



ORC

Offshore Racing Congress
World leader in rating technology

**2019
ORC Club
Certificate**

Rating Office

**EYU
Purje 8
11911, Tallinn
Estonia**

Certificate

Number **Est433**
Issued On **5/23/2019**
ORC Ref **EST0000583**
VPP Ver. **2019 1.01**
Valid until **12/31/2019**

Crew Weight

Default 859kg
Maximum **850kg**
Minimum* **638kg**
**when applied by the NoR and SI*
Non Manual Pwr **No**

Special Scoring

| | ToD | ToT |
|--------------|--------------|---------------|
| Double H.GPH | 596.8 | 1.0054 |
| Double H.OSN | 582.0 | 1.0308 |
| Non Spin GPH | 617.8 | 0.9712 |
| Non Spin OSN | 600.8 | 0.9986 |

Sails Limitations

Headsails **6** Spinnakers **4**

Spinnaker configuration
Symmetric: **Yes** 130.50
Asymmetric: **No**
Flying H/S: **No**
Spin. Pole: **Yes**

Class Division Length

CDL = 10.627

Stability (Measured)

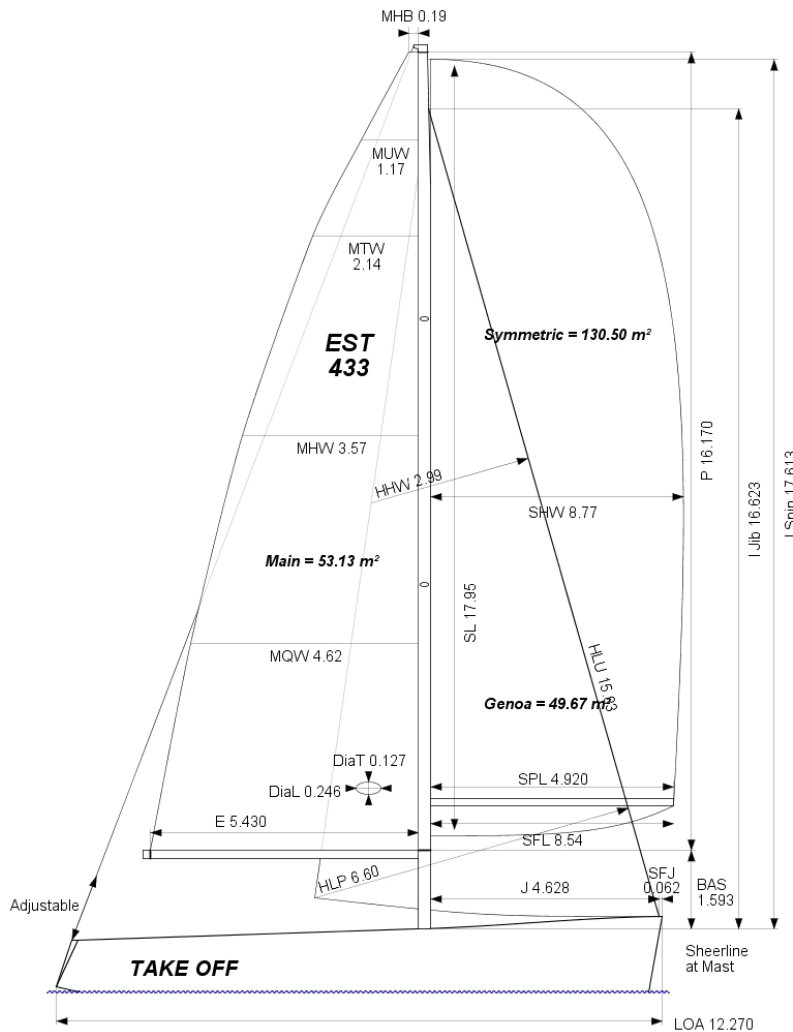
Limit Positive Stab.: **111.6°**
Stability Index: **117.2**

