

## NEUDUNQND

# Generic PMMA Round Fresnel Lens Instruction Manual

Model: NEUDUNQND (55mm Diameter, 40mm Focal Length Variant)

## 1. PRODUCT OVERVIEW

This instruction manual provides essential information for the proper use and care of your Generic PMMA Round Fresnel Lens. This optical component is designed for a wide range of applications requiring light concentration, beam shaping, or magnification.

The lens is constructed from PMMA (Polymethyl methacrylate), also known as acrylic, offering good optical clarity and durability. Its round shape and specific focal length make it versatile for various optical setups.

### Key Features:

- Material:** PMMA / Acrylic
- Shape:** Round
- Thickness:** 2 mm
- Lens Transmission:** Approximately 92%
- Temperature Resistance:** -40°C to +80°C
- Thread Pitch:** 0.3 mm (Note: 0.5 mm for 100mm diameter, 120mm focal length variants)

### Applications:

- LED lighting, stage lights, flashlights, and fishing lights for beam adjustment.
- DIY projectors and VR glasses.
- Magnifying images or details.
- Various optical experiments, research, and product development.

## 2. SETUP AND INSTALLATION

Proper setup is crucial for optimal performance of the Fresnel lens. Consider the following guidelines:

- Unpacking:** Carefully remove the lens from its packaging. Avoid touching the optical surfaces directly with bare hands to prevent smudges or scratches.
- Mounting:** The lens should be securely mounted in a holder or frame that does not obstruct the optical path. Ensure the mounting mechanism applies even pressure to avoid distorting the lens.
- Orientation:** Fresnel lenses have a grooved side and a smooth side. For most light concentration or projection applications, the grooved side should face the light source or the object being magnified. For specific applications, refer to your project's optical design.

4. **Focal Length:** Position the light source or object at the appropriate focal distance from the lens to achieve the desired effect (e.g., concentrated spot, collimated beam, magnified image). The focal length for this variant is 40mm.
5. **Alignment:** Ensure the lens is properly aligned with the light source and target to maximize efficiency and minimize aberrations.



Figure 2.1: Two Generic PMMA Round Fresnel Lenses. Note the concentric grooves on the surface, characteristic of a Fresnel lens design.

### 3. OPERATING INSTRUCTIONS

Once installed, operating the Fresnel lens involves adjusting its position relative to the light source and the target to achieve the desired optical outcome.

- **Light Concentration:** For solar energy concentration or focusing a light beam, position the lens so that the light source is at its focal point. Adjust the distance until the most intense and smallest spot of light is achieved.
- **Beam Shaping:** When used with LED lights or flashlights, experiment with the distance between the LED and the lens to widen or narrow the light beam.
- **Magnification:** To magnify an object, place the object within the focal length of the lens and view it

from the opposite side. Adjust the distance for clear magnification.

- **Projection:** For DIY projectors, the lens is used to focus light through a transparency or display onto a screen. Precise positioning relative to the light source and projection medium is essential.

