



MOORING BUOYS SOLUTIONS



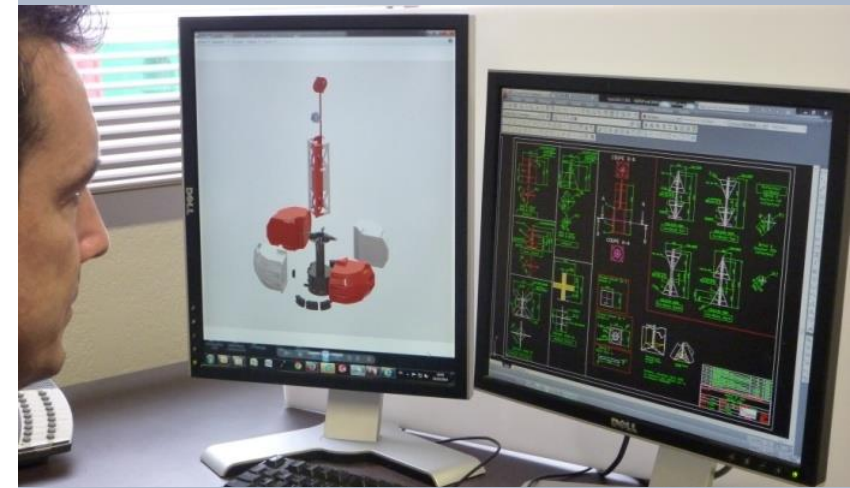
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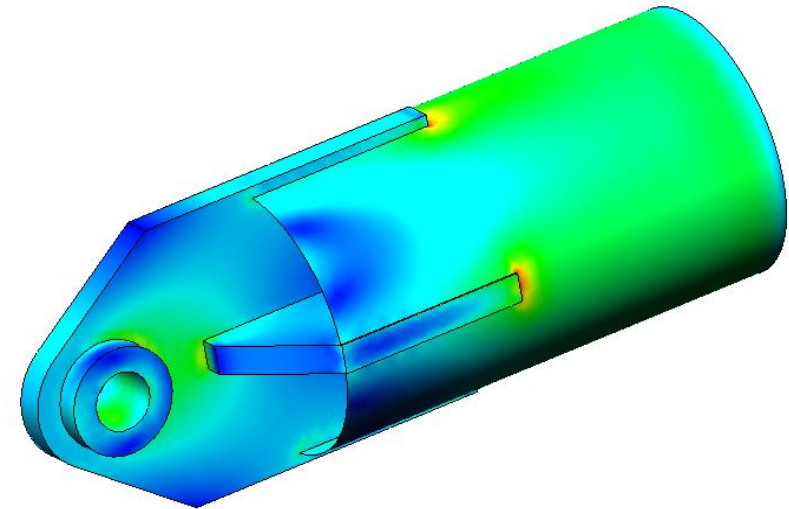
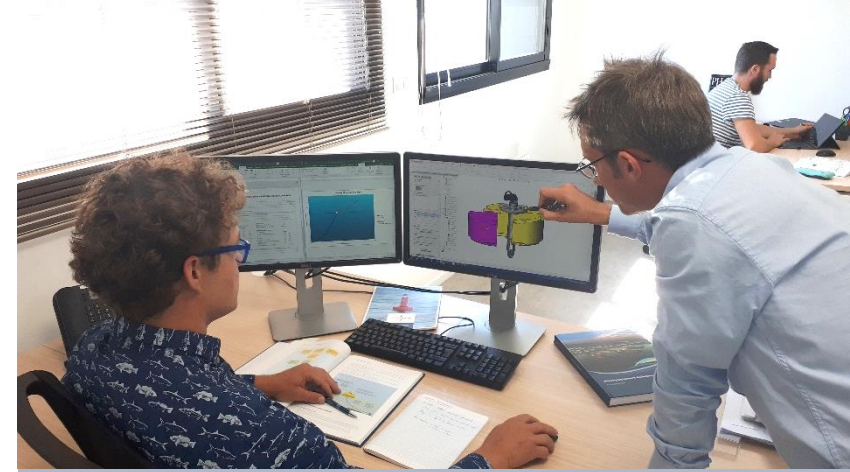
INNOVATIVE PE FLOATING SOLUTIONS

- Since the 1990's, GISMAN has been designing and manufacturing rotationally-moulded polyethylene buoys:
 - › Diameter from 0.9 to 3m,
 - › Volume from 0.2 to 12m³.
- Quality Management System certified according to ISO-9001:2015 standard:
 - › Approved by Lloyd's Register Quality Assurance since 2013,
 - › ISO 9001:2015 certificate ID no. 10241392.



