Issued to: Fake Customer 2
111 Fake St
Oldsmar, FL 34677
USA
Requested by: Joe Smith

COLTS | Laboratories™

Report Summary

Sample #: FC2-00343-02
Date Received: April 03, 2023
Date(s) Tested: April 10, 2023 to
Laboratory Conditions: 23°C, 49% RH

Initial Transmittance (%T). NOTE: This %T should not be considered the final optical measurement. Contact TSM for details.

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.

Initial % Haze. %T and %H are taken before and after.

Results Summary:
FC2-00343-02 (Description)

Test Name	Results Summary	
RLS Calculations-DQ	Weighted Score Index	4.43
RLS Initial Haze and Transmittance-DQ	Avg Transmittance	97.96
	Avg Haze	0.10
RLS Tumble-DQ	Avg Tumble Ratio	2.57
	Avg Transmittance (Post Tumble)	97.60
RLS Cycle Humidity Oven Crosshatch Adhesion	Avg Crazing 24 Hrs	4.0
	Avg Delamination 24 Hrs	4.8
	Avg Crosshatch 24 Hrs	5.0
RLS Haze/Transmittance - Post CHOCA-DQ	Avg Haze 8 Hrs	1.03
	Avg Haze 16 Hrs	1.05
	Avg Haze 24 Hrs	0.96
	Avg Transmittance 8 Hrs	97.94
	Avg Transmittance 16 Hrs	97.94
	Avg Transmittance 24 Hrs	97.74

When applicable, click here for Understanding the Numbers

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.

Crosshatch Adhesion follows each cycle and is ranked as shown in Appendix B.

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RLS Initial Haze and Transmittance-DQ

Sample	Transmittance (%)	Haze (%)	RLS Lifetime Properties - Initial (g)	RLS Lifetime Properties - 20K (g)
1	98.00	0.04	17	28
2	97.90	0.23	16	26
3	98.00	0.06	15	33
4	98.00	0.08	15	34
5	97.90	0.08	16	25

Avg Transmittance	**97.96**
Avg Haze	**0.10**
Avg Lifetime Properties - Inital	**15.8**
Avg Lifetime Properties - 20k	**29.2**

RLS Tumble-DQ

Sample	Std Before	Std After	Test Before	Test After	Transmittance (Post Tumble)
1	0.17	2.44	0.04	0.85	97.70
2	0.14	2.57	0.23	1.25	97.40
3			0.06	0.95	97.60
4			0.08	0.86	97.70
5			0.08	1.15	97.60

Avg Std Haze Delta	**2.35**
Avg Test Haze Delta	**0.91**
Avg Tumble Ratio	**2.57**
Avg Transmittance (Post Tumble)	**97.60**

RLS Cycle Humidity Oven Crosshatch Adhesion

Sample	Crazing 8 Hrs	Crazing 16 Hrs	Crazing 24 Hrs	Delamination 8 Hrs	Delamination 16 Hrs	Delamination 24 Hrs	Crosshatch @ 8 Hours	Crosshatch @ 16 Hours	Crosshatch @ 24 Hours
1	4	4	4	5	5	5	5	5	5
2	4	4	4	5	5	5	5	5	5
3	4	4	4	5	5	5	5	5	5
4	4	4	4	5	5	4	5	5	5
5	4	4	4	5	5	5	5	5	5

Avg Crazing 24 Hrs	**4.0**
Avg Delamination 24 Hrs	**4.8**
Avg Crosshatch 24 Hrs	**5.0**

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RLS Haze/Transmittance - Post CHOCA-DQ

Sample	Transmittance @ 8 Hours	Transmittance @ 16 Hours	Transmittance @ 24 Hours	Haze 8 Hrs	Haze 16 Hrs	Haze 24 Hrs
1	98.00	98.00	97.70	0.96	1.07	1.09
2	97.70	97.80	97.60	1.56	1.19	1.21
3	98.00	97.90	97.80	0.83	1.01	0.82
4	98.00	98.00	97.80	0.77	0.81	0.75
5	98.00	98.00	97.80	1.03	1.16	0.94

Avg Haze 8 Hrs	**1.03**
Avg Haze 16 Hrs	**1.05**
Avg Haze 24 Hrs	**0.96**
Avg Transmittance 8 Hrs	**97.94**
Avg Transmittance 16 Hrs	**97.94**
Avg Transmittance 24 Hrs	**97.74**

Appendix A

COLTS Index

The COLTS Index is a composite number that takes into account the crazing (A Effects), delamination (B Effects) and crosshatch (D Effects) as well as haze gain and transmission loss as the lenses are subjected to Lifetime Properties Determination, Tumble Abrasion and Cycle Humidity Oven / Crosshatch Adhesion testing.

