

Specifications for the WMO-SPICE Single Alter Shield Configuration

Prepared by Craig Smith, Jeffery Hoover, John Kochendorfer, Rodica Nitu

The single Alter configuration that will be used during the WMO-SPICE is a modified configuration of the design distributed by Geonor, originally designed by the Norwegian Meteorological Institute (Circa 1985).

This shield will be used for the gauges which are part of the reference systems, i.e. the gauge in the Double Fence Intercomparison Reference, the R2 reference, and the gauge in a single Alter, part of the R3 reference.

The single Alter shield configuration will consist of a single ring of “blades”, also known as slats or fins, mounted on a ring of 1230mm diameter (or approximately 4 feet), centered about the gauge. The height of the blades will be positioned at a height of 20mm above the orifice of the gauge.

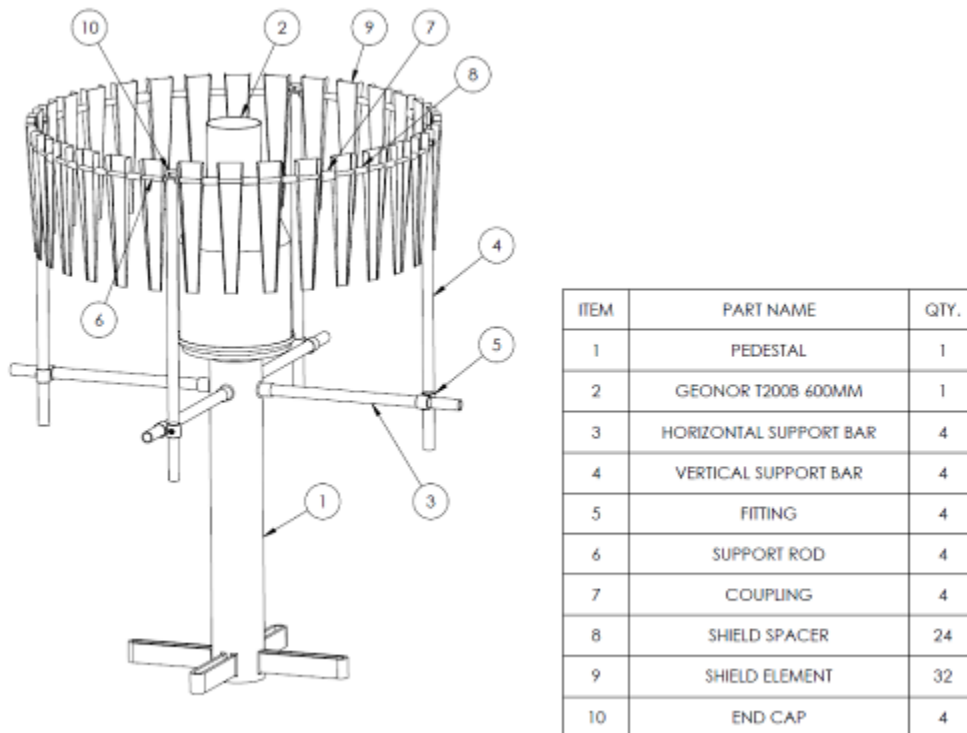


Figure 1: Alter shield: general view and components

Note: although shown connected to the post of the gauge, it is strongly recommended that the shield is mounted independently of the posts of the gauge.

