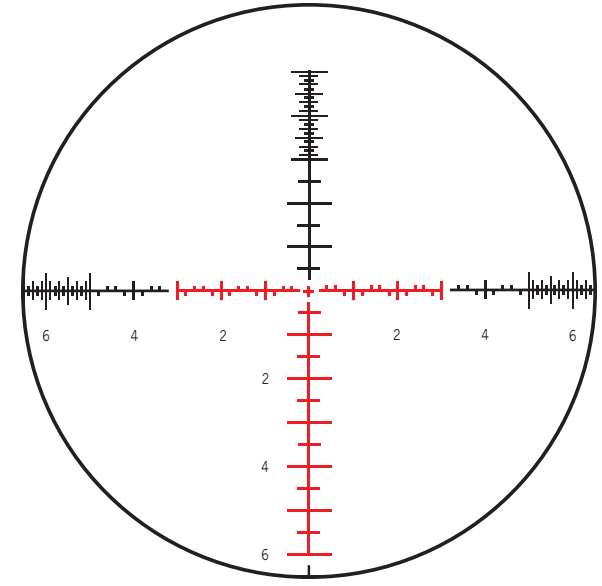


Steiner made its name building binoculars, and recently introduced riflescopes. To find out exactly what goes into their rifle scopes we traveled to Colorado, built one and put it to the test.



Steiner's Special Competition Reticle or SCR is a Mil-based design developed to provide both the ability to range targets and provide ballistic compensation.

Steiner was founded by Karl Steiner in 1947 as a one-man shop and has grown exponentially. Today it supplies militaries around the world and is now part of the Beretta Group.

harmful UV radiation. Today Steiner is part of the Beretta Group. Steiner, unlike the other European optical giants such as Carl Zeiss, Hensoldt, Meopta and Swarovski, made its name building binoculars rather than a diverse array of optical instruments. We're not talking about prissy birding binos either. Steiner built good solid Porro prism binoculars with that distinctive look which set them apart from every other brand. Steiners were the binocular of choice for men like Thomas Magnum in the hit 1980 TV series *Magnum, P.I.* In the days of my youth Steiner binos screamed adventure. Not only was their cool factor off the charts, but their optical performance and durability was impressive enough that they were adopted by the U.S. military.



This is the Steiner scope Fortier built, seen here mounted onto a LaRue .260 Rem, a T5Xi 5-25x56mm tactical scope built on a 34mm tube and featuring an illuminated SCR reticle.

Riflescopes are actually a fairly recent addition to the Steiner line. I wasn't really sure what to expect when Steiner first introduced a line of riflescopes. I was quite

skeptical and didn't expect to be impressed by what they designed. However, when push came to shove I was proven wrong and to date all my impressions concerning Stein-

er riflescopes have been quite positive. It was the performance of the Steiner optics I had tested which piqued my interest to see how they were made. Time for a road trip!

BUILDING A T5Xi

Firearms News heads to Colorado to see exactly what goes into building a Steiner scope.

By David M. Fortier

It looked easy. You simply took the Q-tip-looking thingy, dipped it in the cleaner and wiped the lens free of any particles. Seems straightforward, right? What could be so difficult about this? My instructor, a very personable Steiner technician named Rosa, had a knowing smirk on her face. I did my best to duplicate her technique and then we examined the lens again. Her smirk became a smile. There was more debris, lint and particles on the lens now than when I started. Good grief. I laughed and cleaned it again, and again and again. Every time I thought it must be perfect now, she patiently pointed out a particle here or a speck there. When I finally asked her to show me her cleaning technique again she took the lens, and with

great skill wiped it spotless in a matter of seconds. It was obvious she had done this once or twice before. Sitting in a cleanroom surrounded by highly skilled female technicians reminded me of my days building specialized semi-conductors for the military aerospace industry a lifetime ago. While the flavor was the same, there wasn't a semi-conductor in sight. Instead, I had traveled to Greeley, Colo., to visit the famous optical company Steiner. Not just to visit their North American headquarters or to tour their plant where they produce optics, but for something special. I had the opportunity to go behind closed doors at the Steiner plant and to spend a day learning how their rifle scopes are built by

