SUMMER 2015

CUTTING EDGE

MEMBERSHIP NEWSLETTER OF THE GASKET CUTTERS ASSOCIATION

Annual Golf Day and Dinner – 15th October 2015

Shrigley Hall Hotel

Golf and Country Club, Pott Shrigley,
nr Macclesfield, Cheshire SK10 5SB

This has always been a fantastic day out, and a chance to meet fellow gasket cutters and suppliers away from the workplace. Many a long standing business relationship has been developed on the golf course.

Shrigley Hall Hotel, Golf & Country Club, close to Manchester, is an impressive manor house in leafy Cheshire countryside with its resident herd of Deer. Within the grounds are a health and fitness club and a championship golf course.

The historical hotel sits high above the estate on the edge of the Peak District National Park. Shrigley Hall Hotel welcomes you with fresh flowers in the grand entrance hall and a real log fire in the Courtyard Bar.

You will find an 18-hole championship golf course in the grounds with a fantastic golf shop and bar.

continued overleaf >

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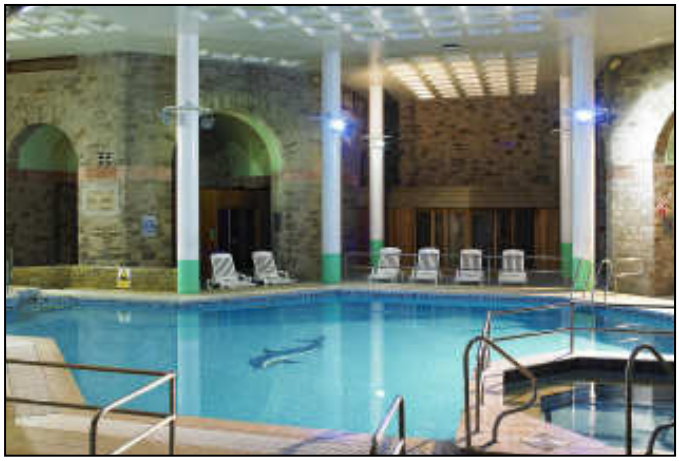
Buggies are available for only £15 per cart so please book in advance.

Shrigley Hall also has a unique health and fitness club in the former chapel. Enjoy the swimming pool, steam room, sauna and full gym; or the wide range of beauty and aromatherapy treatments; please note that any treatments must be booked in advance directly with the hotel to avoid disappointment. Tel. 06125 575757.

For the non-golfers, the leisure facilities are excellent, or for the shoppers amongst you, The Trafford Centre is only 1/2 an hour away. Alternatively the Spa town of Buxton is within 10 miles or places such as Chatsworth House around 25 minutes away.



Competitions

- 18 Holes Stableford – 4 Ball Team Event
- Best Individual Score
- Best Individual Round
- Hidden Team Competition
- Beat the Pro (PGA Professional Anthony Herbert)
- Nearest the Pin in 2
- Most Accurate Drive
- Wooden Spoon

Sponsorship opportunities

- Halfway house
- All golf competitions including Beat the Pro
- Pre dinner drinks
- Wine with dinner and much much more…

Format

10.00am	Welcome from GCA Chairman
10.15am	AGM
10.30am	Bacon rolls, Coffee, Rules
12.00pm	First tee time
4.00pm-5.00pm	Golfers finish
7.00pm	Pre dinner drinks
8.00pm	3 course meal and presentations

In aid of WE ARE MACMILLAN. CANCER SUPPORT

PLAY GOLF CHANGE LIVES

GCA TEAMS UP WITH MACMILLAN CANCER SUPPORT

In aid of WE ARE MACMILLAN. CANCER SUPPORT

At its most recent meeting the Management Committee of the GCA considered the benefits and viability of the Association and its members becoming associated with a nominated charity. Various charitable organisations were put forward and, after discussion, there was a unanimous decision in favour of Macmillan Cancer Support.

As a well known UK wide charity, Macmillan provide nursing care for cancer patients during treatment and also offer advice on how to deal with the wider implications of the disease whether they be social, financial or family matters.

You can find out more at:
www.macmillan.org.uk

Why should the GCA have taken this step?

The obvious answer is that it is always worthwhile and rewarding to support and fundraise for a deserving cause particularly one which benefits people around us . 98 % of Macmillan's income comes from donations and associations like the GCA holding fundraising events.

Secondly, it was felt important that, aside from the GCA members having the common aim of upholding and maintaining the values and standards of our industry, the common objective of raising awareness of and fundraising for Macmillan would further bind the membership. The intention is that each GCA event will include an element of fund raising for Macmillan.

A further benefit for members is that the GCA's association with Macmillan will provide a platform and focus for member companies or teams within them to become involved in local events out with the GCA. These could be sponsored walks, cycles, kart racing and/or coffee mornings, car boot sales, etc.. It will be interesting to see which of the members has raised the most funds within, say the next year. Macmillan staff and volunteers will be happy to help organise events which members wish to arrange and will supply materials and advice on all aspects of these. Local contacts for Macmillan can be found under the "In Your Area" tab on the Macmillan website.

The Management Committee is keen that all members embrace the Macmillan cause and objectives and get started on fundraising ideas as soon as possible.

We look forward to hearing about your successes and reporting on them through future issues of Cutting Edge.

Simon Winfield

MacLellan Rubber
GCA Chairman.

PLAY GOLF CHANGE LIVES

News from Surrey

Keith has a "Sunday "car

A 1988 Porsche 911 Targa, normally aspirated 3.2 litre air cooled job and was invited by the Children's Trust to drive around his local track. This happens to be the Top Gear circuit just 2 miles away from the factory.

The event was called the Supercar day and was held across the Saturday and Sunday (Fathers day).

