TBS Glass ND Filter

Glass neutral density (ND) filter for action cameras
Variants ND4 · ND8 · ND16 · ND32



Read this manual before use, in particular the safety instructions in section 2.1, and keep it for future reference.

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1. Product description

1.1 Intended use

The **TBS Glass ND Filter** made by Team BlackSheep (TBS) is a flat glass neutral density filter (ND) designed for GoPro-type action cameras carried on FPV drones. The filter is placed in front of the camera lens and evenly reduces the amount of light entering the camera without changing the colours of the footage. It also protects the front glass of the lens from scratches.

Less light means that on a bright day the camera uses a longer exposure for each frame. Motion in the video becomes smoother, with natural motion blur, and the footage looks calmer. The filter is available in several strengths; the higher the number in the designation, the darker the filter (see section 2.2).



Filter variants ND4, ND8, ND16 and ND32
(manufacturer's illustrative photo)

1.2 Specifications and package contents

Product designation	TBS Glass ND Filter – ND4, ND8, ND16 or ND32
Manufacturer	Team BlackSheep (TBS)
Type	flat glass neutral density (ND) filter
Material	neodymium-treated glass
Finish	cut with industrial lasers, clean edges free of micro-scratches
Dimensions ND4, ND8, ND32	36 × 33 × 1.9 mm
Dimensions ND16	36 × 33 × 4 mm
Package contents	1 × ND filter in the selected variant
Not included	filter holder, camera mount, camera, fixing and adhesive materials

2. Use

2.1 Safety instructions

- **The filter is made of glass.** It may crack if the drone falls or crashes. Do not handle a cracked or chipped filter with bare hands and do not use it any further – the fragments are sharp.
- **Do not look at the sun through the filter** and do not use it to observe a solar eclipse. An ND filter is not a solar filter and does not protect your eyes.
- Do not point the filter or the camera directly at the sun for extended periods – concentrated light may damage the camera sensor.
- Keep the filter and its packaging out of the reach of children.
- The filter must sit firmly in the holder. A loose filter may slide out in flight and injure people below the drone or get lost.
- Do not expose the filter to sudden changes of temperature and do not place it face down on hard surfaces.
- When filming from a drone, observe the rules for operating unmanned aircraft. The law of the country in which you operate the product always applies.

2.2 Choosing the variant

The number in the designation indicates how many times the filter reduces the light. An ND8 filter therefore passes approximately one eighth of the light, which corresponds to a reduction of 3 exposure stops (EV). The conditions in the table are a rough guide only – confirm your final choice with a test recording.

Variant	Light passed	Reduction	Suitable conditions (guide)
ND4	≈ 1/4	2 EV	overcast, morning and late afternoon
ND8	≈ 1/8	3 EV	partly cloudy, sun behind clouds
ND16	≈ 1/16	4 EV	bright sunny day
ND32	≈ 1/32	5 EV	very strong light – snow, water, sand, summer midday

2.3 Inserting the filter into the holder

The filter has no thread or mounting feature of its own. It is inserted into a filter holder or into a camera mount on the drone frame that has a slot for a flat 36 × 33 mm filter. Follow the instructions for the holder you use and observe these rules:

① Clean the front glass of the lens and both sides of the filter (see section 2.5). Dust and fingerprints between the filter and the lens will be visible in the footage.

② Hold the filter by its edges only and insert it into the holder slot so that it covers the entire lens.

③ Slide the camera into the mount carefully and without force. If the fit is tight, insert the front of the camera first so that the filter does not break. The ND16 variant is thicker than the others (4 mm compared with 1.9 mm) and may not fit some holders.

④ Check that the filter has no play in the holder and cannot shift during flight.

⑤ Make a short test recording and inspect the corners of the image. Dark corners (vignetting) mean that the filter or holder intrudes into the field of view of the lens.

※ Do not glue or tape the filter across its optical surface – adhesive would spoil the image and the filter could no longer be cleaned.

2.4 Filming with an ND filter

- Use the ND filter **only in sufficient light**. In dim light, in a forest or at dusk the image with the filter is dark and noisy – remove the filter or choose a lighter variant.
- In automatic mode the camera lengthens the exposure by itself once the filter is fitted. With manual settings, choose a low ISO sensitivity and a longer shutter time; a common filmmaking recommendation is a shutter time of about half the duration of one frame (i.e. 1/100 s at 50 frames per second).
- If the light conditions change during the day, swap the filter for a more suitable variant.
- The filter reduces choppy motion in the footage in bright light, but it does not remove image shake caused by vibrations of the frame, the motors or a loose camera mount – these must be solved mechanically.

2.5 Cleaning and storage

- First blow dust away with an air blower, then wipe the filter with a clean microfibre cloth, if necessary with a drop of optical cleaning fluid.
- Do not use paper tissues, rough fabrics, solvents or high-concentration alcohol.
- Inspect the filter after every crash. Replace a cracked, chipped or deeply scratched filter.
- Store a filter that is not in use in a dry place, in its packaging or a case, so that the optical surfaces do not touch other objects.

2.6 Troubleshooting

Problem	Cause and solution
Image too dark or noisy	The filter is too dark for the light conditions. Use a variant with a lower number or remove the filter.
Dark image corners	The filter or holder intrudes into the field of view. Check how the filter is seated and whether the holder suits the camera mode used.
Reflections, haze or spots	Dirty filter or lens, or light entering between the filter and the lens. Clean both and check the seating.
Filter will not fit the holder	The holder is not designed for the thickness of this variant (ND16 is thicker). Do not use force; use a suitable holder.
Image still shakes	The cause is vibration, not light. Check the propellers, motors and camera mounting.

3. Information for the EU and Czech Market

3.1 Importer and responsible person in the EU

The product is placed on the European Union market by the importer stated below, who is at the same time the responsible person within the meaning of Article 16 of Regulation (EU) 2023/988 of the European Parliament and of the Council on general product safety (GPSR).

Importer / responsible person in the EU	Rotorama, s.r.o.
Company ID (IČO)	051 57 692
VAT ID (DIČ)	CZ05157692
Registered office	Okrajová 1351, 674 01 Třebíč, Czech Republic
E-mail	info@rotorama.cz
Phone	+420 252 252 098
Website	www.rotorama.com

3.2 Disposal

- The filter is not electrical equipment and contains no batteries.
- **Do not put** an unwanted or broken filter **into a glass recycling container** – coated optical glass is not packaging glass. Wrap it so that nobody can be cut by the sharp edges and dispose of it with mixed municipal waste, or follow the instructions of your local authority.
- Sort the packaging material by type into the appropriate recycling containers.

4. Warranty and rights arising from defective performance

The rights and obligations of the contracting parties are governed by Czech law, in particular by Act No. 89/2012 Coll., the Civil Code, and Act No. 634/1992 Coll., on consumer protection.

- The seller is liable to the buyer for the product being free of defects on receipt. If the buyer is a consumer, a defect may be notified **within two years of receipt** of the product (Section 2165 of the Civil Code).
- If a defect appears within **one year** of receipt, the product is deemed to have been defective already at the time of receipt (Section 2161(5) of the Civil Code).
- When purchasing online, a consumer has the right to **withdraw from the contract within 14 days** of receiving the goods without giving a reason (Section 1829 of the Civil Code).
- Claims should be made with the retailer from whom you purchased the product. The importer's contact details are given in Chapter 3.1.
- The competent body for out-of-court settlement of consumer disputes is the **Czech Trade Inspection Authority**, Štěpánská 796/44, 110 00 Prague 1, www.coi.cz.