Blades (shield elements)

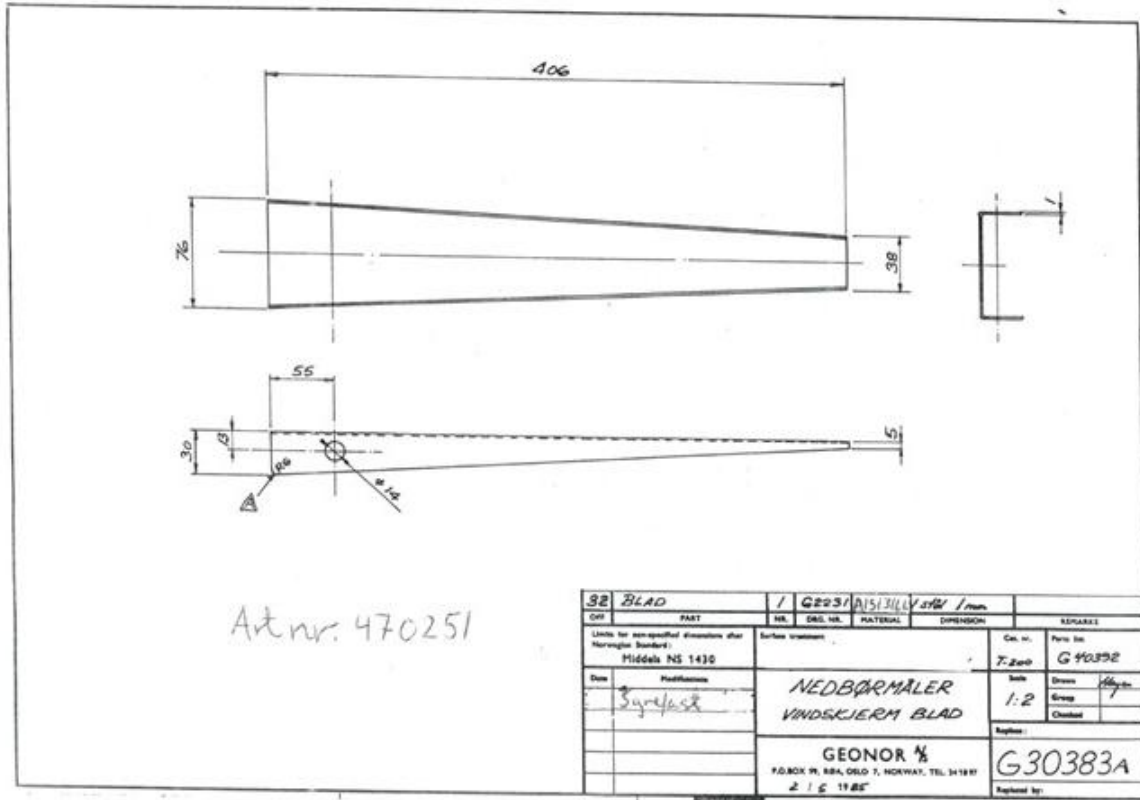


Figure 2: Blade drawing (courtesy of Geonor)

Material: stainless steel AISI 316L, 1 mm thick.

Number of blades/shield: 32

The blades should be able to swing freely on the shield ring.

The blade specifications are shown in Figure 2. A 3-dimensional view of the blade is included in Figure 3. The tapered blade will be 76mm wide at the top and 38mm wide at the bottom with a total length of 406mm (16 inches). The blade will be boxed (open at the top and bottom) with the open side of the box facing towards the outside of the ring.

The edges of the boxed blade are also tapered from 30mm at the top and decreasing down to 5mm at the bottom. The blades will be supported by a shield ring passing through a 14mm diameter hole located 55mm from the top of the blade and 13mm from its inside edge.

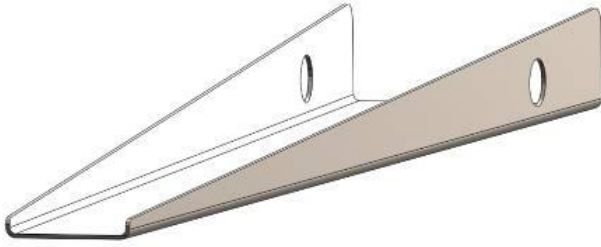


Figure 3: Blade (shield element)

Spacers

The blades are separated by spacers, with a nominal length of 40 mm.
Number of spacers per shield: 24

Note: The Geonor spacer was measured to be 44 mm long with an inner diameter of 16.18 mm and an outer diameter of 20 mm.