Young and old paid lots of money for the experience to be a passenger for three laps of the circuit in super cars and Keith's old Porsche.

Keith assured his passengers that they would see every supercar close-up. The La- Ferrari (cost price £1.2M but you can sell it for £2.4M if you have one) was followed by super fast Porsche Carrera 3's, Blurry red Ferrari's, noisy cheese wedge Lamborghini's and Mclaren's P1 and 650's. Keith passengers first saw them in the wing mirrors, then alongside and then in front.. superfast!

The circuit was modified from the original Top Gear layout as in fact the actual Top Gear circuit is a figure of 8 and that might have caused a few problems with 30 cars out in one session.

The weekend was a great success and the funds collected for the charity was in excess of £100,000.00.

The event will be held again next year on the 27th and 28th June 2016.

The Stig

Good news ... We have found Oil in Cranleigh

The weald basin evidently is full of it! This is good news as our English oil north of Sturgeonland is due to run out soon and we would have been in a bit of a pickle without it. So our industrial unit of Gasket Excellence might soon have a well head pumping this black gold.

As long as the blow-out preventer works, we and Cranleigh will prosper.

There is only one problem… to extract this oil it requires a process called Fracking. When this process has been used in other areas whole communities such as Blackpool have been lost into the ocean. I am sure that if we put our trust in those nice people from Godzilla we will all be fine though!

Continuous improvement drive delivers, creates new jobs & efficiency benefits at Flexitallic

The Continuous Improvement team at Flexitallic Joe Verity, Terry White, Paul Voyce, Iago Radio, Clive Brooks, Cameron Hellowell.

Flexitallic, the international gasket manufacturer and sealing technology specialist, has created new jobs and made significant advances in quality and efficiency as part of a continuous improvement programme across its manufacturing processes and operations.

Through the creation of the Flexitallic Operating System, its engineering team has implemented a programme of continual development within the business, which has enhanced operations and productivity across five key product divisions including Flexpro Kammprofiles, Sigma and Spiral Wound Gaskets.

The company, which has its UK base in Cleckheaton, West Yorkshire, has achieved the savings through the standardisation of production systems and delivering new processes to manage the disposal of waste across gasket material and steel sheet manufacturing.

As part of the standardisation process, Flexitallic has appointed three Value Stream Managers to devise and implement improvements across the company's multiple gasket production lines.

Two of the managers, lean specialist Iago Radio and former production manager Joe Verity have joined the company from the automotive industry.

The third Value Stream Manager, Terry White, has joined the Engineering Department on secondment from his role as a Production Manager for the next 12 months. Terry will be focused on the company's production of specialist gasket material, Sigma, which has been developed to operate in process form cryogenic temperatures to 260˚C.

A further secondment to support Flexitallic's continuous improvement programme comes from the Maintenance Department with Team Leader, Clive Brooks, implementing Total Productive Maintenance (TPM) processes with the development of autonomous and preventative maintenance plans. Clive is supported by apprentice engineer Cameron Hellowell.

Flexitallic instigated the programme 12 months ago with the appointments of experienced lean engineering specialists to its Engineering Department, Manufacturing Engineering Manager, Steve Flooks and Continuous Improvement Manager, Paul Voyce.

Steve and Paul have also created a suite of training and professional development for employees across the business to increase understanding of lean manufacturing processes within the Flexitallic Operating System as well as provide dedicated coaching for team leaders.

In the near future, an additional range of practical demonstration courses will be added including Standardisation for Operators and Office Lean Implementation.

Paul Voyce said: "Colleagues have really embraced the principles behind our drive for continuous improvement, which has enabled us to deliver improved efficiency across our manufacturing operations alongside gains in productivity.

"Continuous Improvement principles and processes are essential to maintaining Flexitallic's position in the global gasket and sealing product sector. They enable the company to remain innovative and responsive to the evolving requirements of industry whilst controlling cost and maximising productivity."

For more information contact Flexitallic on 01274 300330.

Flexitallic®

Demand for effective heat exchanger gasket leads to expansion in applications team

Left to right: Matthew Dentith, Dene Halkyard and Richard Rodgers.

Flexitallic, the international sealing solutions specialist, has expanded its UK-based Applications Engineering Team to meet the demand for its highly-resilient industrial gaskets.

The Applications Engineering Team provides bespoke services to address the requirements of plants and assets featuring bolted joints, particularly those within Heat Exchangers used in sectors such as downstream oil & gas and chemical processing.

While the majority of bolted connections in the oil and gas and chemical sectors are standardised, heat exchangers are subject to individual design and have bespoke requirements to ensure maximum performance in extreme ranges of temperature and pressure.

Flexitallic has worked to address these issues with the development of innovative sealing technology, most notably Change™, the most resilient gasket on the market, which can operate 60 percent longer than other gaskets and successfully withstand multiple thermal cycles of more than 300˚C.

As a result of the increased heat exchanger projects, Flexitallic has welcomed two new Applications Engineers, Richard Rodgers and Matthew Dentith.

Richard has re-joined the applications engineering team after a brief spell with another engineering company. Richard's early career was focused around fluid transmission and mechanical design before moving on to positions in project and engineering management.

With 10 years' experience in automotive, aerospace and marine manufacturing industries, Matthew most recently worked in the field of mechanical sealing providing technical support to internal sales and clients. He is now applying his skills to application engineering in the sealing industry with his new role at Flexitallic.

The reputation of Flexitallic's applications specialists has also been boosted by an accolade from the Heat Transfer Society. The company's Applications Engineering Manager, Dene Halkyard has been awarded the Mike Ackrill Trophy for the best Forum Presentation of the last year.

Dene addressed society members with a presentation about gasket types utilised in heat exchangers and the latest developments in gasket technology.

