

test results & report



**SOMO**

# SUMMARY REPORT

## SOMO HI-INDEX 1.67 HC AR (ASPHERIC)

Real Life Simulation	4.35
Ease of Cleaning	9.38
Cosmetic & Mechanical	Excellent
Reflectance	0.64
Variable Height	292" Average

## SOMO-HI-INDEX 1.60 HC AR (ASPHERIC)

Real Life Simulation	4.48
Ease of Cleaning	9.28
Cosmetic & Mechanical	Excellent
Reflectance	0.60
Variable Height	428" Average

## SOMO-HI-INDEX 1.60 HC AR (SPHERICAL)

Real Life Simulation	4.48
Ease of Cleaning	9.28
Cosmetic & Mechanical	Excellent
Reflectance	0.60
Variable Height	428" Average



## SUMMARY REPORT

### SOMO HI-INDEX 1.59 (POLYCARBONATE)

Real Life Simulation	4.67	
Bayer	2.85	
	(Haze)	(Ratio)
Steel Wool	0.945	1.03
Cosmetic & Mechanical	Excellent	
Yellowness Index	1.45	
Reflectance	0.77	

### SOMO HI-INDEX 1.56 HC AR

Real Life Simulation	4.45
Ease of Cleaning	9.76
Cosmetic & Mechanical	Excellent
Reflectance	1.00