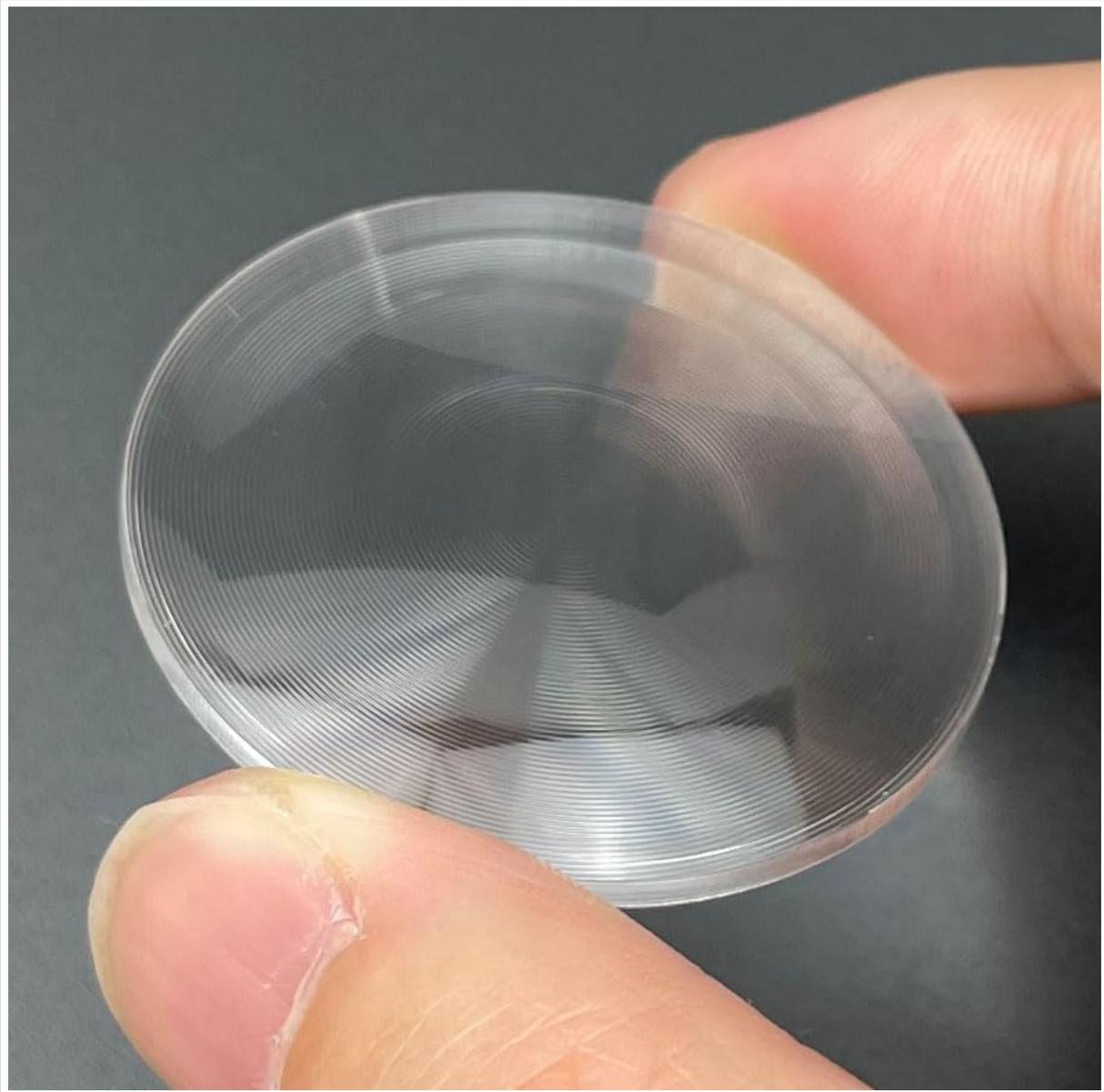


Figure 3.1: A single Fresnel lens held by hand, illustrating its thin and lightweight design.

## 4. MAINTENANCE AND CARE

To ensure the longevity and optimal performance of your Fresnel lens, follow these maintenance guidelines:

- **Cleaning:**
  - Use a soft, lint-free microfiber cloth specifically designed for optics.
  - For stubborn smudges, lightly dampen the cloth with a small amount of isopropyl alcohol or a specialized optical lens cleaning solution.
  - Avoid abrasive materials, harsh chemicals, or excessive pressure, as these can scratch the PMMA surface.
  - Do not use paper towels or clothing, as they can scratch the lens.
- **Handling:** Always handle the lens by its edges. Avoid touching the optical surfaces to prevent

fingerprints and oils from affecting clarity.

- **Storage:** Store the lens in a clean, dry, and dust-free environment. Keep it protected from direct sunlight and extreme temperatures when not in use.
- **Protection:** If possible, keep the lens covered or in a protective case to prevent dust accumulation and accidental damage.

## 5. TROUBLESHOOTING

If you encounter issues with your Fresnel lens, consider the following common troubleshooting steps:

Problem	Possible Cause	Solution
<b>Blurry or Distorted Image/Light Spot</b>	Incorrect focal distance; improper lens orientation; dirty lens surface; misalignment.	Adjust the distance between the lens and the light source/object. Ensure the grooved side faces the light source. Clean the lens carefully. Re-align the lens with the optical path.
<b>Low Light Transmission</b>	Dirty lens surface; incorrect light source.	Clean the lens thoroughly. Ensure your light source is adequate for the application.
<b>Scratches on Lens Surface</b>	Improper cleaning materials; abrasive contact.	Unfortunately, scratches on PMMA lenses are often permanent and can affect optical quality. Prevent future scratches by following proper cleaning and handling procedures.

## 6. SPECIFICATIONS

Detailed technical specifications for the Generic PMMA Round Fresnel Lens (Model NEUDUNQND, 55mm Diameter, 40mm Focal Length variant):

Specification	Detail
<b>Brand</b>	Generic
<b>Model Number</b>	NEUDUNQND-55MM-40MM
<b>Lens Diameter</b>	55mm
<b>Focal Length</b>	40mm
<b>Thickness</b>	2 mm
<b>Lens Material</b>	PMMA / Acrylic
<b>Lens Transmission</b>	92%
<b>Temperature Resistance</b>	-40°C to +80°C
<b>Thread Pitch</b>	0.3 mm (Note: 0.5 mm for 100mm diameter, 120mm focal length variants)
<b>Item Weight</b>	50 g
<b>Package Dimensions</b>	2.54 x 2.54 x 2.54 cm

Specification	Detail
ASIN	B0DBVMVDV5
First Available Date	August 1, 2024

## 7. WARRANTY AND SUPPORT

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Information regarding product warranty and customer support is not available in the provided product data. For any inquiries or support needs, please refer to the seller or manufacturer directly through your purchase platform.