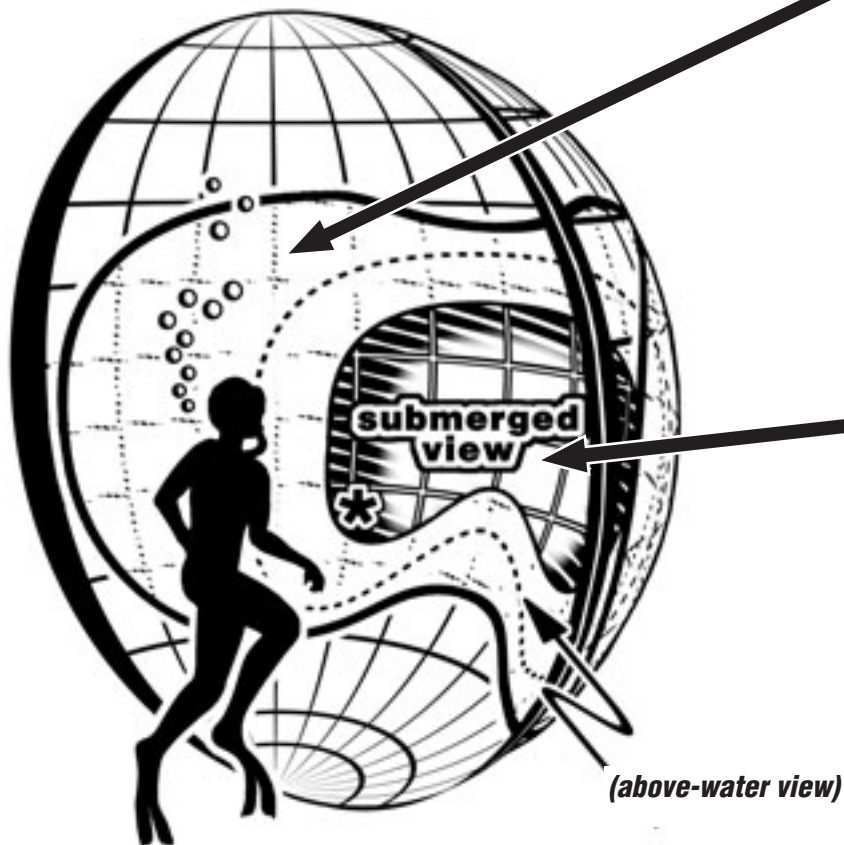


HydroOptix Guide for ECPs

(Eye Care Professionals)

Cure underwater tunnel-vision by making emmetropes (those with 20/20 vision) myopic with 1-day CLs! Many myopes are naked-eye users.



MEGA® Benefits:

350% More View Remarkable situational awareness.

View = $170^\circ \leftrightarrow$ x $90^\circ \updownarrow$.

True View Objects appear at their true distance, shape and size, giving you superior eye-hand coordination.

Razor Sharp Optical design perfection by the same team NASA chose to fix the once-fuzzy Hubble Space Telescope.

Flat Masks Distort:

Tunnel View Water refraction makes objects appear 34% bigger and 25% closer. Top-rated flat mask views are only $71^\circ \leftrightarrow$ x $56^\circ \updownarrow$.

* **Fuzzy Edges** Lateral chromatic aberration makes objects out of focus and worsens water clarity.

* **Warped Shapes** Strong pincushion distortion at edges.

ECPs control the vision revolution for millions of scuba divers

Scuba divers are victims of Low Vision. So-called 'panoramic' flat masks narrow vision to 71° when submerged. While statistically very safe, scuba accidents that do occur usually start with buddy-separation. And low vision is a silly way to enjoy our water planet!

Emmetropes can't wear our MEGA mask with their naked eyes... first they must become 'temporary myopes' with disposable plus-diopter contacts. Although our revolutionary paradigm might sound wacky, seeing is believing! **Thousands** of divers are using our masks and are delighted by their improved underwater vision. There are 8 million divers in the USA; most have a passion for new technology.

The enclosed "How It Works" and "Quick-Fit Guide" should answer most of your questions. Quite simply, disposable CLs allow any CL user to accommodate the range of our MEGA mask.

As many of you already know, the US Navy, all the world's scuba training agencies, and the MD-founded Divers Alert Network (DAN) ALL certify soft lenses as safe for scuba, as long as the lenses are discarded or properly disinfected after the day's last dive.

We want to make it easy for divers to get their contacts... from you. Thank you for joining the **DEC-Pro Network (Diving Eye Care)**, and helping to change the face of diving.