actually doing it. Not only was the plan to build a rifle scope, but afterwards it would be put to work first shooting on steel out to 1,100 yards and then hunting prairie dogs. It sounded like an interesting adventure. As the company's name suggests, Steiner is a German company. Its lineage extends back to the 1940s when the company rose from the ashes of WWII. Founded by Karl Steiner in 1947 as a one-man shop, it has grown exponentially and has become a supplier of the U.S. military among many others. Important technological innovations made by Steiner's engineers include rubber armoring, the first binocular with an integrated compass and special optical coatings to protect against



A scope looks simple on the outside, but hidden beneath the tube is a myriad of small parts, pieces and lenses all working together. Here is what goes into a Steiner T5Xi 5-25x56mm.



The guide tube assembly is the heart of the scope and contains various lens assemblies providing the change in magnification, the reticle and LED illuminator.



Fortier begins initial assembly of the Steiner's guide tube assembly. Properly cleaning the lenses to the required standard was the hardest part of the job.

So this past August I traveled from Kansas to next door Colorado where I met up with three other writers and our hosts from Steiner. Early the next morning we got started at the Steiner plant with a tour of the facilities, an overview of how production flowed and a look at their CNC equipment. They have a lot going on in this facility but the heart of the plant is the cleanroom assembly area. This is where our group would spend most of the day. Before we could enter the cleanroom, we first had to enter a changing area. Here we dressed in special gowns and covers for our heads and feet to reduce/prevent particles and contaminants from being introduced into the assembly area. A key part of the assembly procedure is to ensure everything is as clean as possible. This would become a mantra for our time in this area.

Next we had an overview into the optic we would be assembling, a T5Xi 5-25x56mm riflescope, including its

The guide tube assembly needs to be properly adjusted and aligned. This was done with a special fixture and video collimator.

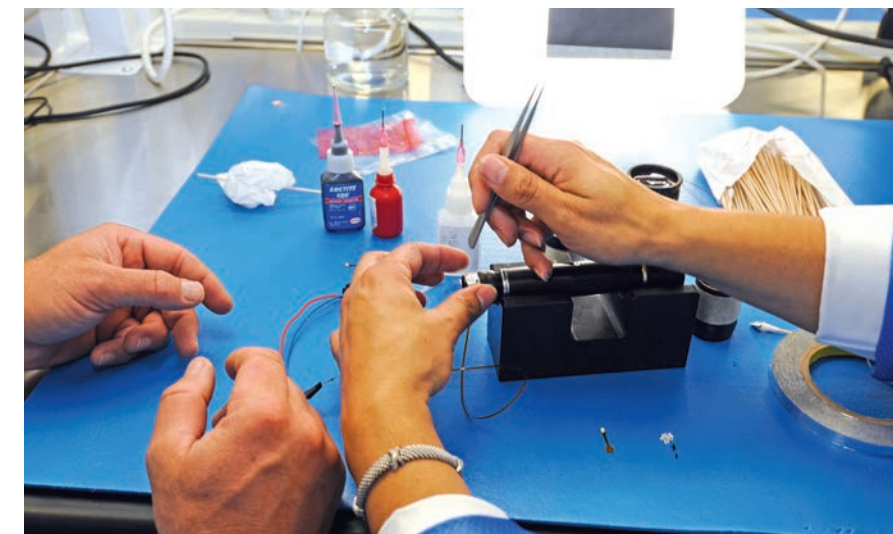
subassemblies and components. There were a lot of very small parts laid out in order across a very big table. On the outside a scope seems like such a simple device, a tube with a few lenses and a couple things to twist to move the POI. Inside though is another story. Many small pieces fit precisely together all working in unison to magnify the image, increase/decrease the magnification, allow you to accurately aim, adjust your point of impact up/down,

illuminate the reticle and more. Not only that but it has to do it with 100% reliable repeatability, day in and day out no matter the temperature, weather or abuse it receives. Plus all these tiny small parts have to perform as intended while hard mounted to a rifle which violently recoils with every shot.