Owner

**Rain Liiber
Pilviku tee 21, Patika
Rae vald, Harjumaa
Estonia**

I certify that I understand my responsibilities under ORC Rules and Regulations

Signature



| BOAT | | GPH | | HULL | | |
|------------------------|--------------------------------|---------------|---------------|---------------------------|----------------------|---------------|
| Name | Take Off | | | Data File | Est0433 | |
| Sail Nr | EST 433 | | | Offset File | ELAN410N.OFF | |
| | | 587.2 | | Displacement | 9,106kg | |
| | | | | LOA | 12.270m | |
| | | | | MB | 3.878m | |
| | | | | Draft | 2.139m | |
| CLASS | | | | IMS Division | Cruiser/Racer | |
| Class | ELAN 410 | | | Dynamic All. | 0.134% | |
| Designer | ROB HUMPHREYS | | | Fwd Accom. | Yes | |
| Builder | ELAN MARIN | | | Construction | Cored | |
| Series | 05/2007 | | | Fiber Rigging | No | |
| Age Date | 03/2009 | | | Aramid Core | No | |
| Age Allowance | 0.390% | | | Carbon Rudder | No | |
| | | | | Light Stanchions | | |
| COMMENTS | | | | IMSL | 11.618m | |
| Ex SWE-48 | | | | VCGD | 0.196m | |
| | | | | Sink | 25.70kg/mm | |
| | | | | RL | 9.633m | |
| | | | | VCGM | 0.134m | |
| | | | | WS | 34.43m² | |
| | | | | LSM0 | 11.676m | |
| | | | | Displacement/Length ratio | 5.7207 | |
| PROPELLER | | | | Water Ballast | 0 | |
| Installation | Strut | PRD | 0.425 | Trim Tab | No | |
| Type | Folding 2 blades | PBW | 0.125 | BLR Index | 0.0000 | |
| | | PIPA | 0.0040 | CENTERBOARD | | |
| | | | | N/A | | |
| SCORING OPTIONS | | | | | | |
| | COASTAL / LONG DISTANCE | | | WINDWARD / LEEWARD | | |
| Time on Distance | 571.1 | | | 637.4 | | |
| Time on Time | 1.0507 | | | 1.0591 | | |
| Triple Number | Low | Medium | High | Low | Medium | High |
| Time on Distance | 671.3 | 520.2 | 467.3 | 867.1 | 641.2 | 557.8 |
| Time on Time | 1.0055 | 1.2976 | 1.4444 | 0.7785 | 1.0527 | 1.2102 |

| | |
|----------------------|---------------------------------|
| BOAT | |
| Name Take Off | Sail Nr EST 433 |
| File Est0433 | Data in meters/kilograms |

| | | | |
|--|------------------|-----------------------|--|
| INCLINING TEST AND FREEBOARDS | | | |
| Inclining Test Current Inclining | | | |
| Flotation date 08/05/2009 | | SG 1.0050 | |
| FFM 1.486 | FF 1.500 | SFFP 0.430 | |
| FAM 1.043 | FA 1.049 | SAFP 11.848 | |
| W1 105.8 | PD1 524.2 | WD 12.223 | |
| W2 105.8 | PD2 523.1 | GSA 1.0 | |
| W3 105.8 | PD3 526.6 | RSA 1.0 | |
| W4 105.8 | PD4 525.4 | PLM 9000.0 | |
| LCF from stem on CL / on sheer | | 6.894 / 7.154 | |
| Maximum beam station from stem | | 7.500 | |
| RM Measured | | 194.0kg·m | |
| RM Default | | 212.7kg·m | |
| Limit of positive stability / Stab.Index | | 111.6° / 117.2 | |
| Freeboard at mast at 4.690 | | 1.267 | |



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2019
Measurements
Datasheet

| | | | |
|--------------------------------|----------------------------|-------------------|-------------------|
| RIG | | | |
| Forestay Tension Aft | Spreaders 2 | | |
| Inner Stay None Fitted | Runners 0 | | |
| Carbon Mast No | Jumper Struts None | | |
| Taper Hollows No | Jib Furler No | | |
| Fiber Rigging No | Main Furler No | | |
| Lenticular Rigging No | Without Backstay No | | |
| Articulated Bowsprit No | | | |
| P 16.170 | E 5.430 | MDT1 0.127 | MW 0.220 |
| IG 16.623 | J 4.628 | MDL1 0.246 | GO 0.228 |
| ISP 17.613 | SFJ 0.062 | MDT2 0.125 | BD 0.170 |
| BAS 1.593 | SPL 4.920 | MDL2 0.176 | MWT 273.00 |
| FSP 0.070 | TPS | TL 2.720 | MCG 6.180 |