Figure 4: Spacer

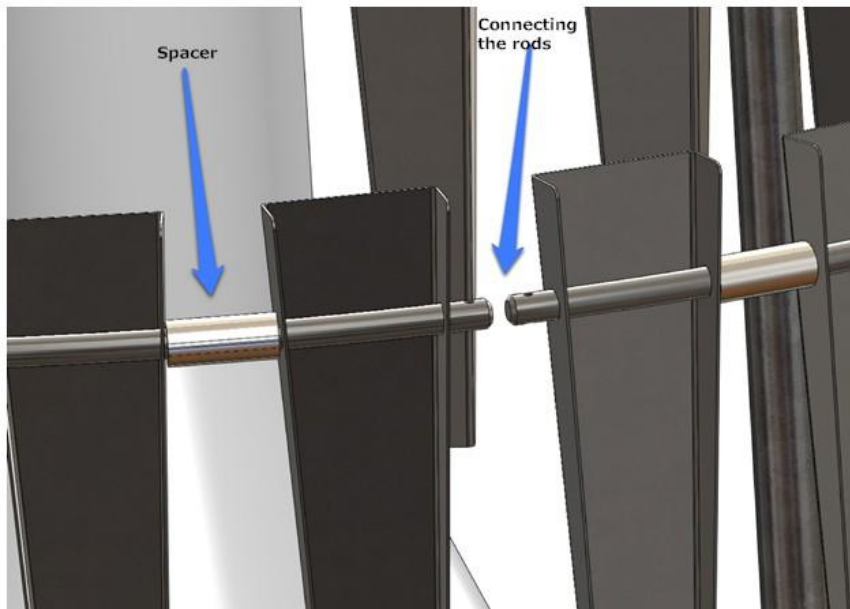


Figure 5: Shield spacers and rod connection: details

Shield Ring

The ring is manufactured from 4 stainless steel rods of 13 mm (1/2") diameter. The diameter of the ring, when installed is 1230 mm.



Figure 6: Support rod (1/4 shield ring)