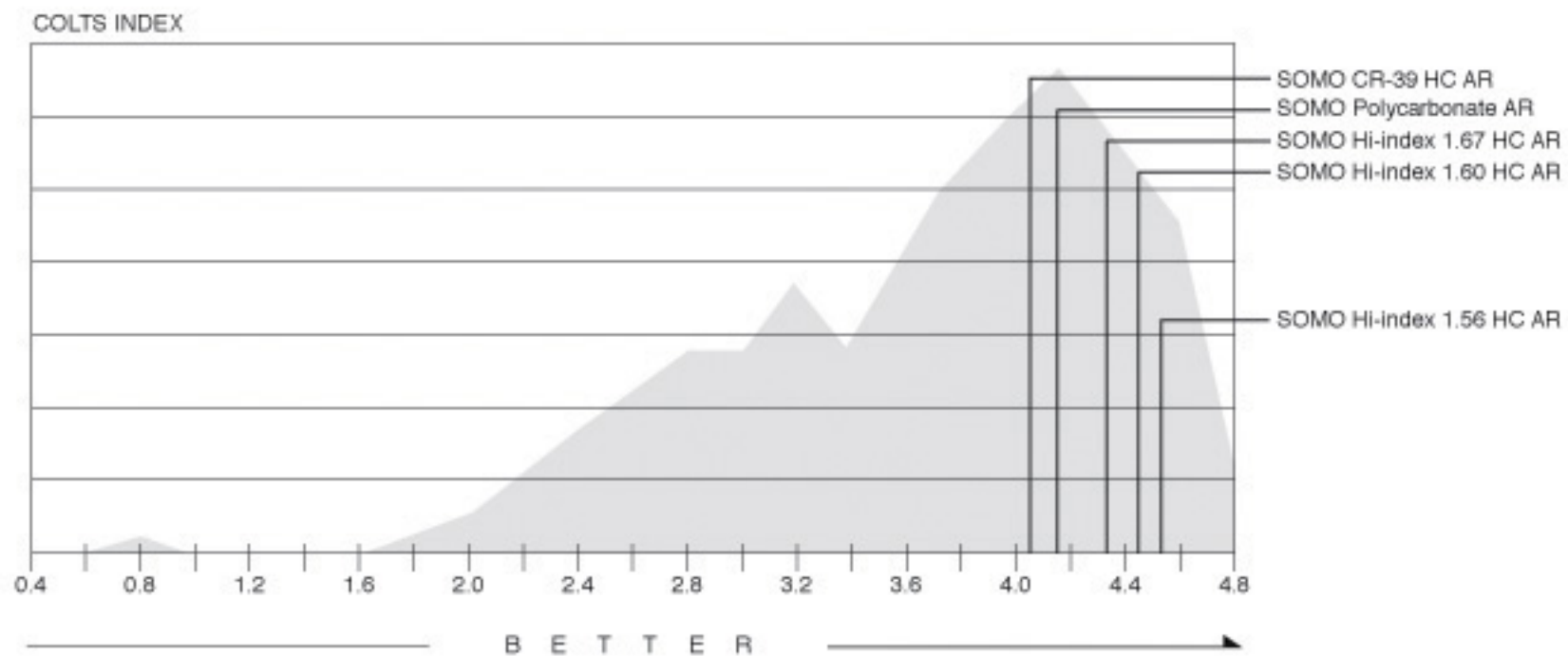
### SOMO HI-INDEX CR-39 HC AR

Real Life Simulation	4.05
Ease of Cleaning	7.76
Cosmetic & Mechanical	Excellent
Reflectance	0.46
Variable Height	85" Average



# COLTS INDEX

(REAL LIFE SIMULATION)



# REAL LIFE SIMULATION

## COLTS INDEX PRODUCT TEST SUMMARY

PRODUCT	Initial Values		Test Results								
	% T	% Haze	Tumble Ratio	Post Tumble		CHOCA - 24 hours			Post CHOCA		Weighted Index
				% Haze	% T	A Effects	B Effects	D Effects	% Haze	% T	
SOMO Hi-Index 1.67 HC AR	98.1	0.150	3.43	0.940	97.9	5	4.8	5	2.06	97.6	4.35
SOMO Hi-Index 1.60 HC AR	98.5	0.120	3.93	1.160	98.2	5	5	5	1.76	97.9	4.48
SOMO Hi-Index 1.59 Polycarbonate AR	97.5	0.070	3.93	0.740	97.3	5	4.9	5	1.01	97.1	4.67
SOMO Hi-Index 1.56 HC AR	97.7	0.120	3.53	0.820	97.6	5	5	5	0.96	97.4	4.73
SOMO CR-39 HC AR	98.8	0.060	4.40	1.050	98.4	3	5	5	1.47	98.2	4.05



## REAL LIFE SIMULATION

This test is actually five tests in one and is an attempt to simulate actual wear conditions for an AR coated lens. Haze and luminous transmittance are measured throughout the test program and represent two (or eleven if all the repeated tests are counted) of the five tests that are completed. AR Cloth Rub, Tumble Test and Cycle Humidity Oven/Crosshatch Adhesion (CHIOCA) are the other three tests and are executed in the order given.

The rub test is designed to replicate the cleaning over the life of the average prescription lens. Measurements were taken using multiple subjects to obtain the finger pressure between the thumb and forefinger during the cleaning process. Also computed were the number of wipes to get the lens clean and the number of times the lens would have to be cleaned during each day of wear over the course of three years. The five lenses would then go on to the Tumble Test, again with appropriate transmittance and haze measurements before and after the test.

The Tumble test is an abrasion test that was created based on actual clinical study data of normal wear for glass, uncoated plastic lenses and coated plastic lenses. It is used by most lens manufacturers in the U.S. and Europe and has repeatedly exhibited good correlation to actual wear experience.

Finally the five lenses are subjected to the CHIOCA test with final transmittance and haze measurements after the test. This test has also been correlated to actual wear. There are three meaningful pieces of information that the test will provide. First is take propensity for crazing (A Effects), second is spontaneous delamination (B Effects and finally the crosshatch tape pull or delamination (D Effects).

Results from each of these tests done individually, without the preceding tests were found to yield more favorable numbers than found in the consecutive manner the Real Life Simulation is done. This was a valuable piece of information since the lenses will experience all of the environmental experiences as represented by the Real Life Simulation test.

The ranking of the test is a weighted composite of the individual tests. Crazing is given a higher weight than is delamination. The reason is that the consumer, while upset and complaining about the prescription that delaminates will at least see the open and obvious problem and do something to get it fixed. The issue with crazing is that it is not usually seen until it is in its final stages of deterioration and therefore can be more serious to the wearer. This is mainly due to the fact that crazing has shown to cause "Flare" in oncoming headlights when driving at night causing momentary blindness of the driver. This presents not only a hazard to the driver and others but creates more serious liability for the seller and maker of the product.