Sitting down next to my mentor and instructor Rosa, I started my journey by taking my first step. I began by



Fortier stands with his instructor Rosa and proudly shows off a completed guide tube assembly.



The Steiner features reticle illumination provided by an LED, which is seen being fitted and glued into place here.



After hours of work the piece is slowly starting to resemble a riflescope. The entire Steiner crew was both very professional and, thankfully, patient.



Once completed, each scope went through an entire battery of tests in the QC department. This was a laborious process, which ensures the quality of each riflescope.

cleaning the lenses for the guide tube assembly, but it provided an education in what goes into every Steiner scope. Every lens must be carefully cleaned by hand to remove any marks, oils or particles. One of the hardest jobs, perhaps the most difficult, of the entire assembly process it must be done perfectly so that even careful examination under magnification reveals no particles. Plus it must be done to each side of each lens, and over and over again with the same constant attention to detail. This type of precise work, done over and over again, day in day out, week after week requires great patience, diligence and attention to detail.

I learned decades ago in the military semi-conductor industry this is the type of work highly motivated women excel at. So it was no surprise to me most of the assembly crew were female. Women shine at this fine detail work and, typically, easily outperform their male counterparts. Time spent elbow to elbow with the Steiner crew showed them to be the down-to-earth blue-collar workers that make up the fabric of our great nation. In the lunchroom they joked, laughed and talked like any female crew. In the assembly area their knowledge, professionalism, dedication and skill impressed me. Why am I dwelling on the assembly technicians? Because these are the people

who are actually responsible for building Steiner optics. White-collar folks are fun and engineers are interesting, but the quality of a product any company produces rests with the person on the line.

While properly cleaning each lens element was enough to drive you crazy, the rest of the guide tube assembly was fairly straightforward. The assembly allows the T5Xi to zoom from 5x all the way up to 25x and it contains the scope's reticle. Due to its location, the reticle is placed in the first focal plane. Once the guide tube was almost completed, it needs to be properly adjusted. This operation was performed at a special station with a fixture and video collimator. Here several important adjustments were made and the reticle was carefully aligned. I performed each adjustment as a technician walked me through each procedure. This was interesting as it gave a peek into how the guide tube assembly and the scope itself operated. Perhaps the most interesting was installing the LED for the illuminated reticle. While not difficult, it needed to be done properly and it was interesting to see how the electrical connection was made and how it illuminated the reticle.

As I advanced I switched to working with one of the supervisors, Erika. She had a great sense of humor, and



After being checked visually and mechanically, surviving a machine recoil test and having been nitrogen purged with no leaks Fortier's scope passed final inspection.

a lot of patience and put up with me pestering her with questions as the tube slowly was transformed into something that began to look like a riflescope. After building the springport I ran into an issue trying to install the springs that ensure the optic mechanically tracks properly. Steiner doesn't use just one or even two springs, but three stacked on top of each other. They have to go in just so, and after numerous attempts Erika leaned over and with a deft well-practiced motion snapped them into place as if it was nothing. From here the rest of the assembly was fairly straightforward. Installing the objective lenses was relatively easy as was the eyepiece. After almost every operation the optic would be whacked, like a hammer, onto a rubber pad and carefully checked internally for particles. The first time I was told to smack it, I hesitated. "Hit it harder," I was told. Then it was properly demonstrated, like a 20-ounce Eastwing. Your average owner of a tactical scope in this price range would have a coronary if you smacked their precious like a scope on the Steiner line.