The rods are connected with 4 couplers

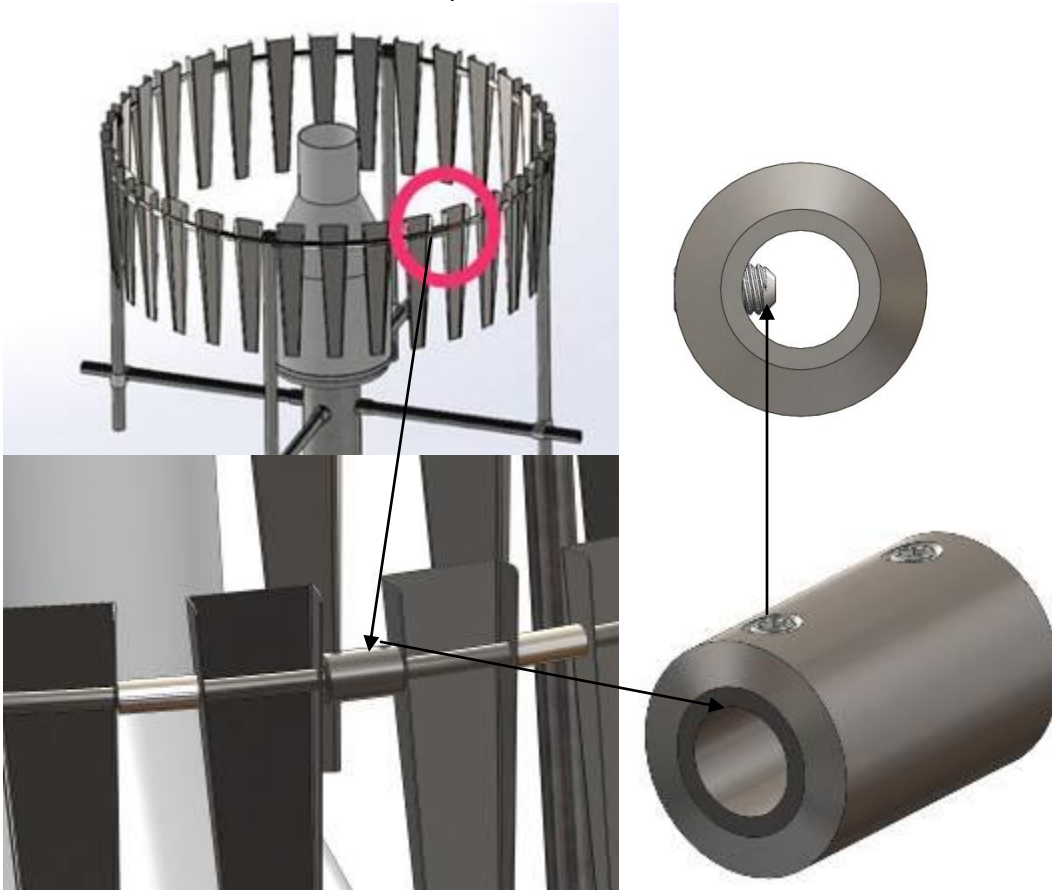


Figure 7: Coupling assembly

Shield Posts

The shield is mounted on 4 vertical posts, equally spaced. It is strongly recommended that the shield is mounted independently from the gauge to reduce the impact of wind vibration on the instrument. Generally, 4 (or more) vertical support pipes are used with the support pipes fitting between the blades (replacing a spacer at that point on the ring).

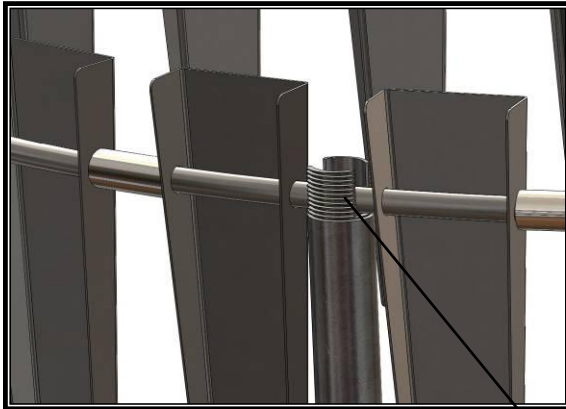


Figure 8: Support post and rod mounting - view 1

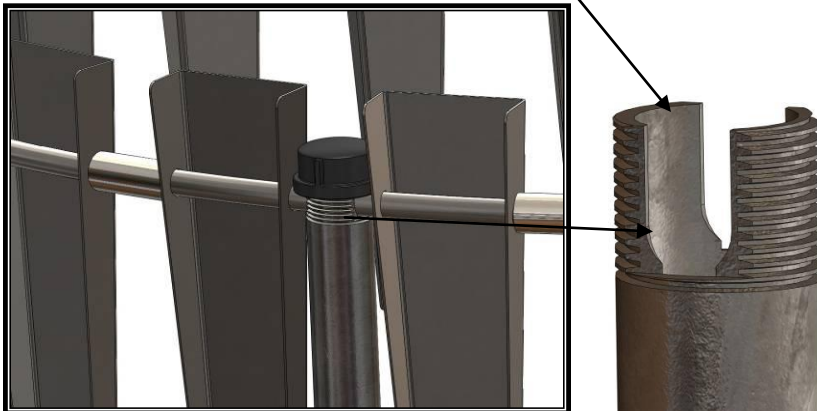


Figure 9: Support post and rod mounting - view 2

Note: The installation solutions presented in this document are for illustration purposes; the user may choose to assemble the shield differently, based on current practice, experience, and availability.