Test Piece Winner (Frank Cooper Award) was a tie for 1st place Connor Kent from Babcock & Jack Owen from Sertec.

Wall Vent Test Piece Written Winner, Jack Owen from Sertec.

Ducting Test Piece Winner, Reece Arcos from Babcock

Ducting Written (Ted Rosmarin Award) Dominic Brewster from Warwickshire

Toolbox Test Piece & Written was a shared project completed by Ryan Bevan & Hadden Demming from Sertec

John Davies Award Open Class winner, Rhys Jones from Babcock

ISME Originality Open Class Award went to Dan Meyer from Babcock

Open Class Written Award went to Jacob Dear from Babcock

ISME Trophy Overall Winner, went to Rhys Jones from Babcock.

We thank all the ISME & ImechE Members with guest retired engineers for doing the Judging which included measuring and project file reading.

Thanks, must go to the College and Company trainers for the time effort and support they give to the students and apprentices. Without their commitment there would not be a competition. We will be discussing the 2020 competition and venue at our next ISME Council meeting in September.

We will keep you posted through our website and social media.

Entrants to the ISME Skills Competition are given student membership of the Institute for a period where they receive the ISME Oracle to keep them in touch with our activities to hopefully encourage them to join us as their careers develop. This year we welcome Reece Arcos, Ryan Chapman, Jacob Dear, Rhys Jones, Connor Kent, Dan Meyer, Sam Ryan and Aidan Woodall of Babcock.

Declan Boylan, Jake Cogin, Mason Collins, Thomas Grainger, Aman Guddu, Charles Horsbury, Luke Jones, Jack Owen and James Pugh of Sertec.

Dominic Brewster, Nathan Claybur, Benedict Davies, Jordan Marston, Joshua Mitchell and Eric Szasz from Warwick College.



MACH 2020 MMMA Metal Working Village

The MMMA 'Metalworking Village' at MACH 2020 will be the largest area taken by the MMMA and has already exceeded expectations of members attending, with 23 confirmed and more to be confirmed. As the original space for the 'Metalworking Village' has been filled, as and when more space is requested by members, additional space will be requested.

This is a fantastic result for the Association and makes the 'Metalworking Village' space taken to around 650 square metres. This is the fourth largest in the entire exhibition halls.

At present, Members exhibiting are:

Esprit Automation, Cotswold Machinery, Worcester Presses, Bruderer, Schuler, Presscare, TMA, Roemheld UK, Industrial Clutch, Kaller

Springs, Press Techniques, Helm, AntonSaws, QualiMach, Wilson Tool, Pressform Machinery, Ortlinghaus, Decade, Group Rhodes, Oerlikon Balsers, Voith Turbo Ltd, Formit.

The excitement of being part of the Metalworking Village begins now as companies start to plan the stands and the technologies, products and services, they will be exhibiting.

Overall 23 members will be there, hoping to be even busier than they were in 2018, which was a great exhibition for members, both from Enquires and orders placed during and post the exhibition.

Whilst planning your visit to MACH 2020. Make sure you take time out to include a visit to the MMMA – Metalworking Village, it will be exciting to see the technologies there on display.

MMMA Member Feature

Can you tell us about the history of Worcester Presses?

Worcester Presses was founded in 1932 as a division of Jones and Attwood. The Company was originally set up to manufacture 2 ton to 50 ton mechanical power presses, but as the years progressed, it expanded into other areas. In 1990, we became the UK and Ireland exclusive agents for Chin Fong mechanical presses and in 1998, became exclusive agents of Tomac coil handling equipment. 2005 became a Limited Company and have continued to expand. Fast forward to 2008, we became exclusive agents for Yeh Chiun hydraulic presses. Most recently, adding Lee Yih in press transfer systems to our range and moved to new premises in Dudley allowing us to offer complete press line assembly in house.

What does Worcester Presses specialise in?

