

Yacht Service

ABSOLWENT 900

the ultimate in Wooden yachts

1. A General Background of the “Absolwent 900” Enterprise

The genesis of the “Absolwent 900” (Graduate 900) is closely connected with her designer Janusz Konkol. The story of his mastery goes back to the 1960s when his first significant contact with water was established and the building of wooden kayaks began. Then there follows his first own construction - a sailing kayak, the first fruit of his dreams about yachts and sailing.

Later he works in Gdansk, at the Stogi Shipyard (now the Conrad Shipyard), which specialises in yacht constructions. At the same time Konkol sails at the Gdansk Shipyard Yacht Club. Under Waław Liskiewicz’s watchful eye he climbs the steps of a professional career - apprentice, boat builder, production engineer, constructor. He works on the type “Opal” and other kinds of boats with traditional and diagonal plating and learns from Emil Kisły shipwright skills on wooden Finns and Flying Dutchmen.

At that time he begins studies at the Ship Building Department of Gdansk Technical University. This period gives him an opportunity to become familiar with the West System Technology through Fritz Marrgraff’s “Lisoletta 1000” from Lake Constance. The new interest resulted in his master’s thesis: *A Project of a Wooden Sailing Yacht in the West System Technology*.

After graduating he continues his professional career in the Yacht Club “Neptun” where he takes a new view of yachts. The new experience gives rise to an exciting and constructive clash between habits, shipyard dogmas and tradition on the one hand and the unrestrained competitive venture of amateurs creating better and better sailing units on the other. Talking about the above we must not forget the significance of Henryk Brylski’s ideas, the man who is the driving force behind the Yacht Club “Neptun” and the author of two most original constructions “Haber 555” and “Haber 700.”

The next stage in Konkol’s life is inseparably combined with Iżawa, a town in northern Poland that has got huge potential, and the wonderful atmosphere of a water sports and tourism centre. After a few years’ break the constructor comes back to his profession and founds the Yacht Service Co. in partnership with Tadeusz Świst. **(Presently Yacht Service Sp. z o.o.)**

Finally the commission of a lifetime - a modern wooden yacht. This is, very briefly, the story that constitutes the background of the “Absolwent 900” enterprise.

2. Specifications

Absolwent 900

2.1. An Introduction

The design and carpentry of the yacht are based on the most recent constructional and technological solutions so that the unit can join the best qualities of a sleek and swift sailing yacht and elegance of natural materials. The West System Technology ensures the unlimited functionality of the yacht, its full resistance and absolute safety, immense comfort, easy transport and service.

The materials used in the production are of the highest quality. Those especially significant for the resistance of the yacht have certificates of relevant classification societies - Germanischer Lloyd, Lloyd’s Register of Shipping, Polish Register of Shipping, etc.

The construction plans have been drawn according to PRS classification requirements for unlimited navigation and have been accepted by that society. PRS also supervises the production.

Measurements:

- length over all 9.00 m (29’ 6’')
- length at waterline 7.70 m (25’ 26’)
- beam 2.80 m (9’ 2’)
- draught 0.48 m (1’ 6’)
- draught with the centreboard dropped 2.08 m (6’ 9’)
- displacement - ocean navigation 3.70 t
- ballast 1.05 t
- centreboard 0.25 t
- sail area 44.00 m² (473 ft²)

Area of sailing: cean navigation - class * yKx

2.2. Hull

The frame consists of a system of lengthwise and crosswise reinforcements made up as a strip-and-plywood construction. The reinforcements function also as elements of the internal framework: partitions, shelves, walls of berths, etc. The main, load-bearing element is the keel with inlaid floor frame elements, centreboard case and bulkheads.

The plating are two four-millimetre-thick layers of Okume mahogany (White mahogany) plywood, laid with Ashcroft’s method, and an outer two-and-a-half-millimetre-thick layer of Sapeli mahogany face veneer. The latter is laid lengthwise in a way resembling a traditional caravel planking made in tune with the traditional carpentry precepts that apply to the plating of this kind. The face veneer is covered with a layer of transparent epoxy laminate which is, in turn, protected by four layers of the two-component varnish “West System 1000” characterised by increased resistance to ultraviolet light.

