

INGEMAR

Maritime Engineering

MARINA D'ITALIA

This easy to consult digest, is an updated panorama of the most important marinas from around our coastline, monitored in collaboration with Panama Editore and Il Giornale della Vela and dedicated to the Friends of Ingemar. Whether you keep it handy for studying your next holidays or whether you are contemplating a weekend excursion in good company, we wish you many a happy itinerary along our beautiful and welcoming coastline in tantalising harbours sheltered from any unforeseen hitches.

2015

Excerpt from *Il Giornale della Vela*

VELA

2015 DOSSIER ON PORTS

More modern marinas and unchanged, or even lower, charges: times have changed and mooring boats in Italy has again become affordable and moreover unique as no other country can offer the tourist, cultural and natural landscape itineraries such as here.



Italians do it better



The re-launching of Italian marinas has begun: competitive prices, VAT on moorings at 10% - the time has come to float the boats again!

The re-launching of Italian marinas has begun: competitive prices, VAT on moorings at 10% - the time has come to float the boats again!

No other country around the Mediterranean (or in the world) can boast coastlines such as this, and it's not just a question of natural beauty but an enormously varied territory rich with ancient history.

Do you remember when it was practically impossible to find a mooring in Italy and the prices were ludicrous?

We're not talking about ancient history but about just a few years ago. Today the situation has changed radically, also regarding costs: prices simply haven't changed since 2008 and in some cases have actually gone down.

Southern Italy has also grown, both in the numbers of moorings as well as services.

If marinas in southern Italy were 'populated' only in the summer season nowadays, thanks to the explosion of low cost airlines, this has all changed. Boat owners, especially those from northern Italy, who move their yachts - for example around Sicily - are ever more numerous and the charges have become extremely affordable meaning that it is now very easy to cruise around and explore.

We are also seeing a growth of networks running marinas, tourist harbours and supplying services that single operators were not able to offer before but whose growth rate offers much optimism for the re-launching of the Italian sailing industry.

As always we hope you enjoy consulting our brochure and we wish you great sailing.