We specialise in Worcester mechanical presses, Chin Fong mechanical power presses and Yeh Chiun hydraulic presses, also Tomac coil processing equipment, and a variety of press shop ancillary equipment.

What makes Worcester Presses stand out from our competitors?

We stand out from our competitors because of our technical support, on-site back-up by a team of trained engineers and our comprehensive 6-12 month service packages tailored to suit customers' needs. We also have over £100,000.00 of spare parts in our central stores for rapid response and a manufacturing department in-house for machining of parts from raw material to finished product. We invest in apprentices and are quality assured ISO 9001: 2015. Worcester Presses also hold a range of presses available from stock at our works in Dudley.

What is something not many people know about Worcester Presses?

Our directors have over 80 year's combined knowledge of Worcester Presses and products. We carry parts in stock and our engineers are available for call-outs 24 hours day. Our new premises comprise a 6,000 sq ft factory which allows us to deliver turnkey packages that reduce downtime on customer sites. If a standard press specification

is required Worcester Presses hold a number of presses available at our new works in Dudley.

What is the main service you offer?

Our main service is the supply of mechanical, hydraulic power presses, coil handling equipment, after sales services and spares.



What are your company values?

To exceed customers' expectations on value, quality, technical support and service back up.

What can we expect from Worcester Presses at the MACH 2020?

We have increased our stand space to give Worcester Presses a more customer focused area – plus, there will be new equipment to allow visitors to interact with during the MACH exhibition.

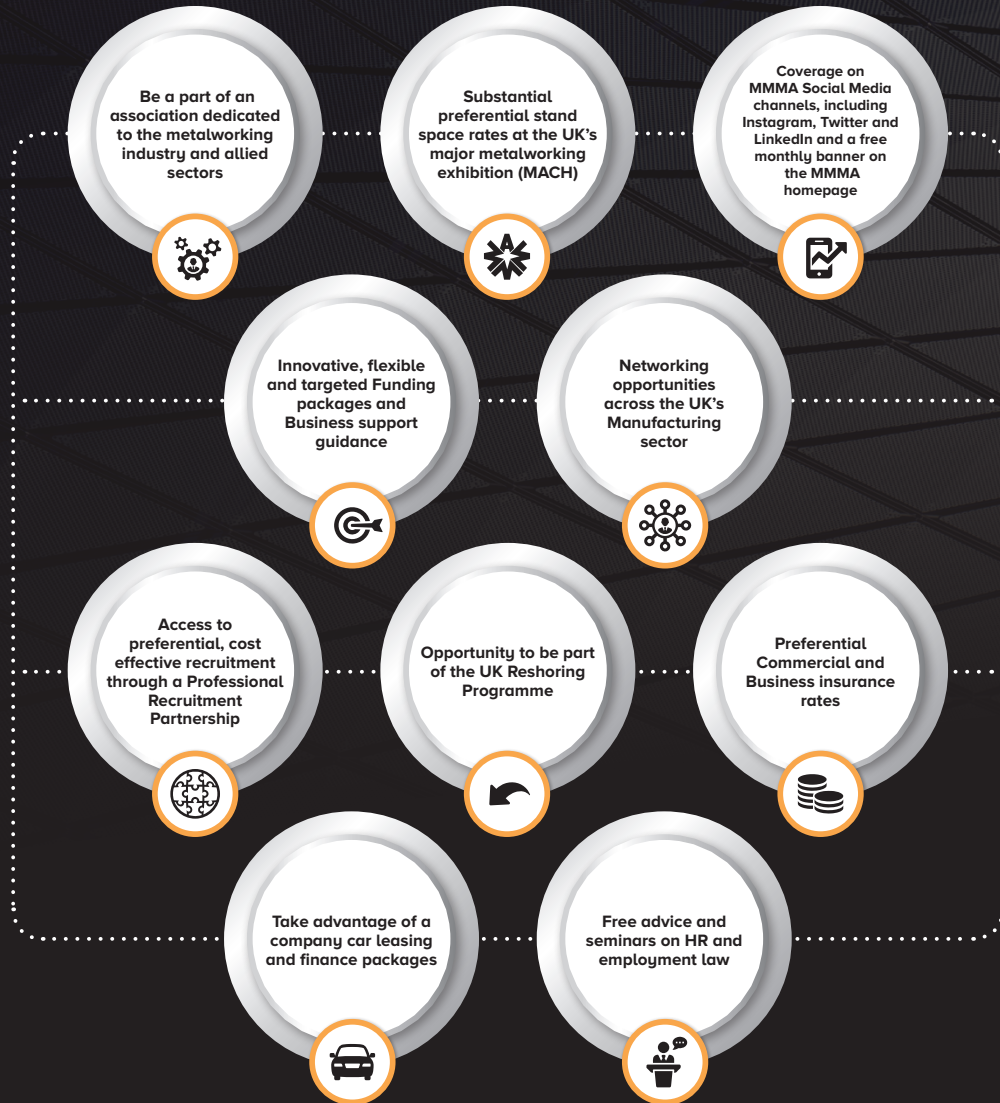
Why did Worcester Presses choose to join the MMMA?