| | |
|-----------------------------|--|
| MIZZEN RIG AND SAILS | |
| N/A | |

| | | | |
|------------------------------|--------------------|------------------|--|
| PROPELLER | | | |
| Installation Strut | PRD 0.425 | | |
| Type Folding 2 blades | PBW 0.125 | | |
| Twin Screw No | PIPA 0.0040 | | |
| ST1 0.065 | ST3 0.180 | ST5 0.305 | |
| ST2 0.180 | ST4 0.110 | EDL 3.130 | |

| | |
|-------------------------------|--|
| Certificate | |
| Number Est433 | |
| ORC Ref EST00000583 | |
| Issued On 5/23/2019 | |
| VPP Ver. 2019 1.01 | |
| Valid until 12/31/2019 | |

| | |
|-----------------|--|
| COMMENTS | |
| Ex SWE-48 | |

| | |
|------------------------|--|
| MOVABLE BALLAST | |
| N/A | |

| | |
|--------------------|--|
| CENTERBOARD | |
| N/A | |

| SAILS INVENTORY | | | | | | | | | | | | | | | | |
|----------------------------------|-------|-------|-------|------|------|--------|----------|------------|-------------|-------------|----------|----------|------------|-------------|----------|---------|
| MAINSAIL (1) | | | | | | | | | | | | | | | | |
| Id | MHB | MUW | MTW | MHW | MQW | Area | Measurer | Meas.Date | Manufacture | Material | Comment | | | | | |
| 1 | 0.19 | 1.17 | 2.14 | 3.57 | 4.62 | 53.13 | EST 7 | 06/04/2019 | | Unknown | | | | | | |
| HEADSAILS (2) | | | | | | | | | | | | | | | | |
| Id | HHB | HUW | HTW | HHW | HQW | HLP | HLU | Ovrlp | Area | Btn | Fly | Measurer | Meas.Date | Manufacture | Material | Comment |
| 1 | 0.06 | 0.75 | 1.44 | 2.99 | 4.72 | 6.60 | 15.83 | 143% | 49.68 | | | EST 8 | 22/05/2019 | | Unknown | |
| 2 | 0.10 | 0.86 | 1.52 | 2.56 | 3.54 | 4.49 | 14.10 | 97% | 34.71 | | | EST 1 | 13/05/2014 | | Unknown | |
| SYMMETRIC SPINNAKERS (2) | | | | | | | | | | | | | | | | |
| Id | SLU | SLE | SL | SHW | SFL | Area | Measurer | Meas.Date | Manufacture | Material | Comment | | | | | |
| 1 | 17.95 | 17.95 | 17.95 | 8.77 | 8.54 | 130.50 | D206 | 26/08/2010 | | Unknown | S-4 | | | | | |
| 2 | 17.88 | 17.88 | 17.88 | 8.77 | 8.54 | 129.99 | | | | Unknown | S-1,5 | | | | | |
| ASYMMETRIC SPINNAKERS (0) | | | | | | | | | | | | | | | | |
| Id | SLU | SLE | SL | SHW | SFL | Area | Kind | Measurer | Meas.Date | Manufacture | Material | Comment | | | | |

| MEASUREMENT INVENTORY | | | | |
|------------------------------|-----------|-------------|-------------|-----------------|
| Measurer 1129 | | | | |
| Date 08/05/2009 | | | | |
| Comment | | | | |
| Id | Item | Weight | Distance | VCG Description |
| A2 | Anchor | 40.0 | 4.60 | MUCHROOM- |
| A4 | Anchor | 45.0 | 4.60 | BRUCE |
| T4 | Tools | 49.2 | 8.10 | |
| Id | Item | Maker | Model | |
| E1 | Engine | VOLVO PENTA | 40 hp D240 | |
| Id | Item | Weight | Description | |
| DG | Deck-Gear | 15.0 | | |

| MEASUREMENT INVENTORY | | | | | | | | | |
|------------------------------|---------|----------|-----------|--------|-------------|-----|-------|--------------|--|
| Id | Item | Tank Use | Tank Type | Capcty | Dist. | VCG | Condn | Description | |
| TW | Tank | WATER | SS | 25.0 | 4.50 | | 3-0 | WATER HEATER | |
| TH | Tank | HOLDING | PLASTIC | 35.0 | 9.80 | | 0-0 | | |
| TF | Tank | FUEL | PLASIC | 120.0 | 9.80 | | 0-0 | | |
| TW | Tank | WATER | PLASIC | 177.0 | 5.10 | | 0-0 | | |
| TW | Tank | WATER | PLASTIC | 177.0 | 5.10 | | 0-0 | | |
| Id | Item | Weight | Distance | VCG | Description | | | | |
| B2 | Battery | | 2.30 | | 2 * 85 Ah | | | | |
| B1 | Battery | | 6.80 | | 85 Ah | | | | |