239 MARINA D'ITALIA/LIGURIAN SEA, NORTHERN TYRRHENIAN SEA

PORTS AND RESORTS		TELEPHONE - FAX	E-MAIL - WEB	VHF CHANNEL	TOTAL No. BERTHS	No. TRANSIT BERTHS	METRIC LENGTHS	DEPPTH IN METRES	MAXIMUM LOAD IN TONNES	ANNUAL RENTAL			DAILY RENTAL (HIGH SEASON)		
										9 METRES	12 METRES	18 METRES	9 METRES	12 METRES	18 METRES
LIGURIAN SEA															
1	Marina di Sant'Ampeglio Bordighera (IM)	0184 266688 0184 265656	ufficioporto@bordighera.it www.bordighera.it	9-16	250	35	max 20	3-5	25	1.4/1.700	2/2.200	3.2/3.500	15/20	20/30	35/45
2	Portosole C.N.I.S. Sanremo (IM)	0184 5371 0184 537411	info@portosolesanremo.it www.portosolesanremo.it	9	804	40	7-90	2,5-7	750	-	7.100	12.900	25/45	30/50	60/100
3	Marina degli Aregai S. Stefano al Mare (IM)	0184 4891 0184 489200	info@marinadegliaregai.it www.marinadegliaregai.it	9	898	-	6-40	3-7	100	4.900	6.600	12.500	25/35	35/55	60/100
4	Marina di San Lorenzo San Lorenzo al mare (IM)	0183 9352 0183 931418	info@marinadisanolorenzo.it www.marinadisanolorenzo.it	9	365	37	6-20	3-5	-	5.150	7.200	11.400	38	55	90
5	Porto di Imperia Imperia Porto Maurizio (IM)	0183 62679 0183 62112	info@portodimperia.it www.portodimperia.it	9	1293	130	5-90	5/6	130	6.000	7.200	12.800	45	55	100
6	Gestioni Municipali Diano Marina (IM)	0183 426860 0183 495131	porto@gestionimunicipali.com www.gestionimunicipali.com	16	250	10	5-15	1,5-2,5	15	2.800	4.800	6.800	20	35	50
7	Cala del Forte Ventimiglia (IM)	340 1859397 -	g.mascolo@grup pocozziparodi.it www.caladelforte-ventimiglia.it	24	300	-	6,5-45	-	-	-	-	-	-	-	-
8	Marina di Andora Andora (SV)	0182 88313 0182 681707	info@portodandora.it www.portodandora.it	9	852	79	max 20	2-4	30	3.400	5.000	9.500	25	70	80
9	Marina di Alassio Alassio (SV)	0182 645012 0182 648655	info@marinadiallassio.net www.marinadiallassio.net	9	400	500	5-35	1-3	30	3.200	5.000	8.700	35	60	100
10	Porto di Loano Loano (SV)	019 675445 019 669264	info@marinadiloano.it www.marinadiloano.it	9	827	100	40	3,5-5	8	5.950	7.650	17.000	58	75	166
11	Porto Poseidon Borghetto Santo Spirito (SV)	0182 990038 0182 991211	info@portodiborghetto.it www.portodiborghetto.it	9	200	-	0/840	2,5	40	-	-	-	-	-	-
12	Capo San Donato Finale Ligure (SV)	019 603290 019 6049756	porto@finaleambiente.it www.comunefinaleligure.it	16-69	565	15	4-17	1,5-3,50	3,5	560/2.600	3.1/4.700	5/8.200	10/20	25/35	40/60
13	Marina di Varazze Varazze (SV)	019 935321 019 9353250	giorgio.casareto@marinadivarazze.it www.marinadivarazze.it	9	800	71	10-35	3-6	100	-	-	-	-	-	-
14	Marina Molo Vecchio Genova	010 27011 010 2701200	mmv@mmv.it www.mmv.it	71	160	-	90	s. limiti	300	5,5/6000	8/8.500	12/12.500	40	55	90
15	Marina Porto Antico Genova	010 2470039 010 2516910	porto@marinaportoaantico.i t www.marinaportoaantico.it	74	280	27	10-55	2-6	75	-	8.500	15.000	40	50	100
16	Marina Genova Aeroporto Genova	010 6143420 010 6531558	info@marinagenova.it www.marinagenova.it	71	500	50	8,5-125	15	25	4.700	6.250	11.300	42	58	104
17	Porto Carlo Riva Rapallo (GE)	0185 6891 0185 63619	info@portocarloriva.it www.portocarloriva.it	9	400	-	max 75	2,5-9	25	8/9.000	13/14.000	22/23.000	55/65	110/120	170/180
18	Marina Chiavari Chiavari (GE)	0185 364081 0185 1871260	info@marina-chiavari.it www.marina-chiavari.it	10-16	459	35	6-25	2,5	40	6.799	9.104	15.148	40	55	90
19	Porto di Lavagna Lavagna (GE)	0185 312626 0185 300211	reception@portodilavagna.com www.portodilavagna.com	9-16	1400	140	8-50	2,3-5,9	350	5.200	7.700	17.600	40	45	95