Dene said: "The need to maintain effective sealed joints in heat exchangers is becoming more prevalent across industry and has led to the expansion of our Applications Team. Timescales between shutdowns are increasing, for example, which dictates the need for gaskets with longer lifespans that can operate successfully in extreme environments.

"Alongside utilising the specialist solutions we have created, such as Change™, our Applications Engineers apply their experience and expertise to meet the exacting requirements of individual applications.

"Richard and Matthew are welcome additions to the team and they bring a wealth of experience and knowledge that will be of real benefit to our customers."

For more information contact Flexitallic on 01274 300330.

Flexitallic®

Phoenix investing heavily in UK expansions

Phoenix Training & Technologies are due to finish their latest year of successful trading in August and have released plans for a high level of UK Investment that will aid in the future aggressive development plans of the business.

Managing Director, Simon Winfield commented "The purchase of a new UK HQ will increase our capacity ten fold. We have been increasing our levels of finished stock holding and associated new products including PTFE thread tape and spiral wound gaskets. It is our desire to include manufacturing plans into the new HQ.

Research & Development is a critical necessity to any business wanting to be successful going forward. The new HQ will have significant investment in laboratories for testing and qualification.

Dr Gavin Smith commented "Our venture will be aided by the technical and manufacturing agreement that we have with the Nichias Corporation of Japan. Together we have been developing new ideas and concepts and their input into the new facility will be a key factor in it's success.

Commercial Director Andy Heywood commented "With the World's largest technical back up facilities in Japan we will be able to find and work on new concepts and ideas. It could be the development of a 'green gasket', manufactured solvent free or incorporating the new 'wonder materials' like Graphene into our products."

Exciting times certainly lay ahead!

The Company is at the later stages of selection for someone to head up the Research and Development function and see continued opportunities for new staff with innovative ideas and motivation to be part of a successful team.

Phoenix believe that people are the key to any successful business and a team pulling in the right direction provides a huge platform to work on, especially when you are trying new ideas and concepts.

Setting up Phoenix has allowed all the good ideas to flow back and enable the people to express themselves in doing what they do best.

At Phoenix we want to provide a fantastic service, a technically superior product at a very competitive price.

We assure you that we won't cut any corners or look to outsource anything for cost saving purposes as constant quality problems could be a concern. We believe in what we are doing and want you, our customers to believe in us!

PHOENIX LEGACY

New team managers at MacLellan, focussing on service

MacLellan Rubber, manufacturer and distributor of one of the largest range of Rubber Sheeting materials in the UK and Europe, continue to strengthen and develop their management team with the promotion and introduction of key personnel to head up the Customer Service and Sales Teams.

Amanda Slyde

Amanda Slyde who has recently been promoted to Order Fulfilment Manager ensuring that all post order placement activities are undertaken to the highest standard and that the customer experience in relation to orders placed is positive. Amanda has worked for MacLellan and its associated business's for over 15 years and has unequalled experience of its manufacturing and distribution activities.

Amanda commented ' the prospect of taking on such a significant challenge, managing the customer engagement process from order placement through to despatch of goods by our warehouse team, was daunting. The role continues to develop as we identify improvements to processes and opportunities to better manage customers' expectations.'

Lewis Nielson

Lewis Nielson has recently joined MacLellan Rubber as Sales Manager responsible for all pre-order activities within the business. Lewis brings a wealth of commercial and technical experience to the business from his previous roles at Trelleborg, Northern Engineering and Garlock UK and is tasked with expanding MacLellan Rubbers product range offering and market reach.

Lewis commented 'the opportunity to join a well-known and respected business with significant ambition to grow and strengthen its market position not just in its current competencies but beyond was tantalising. Andrew and Simon have demonstrated their willingness to invest in MacLellan Rubbers future having some notable successes since their MBO in 2010, and I will do everything I can to contribute to that continued success.'

If you would like more information on MacLellan Rubber products or services please contact your Key Account Manager or phone our Sales office on 01902 307711.

MacLellan rubber

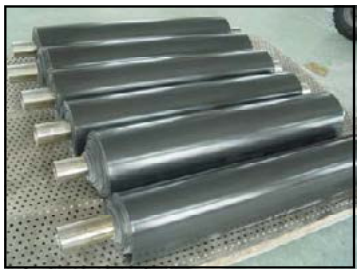
13 POWERFUL REASONS!

TO BUY FKM / VITON® SHEET FROM J-FLEX

When it comes to FKM / Viton® Sheet you could say that J-Flex has it covered. In fact we've come up with 13 reasons why you might want to buy your FKM / Viton® Sheet from us, rather than any other supplier. Seriously now, check out our reasons, we think they are pretty powerful.

1. Possibly the largest stock of FKM / Viton® Sheet Stock in Europe – which means you'll always find the products you need and be able to get them fast, so keeping your production moving, your inventory low and your customer happy.

2. Our 10 point quality assurance system ensures each roll of FKM / Viton® has gone through many different inspections to guarantee perfection. This includes Rheometer Cure Trace which means material is not released from laboratory unless the compound meets the specification.



3. Further lab tests for hardness; tensile strength; elongation and compression set are verified to confirm compliance.

4. Physical testing is actually verified by independent test houses.

5. Final sheet checks include thickness; hardness; width and length to ensure all conform.

6. J-Flex FKM / Viton® has been exhaustively tested by one of Germany's leading seal and gasket test houses. Independent tests carried out by Labo Richter confirm the integrity required of our leading European sheet material.