When stored or transported the hull is supported at three points strongly linked with the construction: one

on the line of the keel in front of the centreboard case and two symmetrically under the stern. In such a way the yacht can be stood directly on the ground without any additional substructure.

2.3. Deck

The deck plating is based on two-part deck beams and deck stringers. The sides of the deckhouse have been carpentered of special Khaya mahogany (Red mahogany) plywood. Both the deck and the deckhouse platings are inlaid with thermal insulation in the living area of the vessel.

First from the inside is a white dressing layer followed by twenty millimetres of insulation which hides PVC pipes with electric conduits. The third is an Okume mahogany plywood layer which is fastened to the upper surfaces of the deck beams and stringers. Finally, there comes six-millimetre-thick teak laid like traditional planking. Owing to such a construction the deck is easy to maintain and has good nonslip characteristics.

The hatch is equipped with a wave deflector that prevents waves from the bow from getting inside the yacht. Both the hatch and the deflector have been made on preparatory frames as self-bearing elements.

The self-draining cockpit is made of teak. Only the side walls of the cockpit are made of mahogany plywood.

All the mahogany elements are proofed and varnished. The cockpit floor is equipped with a grating and the cockpit benches with strip-gratings. There is also an aft locker for two gas cylinders and a hand bilge pump.

2.4. Interior furnishings and equipment

On both sides of the vessel there are two levels of shelves built-in lengthwise. In the bow there is an anchor chain locker. In order towards the stern are:

2.4.1. Forepeak

- double berth
- net for sails
- wardrobe
- cabinet with shelves
- vestibule
- two fresh water tanks and room for a third one
- Lewmar hatch - headroom: 1.75 m (5' 8'')
- fixed side windows

2.4.2. Mess

- maximum headroom: 1.83 m (6')
- big folding table on the centreboard case
- double folding bunk on the port and fresh and dirty water tanks under the bunk
- on the starboard - bunk; drinking and outside water pumps, pressure vessels and distribution

valves under the bunk

- folding chart board (half-chart size) with a map pocket, nautical instrument holders; electric current distribution panel and radio above and beside the navigation board
- two opening Vetus windows and two fixed ones
- galley, combined with the mess as one room:
 - sink
 - fresh water tap (pressure system of water supply, reserve foot pump)
 - hot and cold water tap
 - dirty water draining system
 - Engel 15 refrigerator or any other cooling machine for individual orders
 - two-burner gimbaled cooker
 - various stowage
 - electric Ventair ventilator
 - electric bilge pump (100 l/min. = 22 imp. gal./min.) - automatic or manual mode

2.4.3. Heads (headroom: 1.75 m = 5' 8'')

- shower
 - tap
 - water draining system
 - drainage valves of dirty water
- washbasin
- chemical toilet
- heating Eberspacher unit
- boiler for hot water supply
- opening Vetus window
- two-way Ventair ventilator

Under the cockpit there is a soundproof engine chamber with a ladder on the front door and opening doors on both sides of the chamber for operating the engine. In addition, under the engine there is a special basin preventing spreading of the fuel and engine oil into the bilge in case of breakdown.

2.4.4. Aft cabin

- vestibule with an opening Vetus window
- double berth - an opening Lewmar window in the cockpit wall

2.4.5. Aft locker

At the bottom there are fuel tanks, storage battery case and a plywood floor above. Thus there is still an eighty-centimetre-deep locker for sails, ropes, etc.

2.4.6. Water supply system

- basic pressure system - electric pumps, boiler (220-volt + engine), fresh water
- emergency system - fresh water foot pump
- fresh water tanks - 270 - 330 l (59 - 72 imp. gal.) in total
- dirty water tank - 110 l (24 imp. gal.)

2.4.7. Bilge system

- electric pump
- Whale-Titan Gusher hand pump – coordinated with dirty water draining system

2.4.8. Electrics (12 V)

- two storage batteries
- electric current distribution panel – electric current meters and sixteen automatic fuses
- rectifier
- 220-volt socket
- interior lighting - nine lighting points:
 - forepeak - three points
 - mess - one point
 - galley - one point
 - navigation board - one point
 - toilet - one point
 - aft cabin - two points
- deck and navigation lights

2.4.9. Heating system

- fuel-fired Eberspacher heating unit
- heating factor: hot air
- heating outputs:
 - forepeak
 - mess
 - toilet
 - aft cabin

2.4.10. Gas supply system

- gas cylinders under the deck in the cockpit
- copper pipe
- cut-off valve at the cooker
- gas detector
- two-burner cooker

2.4.11. Air conditioning

- opening windows
- vertically sliding door with a louvred ventilator
- electric ventilators
- water trap ventilators

2.4.12. Ballast (ca. 1.05 t)

Lead blocks are suspended between the floor and the plating in the bilge. They are fastened to the crosswise floor frame elements with stainless steel elements.

