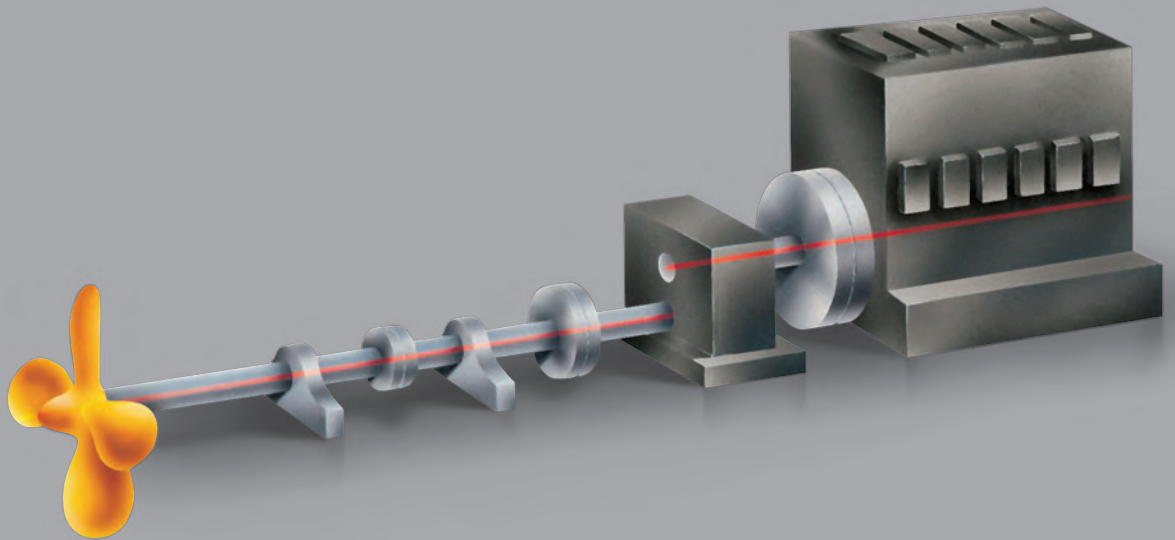


ALIGNMENT, MOUNTING & ENGINEERING SERVICES



MACHINE SUPPORT

Alignment, On-Site Machining and Chocking Solutions



Machine Support - Marine Services

Machine Support is a leader in the field of alignment and mounting of machines for blue water, brown water and platforms. Machine Support has offered owners, operators, shipbuilders, ship repair organizations and OEM's a comprehensive portfolio of measuring, positioning, mounting and bolt tensioning for all types of drives, gears, shafting and steering systems for over twenty years. Our experience in the marine field with the alignment and mounting of both main propulsion units and auxiliary equipment is unsurpassed.



Misalignment is a main cause of machinery failure. Generally, misalignment is caused by inadequate measurement techniques, an improper foundation or degradation of the foundation. The alignment of a propulsion unit can also be influenced by deformations in a vessel's engine room and hull, caused by changes in the operation conditions, working environment or the cargo load condition

of a vessel. Misalignment reduces the life time of bearings, seals and couplings. Higher energy consumption, noise, vibrations and excessive stress in machine parts can all be a result of misalignment. Ultimately misalignment may lead to costly down time.

We routinely consult with classification societies and navies around the world to examine alignment and mounting problems, solutions and measuring technique improvements to accomplish our shared objectives to reduce operation down time. The combination of our engineering and calculation software, measurement techniques and machinery mounting solutions is unique in the world.

