

Inside

UMAREX

Umarex is one of the biggest players on the global airgun stage, and **the editor** gets an access-all-areas pass to go inside its German HQ. In a two-part look behind the scenes, he begins with a gander at the company's history and its production of CO2 airguns...

Airsoft, blank-firers, rimfires, 9mm, CO2 and airguns. You name it, and Umarex either build it, or have it built! And that's not even including the accessories side of things, like knives, torches and ammo! Although the Umarex brand is relatively 'new' to UK shooters – arriving as a name in around 2007, when Armex became one of its UK distributors – its roots can be traced back to 1972. That is when two entrepreneurs and passionate hunters – Wulf-Heinz Pflaumer and Franz Wonisch – decided to form a business partnership which focused on the marketing and distribution of 'non-lethal' guns for a home shooting market that was then limited by strict legislation.

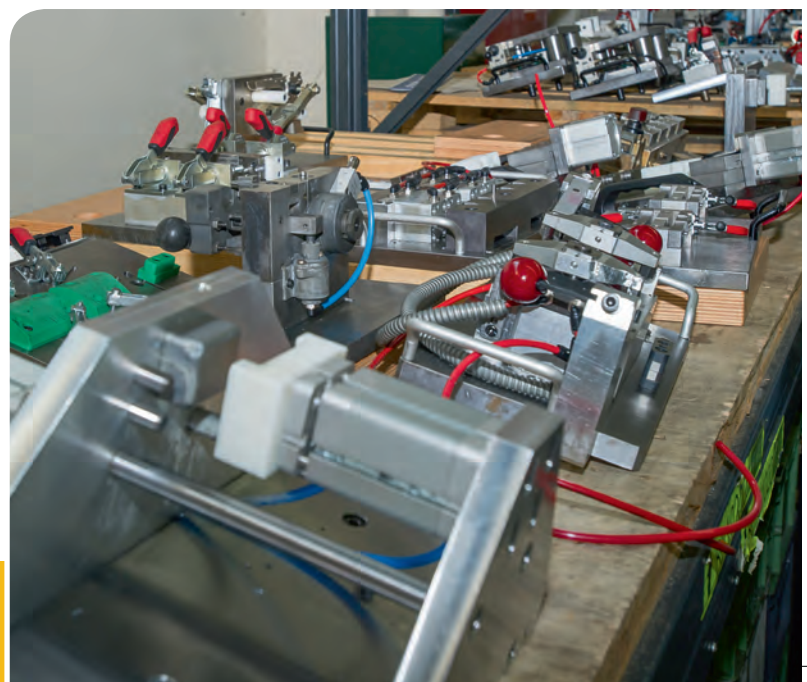
Back then, the company was original called Mayer & Riem GmbH, later known as Uma before finally becoming Umarex – and their first-ever success was the blank-firing replica known as the Perfecta. Since then, the company has grown to become the largest manufacturer of replica and blank-firers in the world, with the group

employing some 850 workers across its international territories. And it's also run by its founders' sons, Eyck Pflaumer and Martin Wonisch.

Shoot to the present day, and Armex has now been appointed Umarex's sole UK distributor, where they've been supplying our gun shops with nigh-on all of Umarex's exciting airgun catalogue: products like the 850 AirMagnum, Hammerli Black Force 800, Walther LGV and the many CO2 pistols which Umarex licence from the likes of Beretta, Browning, Colt, Heckler & Koch, Smith & Wesson and Walther (to name but a few).

So as far as the British airgun market is concerned, Umarex is a major player – even though very few of the guns that shooters see are actually 'badged' Umarex. And you can understand why I jumped at the opportunity to go behind the scenes at their German HQ in Arnsberg, a short drive from Dortmund.

Germany is known for its highly-efficient, highly innovative engineering prowess – and as soon as I walked through the Umarex





doors, I realised I was about to enter more than just one of the most high-tech manufacturing plants in the gunmaking world. Even the floor to the entrance had been designed in the shape of a ring target – and upon arrival at reception to collect my name-badge, I'd already scored a bullseye!

While the whole gamut of the Umarex operation takes in replicas and live-round manufacturer and assembly, I was acutely aware of just how much of the giant plant was given over to air (or, more correctly, CO2) power. While much of the spring-powered airgun product line – those bearing marques like Browning and Hammerli – are sourced in the Far East, where they're designed and built to Umarex's specification, the vast majority of the CO2 are manufactured inside the EU.

