
TSBc (Telenor Satellite Broadcasting AS) hereby approves the antenna mentioned below with the restrictions listed for the use on the TSBc space segment. The restrictions are based on that the antenna must be compliant with "VSAT Type Approval Procedures for Earth Station on Vessels (ESVs) accessing Telenor Space Segment".

Antenna manufacturer:	<u>Thrane</u> & Thrane A/S trading as Cobham SATCOM Lundtoftegaardsvej 93D, KD-2800 Kgs. Lyngby, DENMARK Tel: +45 39 55 88 00, Fax: +45 39 55 88 88, info@thrane.com
Antenna Model:	SAILOR 600 VSAT Ka
Antenna:	65 cm, Stabilized maritime Ka-band antenna, 3 axis
Transmit Gain:	43.7 dBi at 29.75 GHz
Tx axial ratio:	1.06 (on axis), 1.1 (within -1 dB contour) at 29.5 GHz
Polarisation:	Circular (THOR 7, Tx: RHCP/ Rx: LHCP)
Transmit Frequency:	29.5 – 30.0 GHz
Receive Frequency:	19.7 – 20.2 GHz
Maximum allowed EIRP:	35 dBW/40 kHz

Stabilized platform movements and pointing accuracy

The manufacturer confirms that the Sailor 600 Ka Maritime VSAT Antenna, when being operated within the specified ship motion limits, is able to maintain RMS pointing accuracy towards the satellite to within $\pm 0.2^\circ$. The specified ship motion limits are:

Roll= 30° in a period of 6 sec

Pitch= 15° in a period of 5 sec

Yaw= 10° in a period of 8 sec

If the ship motion in terms of vibration and shock should exceed the specified limits, an additional safety mechanism is built in to protect neighboring satellite systems and will, via control signals to the BUC, disable signal transmission if the pointing error towards the satellite exceeds $\pm 0.5^\circ$.

Antenna testing and reproduction

The antenna approval is based on test data provided by the manufacturer during an antenna system testing at Politecnico di Torino Antenna Laboratory (LACE), Italy, October 2015. The manufacturer is responsible for quality reproduction in the factory. Any major changes in the construction of the antenna or RF system are subject to revision, and will be considered on case-by-case basis.

Environmental standards

The antenna complies with, inter alia, the following environmental standards including EMI/EMC/ERM: EN 60945, EN 60950, R&TTE Directives 1999/5/EC (essential requirements), ETSI EN 301 489-12; V1.2.1 (2003-05).