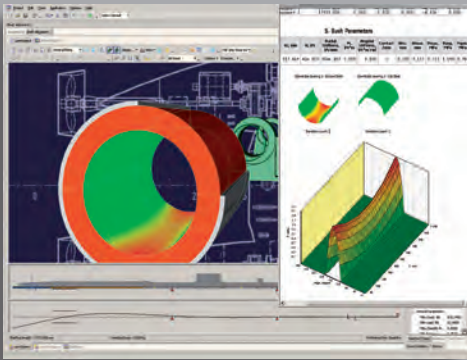
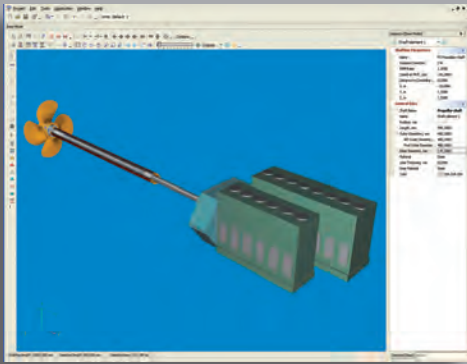
The Machine Support strength is that we can measure, detect and solve alignment problems. From design through trials or spot repairs, Machine Support offers an efficient and competitive solution to your machinery alignment and mounting needs. When re-alignment or machining is necessary to reach the alignment targets, we have the flexibility to do this anywhere in the world. You can leave large and complex turnkey projects up to us, both in new building and repair. We welcome your inquiries!

MACHINE SUPPORT, WHEN THERE'S NO TIME FOR THE UNEXPECTED!



Measuring Services

- Horizontal and vertical alignments (propulsion systems)
- Straightness and concentricity (stern tubes, line bores)
- Flatness (slewing bearings, bed plates, etc.)
- Perpendicularity (rudders & propeller shafts)
- Parallelism (bores and shafts)
- Thermal growth
- Crank web deflections (crankshafts)
- Torsional vibration measurement and analysis
- Coordinates, distances and geometric shapes (hull deformations)

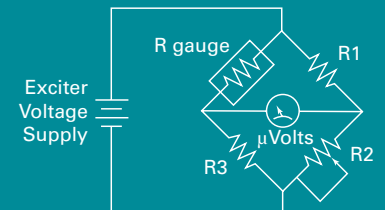


Engineering Services

- Shaft alignment calculation and analysis
- Engineering of chocking plans to suit customer and classification society requirements
- Trouble shooting of noise & vibration problems
- Project engineering
- Ship design; hull, machinery & piping systems (NUPAS-CADMATIC, Tribon software)

Measuring Technologies

- Laser alignment (shaft/line bore/geometric)
- 3D measurement with Sokkia MONMOS Total Station or with a laser tracker system
- Electronic measurement of bearing reaction forces
- Strain gauge measurements (torque, shaft alignment)



Mounting & Installation Services

- Chocking using our patented Vibracon[®] adjustable chocks or with epoxy resins (main engines, stern tubes, gearboxes, gas tanks, winches, etc.)
- On site machining (stern tubes, line bores, bed plates, slewing bearing foundations, flange facing, propeller taper and keyway, etc.)
- Mounting of couplings, bearing housings, propeller blades, water jets, etc.



Products

- Vibracon® self leveling, height adjustable and re-usable chocks
- Mounting kits (package including Vibracon®, foundation bolts, spherical washers, class approval, etc.)
- Steelshim® stainless steel shims and kits
- ShaftDesigner, the shaft alignment and vibration calculation software



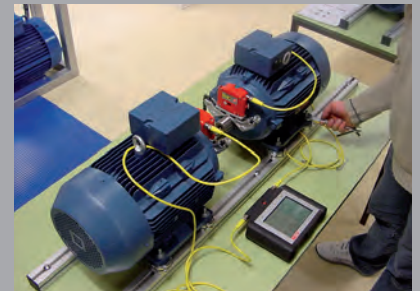
Training

We offer basic and advanced training programs which are tailored to suit the specific training needs of your organization. The alignment and machinery mounting courses are available in our offices or at a location of your choice.



Quality

Our employees are highly trained professionals. They regularly undergo refresher courses to stay current with advanced equipment and technologies. Our work complies with contract specifications and we are accustomed to perform to the class standards. Machine Support is qualified to the international ISO 9001 standard.



Time

With our comprehensive experience, flexibility and creativity we have the knowledge to save money through efficient repairs. Wherever you are in the world, Machine Support can save you time and money when it comes to alignment and mounting.



Offices

Our services and products are available worldwide, directly from Machine Support or through our distributors. Please check our website for our current overview of contacts.



www.machinesupport.com



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