Info Just For ECPs:

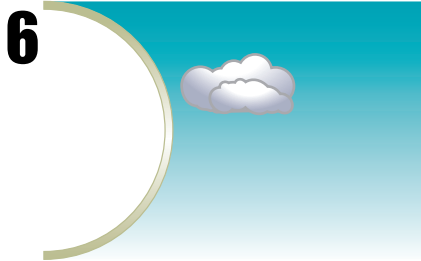


www.HydroOptix.com/decprivate/

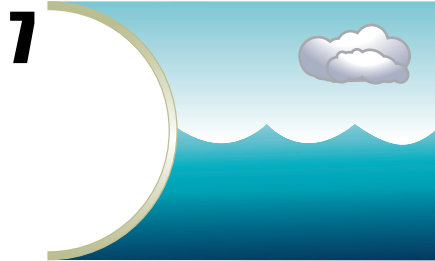
HydroOptix

SCUBA MASKS THAT CONQUER TUNNEL-VISION™

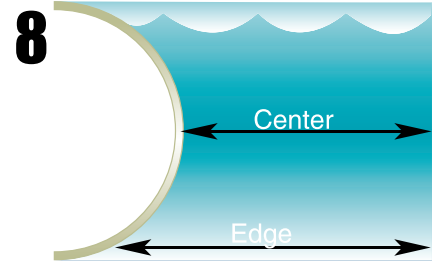
Culver City, California • Tel: (877) WIDE EYE (943-3393)



6 Above water, a dome is a zero-power lens, neither positive or negative.

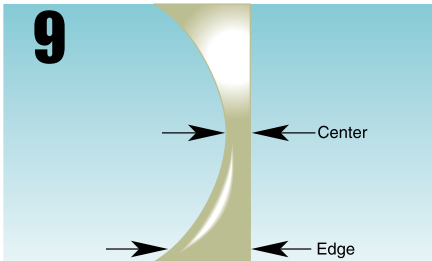


7 But when submerged, this dome shape behaves like a negative power lens. Why?

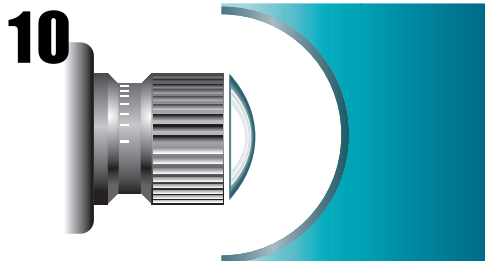


8 Water curves against the camera dome, forming a concave shape. Notice that in this side-view the water column has a thin center and thick edge. Water is shaped into a negative lens.

Dome radius, and the refractive index of water, determines the strength of the negative-diopter effect.

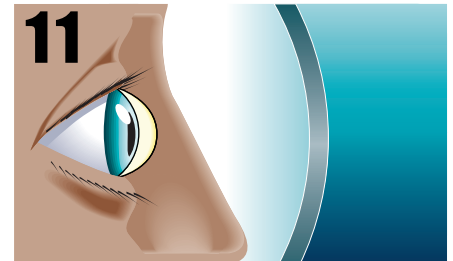


9 How do we fix the focus shift problem?



10 Photographers use accessory close-up lenses (+ diopters) inside their housings to neutralize the "-" power caused by water curved on the dome.

An object may be 15 feet away from the dome, but underwater the camera has to focus to just a few inches (exact focusing distance is determined by dome radius).



11 Many naturally nearsighted divers (people who's eyes have excess positive diopter power) can wear the mask with their naked eyes, if their vision falls within an appropriate range.

Emmetropes can wear plus-power CLs to become temporarily nearsighted, thereby accommodating the mask.

Satisfy a high percentile with minimal optical inventory

A remarkable Rx range of myopic divers can use MEGA-system masks with their naked eyes, by simply accommodating excess diopters.

With spectacles, 3 cues are visible if the minus Rx is too strong:

- size is smaller than normal
- distance is greater than normal
- barrel distortion

Unlike spectacle lenses, the twin domes are concentric to the eyes' rotation point, so no cues occur if the MEGA mask is too strong.

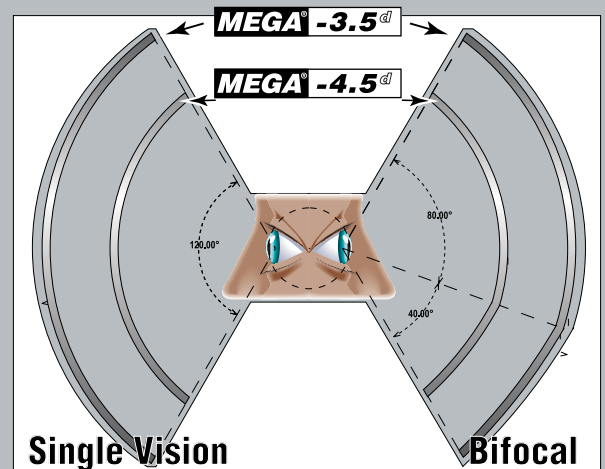
The Quick-Fit Guide (back page) details how to prevent eye strain by "over-minusing" a diver with the MEGA mask.

