

## German Navy Frigate (Type 122)

### BIOLOGICAL STKS 300 ONBOARD WASTEWATER TREATMENT PLANT

#### Task

MARTIN Systems has been contracted to review the existing wastewater treatment system and to upgrade all German Navy frigates type 122 – BREMEN class with their new biological membrane technology. MARTIN Systems will deliver an ultrafiltration wastewater treatment plant with a pre-treatment module to meet the Navy's updated complex wastewater management requirements.

#### Ship Details

The type 122 frigates are designed as multi-purpose vessels intended for submarine missions. Their state-of-the-art sensors, electronic equipment and communication devices can coordinate fleet defences and greatly enhance the fleet's capabilities.

#### Wastewater Management

Each ship will be supplied with one BMA® plant installed in the bow. The plants are equipped with a BMA® reactor and two filtration cells with siClaro® filtration technology which can be configured individually, providing full redundancy. The pre-treatment stage consists of a fine screen and grease removal by flotation. The plant operates fully automated and is integrated into the ships' central control systems.



#### Treatment Capacity

Population Equivalent (PE)	236
Raw sewage input (m <sup>3</sup> /d)	35
Grey water input (m <sup>3</sup> /d)	30
BOD <sub>5</sub> input (kg/d)	21,2
No. of membrane modules	48
Total BMP tank volume (m <sup>3</sup> )	35

#### Final Effluent Quality

The final effluent exceeds all requirements given by the IMO (International Maritime Organization), the German "Seeberufsgenossenschaft", Germanischer Lloyd and the German Navy.