A member of the Gasket Cutters Association

Certificate No. RS 27920 Approved to BS EN ISO 9001:2008

J-FLEX RUBBER PRODUCTS

Engineering Rubber Components & Specialised Sheeting Products

Units 1 & 2, London Road Business Park,Retford, Nottinghamshire, DN22 6HG, United Kingdom

tel: +44 (0) 1777 712 400 fax: +44 (0) 1777 712 409

www.j-flex.co.uk

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7. J-Flex FKM/Viton® is safe to work with. Tests confirming compliance to the latest REACH – Candidate List of 161 S.V.H.C. – No problems there then.

8. Full Compliance to latest PAH / PAK – Carbon Black trace levels in accordance with AfPS GS 2014:01 PAK.

9. The widest thickness range available EX-STOCK – 0.5mm to 25mm inclusive – so with same day despatch from us, you can respond quickly to your customers needs, hold less stock and improve your business cashflow!

10. What about the width options also? From stock, we can supply your needs whether it's for 1,000mm, 1,200mm and 1,400mm **and NOW AN ENORMOUS 2,000mm wide material.** Minimise the number of joint segments and maximise yield by using J-Flex FKM / Viton®.

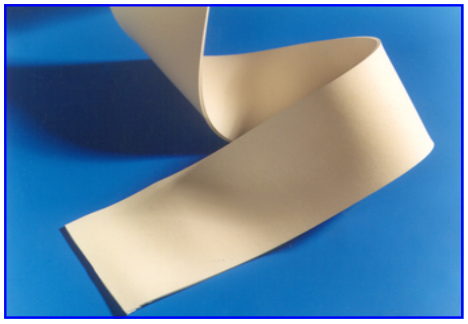
fluor-a-com® only from J-Flex

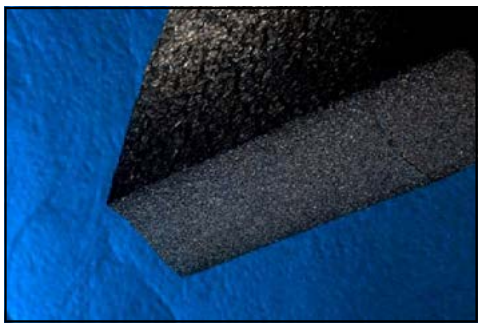
MADE WITH DuPont™ VITON® Fluoroelastomer GENUINE VITON®

11. For over 12 years now J-Flex has been Europe's only Genuine Viton® Licensee majoring on Sheet Products. Take advantage of this experience; we really understand FKM materials and we think it shows.

12. Off-white and now Blue FDA Compliant FKM / Viton® are exciting new additions to our huge sheet stock range.

13. FKM/Viton® "Specials" are pretty standard for us; whether it be Aflas; Viton® B, GF or Viton® Sponge – just tell us what you need and we will deliver.





So, when it comes to buying FKM / Viton® Sheet, there's really only one supplier; J-Flex.

J-Flex has 30 years' experience in the industry and is an expert in precision rubber manufacture and supply. We have a real passion for helping our customers and exceeding expectations is what we set out to do and by and large is what we achieve.

June 2015

Lamons UK expand their manufacturing facility in the UK

As of September 2015, Lamons UK will be manufacturing special gaskets within their impressive 5000m2 facility located in Wolverhampton. Further to this, a comprehensive range of spiral wound gaskets, ring type joints and non-asbestos sheeting will be held in stock to further service the UK market demands.

Our capabilities will include metallic seal rings and ring joints to API 6A/17D in a variety of materials, and bespoke manufacturing to customer specific requirements. The location will also boast considerable capacity for the production and distribution of semi-metallic gaskets in a variety of forms, sizes and materials.

Lamons UK Gaskets Division shall complement the Fastener and Bolting Division that will share the Wolverhampton facility. Further to the specialty bolting that this location is currently renowned for, comprehensive stocks of standard B7/L7, B8/B8M and B16 bolts shall be available as part of the expansion.

We hope our customers share our excitement for the coming developments and we look forward to supplying existing and new customers around the globe with the highest quality bolting and sealing solutions from one location.

Should there be any requirements that you wish to discuss, please contact jane.fisher@lamons.com to discuss in greater detail.

LAMONS®
Sealing Global - Servicing Local

Particle-filled silicones for EMI gaskets for defense touchscreens

This article explains why a custom component manufacturer selected a nickel-coated, graphite-filled silicone to produce EMI gaskets for a touchscreen integrator. It examines all of the application requirements (including cost) and describes the gasket manufacturing process. The article also discusses design and production challenges, and how overcoming them enabled the integrator to win its DOD bid.

Introduction

Stockwell Elastomerics is a custom component manufacturer that serves niche markets in aerospace, defense, telecommunications, and other technology-based industries. Located in Philadelphia, Pennsylvania, the company manufactures custom components to OEM specifications using its full range of capabilities. Processes include die-cutting, water jet cutting, silicone injection molding, compression molding, custom assemblies and adhesive lamination onto silicone rubber and other high performance materials.

The customers who benefit most from Stockwell's capabilities are manufacturers that utilize design innovation as part of their strategy. So when a touchscreen integrator needed a custom EMI gasket for a defense contract, they turned to Stockwell Elastomerics for a solution. The EMI gasket had to attenuate electronic emissions, seal the units from harsh environmental conditions, and offer cushioning for mechanical shock – all while meeting a competitive price point.

Understanding the application

Stockwell needed to select an EMI gasket material that could withstand a wide range of physical demands. The touch screen unit would be deployed globally in rugged environments. The gasket needed to seal under the extremes of desert heat or arctic freeze, keeping out dust, rain, and water during wash-down. In addition to sealing, the customer wanted the gasket to offer some cushioning to help protect the unit from mechanical shock and be soft enough to avoid distorting or interfering with the touch function of the display. Finally, the gasket needed to attenuate EMI emissions.