Current mask:

– 4.5 single-vision mask (nose-pocket is tight for prominent nose bridges)

Future masks:

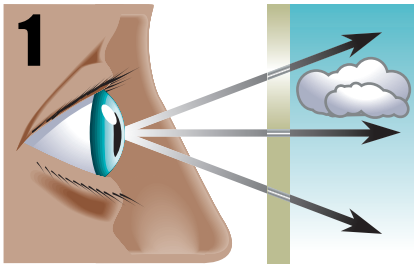
– 3.5 single-vision mask, available dive season 2005.



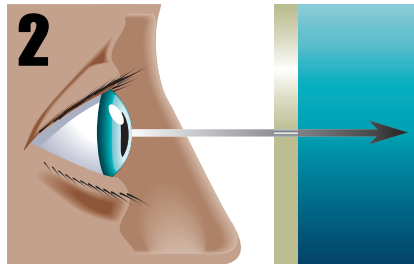
Of course one size doesn't fit all. HydroOptix has plans for a full line of face skirts and frames to fit a high percentile of divers.

How It Works

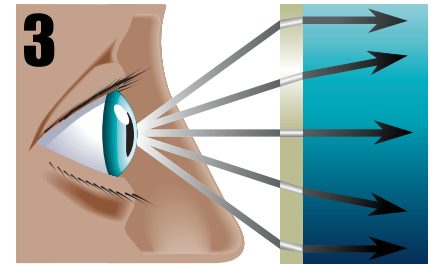
Underwater Optics – Flat vs. Dome



1 With air on both sides of a traditional flat mask there is no magnification; the light rays don't bend.



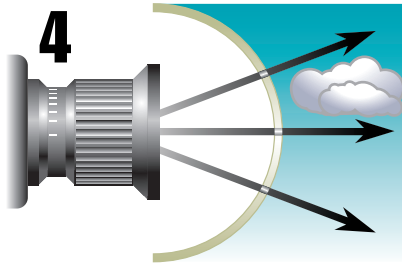
2 Now with water on the other side of the mask, if you look straight through a flat mask, the dead-center viewing path is not bent.



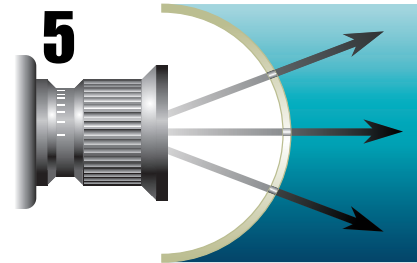
3 But as the view path angles away from perpendicular (goes off-axis), the path bends (refracts).

The further off axis, the more light bends toward the centerline. That's why objects look bigger and closer underwater. (Bending exaggerated for clarity).

Underwater photographers have used dome-ports for decades to achieve distortion-free panoramic images.



4 When a camera lens is at the center of the dome, every direction the lens sees through the dome is perpendicular to the dome wall (just like #2 above).

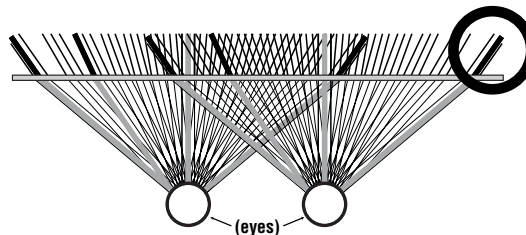


5 Underwater, no refraction magnification occurs; objects appear their actual size.

Flat Mask vs. HydroOptix Double-Dome Masks

Ray Trace Analysis

and comparison performed by Optical Research Associates using **Code-V**® software. This was the same team that NASA hired to fix the once-fuzzy Hubble Space Telescope.

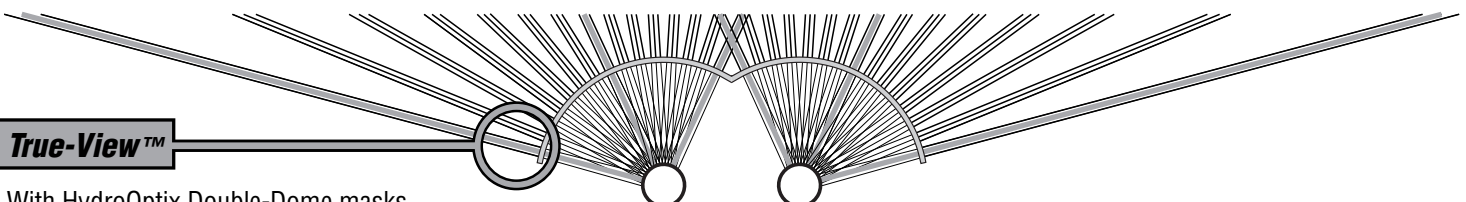


Flat masks distort

As the look-angle gets further off-axis, the actual viewing-angle is bent further inward which distorts your vision

three ways:

- Tunnel-Vision
- Fuzzy Edges
- Warped Shapes



True-View™

With HydroOptix Double-Dome masks, each eye is at the center of each dome. All your look-angles are perpendicular to the dome wall and you enjoy a **True-View**.