We have been a member for 40 years. Originally it was only for manufactures of equipment directly involved within our market sector that worked well in the early days. However, MMMA has developed in recent years and opened up the member's criteria allowing different market sectors to become involved – which in turn has made the MMMA a great marketing force that we are proud to be a part of.



The Metalforming Machinery
Makers Association

What it means to be a MMMA member



All this for less than
the price of a coffee
per day

#mmma
www.mmma.org.uk



The Metalforming Machinery
Makers Association

Founded in 1949 then known as "The British Power Press Makers Association", to constitute and maintain a central National Organisation between all those engaged as Manufacturers in the Power Press making and Allied Industries.

In 1971 it became the MMMA to enable the Association to expand its activities to encompass manufacturing companies outside of the UK. This has now been opened to companies providing a wider range of services.

The MMMA is the only association to represent the needs of the 'Sheetmetal Industry' more recently, meeting the needs and expectations of companies involved with associated technologies. The MMMA now embraces 'UK manufacturing' and continues to offer, great value for money and cost-effective Marketing to help promote and encourage, innovation and productivity within the Manufacturing sector.

In addition the MMMA have partnered with Specialised companies which offer members, support, advice and encouragement in many

areas of business, that include:- Insurance, Finance packages, Health & safety, HR, Legal Advice, Training, Car Leasing, Recruitment etc.

MMMA work very closely with the MTA to promote the 'Metalworking Village' within the MACH exhibitions. Where members have the opportunity, to participate in the UK's largest manufacturing technologies exhibition at substantial preferential stand space rates. MACH 2018 attracting over 25,000 visitors over 5 days. Every exhibiting member has the opportunity to engage with these visitors allowing them to demonstrate the depth of Technology available through the 'Metalworking Village'.

MMMA 'The Metalforming Machinery Makers Association' is rapidly becoming the Association to be part of -
Why Not join today?

Technologies and Services the MMMA cover in UK Manufacturing.

- Laser cutting
- Waterjet cutting
- Metal Cutting
- Automation
- Mould & Die Design and Manufacture
- Tool and Mould Making
- Metal Forming
- Press Manufacturers and Machinery
- Press Ancillary Services
- Training
- Sawing & Cutting Off
- Magnetics
- Injection Moulding
- Lifting and Assembly
- Monitoring
- Rubber Moulding

MACH
20-24 April **2020**
NEC Birmingham UK
machexhibition.com





Environmental Sustainability Issues within the Sheet Metal Forming Industry

John Yarnall CEng, CEnv MISME

Pollution prevention, eco-efficiency, eco-innovation may all be interpreted as steps in the direction of environmental sustainability. Compliance to new guidelines for industry, and is now mandatory to meet environmental laws and standards. These new laws now reflect on how manufacturing impacts via its services and products on the environment. The main purpose of legislation is to make sure that businesses that manufacture and sell products are responsible for their end-of-life environmental impact.