Other requirements for this touch screen EMI gasket were that it needed an adhesive backing and had to meet a specific price point. The adhesive was needed to keep the gasket in place during installation and product refurbishment. It also had to be electrically conductive to maintain the Z-axis conductivity. Lastly, the entire gasket configuration needed to be priced competitively since the custom touchscreen assembly was headed into a bidding process for a defense contract.

Choosing the right EMI material

Stockwell Elastomerics looked to Specialty Silicone Products (SSP Inc.), a Ballston Spa, New York supplier with a deep history in silicone rubber technology, for a unique silicone compound that would address all of the application requirements. As a long-time supplier to Stockwell Elastomerics, SSP understood Stockwell's ability to mold conductive silicone rubber and laminate adhesives – a low durometer (soft), nickel coated, graphite filled silicone could be molded efficiently by Stockwell. The nickel/graphite fill would meet the attenuation requirements and cost restrictions, while the low durometer silicone would meet physical requirements.

SSP's nickel/graphite particle-filled silicones are used in numerous military and commercial EMI applications, and are designed specifically to overcome challenges that are inherent to some Mil Spec materials. Traditional Mil Spec EMI materials, specifically MIL-DTL-83528, are limited to higher cost conductive fills like silver plated copper and silver plated aluminum, and high durometer (hard) rubber materials. SSP's nickel graphite filled silicones offer very good attenuation and lower durometers, which allows engineers more latitude to meet tough design challenges – and within budget.

Silicone is the elastomer of choice for many outdoor gasketing applications due to its thermal stability, low compression set, and resistance to ozone and ultraviolet (UV) light. Silicone rubber can easily withstand desert heat and Arctic cold, and seal against wind-driven rain, heavy wash down or submersion. These properties, in addition to silicone's long life, are critical for products requiring ruggedization. When filled with fine conductive particles, these specialty silicone compounds perform the dual functions of environmental sealing and EMI attenuation.

Stockwell Elastomeric's touch screen application also required an adhesive backing. To meet this, Stockwell chose a 3M product, an X-Y-Z axis conductive pressure-sensitive adhesive, to maintain electrical continuity between the gasket and assembly. The selected adhesive offered very good bond strength to the touchscreen bezel, and the easy-peeling release liner allowed for quick and easy installation, keeping assembly costs down.

Particle-filled silicones for EMI gaskets for defense touchscreens cont.

Solving design and manufacturing challenges

Once the materials were selected, the process to manufacture the EMI gaskets needed to be determined. This project had two distinct timelines. The first was the engineering build where gaskets were needed very quickly to meet a deadline for testing. The second challenge was for production parts with high quantities. In order to meet the short engineering build deadline, Stockwell Elastomerics waterjet cut sheets that were laminated with the 3M conductive adhesive. The waterjet cutting process allowed Stockwell to deliver custom cut parts within 2 days and with no tooling costs. Once the functional and EMI testing was completed, production tooling was made. The same nickel/graphite filled silicone compound that was used to make the sheets was used to mold rough blanks for the touch screen gasket. These molded blanks greatly reduced material waste while still allowing for proper adhesive lamination of the narrow wall gasket. The adhesive backed blanks were then cut to the final gasket geometry and tolerances.

This two-step approach allowed the customer to meet its timeline and test parts without any tooling investment. Once testing was complete, Stockwell was able to manufacture the custom EMI gaskets in an efficient manner to hold down labor and material costs. In turn, this provided the customer with a pricing advantage that helped them win the DOD bid with a water-sealed touchscreen that met the EMI attenuation requirements.

About the author

Stephen Hughes is the Product and Applications Engineering Manager at Stockwell Elastomerics (Philadelphia, Pennsylvania).

Stephen Hughes
Product and Applications Engineering Manager
Stockwell Elastomerics

Turning clamp load into torque

Probably the most important feature of any bolted flange connection is to apply (and maintain) the correct clamp load on the chosen gasket. Most likely the gasket manufacturer will have performed detailed laboratory based tests (EN13555) to derive operational performance characteristics for their products that can be used by designers and end-users alike to reflect expected performances in the field.

Leakage data and resulting tightness classifications (at ambient and elevated temperatures) are almost always related to the amount of clamp load applied to the gasket sealing surfaces and is often referred to as 'Gasket Stress'.

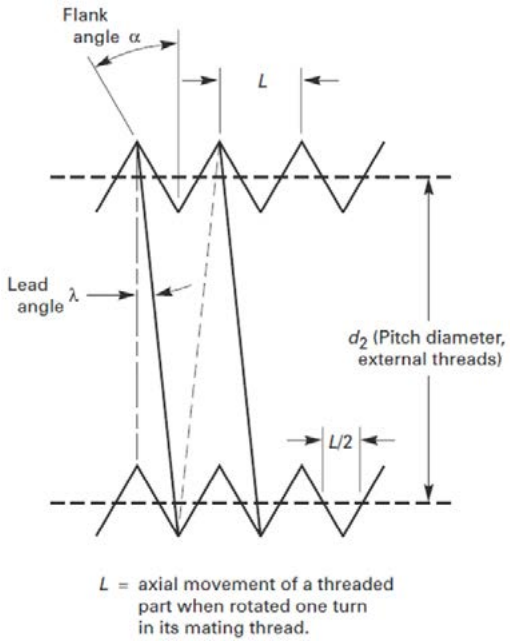
The application of the clamp load is mostly achieved through torque tightening the nuts on the bolts of the flange and for most applications where the bolts are small enough to be assembled by hand, a torque wrench will be recommended in conjunction with a recognized assembly procedure.

The objective at the assembly stage is to impart sufficient clamp load onto the gasket for the connection to seal within the expectations of the end-user for the life-cycle of the joint.