The plant's general manager, Olaf Beisheim, explained to me how it works best for Umarex: "We design the tooling to make the componentry, but in much of the manufacturing process, we then give this tooling to other production manufacturers – primarily in the automotive business. They have the capacity to make the sort of quantities we need in a very short space of time – and this is just the sort of work they like to have as it means their fabricating machinery is never idle. We, of course, benefit from their highly-sophisticated manufacturing processes, so it's a win-win system."

It's not just a case of sub-contracting, either. The innovative set-up actually gives Umarex total control. It is their own tooling – made to their own specification and tight tolerances upon which components are made – and what's then produced on them comes back to Umarex for final finishing. "Typically, we are involved in the last 25 per cent of the process," explained Olaf, adding: "the most important part, you could say."

Aside of the physical size of the operation, what immediately caught my eye was the many tooling jigs I saw – a sign of just how complex the Umarex operation actually is. We're talking big numbers – not tens of thousands, but *hundreds* of thousands of components.

Mass production, of course, is often synonymous with poor quality. That, I'd agree is true – unless you're putting a German into the



equation! More than any other factory I've visited over the decades, the attention to quality control by Umarex is mind-boggling. Indeed, I had to repeatedly ask Olaf for his confirmation that, for many components that I saw on production lines, the checking was for every item.

"We do undertake batch testing in some instances," he explained, "but in other areas, it is more important that we check each item individually so that we don't have problems later on in the production process. Or, worse, the end user finds a fault."

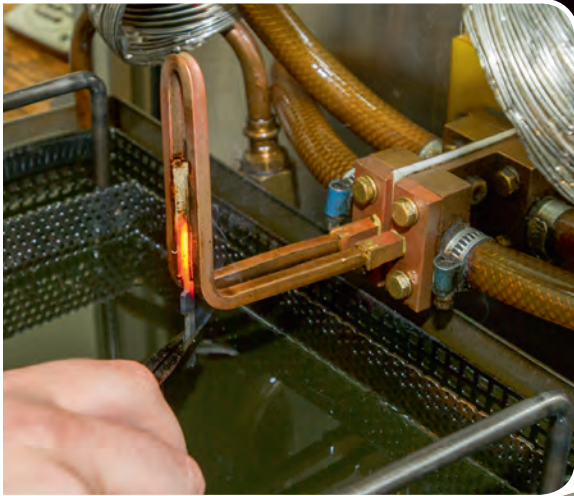
Early-on in the tour, I was taken into the quality control areas, where highly-trained technicians were analysing everything on state-of-the art equipment. This didn't just include computerised 'shadowgraphs' that checked the dimensions and tolerances of every component, but even machinery which analysed the metallurgic properties to ensure they were within the defined parameters!

Above: Technicians run detailed checks on every component

Bottom left: Even the reception at Umarex's HQ is shooting-themed!

Centre left: The amount of tools and components behind the Umarex production process is mind-boggling





Group left: This part-tempering process for a trigger sear is carried out skilled technicians



One item that was being checked was a trigger sear. "This has to be part-hardened," advised Olaf, "so we're checking here to make sure that the hardened and unhardened areas have not been compromised during the process."

That 'process' happens to be done by hand – and I was given a demonstration of how it was done, using a special heating machine and oil bath. While I had expected it to be fully mechanised, Olaf explained that it was too complex a job to be done by robot – and the 100,000 (at least that's what it looked like to me!) units going through at the time of my inspection were being carefully part-hardened by a skilled engineer.

He selected each sear with tweezers, which he then placed in an exact position for a set amount of time between two jaws that rapidly heated up, before dropping the component into a bath of oil to correctly temper it. It was fascinating to watch.

I was taken into the blueing plant, where Umarex colour all their components. I say 'colour' because they use special mixes of alloys and steels to ensure the correct hue. "It's not just blueing!" laughed Olaf.

As I worked my way through the plant, I was amazed at the industry of the 200-plus workforce, and I certainly got the impression that the Umarex technicians from the shop-floor to the packaging department take a great pride in their work.

Boxes of components were stacked high wherever I looked; a set of CP99 top slides here, a box of lever actions there... a load of eight-shot rotary magazines on their way to final finishing. Every step of the production process was documented so that there was a

record of what had been done when, by whom, and using what materials. "I bet you never knew so much went in to making one of our guns!" Olaf quipped. In truth, no, I never did – but I do now. And I'm absolutely amazed that Umarex's range is so competitively priced given the attention to detail that every gun has had between its birth and sale.