2009

ORC Club Certificate Appendix

| BOAT | | | |
|-------------|----------|--------------------|-----------|
| Name | Take Off | Certificate Number | Est433 |
| Sail Nr | EST 433 | Issued On | 5/23/2019 |

| TIME ALLOWANCES | | | | | | | |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Wind Velocity | 6 kt | 8 kt | 10 kt | 12 kt | 14 kt | 16 kt | 20 kt |
| Beat VMG | 983.3 | 814.1 | 722.1 | 680.3 | 662.6 | 654.8 | 649.4 |
| 52° | 642.8 | 542.9 | 491.0 | 472.1 | 465.2 | 461.8 | 460.3 |
| 60° | 606.9 | 517.2 | 476.3 | 460.0 | 452.9 | 449.3 | 446.9 |
| 75° | 579.6 | 499.4 | 466.2 | 449.7 | 438.8 | 431.9 | 425.8 |
| 90° | 585.4 | 500.7 | 465.3 | 447.3 | 433.5 | 421.2 | 403.0 |
| 110° | 601.0 | 497.7 | 456.6 | 436.2 | 422.4 | 412.7 | 394.9 |
| 120° | 616.7 | 507.8 | 460.9 | 437.7 | 417.4 | 398.9 | 377.8 |
| 135° | 680.8 | 553.6 | 482.7 | 451.9 | 431.0 | 409.8 | 368.5 |
| 150° | 805.3 | 641.8 | 544.1 | 484.4 | 453.8 | 433.9 | 394.1 |
| Run VMG | 929.8 | 741.1 | 628.2 | 553.1 | 504.0 | 466.8 | 426.0 |
| Selected Courses | | | | | | | |
| Windward / Leeward | 956.6 | 777.6 | 675.2 | 616.7 | 583.3 | 560.8 | 537.7 |
| Circular Random | 806.4 | 651.9 | 569.6 | 522.5 | 494.0 | 475.7 | 453.4 |
| Coastal / Long Distance | 953.9 | 730.4 | 608.5 | 539.1 | 503.2 | 475.6 | 433.7 |
| Non Spinnaker | 862.1 | 691.2 | 598.5 | 544.4 | 511.1 | 489.6 | 463.2 |

| Velocity Prediction in Knots for True Wind Speeds | | | | | | | |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Wind Velocity | 6 kt | 8 kt | 10 kt | 12 kt | 14 kt | 16 kt | 20 kt |
| Beat Angles | 43.0° | 41.3° | 40.8° | 40.0° | 39.2° | 38.9° | 38.8° |
| Beat VMG | 3.66 | 4.42 | 4.99 | 5.29 | 5.43 | 5.50 | 5.54 |
| 52° | 5.60 | 6.63 | 7.33 | 7.63 | 7.74 | 7.79 | 7.82 |
| 60° | 5.93 | 6.96 | 7.56 | 7.83 | 7.95 | 8.01 | 8.06 |
| 75° | 6.21 | 7.21 | 7.72 | 8.01 | 8.20 | 8.34 | 8.45 |
| 90° | 6.15 | 7.19 | 7.74 | 8.05 | 8.30 | 8.55 | 8.93 |
| 110° | 5.99 | 7.23 | 7.88 | 8.25 | 8.52 | 8.72 | 9.12 |
| 120° | 5.84 | 7.09 | 7.81 | 8.22 | 8.62 | 9.02 | 9.53 |
| 135° | 5.29 | 6.50 | 7.46 | 7.97 | 8.35 | 8.78 | 9.77 |
| 150° | 4.47 | 5.61 | 6.62 | 7.43 | 7.93 | 8.30 | 9.13 |
| Run VMG | 3.87 | 4.86 | 5.73 | 6.51 | 7.14 | 7.71 | 8.45 |
| Gybe Angles | 142.6° | 148.6° | 150.4° | 155.0° | 167.6° | 180.0° | 180.0° |