Calculation of target torque

The target torque required to tighten bolting is calculated as follows[1]:

$$T = \frac{F}{2}\left[d_n f_n + d_2 \left(\frac{f_2 + \cos\alpha \tan\lambda}{\cos\alpha - f_2 \tan\lambda} \right) \right] \quad (1)$$



where:

d_n = mean diameter of the nut (or bolt head) bearing face, mm (ins). This diameter is equal to the simple average of the diameter of the nut washer face and the nominal bolt size.

d_2 = pitch diameter ((or mean thread contact diameter, mm (ins).

F = target bolt tensile load, N (lbf)

fn = coefficient of friction between bolt nut (or bolt head) and the flange (or washer), dimensionless

f_2 = coefficient of friction between the bolt/nut threads, dimensionless

T = Target Torque, N.mm (ins.lbf)

α = thread flank angle, deg.

λ = lead angle, deg.

This formula requires detailed information regarding the geometry of the bolt/nut and the standard that controls the geometry. In many cases, the coefficient of friction between all the mating parts can be difficult to determine (particularly in the field). Different thread lubricant compounds introduce yet another variable along with how exactly the lubricant is distributed across the individual mated components.

1 Information taken from ASME PCC-1 'Guidelines for Pressure Boundary Bolted Flange Joint Assembly", pages 47 & 48

Turning clamp load into torque cont.

Nut factor calculation of target torque

There exists a much simpler approach that uses a nut factor 'K'

A common method for calculating Target Torque is the use of the following formula:

(SI Units) (U.S. Customary Units)

(2) (2)

$$T = KDF/1\,000 \qquad T = KDF/1\,000$$

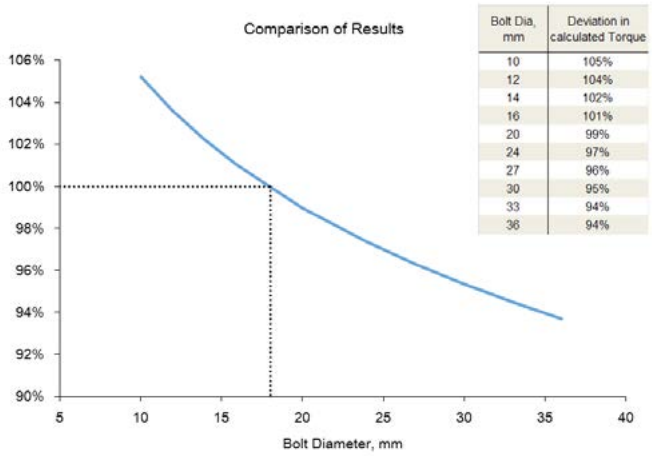
where:

α = thread flank angle, deg.
D = nominal diameter of the bolt, mm (in.)
F = target bolt load, N (lb)
K = nut factor (see below)
T = Target Torque, N.m (ft-lb)

'K' is an experimentally determined dimensionless constant related to the coefficient of friction. The value of K in most applications at ambient temperature is generally considered to be approximately equal to the coefficient of friction plus 0.04[2].

Comparing these two methods for calculating the torque based on a nominal target bolt stress of 276 N.mm-2 (40,000 psi) on bolt sizes ranging from M10 to M36 (using a manual torque wrench), then for bolt sizes less than Ø18mm the more detailed formulation **Calculation of Target Torque**[(1)] returns a higher target torque than the simplified Nut Factor Calculation of **Torque**[(2)] and the reverse is true for bolt sizes greater than Ø18mm (Fig.1).

Fig. 1



Bolt Dia, mm	Deviation in calculated Torque
10	105%
12	104%
14	102%
16	101%
20	99%
24	97%
27	96%
30	95%
33	94%
36	94%

Conclusions

Determining the clamp load (based on gasket stress data) is a vital component used by the gasket industry in communicating to the end-users an expected performance capability for their sealing materials and gasket designs. The application of the clamp load to a bolted flange connection through manual torque tightening is fraught with many variables that can lead to over-loading, under-loading, uneven distribution of the clamp load around the flange and we all know the list goes on. In general, the accuracy when applying clamp load using a manual torque tightening technique might deliver at best ±25% of the target gasket stress prescribed by the gasket manufacturer, which calls into question the accuracy and methodology used to translate clamp load into bolt/nut torque.

Method	Accuracy
Torque Wrench on Unlubrucated Bolts	±35%
Torque Wench of Cad-Plated Bolts	±30%
Torque Wrench on lubricated Bolts	±25%
Preload Indicating Washers	±10%
Bolt Elongation	±5%
Ultrasonic Sensing	±5%
Strain Gauges	±1%

For general purpose in-the-field piping applications, the **Calculation of Target Torque**[(1)] methodology is quite detailed and is influenced by many parameters not always available in the field. The **Nut Factor Calculation of Torque**[(2)] while based on much simpler input parameters (nut factors 'K' are available for different thread lubricants) the difference when calculating a torque for a required bolt load is not considered significant (±6%) when compared to the variances known to exist when assembling a bolted flange connection using manual tightening techniques in-the-field.

For more information contact Jake Goldsmith, Applications Engineer, Lamons UK Limited.

2 "An Introduction to the Design and Behavior of Bolted Joints," Bickford, p. 233.

Nickel-graphite vs. silver-aluminum in metal-filled shielding elastomers

Silicone rubber can be filled with metal particles to provide EMI/RFI shielding along with environmental sealing. These particle-filled elastomers are perfect for applications that require sealing and shielding between two metal surfaces. Particle-filled silicones also can be formulated to provide electrical conductivity, and to impart properties such as corrosion resistance. Today, many readers know of these specialty silicones simply as EMI/RFI shielding materials. But there's more to the story.

