= Ersatz Yorck @-@ class battlecruiser =

The Ersatz Yorck class was a group of three battlecruisers ordered for the Imperial German Navy in April 1915 . The name derived from the fact that the lead ship was intended as a replacement (German : ersatz) for the armored cruiser Yorck , lost to mines in 1914 . They were a slightly enlarged version of the Mackensen @-@ class battlecruiser , armed with 38 cm (15 in) guns as opposed to the 35 cm (13 @.@ 8 in) weapons on the preceding design . The boilers would have been trunked into a single massive funnel . The three ships were originally ordered as part of the Mackensen class but the design was changed when details of the British Admiral @-@ class battlecruisers became known to German intelligence . The vessels were ordered under the provisional names Ersatz Yorck , Ersatz Gneisenau , and Ersatz Scharnhorst . They were considered to be replacements for the armored cruisers Yorck , which had been sunk by German mines in 1914 , and Gneisenau and Scharnhorst , both of which had been sunk at the Battle of the Falkland Islands also in 1914 .

As with the Mackensens , the three ships of the Ersatz Yorck class were never completed . This was primarily due to shifting wartime construction priorities ; U @-@ boats were deemed more important to Germany 's war effort , and so work on other types of ships was slowed or halted outright . The lead ship , Ersatz Yorck , was the only vessel of the three to have construction begin , though she was over two years from completion by the time work was abandoned . With the hull incomplete , the ship could not be launched and towed to ship @-@ breakers ; as a result , Ersatz Yorck was broken up in situ .

= = Design = =

= = = General characteristics = = =

The Ersatz Yorck @-@ class ships were an enlargement of the previous Mackensen @-@ class ships . They were 227 @.@ 80 m (747 ft 5 in) long , compared to 223 m (731 ft 8 in) on the earlier vessels . Ersatz Yorck had the same beam as the earlier vessels , at 30 @.@ 40 m (99 ft 9 in) , and the same draft of 9 @.@ 30 m (30 ft 6 in) . The ships were planned to displace 33 @,@ 500 tonnes (33 @,@ 000 long tons) at standard weight , and up to 38 @,@ 000 t (37 @,@ 000 long tons) fully laden . This was approximately 2 @,@ 500 t (2 @,@ 500 long tons) heavier than the Mackensens . The Ersatz Yorck @-@ class ships ' hulls were to have been constructed with longitudinal steel frames with the outer plating riveted on .

= = = Machinery = = =

As with all German battlecruisers that had been built , the Ersatz Yorck @-@ class ships would have been equipped with four sets of Parsons turbine engines , each of which drove a 3 @-@ bladed screw that was 4 @.@ 20 m (13 ft 9 in) in diameter . The turbines were supplied with steam by 24 coal @-@ fired Schulz @-@ Thornycroft single ended boilers and 8 oil @-@ fired Schulz @-@ Thornycroft double ended boilers . Ersatz Yorck and Ersatz Gneisenau were intended to use Föttinger fluid transmission for their turbines , while Ersatz Scharnhorst 's turbines retained direct coupled geared transmissions . The ships were to have electrical power provided by diesel generators . The Ersatz Yorcks were intended to mount a pair of twin rudders alongside each other for steering .

The power plant was rated 90 @,@ 000 shaft horsepower and 295 revolutions per minute , the same as the preceding Mackensen @-@ class ships . Their slightly greater size reduced their speed somewhat , from 28 knots (52 km / h ; 32 mph) in the Mackensen @-@ class ships to 27 @.@ 3 knots (50 @.@ 6 km / h ; 31 @.@ 4 mph) for the new vessels . The ships were designed to store 850 t (840 long tons) of coal and 250 t (250 long tons) of oil in purpose @-@ designed fuel bunkers . However , the areas of the hull between the torpedo bulkhead and the outer wall of the

ship were also used for fuel storage . This additional space provided an increased total of 4 @,@ 000 t (3 @,@ 900 long tons) of coal and 2 @,@ 000 t (2 @,@ 000 long tons) of oil . With fuel stores topped off , the ships were estimated to have been able to steam for 5 @,@ 500 nautical miles (10 @,@ 200 km ; 6 @,@ 300 mi) at a cruising speed of 14 kn (26 km / h ; 16 mph) .

= = = Armament = = =

The ships ' main battery was to have consisted of eight 38 cm (15 in) SK L / 45 guns in four Drh LC / 1913 twin gun turrets , placed in superfiring pairs fore and aft of the superstructure . These were the same " Langer Max " guns as those mounted on the Bayern @-@ class battleships . The guns could initially depress to ? 8 degrees and elevate to 16 degrees ; this provided maximum range of 20 @,@ 400 m . The gun mountings were modified to allow elevation up to 20 degrees ; the range was correspondingly increased to 23 @,@ 200 m . The turrets could train 150 degrees to either side of the centerline . The main battery was supplied with a total of 720 shells or 90 rounds per gun . The guns had a rate of fire of around 2 @.@ 5 shells per minute . Post @-@ war tests conducted by the British Royal Navy showed that the guns on the battleship Baden could be ready to fire again 23 seconds after firing ; this was significantly faster than their British contemporaries , the 38 cm guns on the Renown class , which took 36 seconds between salvos . The guns fired 750 kg (1 @,@ 650 lb) armor @-@ piercing shells with a 277 kg (610 lb) RPC / 12 propellant charge in a brass cartridge . The shells were fired at a muzzle velocity of 800 meters per second (2 @,@ 625 fps) . Each gun was expected to fire 300 shells before replacement was required .