The operation is particularly slick in the way each gun (and its component parts) are identified – barcoded information accompanies most pieces once they get to a certain level of assembly, and I watched with interest as some finished pistols were put on to the laser-engraving machinery where they had their 'labelling' applied, along with a unique serial number.

"We can put on whatever we want, wherever we want," demonstrated Olaf as he directed my attention to a nearby computer monitor, "simply by adjusting this computer programme."

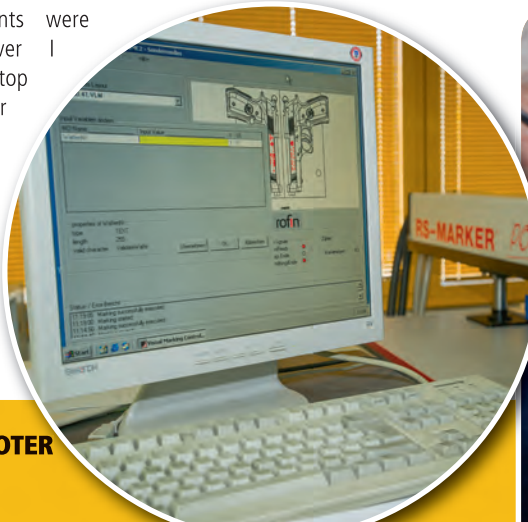
While much of the Umarex CO2 operation caters for the lookalike revolvers and semi-autos which Umarex build under licence from the world's famous shooting marques, it was the final leg of the tour that I was particularly eager to experience – the assembly line of the Walther LGV 2012 break-barrel.

I'll continue my tour of Umarex's Arnsberg HQ next month, when I'll show you some fascinating behind the scenes shots of the LGV being assembled, not to mention some remarkable R&D information that 'Project LGV' uncovered as the team set out to produce the finest production spring-piston air rifle ever built. ●



Above: Boxes of parts, such as these rotary magazines, are stacked high around the premises

Below + inset: Laser engraving machinery and the bar-coding process are particularly slick



Inside UMAREX

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Last month, I began my tour of Umarex's German HQ in Arnsberg, near Dortmund, and this month I'm concluding my behind the scenes look with a visit to the Walther LGV's assembly facility.

Carl Walther's 1964 LGV break-barrel model ultimately played a major role in their success as a target gunmaker, and I've gone on record to say their new, 2012 LGV is the best mass-produced springer I've ever shot. By spring gun standards, it's expensive – but what you get is one of the most highly-researched, innovatively designed and beautifully engineered break-barrels ever produced. There's a reason why it's in the price bracket that it is – it's so sophisticated. The hour I spent discussing the LGV with project manager, Jürgen Kloeckener could have gone on for days were it not for a looming appointment with a Luton-bound Airbus!

I penned a full test report on the flagship Competition Ultra LGV 2012 back in October 2012's edition of *Airgun Shooter*, but I learned even more startling facts while at the factory – and it was particularly interesting to see both the mechanical workings of this rifle up close... and just how much effort goes into assembling every rifle so that it's 'just so'.

Obviously, the LGV's *piece de resistance* is its breech, and Jürgen pointed out a few things of which I was blissfully unaware. The angle of the breech face and lock has been designed to make 'breaking' the barrel effortless – and a force-fit closure system ensures the breech

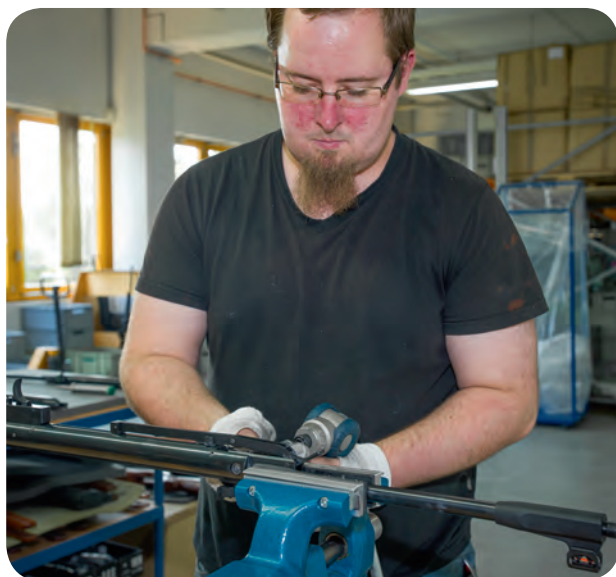
faces mate identically, with the O-ring breech seal being there purely as an air seal and nothing else. "If a squidgy O-ring determines the closure," explained Jürgen, "then you will not get repeat accuracy. So we don't have any pressure bearing down on the O-ring."