Once the scope was actually assembled, it then moved over to Steiner's QC department where it underwent an exhaustive battery of tests. Each scope underwent an initial inspection both visually and mechanically. Next it was solidly mounted into a fixture and was subjected to machine recoil testing to try to shake things apart. The optical performance and parallax were carefully examined and checked along with every aspect of its mechanical function. Adjustments and return to zero were carefully checked using a chart placed at 100 meters. Finally the optic was nitrogen purged and all its seals were checked and verified for leaks. The T5Xi I assembled passed inspection on its first examination, something I was fairly proud of. Credit of course goes to the skilled technicians who trained me and patiently put up with my mistakes.

So what was the end result of a day's labor? Steiner's T5Xi is a very attractive tactical scope that is modern



Many thanks to the entire Steiner crew who came in on their day off to make this article possible. All of them were very proud of their company and their work.



With the Steiner T5Xi completed and ready for work they were mounted onto Sako TRG 22 precision rifles in .308 Win.

smoothly with the rheostat having easy to differentiate clicks.

I built my scope with Steiner's Special Competition Reticle or SCR. This is a Mil-based design developed to provide both the ability to range targets and provide ballistic compensation. As the reticle is Mil based, it is not caliber/load specific and can be used with any caliber or load. Located in the front focal plane it features .5 Mil holdover marks on the vertical stadia and .2 Mil hold off marks for windage on the horizontal stadia. The design also incorporates .1 Mil marks for ranging. Because the reticle is located in the first focal plane it can be used for ranging/ballistic corrections at any magnification setting.

Specifications of this model are impressive and so I was looking forward to seeing how Steiner's big T5Xi 5-25x56mm performed. I am a fan of optics in this magnification range as they cover both near and far when mounted on a typical precision rifle. You can take close shots on 5x or crank up the magnification and have a look about on 25x. Plus you have everything in-between. That uber-fat 56mm objective lens isn't just for looks, either. Low light performance of scopes in this class can be quite impressive. The trade-off is size and weight. Downside is this model is fairly long, has a fat objective and weighs in at 33 ounces.

The next day we got up bright and early and went to Steiner's headquarters. There we carefully mounted the scopes we had built the day before onto Sako TRG 22 precision rifles in .308 Winchester. With this accomplished we hit the range. Steiner had brought in one of their sponsored PRS competitors, Andrew Reinhardt, to help us appreciate the T5Xi's capabilities. After zeroing we tested the scope/rifle combinations out to 1,100 yards on steel and recorded our dope. Then we did some informal shooting getting used to the reticle. The man behind this optic and reticle, Martin Noller shared his thoughts and provided input as we increased our round count. The scope is designed to be used where you dial in your elevation and use the reticle for windage/lead corrections. My colleague Joseph von Benedikt and I worked together and had no issues running the Sako/Steiners out to 1,100 yards using Hornady 168-grain Match ammunition.

.1 Mil adjustments with audible and tactile clicks. A full turret revolution provides 12 Mils of adjustment with 26 Mils of elevation adjustment available. The elevation turret has the typical hash marks to keep track of adjustments but it has an interesting trick up its sleeve as well. The full Mil markings on the turret can be seen through small windows, after you go past a full turret revolution the numbers change to reflect this. The first time you rotate the turret and see the numbers change, you'll stop and do it three or four times while thinking to yourself, "Neat". In operation it ensures you are never one rotation off.

On the left side of the mechanism block is a larger and small knob. The smaller outside knob is a rheostat that controls the intensity of the illuminated reticle. It features 11 powered settings with off positions in-between each powered setting. This allows use with night vision devices, in low light as well as in daylight conditions. Power is provided by a CR2450 battery. The larger inner knob adjusts parallax from 50m to infinity. Both knobs adjust

in appearance yet not too German. From the fat 56mm objective to the sculpting on the fast-focus diopter eye-piece, it's designed to be both functional and good looking. More to the point, it is also designed to appeal to the American shooter. American riflemen often have distinctly different tastes than their European counterparts. Steiner has recognized this and designed a sight with the features an American rifleman will appreciate.

