3M Science. Applied to Life.™

3M Display Materials & Systems Division

2020 Technical Data

3M™ Automotive Roll Optically Clear Adhesive

ARO 02N-XXX Series

- High bonding strength
- High durability in reliability testing on PC/PMMA

Product Description

3M Automotive Roll OCA (ARO) films are specialized optically clear adhesives offering excellent clarity and adhesion to various transparent display substrates. 3M ARO 02N-XXX is an optically clear laminating adhesive for bonding smooth, transparent substrates. 3M ARO 02N-XXX has shown good durability when bonding to plastic substrates. No UV curing required.

Construction

Product	3M ARO 02N-025	3M ARO 02N-050
Adhesive Type:	Acrylic	Acrylic
Adhesive Carrier:	None	None
Approximate Thickness:		
Release Liner:	75 um (3.0 mils) Clear Polyester	75 um (3.0 mils) Clear Polyester
Adhesive:	25 um (1.0 mils)	50 um (2.0 mils)
Release Liner:	75 um (3.0 mils) Clear Polyester	75 um (3.0 mils) Clear Polyester

Typical Physical Properties and Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Durability Performance to Environmental Conditions:

The following environmental tests were conducted in the 3M laboratory under the conditions specified without any appreciable deterioration in visible appearance (no bubbles, delamination, haze <0.2%, b* <1). Sample construction is cover glass/3M ARO 02N-XXX/cover glass.

Condition		Duration
High Temperature	+95°C	1000 hours
Low Temperature	-40°C	1000 hours
High Temp/Humidity-1	+65°C/90%RH	800 hours
High Temp/Humidity-2	+85°C/85%RH	1000 hours
Thermal Shock	-40°C and +95°C (1 hour dwell, <1 min ramp time)	300 cycles
UV	.55 W/m² at 340nm, Daylight filter	500 hours

Construction	Condition	Duration
LCD Glass/ARO 02N-050/PC (1 mm)	65°C/90%RH	800 hours
LCD Glass/ARO 02N-050/PMMA (1 mm)	65°C/90%RH	800 hours
LCD Glass/ARO 02N-050/PET (2 mil)	65°C/90%RH	800 hours

Peel Adhesion:

ASTM D3330 modified, 180 degree peel from float glass, 1 cm wide peel strips, 12 in/min (305 mm/min), 2.0 mil polyester backing

	Float Glass		PC		PMMA	
Dwell Time	20 min dwell at 23°C/50%RH	3 days dwell at 23°C/50%RH	20 min dwell at 23°C/50%RH	3 days dwell at 23°C/50%RH	20 min dwell at 23°C/50%RH	3 days dwell at 23°C/50%RH
Units	N/cm	N/cm	N/cm	N/cm	N/cm	N/cm
3M OCA ARO 02N-025	6.0	6.4	3.0	5.2	3.7	5.3
3M OCA ARO 02N-050	6.6	6.8	3.8	5.8	4.3	5.4

Color:

Ultra Scan Pro (Hunter Lab)
ASTM E308, D65/10°

3M ARO 02N-025	3M ARO 02N-050
L* = 96.6	L* = 96.8
a* = -0.01	a* = -0.01
b* = 0.18	b* = 0.20

Refractive Index:

3M ARO 02N-XXX
(+ 0.0005 Metricon measurements)

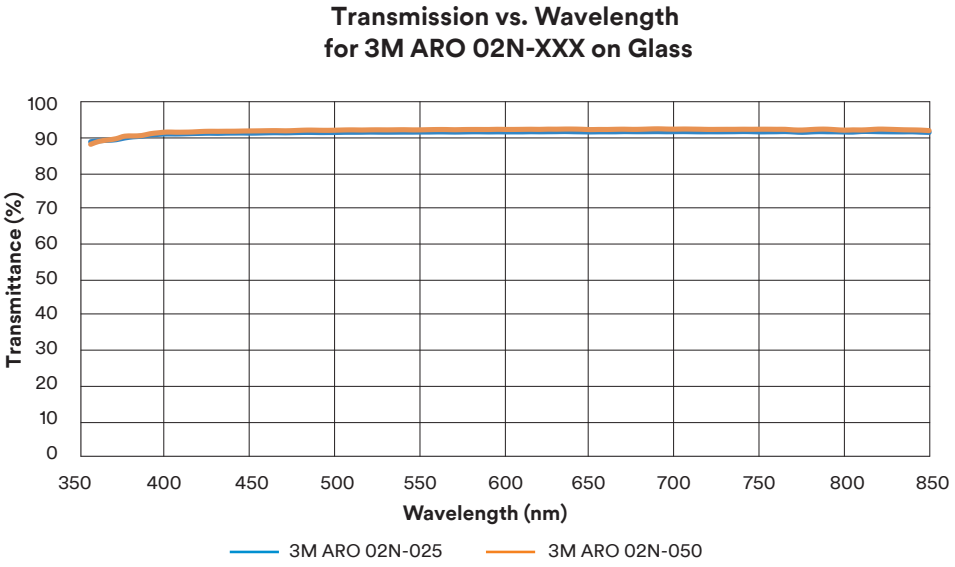
3M ARO 02N-XXX		
405 nm	532 nm	633 nm
1.4876	1.4757	1.4712

Haze:

Haze is measured according to ASTM D1003-92

3M ARO 02N-025	3M ARO 02N-050
0.2%	0.3%

Transmission Curve:



Typical Electrical Properties at Room Temperature

ASTM-D150-92

Dielectric Constant:

3M ARO 02N-XXX	
Frequency (kHz)	Dielectric Constant
100	3.42
500	3.20

Suggested Lamination Process

Step 1: Remove secondary liner, and then laminate 3M ARO 02N-XXX to first adherent substrate by roller at room temperature

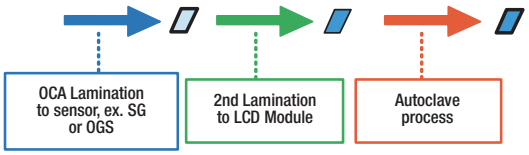
Recommendation: roller pressure 0.1 – 0.2 MPa, roller speed 0.5 – 1 m/min

Step 2: Remove primary liner, and then laminate 3M ARO 02N-XXX/first adherent to second adherent by vacuum lamination

Recommendation: Vacuum condition < 50 Pa, pressure around 0.1 – 0.2 MPa

Step 3: Autoclave process

Recommendation: 30-60°C/3-5kgf/cm^2/ 20-30 min



Storage

- Avoid applying pressure of resting objects on the product to prevent marking, denting, or deforming the surface.
- Wear gloves to prevent fingerprints or nail marks when handling.
- Product needs to be unpacked and handled in a clean-room facility.
- Product must be protected from light exposure.
- Store in sealed, foil bag under -20°C to 30°C and less than 70% relative humidity. If removed from cold storage, ensure no condensation on packaging.

Regulatory

For regulatory information about this product, please contact your 3M representative.

Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use

Many factors beyond 3M's control and uniquely within the user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for user's method of application.

Warranty. Limited Remedy, and Disclaimer

Unless an additional warranty is specifically stated on the applicable 3M product packaging or product literature, 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. If the 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability

Except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted.

3M Display Materials & Systems Division
3M Center, Building 235-1E-54
St. Paul, MN 55144-1000 U.S.A.

Phone 1-800-3M HELPS
Web 3M.com/autoHMI