I watched as a Walther technician was hand-building a gun designed for the UK – though it's been a success all over the world, including Thailand where it's sold as a sub-2 joule version. Yes – that's less than 1.5ft/lb! He was setting the tension of the breech axis bolt, and they'd even built a bespoke tensioning system to make every gun not only the same, but perfect. I always had visions of an 18-stone German engineer bearing down on a three-foot long screwdriver, but I couldn't have been more wrong! There's a lot more science behind the LGV's breech bolt than you could ever envisage...

I was also allowed to inspect the LGV's trigger unit, which I've already said in

Bottom left: A Walther engineer hand-crafts an LGV destined for the UK

Bottom right: The inner workings of the LGV's sophisticated trigger unit

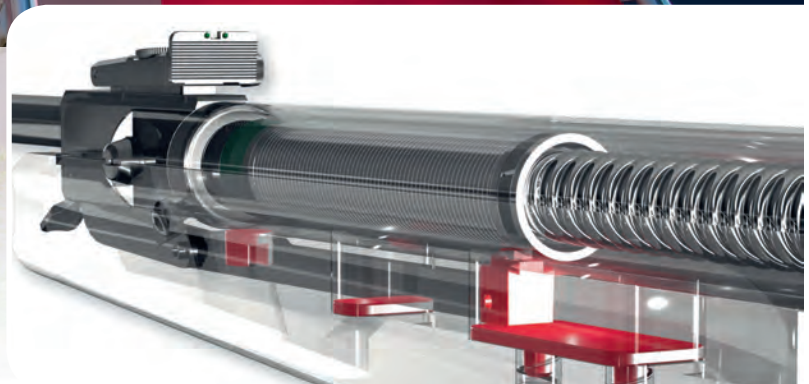




print is a rival to Weihrauch's Rekord as far as spring guns go. Now that I've seen inside one, I can see why its performance so impressed me in the field and on the range. Its internal workings are beautifully engineered and there's even a special guide through which the piston rod slides to maintain the correct relationship with the sear. It's this incredible attention to detail which translates into the super-efficient performance the unit has.

Talking of pistons, there's also a lot of technology in them, too. The head has been especially moulded from special polyurethane to not only ensure exact tolerances with the internal diameter of the CNC-machined air chamber, but to offer the correct type of seal – one that allows controlled combustion during the firing phase. Its lip scrapes the cylinder walls leaving only microbes of lubricant in front.

Its front and rear bearing surfaces are made from zero-play Delrin to ensure a smooth operation, and it spins around a centralised piston rod to eliminate any twisting motion imparted by the spring as it unleashes its power during the firing cycle. Jürgen told me how they'd ultimately modified the piston/rod union to maintain this all-important concentricity, and that the length of the rod is adjusted to account for markets with different power requirements. LGVs destined for the UK, for instance, have a slightly shorter rod than those for other European territories (so as to give a longer piston stroke).