The ships ' secondary battery consisted of twelve 15 cm SK L / 45 quick @-@ firing guns mounted in armored casemates along the central superstructure . Each gun was supplied with 160 rounds , and had a maximum range of 13 @,@ 500 m , though this was later extended to 16 @,@ 800 m . The guns had a sustained rate of fire of 5 to 7 rounds per minute . The shells were 45 @.@ 3 kg (100 lb) , and were loaded with a 13 @.@ 7 kg (30 lb) RPC / 12 propellant charge in a brass cartridge . The guns fired at a muzzle velocity of 835 meters per second (2 @,@ 740 ft / s) . The guns were expected to fire around 1 @,@ 400 shells before they needed to be replaced .

The ships were also armed with eight 8 @.@ 8 cm (3 @.@ 45 in) L / 45 Flak guns in single pedestal mounts . Four were arranged around the rear superfiring main battery turret and the other four around the forward conning tower . The Flak guns were emplaced in MPL C / 13 mountings , which allowed depression to ? 10 degrees and elevation to 70 degrees . These guns fired 9 kg (20 lb) shells , and had an effective ceiling of 9 @,@ 150 m at 70 degrees .

As was standard for warships of the period , the Ersatz Yorcks were equipped with submerged torpedo tubes . There were three 60 cm (24 in) tubes : one in the bow , and one on each flank of the ship . The torpedoes were the H8 type , which were 8 m long and carried a 210 kg (460 lb) Hexanite warhead . The torpedoes had a range of 6 @,@ 000 m (6 @,@ 600 yd) when set at a speed of 36 knots ; at a reduced speed of 30 knots , the range increased significantly to 14 @,@ 000 m (15 @,@ 300 yd) .

= = = Armor = = =

The Ersatz Yorck @-@ class ships were protected with Krupp cemented steel armor , as was the standard for German warships of the period . The armor layout was identical to the preceding Mackensen class , which was itself very similar to the armor scheme on the preceding Derfflinger @-@ class ships . They had an armor belt that was 300 mm (12 in) thick in the central citadel of the ship , where the most important parts of the ship were located . This included the ammunition magazines and the machinery spaces . The belt was reduced in less critical areas , to 120 mm (4 @.@ 7 in) forward and 100 mm (3 @.@ 9 in) aft . The belt tapered down to 30 mm (1 @.@ 2 in) at the bow , though the stern was not protected by armor at all . A 45 mm (1 @.@ 8 in) thick torpedo bulkhead ran the length of the hull , several meters behind the main belt . The main armored deck ranged in thickness from 30 mm thick in less important areas , to 80 mm (3 @.@ 1 in) in the sections that covered the more critical areas of the ship .

The forward conning tower was protected with heavy armor : the sides were 300 mm thick and the roof was 130 mm (5 @.@ 1 in) thick . The rear conning tower was less well armored ; its sides were only 200 mm (7 @.@ 9 in) thick and the roof was covered with 50 mm (2 @.@ 0 in) of armor plate . The main battery gun turrets were also heavily armored : the turret sides were 270 mm (11 in) thick and the roofs were 110 mm (4 @.@ 3 in) thick . The 15 cm guns had 150 mm (5 @.@ 9 in) worth of armor plating in the casemates ; the guns themselves had 70 mm (2 @.@ 8 in) thick shields to protect their crews from shell splinters .

= = Construction and cancellation = =

Three ships were ordered for the new design . Ersatz Yorck , a replacement for the armored cruiser Yorck , was ordered from AG Vulcan in Hamburg , laid down in July 1916 under construction number 63 . After 1917 , work on the ship only took place in order to keep dockyard workers occupied . Construction was suspended to concentrate on the U @-@ boat program , and the hull frames that had been assembled were subsequently scrapped on the slip . Ersatz Gneisenau , a replacement for the armored cruiser Gneisenau , was ordered from Germaniawerft in Kiel under construction number 250 . Work was not started due to shifting priorities , though some material had been constructed . The diesel engines that had been built were subsequently installed on the first four Type U 151 U @-@ boats U @-@ 151 , U @-@ 152 , U @-@ 153 , and U @-@ 154 . Ersatz Scharnhorst , a replacement for the armored cruiser Scharnhorst , was ordered from Blohm + Voss in Hamburg under construction number 246 . Construction never began on her as well , due to shifting priorities . However , the design formed the basis for the Scharnhorst @-@ class battleships built by the Kriegsmarine in the mid @-@ 1930s .