The heart of the scope is a 5-fold magnification increase lens system housed inside a 34mm tube. A 5-fold magnification increase is a small but useful step up from the traditional 4-fold designs, while being less expensive and complex than comparable 6-fold designs. Magnification runs from 5x up to 25x in a 180-degree twist of the zoom ring. The magnification ring markings are angled for better visibility from behind the rifle. A cattail allows rapid magnification adjustments but is easily removed if so desired.

The mechanism block sports two large-diameter, low profile turrets for windage and elevation. These feature



A day was spent on the range zeroing and shooting in various positions out to 1,100 yards on steel targets.



The Steiner T5Xi's performed very well on the range with impressive optical performance, a practical reticle design and reliable mechanical operation.



After a day spent verifying the scopes performance on steel we traveled to Longmeadow Game Resort for some prairie dog hunting.

With dope in hand, we shot an informal competition to see just how well the scopes performed. This started with a ranging exercise using the reticle, a cold bore shot and then a target at unknown distance. This was followed by a know-your-limits stage shooting at five progressively smaller plates at 225 yards and then hitting a boar target at 592 yards in-between. From there we moved to shooting from various positions off a barricade on four steel plates randomly placed from 335 to 475 yards. The last stage began with engaging a spinner at 250 yards and then five steel targets from 742 to 1,100 yards. Both speed and accuracy were required in the match and I managed a respectable second place finish behind von Benedikt. We finished the day mounting the Steiner's onto Tikka .223 Rem varmint rifles and performed a quick zero.

Early the next morning we drove about an hour east of Denver to Longmeadow Game Resort and Event Center in Wiggins, Colo. There we met up with a guide

and we headed out to do some prairie dog hunting. These small vermin are about the size of a water bottle, and would prove an entertaining challenge. Our guide was great and we had an entertaining afternoon putting the Steiner/Tikka combination to work. Most of our shots were made between 250 and 350 yards but some nicely executed ones reached out to about 500 yards.

I found the Steiner to possess very good optical qualities. Color rendition is accurate, resolution is very good and the image is bright and clean. The eyepiece is very forgiving regarding head placement on 5x but not so much at 25x. Adjustments are both consistent and accurate. I particularly like the size, height and design of the turrets. The reticle also worked well being relatively simple and straightforward to use without all sorts of things cluttering it up.

Personally I found the T5Xi much to my liking. It looks good visually with a certain appeal to it which



Most of our shots on prairie dogs were made between 225 and 350 yards with a number at 400 and a few at about 500 yards.

The Steiner/Tikka combination teamed with Hornady 55-grain VMAX's proved not only highly effective but entertaining as well.

SPECIFICATIONS	
STEINER T5Xi 1-5X24MM	
Magnification Range:	5-25x
Objective Lens Diameter:	56mm
Tube Diameter:	34mm
Field of View (ft. @ 100 yards):	21.5-4.3
Eye Relief Inches:	3.5-4.3
Exit Pupil mm:	11.2-2.3
Focal Plane:	Front
Power Source:	CR2450
Overall Length Inches:	16.6
Weight Ounces:	33
Adjustments:	.1 Mil
Adjustment Range:	26 Mils

SOURCES

Steiner Optics
970-356-1670 / www.steiner-optics.com

Hornady
800-338-3220 / www.hornady.com

Longmeadow Game Resort
970-483-8368 / www.longmeadoweventcenter.com

softens the blow of its relatively high price. Optical performance, especially in low light conditions is very good. The controls all operate smoothly and the scope provides a certain pride of ownership. Practical performance either off the bench or lying prone in the field was excellent. All in all I was impressed by Steiner's T5Xi 5-25x56mm scope. It's nicely made with impressive optical qualities. Performance was very good with zero issues. Price is a bit hefty though at \$1,999.99. If you can afford it, it's one to consider for your precision rifle. **EN**