2.4.13. Centreboard - NACA profile for ballast fin (ca. 0.25 t)

It is a steel construction covered with epoxy laminate. An appropriate system of fastening and blocking the blade prevents the centreboard from hitting the case and makes all the forces and loads be taken over by the left, solid part of the under-mast bulkhead and the keel. The centreboard is pivoted in front so that it lifts automatically in case of meeting an obstacle. It may be blocked after dropping and raised

with a tackle and a winch. The centreboard halyard and blocking system are operated from the cockpit.

2.4.14. Rudder - NACA fin profile

- stainless steel yoke and wooden tiller
- blade - steel construction covered with epoxy laminate
- blade raising tackle, downhaul

2.4.15. Stern stabilisers

Yacht arduency is controlled and course stability ensured especially during full course sailing.

2.4.16. Engine

- Volvo Penta 2002 R FWC
- folding Gorii propeller
- steering from the cockpit
- fuel tank - 90 l (19 imp. gal.)

2.4.17. Rigging

- standing rigging
 - dismantable mast standing on the deck and laid on a special support in the stern after lowering, boom, telescopic spinnaker booms - aluminium
 - telescopic boom tensioner
 - forestay, shrouds: string rope 1 x 19, diameter 5 mm (0.2 in); backstay: string rope 1 x 19, diameter 4 mm
 - stay tackle and anchor winch, rotary support, two-stage immovable support with an anchor rope and life buoy rope windlasses in the stern; mast guiding system
- running rigging
 - quick reefing and main sail clearing systems
 - “lazy Jack”
 - furling and reefing foresail “Profurl” with a double boltrope groove

2.4.18. Deck equipment

- double rope side railing, stern pulpit with a fender rack, bow pulpit, anchor CQR and anchor device
- bow ladder for dismounting from the vessel
- stern ladder for descending to the water
- winches:
 - two Lewmar 16 ST self-tailing sheet winches
 - Lewmar 7 anchor winch
 - two Lewmar 16 halyard winches
- rope clutches
- Autohelm 50 electronic equipment
 - log (speed, daily route, total route)

- echo sounder
- wind speed and direction meter

2.4.19. Other accessories

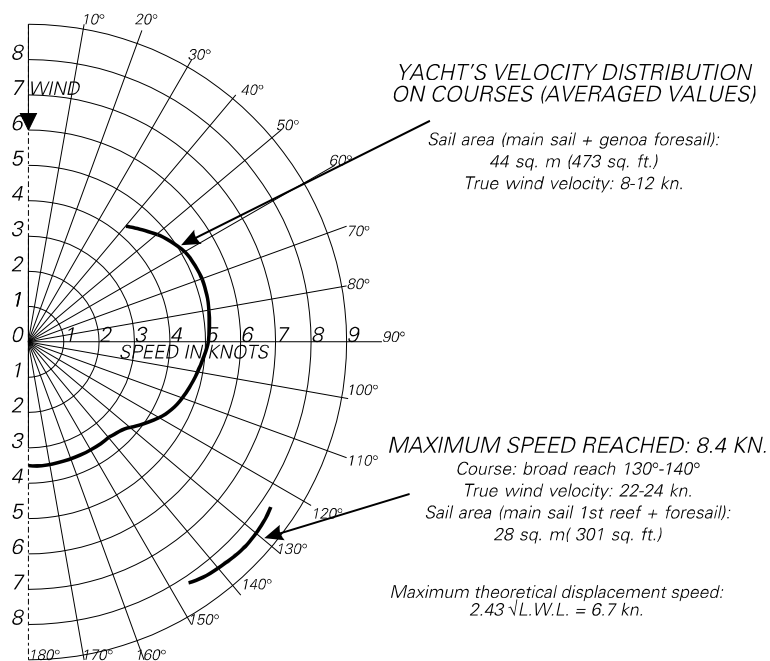
- six fenders
- four mooring ropes
- one towing warp
- two anchors
- one boathook
- two fire-extinguishers

3. Tests

3.1. Tests under sail

ABSOLWENT 900 **TESTS UNDER SAIL**

The Gulf of Gdansk
October 1994



3.1.2. Sail balance

Full control over the sail balance from luffing through ideal balance to falling off by dropping and raising the rudder blade with the halyard and downhaul tackles.