Exploring Environmental Sustainability Issues with sheet metal forming and fabrication.

Although it is a necessary part of modern manufacturing, sheet metal and its fabrication it is not an environmentally friendly industry. Over the past several years, sheet metal technology and techniques have created 'greener processes'. It's easy to find examples of ways that the industry has worked to consume less power, rely less upon toxic chemicals, consume less water, and to generate less waste.

The Key Issues:

Power Use: The processes that have to be used to change sheet metal into useful products consume a lot of energy. Each stage of the process, including any actual fabrication, transportation and distribution, consumes its own share. To save money and help with the environment, many manufactures have begun to look into more eco-friendly technologies and business processes.

Use of Raw Materials: It can be said that at the present time many sheet metal products come from non-renewable resources. These include ore and minerals. Good recycling of these materials can help somewhat with the issue of using raw materials in a sustainable way. Sheet metal manufactures that focus upon reuse and recycling

can conserve materials and reduce their own costs. It is generally pleasing to not that most raw sheet metal supply from Europe has had some recycle processing already. But this is not necessarily the case for sheet materials purchased via Asia to produce product.

Dangerous Chemicals: The process to form and fabricate sheet metal uses different solvent, surface treatments, cutting agents and forming oils. These chemical and oils are often toxic by nature, and are hard to work with and difficult to dispose of safely. This can create environmental hazards within the manufacturing plant, and within the local community. Researchers have been looking into ways to minimise the impact of these processing chemicals by investigation suitable more eco-friendly alternatives that might be substitutes.

Water Use: Sheet metal makers often need to use water in various makeup fluids as dust suppressants, coolant/ process lubrication, and cleaner. In some areas, this reliance upon fresh water adds an expense and even puts a drain upon on a critical resource. Some examples include desalination of sea or grey water. Reductions of reliance upon fresh water can also lower costs and help make sheet metal fabrication more sustainable.

Handling Waste: Lots of non-degradable waste by-products are formed during the sheet metal forming process. The problem of waste recycling and disposal certainly isn't the huge problem as in the past years. However, there is still more work to be done with many issues of waste handling to be fully addressed.

Society for The Environment (SocEnv)

There are now many professional licenced advisory bodies now able to advice on environmental regulations as applicable to manufacturing. In the UK SocEnv, with more than 7,400 registered practicing Chartered Environmentalists (CEnv) and Environmental Technicians (REnvTech) registrants, offer advice and registrations through their Licenced Professional Bodies.

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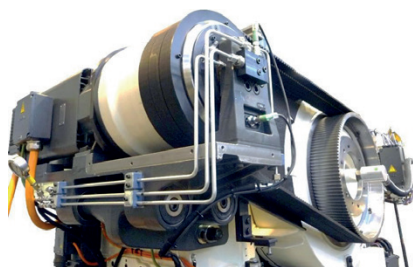
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Providing you with 3 Presses in 1

The BPG 22 planetary gearbox developed by BRUDERER is a world first, and something that stamping experts and tool-makers have been waiting for – for a long time. It is an additional gearbox which will enable fully-automated High-speed precision BRUDERER BSTA 510 stamping presses to be turned into test machines for trying out new tools of speeds at less than 1 stroke per min controlled an increment at a time, and at a flick of a switch return to full production from 100spm to 1500spm – creating incredible added value for customers!



In the past, stamping/manufacturing companies who designed and made their own press tools in-house had only one solution for these very different tasks – they had stamping presses for actual production whilst having to carry out tool and stamping tests on a separate machine, which would then as a rule stand idle until the next series of tests, taking up valuable capital and production space.