Silver-aluminum silicones

For many years, the filler material of choice for shielding silicones was silver-aluminum. Let's consider why this was the case. During the late 1970s, the price of silver was between $4.00 and $5.50 per Troy ounce. This meant that material suppliers could fill silicones with highly-conductive, silver particles without regard to cost. It's also important to recognize the main buyer for silver-filled EMI gaskets. The U.S. military needed EMI shielding materials, and the Cold War ran the risk of getting hot.

Now let's dig a little deeper into our investigation. The development of the MIL-DTL-83528 specification (also known as the "QPL" in the EMI elastomer world) played an important role in the popularity of silver-aluminum silicones. This full title for this Defense Logistics Agency (DLA) callout is "Gasketing Material, Conductive, Shielding Gasket, Electronic, Elastomer, EMI/RFI." Within this specification, letters are (such as A and B) are used to described different types of materials based on performance.

Back when the MIL-DTL-83528 specification was developed, silver-aluminum filled materials (Type B) were the only technology that could meet the U.S. military's needs. So it's not surprising that silver-aluminum filled silicones were specified on thousands of gasket drawings and prints. As our industry knows, however, changing a product that's been specified for years is no easy task. Yet times do change. Let's look at some more recent history – and another particle-filled silicone.

Nickel-graphite silicones

In 2011, silver began approaching $50.00 per Troy ounce. The end-users of silver-aluminum shielding gaskets felt this pinch, and began questioning why gaskets now cost as much as $100 to $400 each in some cases. Gasket fabricators explained how silver prices drove costs, but end-users pushed back on price. This presented an enormous opportunity for Specialty Silicone Products (SSP). Buyers of SSP's EMI/RFI shielding elastomers asked if we could reduce material costs without sacrificing shielding, corrosion resistance, or physical properties. We accepted that challenge.

Where did SSP come from? In 1989, five former employees of GE Silicones started a business. Our chemists had helped to develop silicones when these elastomers were first mass-produced for military and commercial use. As you can see then, SSP is a silicone company at heart. Other suppliers also learned that adding conductive metal particles to rubber could produce a shielding material, but SSP rose above the rest. Using our collective knowledge, we developed the best formulations possible for particle-filled silicones. Today, our customers – and their customers – are reaping the benefits.

SSP's research and optimization efforts yielded a nickel-graphite filled silicone that performs at the shielding levels of silver-aluminum filled products. MIL-DTL-83528 specifies a minimum shielding effectiveness of 100dB. SSP's nickel-graphite formula reaches 125dB. Full test results from a third-party testing facility are available upon request.

In addition, SSP's nickel-graphite filled silicones shows excellent salt spray and corrosion resistance test results along with great physical properties. Even newer technology is now available as shielding elastomers move into commercial applications such as medical, automotive, and wireless technology.

The U.S. military is still a large and important buyer of EMI gaskets, but the marketplace is changing. For gasket fabricators and end-users, nickel-graphite filled silicones combine sealing and shielding reliability with cost-effectiveness. Have you considered these particle-filled silicones for your applications?

Learn more today

SSP's differentiated product line includes:

- Nickel-graphite and silver-aluminum products made in **continuous roll** form at custom thicknesses and widths. Rolls reduce labor costs, lead times, and waste.
- **Ultra-thin .010"** thick materials for when product designers don't have the space for a thicker gasket
- **Low-Durometer 30 Shore A silver-aluminum** silicone for applications that require a softer material with better sealing properties.
- **Reinforced EMI Elastomers** for thin wall gaskets that need greater tear strength than other materials can provide. These reinforced EMI elastomers are also used when the brittleness of typical filled elastomers cause problems in cutting, packaging, or other applications.

For more information on SSP's unique EMI elastomer product line, contact Dominic J. Testo of Specialty Silicone Products at 518-363-5034, or email dtesto@sspinc.com.

MacLellan Rubber goes large

MacLellan Rubber has always been recognised for its technical ability and innovative solution to customer requirements, and it continues to create advances in material production and supply to the benefit of customers manufacturing processes and operational requirements.

The specialist demand for Wide Width sheeting is a challenging market to support especially when the applications are aggressive as found in the Petro Chemical, Mining and Construction industries, and realistically Wide Width sheeting is not something many businesses could handle. The typical solution for gaskets over 1.6mtr diameter is to produce segmented or dovetailed sections which can then be cold bonded or heat welded – however the joints can be weak and brittle and therefore subject to premature failure – alternatively the application can be such that any join is a potential leak path that will rapidly result in failure.

Similarly applications for Wide Width Sheet material might be achieved by bonding or welding two pieces together – resulting in a seam along one axis which is often a weak point or a ridged surface that diminishes the sealing effectiveness.

Challenge accepted, MacLellan Rubber set about working within its manufacturing base to create a production process that enabled a range of materials to be offered, meeting international technical standards and quality requirements.

Typically for Wide Width sheeting controlling the thickness and surface finish across the material is difficult; achieving a consistent cure and material hardness is problematic; producing it in a range of hardness's is testing. Recognising these were not issues that could be overcome using conventional production methods MacLellan Rubber has spent over 18 months identifying new processes that could be applied to achieve the required standards and the results are we believe significant.