Supporting the balance with stern stabilisers:

- windward - steering facilitated at high wind velocities
- leeward - very good course stability after raising the centreboard and dropping the stern stabilisers.

The yacht went self-steered for a longer time. Correcting the course required minimal rudder turns.

3.1.3. Going about and gybing

- going about: sailing on a beam reach - luffing –

Place: The Gulf of Gdansk
Time: 26th October 1994
Wind velocity: 10-12 kn.
The state of the sea: 1-2

The tests carried out in the presence of PRS inspectors, Messrs Zbigniew Rudnicki and Benedykt Korybalski

3.1.1. Yacht's velocity distribution on courses

The tests were begun on the close-hauled starboard tack through falling off to running, followed by gybing and luffing to the close-hauled port tack. In irons: 80°.

going about - falling off to the beam reach on the other tack. Time - 18 s.

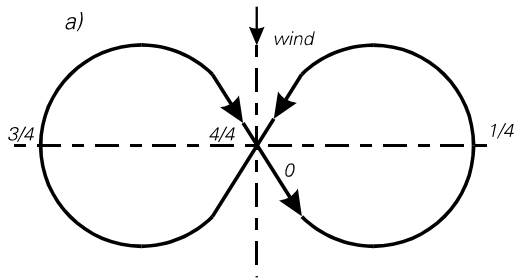
- gybing: sailing on a beam reach - falling off – gybing - luffing to the beam reach on the other tack. Time - 10 s.

3.1.4. 360° turn

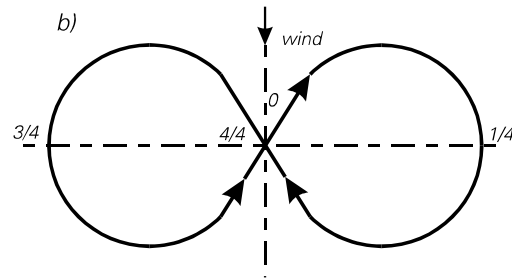
- sailing on a beam reach - luffing - going about – falling off - gybing - luffing to the beam reach. Time - 36 s.
- sailing on a beam reach - falling off - gybing – luffing - going about - falling off to the beam reach. Time - 38s.

The diameter of the turn: ca 14 m (46 ft.)

3.1.5. The figure of eight



- a. through tacking: sailing on a broad reach – luffing - going about - falling off to the broad reach - luffing - going about - falling off to the broad reach. Time - 47 s.
- b. through gybing: sailing on a close reach – falling off - gybing - luffing to the close reach - falling off - gybing - luffing to the close reach. Time - 46 s.



$V_{max.} = 8.4$ kn. (true wind velocity: 22 - 24 kn.; the course in respect to the true wind: ca 130°; sails: main sail 1st reef + foresail = 28 sq. m/301 sq. ft.)

3.2. Tests under engine power

Date: 7th September, 1994
 Engine: Volvo Penta 2002 R FWC
 Folding Gorii propeller
 True wind velocity: 10 m/s (19 kn.)
 Crew: 8 pers.

3.2.1. Speed test

3.1.6. Maximum speed reached at the tests

No.	Engine rotational speed in r.p.m.	Yacht speed windward in knots	Yacht speed leeward in knots
1.	1500	3.8	4.2
2.	2000	5.1	5.5
3.	2500	6.3	6.5
4.	2900	7.0	7.1

3.2.2. Slowing-down test (leeward)

- a. $V_{max.} = 7.1$
 b. two-second inert sailing
 c. slowing down from the speed $V = 6.2$ (speed reduction during the inert sailing)
 d. smooth change to the reverse gear, increasing engine rotational speed
 e. total time of slowing-down from the speed

$V = 7.1$ to a standstill: 13 s. (from $V = 6.2$: 11 s.)