THREE BECOMES ONE

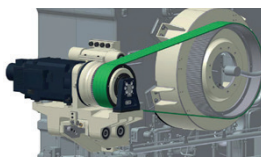
This new development from BRUDERER now offers a practical alternative which provides the

customer with real added value. A planetary gearbox that is built into the shaft of the main motor of a fully-automated stamping press enables test runs to be carried out, steered by manual control, at the lowest stroke rate and at full press tonnage. In essence the machine can be run from as little as 1 spm or micron increments through BDC (bottom Dead centre) at full tonnage of the machine in this case 50 tons.

The findings that are produced can then be carried over exactly and used in the regular production process. **The advantages for customers are manifested in:**

- increased efficiency
- reduced costs
- less space required
- simple handling and more flexible work processes such as forming etc
- There is also a gain in terms of logistics, since tools have to be transported less often

The catalyst for this development was the servo press technology which has become far more prevalent in recent years on other machine types.

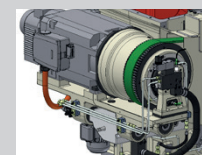


While it is of little or no use for stamping at high stroke rates, which is one of BRUDERER's core competencies, it is however very suitable for slower processes such as test stamping and try-out of tools. BRUDERER therefore decided to use these very properties and adapt them to their high-performance fully-automated stamping presses, and the result is the BPG 22.

The aim was to combine three machines in one – namely to take a regular high-performance fully-automated stamping press and equip it at very low stroke rates with the capabilities of a test press, which however do not have any influence on the (day-to-day) functioning at higher stroke rates. A particular challenge was making the strength and torque which are required for comprehensive test settings available without the need for a significantly larger electric motor or having to changing something significant to the basic principles of the tried and trusted BRUDERER stamping press.

ALL DIFFERENT, ALL NEW

The project team found themselves confronted with quite a task. It was not merely a case of developing a planetary gearbox – it had to be a three-level version. The basic concept also called for it to be enclosed in a rotating casing, which posed a further challenge for project manager Pascal Hardmeier and the rest of his team.



After the gearbox had been constructed mechanically, it was time to focus on the development of the software, and this proved to be an exciting challenge for Engineering, and Sven Kächelin, in charge of the relevant software development. This was a project where production at low speed was the main priority as opposed to stamping, and this meant that everyone involved had to approach the project from a completely different point of view.

The work on the BPG 22 also provided new insights of a more general nature, for example in terms of process monitoring or the behaviour of BRUDERER fully-automated stamping presses at low stroke rates. What Herbert Högger found most impressive is the fact that the complete tonnage of the machine is literally in the hands of the machine operator. Kächelin found the development of the manual control particularly demanding. The requirement was for it to be

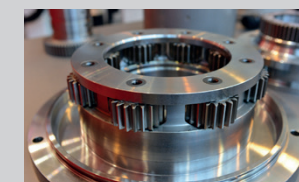
able to work slowly but at high strength and this ended up creating various new functionalities.

BRUDERER and the relevant suppliers were also involved on the hardware side, and whereas »speed at all costs« used to be the watchword, now it is more a case of »slower but stronger«. Consequently, everybody involved in the BPG 22 project has come to see the BRUDERER stamping press in a new, previously unseen light.



The result of this teamwork is a three-level planetary gearbox with a ratio of approximately

1:19. The real heart of the BPG 22 is the software and the manual control for the machine. The main functionalities include the switching on and off of the gearbox in test mode, movement of the machine and adjustment of the ram height all via manual control, as well as production at low stroke rates. The data that is generated can then be transferred to the tool data memory of the machine's control system.