CUSTOM-MADE MOORING SOLUTIONS

- Our in-house design and engineering department is able to provide custom-made mooring solutions to match all operational parameters:
 - › All types of ships: tankers, LNG, passengers' ships, working vessels, tug-boats, fishing boats, etc.,
 - › All types of site conditions: deep sea, coastal waters, estuary, ports, rivers, etc.,
 - › Single Point Mooring (SPM) or Multi Buoy Mooring (MBM),
 - › All type of anchoring solutions: drag embedment anchors, concrete or cast-iron sinkers.



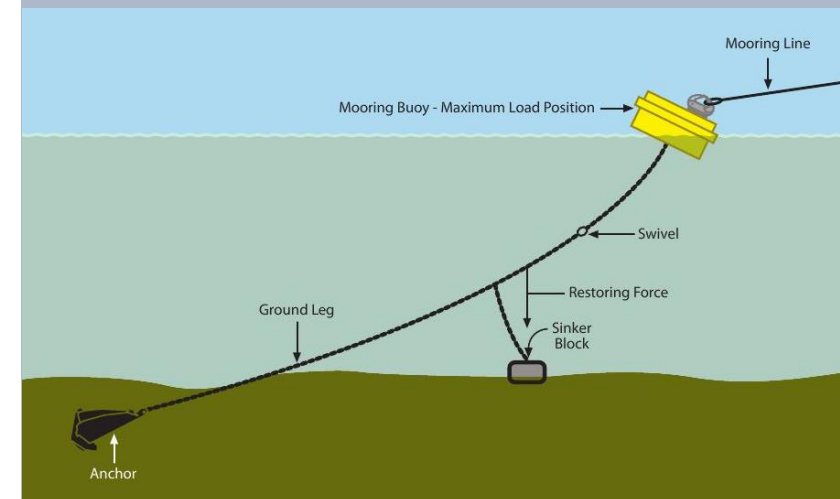
MOORING SOLUTIONS COMPLIANT WITH INTERNATIONAL STANDARDS

- Analytic and dynamic calculations:
 - › ORCAFLEX dedicated software,
 - › Standards: API RP 2SK “design and analysis of station-keeping systems for floating structures” and DNVGL-C205 “environmental conditions and environmental loads”.

- Structural calculations:
 - › SolidWorks Simulation software,
 - › DNV standards: “DNVGL-OTG-18 “long term near shore mooring” and DNVGL-OS-E301 “position mooring”,
 - › OCIMF Guidelines.

GISMAN		CONVENTIONAL BUOY MOORING (CBM) CALCULATION	
Customer	GISMAN	Date	07/08/2019
Country - Location	France - Brech	Realised by:	JLB
Mooring calculations - Calculation based on : - API RECOMMENDED PRACTICE 2SK THIRD EDITION, OCTOBER 2005 - Estimating The Environmental Loads On Anchoring Systems / Oil Companies International Marine Forum / First Edition - October 2010 - Oil Companies International Marine Forum / Mooring Equipment Guidelines 4th Edition			
INPUT DATA FOR CALCULATIONS			
<i>Site information</i>		<i>Mooring type</i>	
Exposure	Semi-exposed	Mooring configuration	CBM
Seabed type	Mud-Clay	Mooring buoy type required	QRH type
Mooring depth (Chart datum)	25 m		
Maximum tidal range	0 m	<i>Characteristics of vessels</i>	
Atmospheric surge in meter (if any)	0 m	Vessel type	Tanker
Maximum wind speed	25 m/s	Length between perpendiculars	115 m
Prevailing wind direction*	45 °	Beam	25 m
Maximum current speed	1 m/s	Draught	6 m
Prevailing current direction*	90 °	H (height above MSL)	20 m
Maximum height (Hmax) of the swell	2,418 m	Fairlead height (with respect to MSL)	10 m
Period of the swell	5 s	Hawser length	100 m
Prevailing direction of the swell*	0 °	Ship's mooring lines capacity	25 Tons