Adding to MacLellan Rubber's already diverse range of high quality materials we can now offer Wide Width Sheet Rubber within the following parameters

Natural, Neoprene, Nitrile, EPDM Solid Rubber 40 Shore to 60 Shore

Roll Width of 2mtr with British Standard Thickness Tolerances
Roll Length up to 100mtr subject to customer handling capabilities – typically shipped in 10mtr Lengths
Thickness Range from 6mm to 50mm

Silicone Rubber 50 Shore to 70 Shore

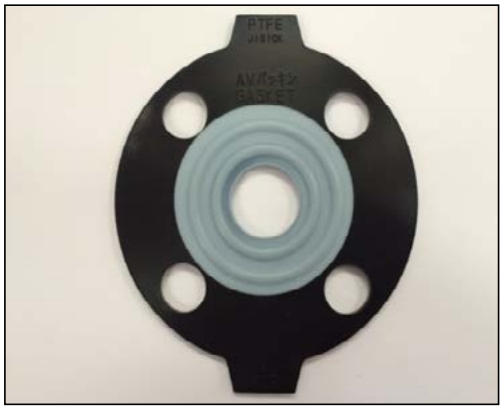
Roll Width of 2mtr with British Standard Thickness Tolerances
Roll Length up to 50mtr – shipped to customer specified Lengths
Thickness Range 1mm to 3mm

Simon Winfield said: "These new manufacturing capabilities further enhance MacLellan Rubbers position as an innovative manufacturing partner; continuously improving our product range to keep pace with the evolving demands of our markets is essential to enabling us to deliver increased efficiencies to our customers and providing gains in productivity and reduction in waste.

To learn more, please contact your Key Account Manager or call our customer services team on 01902 307711.

MacLellan rubber

Phoenix style 9013 PTFE core gaskets



Phoenix style 9013 gaskets comprise a rubber core coated with a pressurised, heat formed PTFE film. The gasket exhibits the elasticity of rubber but with the corrosion resistance of PTFE .

The gaskets are ideally suited to PVC, FRP and glass-lined flanges or in applications where the load that can be applied is limited. The addition of the PTFE coating means they are also suitable for food applications and conform to the Japanese standards and criteria for food and food additives.

Phoenix PTFE thread seal tape

The ultra high density of our Phoenix Yellow Gas Line PTFE Tape reduces the possibility of Liquid Petroleum Gas (LPG) and Compressed Natural Gas (CNG) leakage through permeation. The product is certified by Underwriters Laboratory (UL) USA for usage in threaded assemblies handling Gasoline, Petroleum, Oils, Propane, Butane, Naptha, Benzene, Kerosene, Natural Gas for pressures not over 100 PSIG

1. Provides a tight seal and is flame resistant
2. Colour coded YELLOW for easy identification
3. No curing time required
4. Chemically inert and withstands solvents
5. Conformance to MIL SPEC A-A-58092

Phoenix Thread Seal tape is manufactured from high quality unsintered PTFE, extruded and rolled into tape form. It is very soft, non-contaminating and can be easily removed. The tape is widely used in general water plumbing applications. Housed in a convenient spool and cap, Phoenix Thread Seal Tape is easy to use and meets the requirements of ISO 9001-2000 standards.

PHOENIX LEGACY

Paul Gregory – W.C. Munsch and Co. Limited

W.C. Munsch and Co. Limited are pleased to announce that Paul Gregory recently joined them.

Paul has a wealth of experience having been a Director of PTM and then working for Garlock for several years.

Munsch and Co. are renowned within the rubber industry for their massive range of rubber and after acquiring Wrexham Rubber Fabricators in 2007, expanding into moulding and fabricating.

When Clive Marsh joined Munsch as Sales Director in 2010 he brought with him additional knowledge and specific experience of the plastics, hose and PTFE markets.

Paul Gregory will be concentrating on promoting Metallic Gaskets, PTFE products, and also introducing a NEW full range of fibrous sheeting from general purpose through graphite to modified PTFE.

He also brings technical experience of the full Garlock product range which he will support and promote to both existing and new customers.

In addition Paul will also be developing Munsch's range of inflatable seals, O-Rings, and High Temperature textile products.

Anyone wishing to get in touch with Paul can contact him via email: paul@epdm.co.uk or by phone Tel. 01625 573971.

Offcuts

Surplus Stock Sale

We have the following surplus stock which we can offer at special prices.

- 5mm 30ppi Fire Retardant Reticulated Filter Foam 2000 x 1500
- 3mm Natural Polyurethane sheet 70 shore 3658 x 686
- 3mm Adhesive Backed Neoprene sponge strip x 50mm wide x 10 metres

The great photo competition

Hello, my name is Warren Saville, sales manager of the South's Premier Gasket manufacturer, Keith Payne Products. You might have seen a couple of photos of Keith tearing around the Top Gear race track, well these were taken by Lincoln Reeves one of our cutting press operators and a keen automotive supercar photographer at weekends (facebook.com/purepowerphotography) and I am a committee member of Uckfield Photographic Society.
Myself and Lincoln thought that it might be a nice idea to have a photographic competition in the Cutting Edge magazine for GCA members.

As a company we have recently revised and launched our new web site www.keithpayneproducts.com and Keith had great difficulty in trying to make a rubber gasket "Interesting" in photographic form.

So I would like to throw a challenge to all the keen photographers out there for the best photograph of a gasket/gaskets to be published on the GCA web site and in this magazine.
See if you can do a better job than us! Shouldn't be too hard!

A prize of a large bottle of Whiskey will be presented to the best photo of an "Interesting" gasket.

All entries Should be in Jpeg format and size not to exceed 1MB. Please send your entries to me at warren@keithpayneproducts.com

Entries to be in by 1st September. We can publish the entries in a future edition of Cutting Edge, the Judge's decision is final.

Date for your Diary Ladies

Ladies Race Day
September 2016
Venue and date to be confirmed

Look out for news of forthcoming meetings and events on the website at:

www.gcassociation.co.uk

And finally

Remember, GCA members can advertise off-cuts for free in the Cutting Edge. This is a first come, first served basis, so send details now!

If you would like further information about anything in this 'Cutting Edge' or, you would like to book advertising space in the next issue, please contact us. If you are interested in joining the GCA and would like more information, please contact us or take a look at our website which has full details.

And finally

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