Optical Quick-Fit Guide

MEGA® -4.5^d

BACKGROUND: In air our MEGA masks have no optical power. They are simply thin-walled zero-power hemispheres for each eye. But when submerged, the air-water interface of the twin-domes causes the water itself to behave like a negative-power lens. Remarkably the diopter effect automatically becomes weaker as object viewing distance gets closer, whereas spectacle lenses maintain uniform Rx regardless of object distance. This optical phenomenon is caused by a large vertex and imaging objects essentially embedded within the optical media. **The result is superior to progressive lenses, because every angle of view provides exceptional acuity and no distortion. At infinity, the mask actually provides -4.75 correction; up close a bit less than -4.0... so we split the difference and call it -4.5.**

REMARKABLE VERSATILITY FOR YOUNGER DIVERS: No distortions are perceived if the mask is "too strong" (unlike too-strong spectacle lenses), because the twin domes of the mask are concentric to the eyes' rotation point, but accommodation is degraded. Utilize accommodation of younger divers to fit a "too-strong" mask.

EXAMPLE: Most under 25-years of age can use the -4.5 mask if overplus a total of +2.0 from "normal" in-air vision ("under-matching" by 2.50D). Many in their 30's are fine if overplus +3.0 from "normal" in-air vision ("under-matching" by

OPTICAL FITTING GROUPS:

1. NAKED-EYE MATCHES

Divers with in-air Rx of -4.0 to -5.0, no acute presbyopia and cylinder less than 1.0 can use the mask with their naked eyes.

2. ACCOMMODATORS

Divers with in-air Rx of -2.5 to -3.75 and cylinder less than 1.0 can use the mask with their naked eyes if they have good accommodation ability. Many early-20's emmetropes have used MEGA -4.5 prototypes with their naked eyes -- however to conservatively avoid eyestrain during lengthy (e.g. 60-minute) dark dives, we recommend not "over-prescribing" the mask more than 2.0 diopters of excess accommodation. For most up to their early-30's, a 1.5d excess neg-diopter state works very well. For late-30's / early-40's, match closer to the masks' required net +4.50 eye power. Byopes may require mono-vision or modified mono-vision.

Testing for accommodation AT HOME: The "Five-Inch / 125mm Test" can be performed at-home to confirm a diver can use the MEGA -4.5 with their naked eyes. One must be able to sustain sharp focus on fingerprint-whorls comfortably at five inches for 60 seconds. That's 8 diopters / 125 mm of accommodation while illuminated only by one candle at one foot from the finger.

Testing for accommodation IN YOUR EXAM ROOM: Divers must be able to read their gauges in turbid water (12 inches in VERY dim light). **EXAMPLE:** Using the -4.5 mask and focusing to 12 inches (-3.25D of accommodation) requires total accommodation of 7.25D. But the built-in "progressive effect" actually nets -6.5D accommodation required. Confirm the patient's 12-inch focus ability in **dim** light while they wear their new "diving" Rx contacts (or just myopic eyes) **AND -4.25 trial spectacle lenses over the CLs to simulate the masks's effect.**

3. DIVING Rx WEARERS (everybody else)

Of course this is easiest for those with prior CL wear experience... just bring them within accommodation range.

- A. **EMMETROPES:** Induce the least amount of myopia for their surface-comfort. Most emmetropes are psychologically uneasy when temporarily myopic (i.e. for some, +3.0 may be OK but +4.50 may be too much). For younger divers, we suggest trying +3.0 CLs, **but be careful not to induce "temporary" hyperopia / presbyopia.**
- B. **ADAPTING:** Before heading out on a vacation on a rocking boat, divers with no CL experience - especially emmetropes - should first get comfortable with this new paradigm on DRY LAND. We suggest wearing Surface-Interval eyeglasses over Diving Rx CLs for 2 hours / day X 3 days, prior to a vacation departure.
- C. **CL BRAND CHOICE:** Easy handling characteristics are important for divers who are new to CLs. While thin lenses are more comfortable, some may be better off with thicker lenses.

SURFACE-INTERVAL EYEGLASSES: For those who modify their vision with Diving Rx CLs, we offer low-cost eyeglasses in two styles for between-dive wear. Either style includes UV blocking polarized clip-ons:

- "Buddy Holly" style in -4.5 and -3.0 Rx.
- "Harry Potter" style in any SV Rx; no edging required for these round lenses, since the bevel is molded in. What they lack in style they make up for the economy. Frames vary the PD (Narrow-Medium-Wide).