Above: An X-ray look at the complex internals of the LGV's advanced action

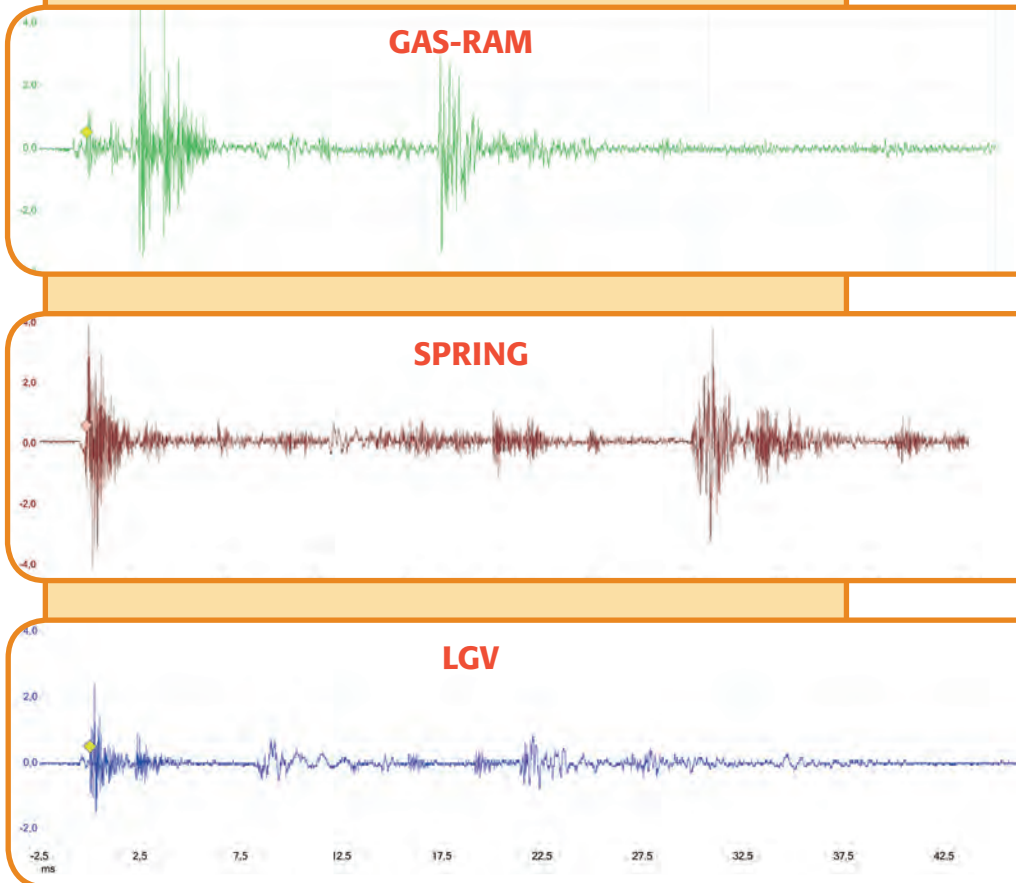
Left: Walther adjusts the length of the piston's rod to suit the power levels required by different markets

Left centre: The piston heads are moulded from special polyurethane





VIBRATION COMPARISON – GAS-RAM v SPRINGER v LGV



I was unable to take photos of much of the top secret stuff Umarex used in their design of the Walther LGV, but I did get a snap of rig that the development team used to calculate the amount of vibration a spring-piston air rifle experiences during the firing cycle. It measures vibration over time – the amount of movement between the trigger being pulled and the pellet exiting the muzzle.

“It was necessary to establish such a test,” explained Jürgen, “because our ultimate objective was to make the quietest, most vibration-free recoiling spring gun.” Indeed, project LGV was over two years in the making, and as anyone familiar with the 2012 model will know, the Umarex team ultimately delivered Super Silent Technology (SST) and a Vibration Reduction System (VRS) in their rifle.

To prove VRS, I was shown graphs which demonstrate the amount of vibration present in a conventional spring-and-piston air rifle, a gas-ram piston rifle and the LGV with VRS. The results, as you can see, are quite remarkable and really staggered me! Results that have been achieved by some of the most advanced engineering ever applied in a production springer. Among many concepts, their R&D allowed Umarex to incorporate ‘air brakes’ inside to slow the piston down at the end of its travel and utilise a longer-than-normal spring guide to reduce vibrations. Even the cocking linkage runs on a spring-dampened plate to make pulling back the barrel silky smooth!

I fired a few LGVs at varying power levels (for different markets) on the test range, but it didn’t really tell me anything I didn’t already know from my weeks of testing the gun last year. The LGV 2012 is an incredibly smooth performer, of that there is no doubt – although I now have a lot greater understanding of just why. Like the rest of the Umarex operation, the attention to detail at every stage of the process – from design through to final assembly – is really quite extraordinary.

And to add further credibility, Umarex don’t just talk the talk, they also walk the walk. When Jürgen clocks off and leaves the factory gates, he doesn’t leave the Walther LGV behind. In fact, he shoots one – and not just in

the back garden, either. He’s pretty competent at the toughest outdoor discipline of them all – field target. And in July of this year, Jürgen actually won the Spring-piston class in the German national championships!

Unsurprisingly, it was bog standard off-the-shelf Walther LGV (Competition Ultra)... though ‘bog standard’ are hardly words you can use on what is the most advanced production spring air rifle the world has ever seen! ●

Top left: Umarex has a dedicated set-up for calculating a rifle’s spring vibration

Below: Jürgen firing the LGV in a field target competition – proof that Umarex’s engineers are happy to take ‘work’ home!