In the end the weighted portions were reduced to one number, which is call the COLTS Index and it exists for both the front and the backsides of the lens, depending on which one the customer is interested in obtaining. Most important is that after over 170 different products tested, there has been some confirmation that the results match what has been found in the field in complaints and returns at Cole Vision. At least from an anecdotal point of view if a product can achieve a COLTS Index of 3.25 or better the potential is very small for a return of the product by the customer. Cole Vision's 2,000 stores has shown this over a 3-year period.

# REAL LIFE SIMULATION COLTS INDEX PRODUCT TEST SUMMARY



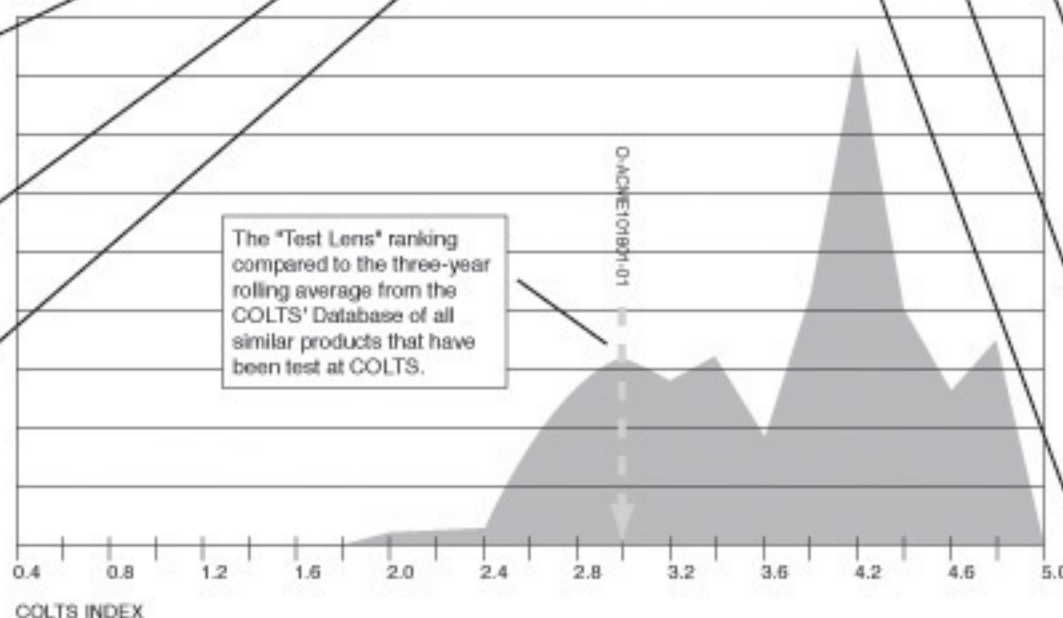
PRODUCT	Initial Values		Test Results								
	% T	% Haze	Tumble	Post Tumble		CHOCA - 24 hours			Post CHOCA		Weighted Index
			Ratio	% Haze	% T	A Effects	B Effects	D Effects	% Haze	% T	
O-ACME101801-01 CX	0.18	93.4	1.77	3.270	92.6	3.6	4.8	3.2	4.37	92.5	3.03

ID No. and Convex (CX) or Concave (CC) surface.

Initial Transmittance (%T).  
Note: This %T should not be considered the final optical measurement. Call for details.

Initial % Haze. %T and %H are taken before and after each test as a means of tracking changes.

The Ratio equals the number of times more scratch resistant the sample lens is when compared to an uncoated CR-39 (Standard) lens. The Ratio is created by dividing the "Test Lens" average delta into the "Standard Lens" average Delta.



Weighted index is calculated giving 60% weight to crazing and 40% to adhesion issues. This is based on a ranking of "5" being pristine and "0" unsatisfactory.

Crosshatch Adhesion follows each cycle and is ranked as shown in another appendix. This sample has minor delamination from the tape pull at the end of 24 hours. This is based on a ranking of "5" being pristine and "0" unsatisfactory.

Sample shows only minor issues for adhesion as little delamination was seen on the sample. The same ranking is used here as in Crosshatch.

Marginal crazing on "0" to "5" scale with 5 being best occurred in the 24 hours.



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