



# Seeing is believing

**TOM CERETTO** TALKS WITH **DR RICHARD COLO**

**THE RANGE OF HIDEFSPEX SHOOTING GLASSES HAVE BEEN AN OVERNIGHT MARKETING SUCCESS. IF YOU KNOW SOMETHING WORKS, BUT DO NOT FULLY UNDERSTAND WHY, IT'S BEST TO TALK TO AN EXPERT. DR. RICHARD COLO HAS BEEN WORKING WITH SHOOTERS FOR SOME TIME AND PROBABLY KNOWS AS MUCH ABOUT HOW AND WHY THE HDS SYSTEM WORKS AS ANYONE DOES.**



For over half a century, Polycarbonate and CR-39 have been the industry standard in sport glasses. HiDefSpex Ballistx Diamond Vision is made of a new material said to be superior in terms of ballistic capability. Why is it necessary for the shooting public to recognize that all shooting glasses are not created equal?

■ Before the introduction of this new material there has always been a compromise in

performance for the clay target shooter and the sports enthusiast. A decision had to be made between visual acuity (CR-39) and safety (Polycarbonate). Shooters and sportsmen should know that compromise is no longer necessary. For the first time there is a material that optimizes both acuity and safety.

Additionally, the HDS lens material is the perfect form for rimless shooting glasses. The reason is that when you use a drill to either notch or drill a hole in a lens you create heat. HDS material is less sensitive to heat than either Polycarbonate or CR-39. With time, these other materials can chip, flake or develop spider cracks around the holes or grooves.

Also, because of the stress placed on holes and notches by the flexing of the lens material and the frame, a phenomenon called "hole elongation" occurs. This makes the lenses loose and sloppy in the frame over a period of time. Due to the strength of HDS material the lenses retain their original shape.

**Polycarbonate is a substrate that is manufactured far differently than HDS Ballistx Diamond Vision. Why is the manufacturing process of Polycarbonate not always optimal for spectacle acuity?**

■ The process by which Polycarbonate is made creates internal stress in the lens. This internal stress causes a double refraction condition called birefringence. This condition splits a light ray into two and causes the image to be blurred. The more the stress to the material, the greater the affect will be on the clarity of the lens. Due to the manner in which HDS lenses are made there is an absence of internal stress therefore no birefringence to degrade the image.

**The measuring stick for optical clarity is the ABBE Value of the lens. Please comment on the differences between Polycarbonate and HDS Ballistx Diamond Vision.**

■ ABBE value is actually a measure of the chromatic aberration in a lens. This is the dispersion of light through a lens into it's colored elements. The higher the chromatic aberration, the more the distortion through the lens, also, the higher the Rx the more the distortion introduced. The higher the ABBE value the less the chromatic effect, therefore, the less the distortion. HDS Ballistx lenses have an ABBE value of 45 compared to Polycarbonate, which has a value of 22-30. The high value of HDS Ballistx lenses means the color aberration is undetectable by the individual, therefore optimizing the clarity regardless of the strength of the Rx.

**When dealing with corrective needs of shooters, how do you**

**feel HDS Ballistx Diamond Vision is changing the way prescriptive wearers are achieving optimal focus?**

■ The shooter with an Rx has always been at a disadvantage for three reasons:

■ **Lens thickness** (HDS minimizes thickness because of its safety. It does not have to be as thick in order to deliver proper protection).

■ **Lens weight** (HDS is simply the lightest material made).

■ **Proper alignment** (Because of the large size of the blank it is made from it can properly be decentered to match the distance between the shooters eye). When I first started doing Comprehensive Shooter Eye Exams I didn't feel that small changes in Rx were necessary. I felt the relative gross nature of the

clay target didn't require that level of attention. Well, I couldn't have been farther from the truth. I have had the opportunity to examine some of the top Skeet shooters in the world. Almost to the person they have had 20/10 vision. Now I don't see 20/10 vision more than a dozen times a year. Needless to say, after that I attempted to correct my shooters to the sharpest possible vision regardless of how small the change.

In this same light, HDS has allowed me to make an Rx in a pair of shooting glasses affording my shooters the sharpest material without any compromise to safety.

**HDS Light Management System is the key to achieving perfect focus for the eye. Please comment on the need for the right amount of light coming into the eye to achieve perfect focus.**

■ Vision is broken into three major types: Photopic (which is primarily daylight vision), Scotopic (what we use at night) and Mesopic (which is the transmission between the two).

The human eye contains two types of photo-receptors, known as rods and cones. These receptors change light into impulses that are interpreted by the brain and this is how we see. Photoptic vision uses cones only. These cones are concentrated at one spot in the back of the eye in an area called the macula.