- f. slowing-down distance from the change to the reverse gear to a standstill: the yacht's length
 g. slowing-down distance from the beginning of the inert sailing to a standstill: 20 m (65 ft.)

3.2.3. 360° turn

No.	Engine rotational speed	$V_{init.}$ in knots	V_{term} in knots	Time in seconds	360° turn diameter
1.	1500	3.9	0.4	30	$L + 2 m = 11 m$
2.	2000	5.3	1.3	22	$L + 4 m = 13 m$
3.	2500	6.6	2.3	19	$L + 4 m = 13 m$
4.	2900	7.1	2.6	18	$L + 5 m = 14 m$

3.3. Stability tests

On August 30th, 1994 in Iżawa the yacht was tested for stability in concord with the regulations, part III, in the presence of the constructor, carpenter and PRS inspectors Messrs Słonimski and Rudnicki. The tests were done in two ballast versions and with the centreboard dropped and raised, at a ratio of 1:2: mode 1 - ballast 1020 kg, centreboard raised, mode 2 - ballast 1020 kg, centreboard dropped, mode 3 - ballast 840 kg, centreboard dropped, mode 4 - ballast 840 kg, centreboard raised.

Specifications: $l = 11.4 \text{ m (37' 4")}$; $h_3 = 0.65 \text{ m (2' 1")}$; free board = 0.96 m (3' 1") ; $h_2 = 11.4 \text{ m (37' 4")}$; $h_{\text{with centreboard raised}} = 5.575 \text{ m (18' 3")}$; $h_{\text{with centreboard dropped}} = 5.825 \text{ m (19' 1")}$; $\varphi_k = 3,500 \text{ kg} = 34,335 \text{ N}$ in modes 1 and 2; $\varphi_k = 3,320 \text{ kg} = 32,569 \text{ N}$ in modes 3 and 4.

In mode 2 the yacht's righting moment is insignificantly insufficient at the heel angle of 30° ; yet the maximum righting moment at 60° is bigger than required. The weight of the centreboard : 240 kg.

In mode 1 the righting moment is too small at the heel angle of 30° and the maximum moment is insufficient at 50°

In modes 3 and 4 the value of the righting moment is too small at 30° and the maximum righting moment is insufficient at 60° with the centreboard dropped and at 50° with the centreboard raised.

On the basis of the results of the tests for the heel angle in dependence on the number of persons standing on a yacht's side (max. 8) it was stated that the condition had been met in all the modes.

FINAL CONCLUSION: When sailing on the open sea the yacht should be set into mode 2 and in fairly good weather conditions into mode 1. In mode 2 in bad weather the centreboard should be blocked when dropped. The permanent ballast placed in concord with the approved documents must not be smaller than 1020 kg.

Legend:

φ_k - displacement

h_2 - a vertical distance between the point of the fastening of the line used at the test and the centre of the hull's rotation

h_3 - a vertical distance between the lower fastening of the line tackle used at the test and the surface of the water

$h_{\text{with centreboard raised}}$ - a distance between the centre of the lateral resistance surface of the submerged hull with the centreboard raised and the centre of the sail area.

$h_{\text{with centreboard dropped}}$ - a distance between the centre of the lateral resistance surface of the submerged hull with the centreboard dropped and the centre of the sail area.

l - a horizontal distance between the point of the fastening of the line used at the test and the centre of the hull's rotation

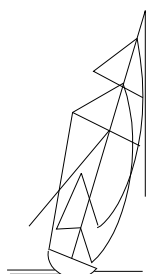
January 2011

The yacht „**Absolwent 900**” sailing on polish inshore and offshore waters from 1994 proved its universality. It also sailed on lakes, canals, rivers and **Baltic Sea**. Excellently performed, with a lot of unique solutions confirmed all design assumptions. It did well in many hard conditions presenting big seaworthiness.

It has been again now for 4 years in hands of its designer and builder. It is kept in very good conditions and under supervision. Construction of the yacht is in ideal state, there are no any damages to the strengthening elements of the hull and the wood is not rotten.

Our offer includes the yacht with its service, connected with partial exchange of installation and some devices and restoration. All these works are to bring the full, original use and aesthetic properties to it. “**Absolwent 900**” awaits a new owner and can be also additionally equipped accordingly to its wishes.

Janusz Konkol
Designer i bilder



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