* prevailing directions (wind/current/waves coming from...) are all considered positive clockwise from North direction (0°)



A COMPREHENSIVE RANGE OF MOORING BUOYS AND ACCESSORIES

- Rotationally-moulded polyethylene floats:
 - › 0.4 to 12m³ volume,
 - › Made from UV-stabilized virgin polyethylene,
 - › Filled with EPS foam to provide high resilience to shocks.
- Steel structures:
 - › Painted or hot dip galvanized,
 - › 5.5 to 80 tons mooring capacity (SWL),
 - › Different mooring links available: D-Link, S-Shackle or T-Static.
- Associated mooring systems and accessories:
 - › Chains,
 - › Drag embedment anchors,
 - › Sinkers.



MEDIUM SIZE MOORING BUOYS FOR A SAFE WORKING LOAD (SWL) UP TO 12 TONS

Model	MB-1250	MB-1400-0.7	MB-1400-1.5
Float diameter (m)	1.25	1.40	1.40
Volume (in m ³)	0.4	0.7	1.5
SWL (in tons)	5.5	5.5 to 11	5.5 to 12
Available links	D	D or S	D or S



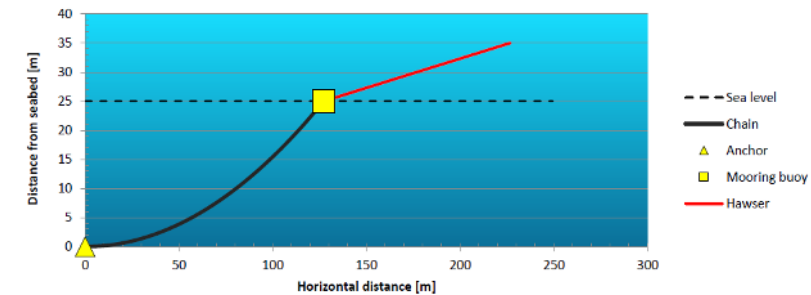
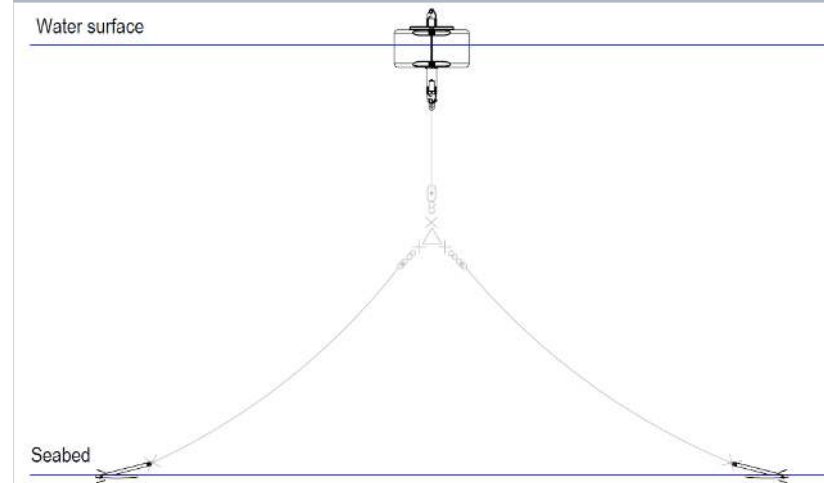
LARGE SIZE MOORING BUOYS FOR A SAFE WORKING LOAD (SWL) UP TO 80 TONS

Model	MB-2000	MB-2500	MB-3000
Float diameter (m)	2.0	2.5	3.0
Volume (in m ³)	3.1	5.25	7.5 or 10 or 12
SWL (in tons)	11 to 33	17 to 80	48 to 80
Available links	D, S or T	D, S or T	D, S or T



MOORING LEGS

- Studless and stud link chains: BV and LRQS certified,
- Associated mooring components: swivels, shackles, kenter shackles, etc...
- Sinkers: in concrete or cast-iron,
- Different types of Drag Embedment Anchors: HHP AC-14, Flipper Delta, Danforth, Stevpris, etc...



ASSOCIATED SERVICES

- Needs and requirements analysis,
- Design and evaluation of solutions by an in-house design and engineering office,
- Commissioning of the equipment,
- Technical assistance.



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