Pursuit and saccadic eye movements are the two movements used in shotgun sports. An example of the relatively slow pursuit movement is the simple act of following a target. An example of the much faster saccadic movement is changing from one target to

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**BLADE Rx.**

another in doubles. It is well established that both saccadic and pursuit movements are enhanced by using the macula, where the cones are concentrated. In order to visually enhance our ability to break clay targets we want to maximize macular function. To do this we need to stimulate as many cones as possible. Obviously, the way to do this is to get as much light into our eyes as we possibly can.

There is no better system on the market to transmit the proper amount of light to the eye than HDS. With the ability to change from 15% transmission all the way to 99% in six graduated steps, it allows the shooter to let as much light in as possible for any given environment without compromising eye strain and lack of focus by allowing too much or too little light into the eye. We call this squinting (retarding light into the eye) or straining (the need for more light to stimulate the cones). Both of these create eye fatigue.

For decades, the shooting public has been presented with 25 to 30 different tinted lenses that mask the sight picture by turning everything one color. HDS Ballistix Diamond Vision Lenses provide full color sight pictures, so please explain why the eye needs stratification of color to properly gauge depth of field – a critical component to the shooting sports

■ The brain uses many sources of information to determine distance in a 3-D space. When someone is using both eyes the angle created by the two eyes is what translates to the brain how far away something is. This is what we all know as depth perception.

However, there are other cues that can help the brain tell

distances that are not dependent on the use of both eyes. These are examples of a two-dimensional perception of a 3-D space.

Texture gradient is probably the most important of these cues for the clay target shooter. An example of texture gradient would be the leaves on trees creating a different mosaic depending on how far away they are. When the

tree is close you see each individual leaf, as it gets further away the picture slowly changes. With texture gradient the further away a target gets the more homogeneous it looks, i.e. loses the rings and the ridges. Masking the natural color of the environment can alter the brain's ability to recognize these differences and therefore not

perform at its highest level. Other examples of a two dimensional perception of a 3-D space include:

- Linear perspective (Railroad tracks being closer together the further away they are)
  - Occlusion (One object blocking part of another)
  - Relative image size (Further away image seems smaller).
- Texture gradient is the one example that is most affected by tinted lenses masking the sight picture. In trap and skeet the advantage is minimized because the distances are relatively constant. In sporting clays and field shooting this can be a distinct disadvantage. HDS Ballistix lenses offer the shooter a full color spectrum to maximize the advantage of textured gradient.



SEB CHROME



PANTHER POST CHROME

HDS places a technology called **ColorTrast** into their lenses. It is a high color saturation and high contrast technology. Explain how the eye uses contrast to acutely define the rings and edges of the target.

- Contrast is the difference in visual properties that makes an object distinguishable from other objects and the background. In visual perception of the real world (a clay target field) contrast is determined by the difference in color and brightness of the object (target) and the other objects within the same field of view. It is important to understand that the eye is more sensitive to contrast than to just brightness (luminance).

It is quite obvious to the clay target shooter that he or she wants to do everything he or she can to increase their ability to separate the target from the background.

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99 PANTHER CHROME.

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SEB LENS SYSTEM WITH FRAME.

What you don't want to do is add color to both the object you are trying to single out and to the background you're trying to differentiate from.

Contrast is obviously very important, however we cannot concentrate totally on target contrast at the expense of luminance (brightness). There have been more changes in lens design over the last 5 years than there has been in the previous 30 years. Technology has enabled the lens manufacturer to do things related to contrast that were never possible. The problem in shooting sports is most suppliers have concentrated on contrast in an attempt to get the greatest "WOW" factor and have not always addressed the light transmission of the lens. If there is a reduction in the brightness for a given

environment there will be a shift in the focus of the eye off the macula in an attempt to use more rods (black and white) and less cones (color). This unquestionably reduces the visual systems ability to track targets. Unfortunately, that is a whole separate discussion which this format doesn't allow time for.

HDS has not followed this "Lens of the Month Club" approach. They have concentrated on enhancing contrast, but with the proper amount of light transmission in the lens for a given environment. ■

*For more information on HDS lenses and the Blade System, log onto [www.hidefspex.com](http://www.hidefspex.com) If you would like to contact Dr Richard Colo, you can reach him during business hours at 860-668-0266.*

## BLADE SYSTEM

Not satisfied to sit on their laurels, HDS has released a new lens and frame for 2008, the Blade System. The new combination has an injected frame that offers what HDS claims is the finest in visual sight picture for shooting sports. The frame utilizes the proprietary HDS Ballistix Diamond Vision Lens material. The Blade is available as a kit with two complete pairs of Spex and a third additional shield. The lenses included are in 40, 65 and 80 LTM. Both 15 and 99 LTM lenses are offered as accessories. The Blade System is available in plano and prescription versions.

The Blade System is very light weight and uses a proprietary invisible nose bridge, the Inviso-Bridge, with soft silicone nose pads. HDS claims that this minimalist nose bridge creates no visual disruption of the sight picture. The new neo-modern Blade System's frame should have special appeal to the younger set.