A, B and D Effects are rated on a 5 to 0, 5 to 2 and 5 to 0 scales respectively, with 5 being no effects and 0 being severe effects.

Haze gain is also on a 5 to 0 scale, with 5 being no haze gain and 0 being 5% or greater haze gain.

Transmittance is similar to haze gain. No transmittance loss is a 5 and a 5% or more loss is a 0.

In addition, the individual parts are weighted as follows.

A Effects = 25%
B Effects = 25%
D Effects = 15%
Haze gain = 30%
Transmittance = 5%

As an example; Product A has the following results.

A Effects = 4
B Effects = 5
D Effects = 5
Initial Haze 0.23
Final Haze 2.31
Haze Gain = 2.31 - 0.23 = 2.08
Rating = 5 - 2.08 = 2.92

Initial Transmittance 97.6
Final Transmittance 97.1
Transmittance Loss = 97.6 - 97.1 = 0.5
Rating = 5 - 0.5 = 4.5

The actual rating index is:

A Effects = Rating X 25%
4 X .25 = 1.0

B Effects = Rating X 25%
5 X 0.25 = 1.25

D Effects = Rating X 15%
5 X 0.15 = 0.75

Haze Gain = Rating X 30%
2.92 X 0.30 = 0.876

Transmittance = Rating X 5%
4.5 X .05 = .225

Total 1.0 + 1.25 +0.75 + 0.876 + 0.225 = An Index of 4.10

Exhibit A

Subjective Delamination, Crazing, and Crosshatch Ratings

Rate and record the performance for the surface exposed on each lens according to the following classification and description.

Classification Category - Crazing

5	No visible Crazing.
4	Hairline Crazing only just visible points or cracks.
3	Hairline Crazing up to 25% of the lens surface.
2	Hairline Crazing up to 75% of the lens surface.
1	Hairline Crazing over the entire lens surface.
0	Severe Fern-like or Matt-like Crazing over any region of lens.

Classification Category - Delamination (interlayer detachment)

5	No Delamination of individual layers over entire lens surface.
4	Partial Delamination of individual layers up to 25% of the surface.
3	Partial Delamination of individual layers up to 75% of the surface.
2	Total Delamination of individual layers over the entire lens surface.

Classification Category - Crosshatch

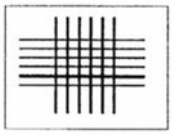
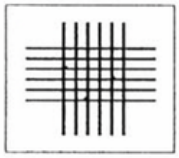
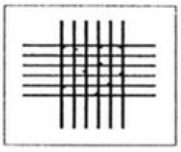
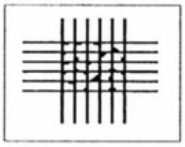
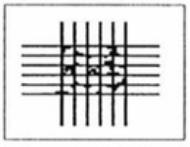
See exhibit B for classifications and descriptions.

NOTE: Delamination relates to either a single layer hard coat or the thin film coating where one is delaminating and where one or both have been applied to the lens depending on the product type. (i.e., HC, Thin Film, HC & Thin Film)

For each lens tested, note any evidence of stains, smears, streaks or cloudiness.

Exhibit B

Crosshatch Coating Loss Ratings

Classification	Appearance	Description
5		The edges of the cuts are completely smooth; none of the squares of the cross hatched area are detached.
4		Small flakes of the coating are detached at the instersections of the squares; less than 5% of the total area is affected.
3		Small flakes of the coating are detached along the edges and at intersections of cuts. The area affected is 5 to 15% of the total area.
2		The coating has flaked along the edges and on parts of the squares. The area affected is 15 to 35% of the total area.
1		The coating has flaked along the edges of the cuts in large ribbons and whole squares are detached. The area affected is 35 to 65% of the total area.
0	Greater than 65%	Flaking and detachment worse than classification 1.