EVERYTHING IN HAND

The manual control enables the speed of the ram movement to be adjusted to different levels. Maximum press capacity and the highest torque levels can also be set and recorded. The machine operator can thus start the top and bottom dead centre individually and move the ram to precisions of a hundredth of a millimetre. The manual control can activate and control the functions that are required for test mode. This for example means that the ram and the upper part of the tool can be moved extremely slowly onto the lower part, imitating a stamping process and testing move slowly forwards or

Providing you with 3 Presses in 1



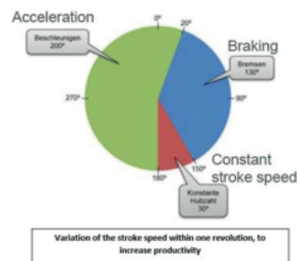
backwards in fixed geometrical increments or by regulated shifting using pre-set values.

Backwards movement can be implemented depending on the tool, and the permitted press capacity can be changed where necessary. The operator can also specify breakoff criteria for continuation or return stroke in the control system.

The manual control has several different indications. A multi-coloured display shows the maximum and current press capacity, the press angle in degrees and the distance of the ram from the lower dead centre. The control also enables error messages from the machine to be displayed and acknowledged. It is linked to the machine by a pluggable cable and can be used in front of or behind the fully-automated stamping press, with the necessary cable connections built in on both sides. If the manual control is not required, it can be stored in the wall mounting that is delivered as standard or attached by means of a magnet to a place of the operator's choice around the machine.

FUNCTIONAL AND PRACTICAL

The press has the ability to be programmed in every press operation you would require and act like a servo press, especially for doing forming work with component parts where its critical to slow the stamping process down through bottom dead centre, to help with small drawn parts or critically formed areas where the



material is able to flow progressively. Therefore, the approach from top dead centre to a given position can be up to speed of say 100spm and then through bottom dead centre at say 10spm and return top thereafter at 90spm.

The BPG 22 has no negative effects on the regular stamping process. On the BSTA 510 when it is in stamping mode, the usual stroke rates of between 100 and approximately 1100 strokes per minute, depending on the machine size, are still possible. The BPG 22 also has no effect on the footprint of the machine – the planetary gearbox is fitted in a way that the stamping press needs no extra floor space to accommodate it, which is another advantage compared with previous solutions which required separate equipment for test and production functions.

The new planetary gearbox option is available from 28-ton machines up to 160-ton machines, with three different die bed lengths of 950mm to 2.2 meters.

The conclusion is the customer will have a very efficient and versatile high-speed precision press, justification for Capital investment is three-fold for the cost of only one machine, representing excellent value for money, residual value would be increased due to the versatility of such a machine.

Examples below of products/applications that can be produced on a Bruderer press with the BPG.



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For more information on the BRUDERER BPG, or any other aspect of our machines, please contact one of our dedicated sales team.

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Calling Young Members! Take control of your future!

The Institute of Sheet Metal Engineering is recruiting new members onto our committee to represent the growing number of apprentices wishing to become actively involved in shaping and developing the future of sheet metal forming in the UK.

As a member of the committee you will be part of the active community who work to recognise, reward and promote the world-class skills of UK sheet metal working apprentices.

You will contribute to organising and promoting this year's Skills Competition, an event that has been running for 50 years,

including promoting the event on social media, contacting colleges and reaching out to sheet metalworking companies to spread the word about the competition.

You will be invited to committee meetings, which you can join in person or via Skype or telephone.

We are looking for current apprentices and also those that have recently finished their training.

If you have questions or would like to put your name forward please contact us at **ismesec@gmail.com**



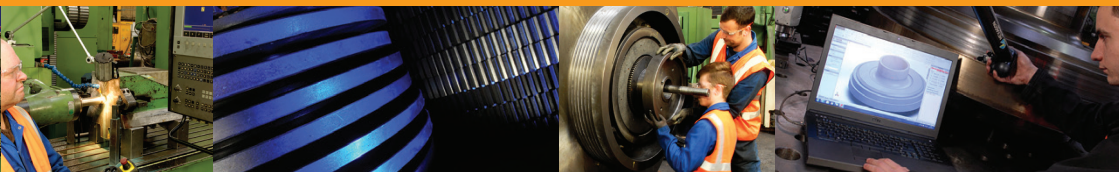
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