20	Marina del Fezzano Fezzano di Portovenere (SP)	0187 790103 0187 790513	info@marinadelfezzano.it www.marinadelfezzano.it	9	250	24	25	6	60	5/6.000	7/7.500	9/10.000	40/50	50/60	110/130
21	Portovenere Portovenere (SP)	0187 793042 0187 793042	portodiportovenere@portodiportovenere.it www.portodiportovenere.it	9	32	6	10-50	1-4	5	-	-	-	50/60	60/80	90/120
22	Porto Lotti La Spezia	0187 532201 0187 532244	ufficioporto@portolotti.it www.porto-lotti.com	9	530	50	12-60	3-9	160	-	9.960	16.440	-	108	216
23	Porto Mirabello La Spezia	0187 778108 0187 732102	dir@portomirabello.it www.portomirabello.it	73	470	39	25-100	3,50-9	160	-	10.000	17.000	-	90.00	180
24	Marina 3 B Sarzana (SP)	0187 676370 0187 676380	info@marina3b.it www.marina3b.com	16	150	-	8-24	-	40	SU RICHIESTA	-	-	-	-	-
25	Darsena Arma di Taggia Arma di Taggia (IM)	0184 41 021	info@cnaarma.it www.cnaarma.it	16	122	3	9	2-3	9	2.000	-	-	26	-	-
26	Marina di Portofino Portofino (GE)	0185 269388	info@marinadiportofino.com www.marinadiportofino.com	12	12	16	-	4,5	8	-	-	-	67	96	135
27	Porto Alberto de Benedetti La Spezia	0187 728263 0187 738368	assonauticasp@libero.it www.assonauticasp.it	71	650	65	5-13	2-6	0	-	-	-	29	37	39
28	Porto di Arenzano Arenzano (GE)	010 9125172	posta@portodiarenzano.it www.portodiarenzano.it	9	185	21	20	3	40	6.900	10.000	18.600	40	50	95
29	Porto di Bocca di Magra	0187 608037 -	info@amegliaservizi.it www.portoboccadimagra.it	8	210	20	30	3-4	0	4.900	8.700	14.500	36	48	72
30	Porto Tur. San Bartolomeo al Mare San Bartolomeo Al Mare (IM)	0183 4092225 0183 406479	bellacico@sanbart.it www.comunesanbartolomeoalmare.it	16	174	17	15	2,6	0	2.600	5.700	-	20	42	55
31	Marina Fiera Genova	010 53911 010 5391270	fierage@fierage.it www.fiera.ge.it	74	200	40	10-60	11	0	-	7.800	11.400	-	54	84
NORTHERN TYRRHENIAN SEA															
32	La Madonnina Viareggio (LU)	0584 32033 0584 32033	viareggioportosrl-inliquidazione@pec.it www.viareggio-portospa.it	12	560	80	max 80	max 4	100	1/3.000	3/5.000	11/13.000	40/50	70/80	-
33	Boccadarno Porto di Pisa Marina di Pisa (PI)	050 36142 050 310621	info@portodipisa.it www.portodipisa.it	74	344	35	8-50	3,50-5	50	-	-	-	-	-	-
34	Marina Cala de' Medici Rosignano Solvay (LI)	0586 795211 0586 764553	info@marinacalademedici.it www.marinacalademedici.it	9	650	65	8-36	2-6	100	5.800	9.300	17.000	20/50	35/87	70/186
35	Marina di San Vincenzo San Vincenzo (LI)	0565 702025 0565 705467	porto@marinadisavincenzo.it www.marinadisavincenzo.it	9	283	40	27	4,5	80	-	-	-	-	-	-
36	Esaom Cesa Portoferraio (LI)	0565 919311 0565 917397	commerciale@esaom.it www.esaom.it	9	174	40	4-35	1-7	240	4/5.000	6/6.500	9/10.000	50/70	60/80	90/120
37	Darsena Medicea Portoferraio (LI)	0565 944024 0565 945355	porto@marinadiportoferraio.it www.marinadiportoferraio.it	9	70	7	7-65	2,5-6,5	0	-	-	-	60	100	140

The symbols beside the numbers mean: ▲ port under construction ◆ in part supplied with Ingemar mooring structures ● fully supplied with Ingemar mooring structures.

239 MARINA D'ITALIA/NORTHERN, CENTRAL & SOUTHERN TYRRHENIAN SEA

PORTS AND RESORTS		TELEPHONE - FAX	E-MAIL - WEB	VHF CHANNEL	TOTAL No. BERTHS	No. TRANSIT BERTHS	METRIC LENGTHS	DEPTH IN METRES	MAXIMUM LOAD IN TONNES	ANNUAL RENTAL			DAILY RENTAL (HIGH SEASON)		
										9 METRES	12 METRES	18 METRES	9 METRES	12 METRES	18 METRES
38	Marina di Salivoli Piombino (LI)	0565 42809 0565 42824	info@marinadisalivoli.it www.marinadisalivoli.it	19-9	490	48	6-18	2,5-4	80	3/4.000	11.000	16.000	40	65	140
39	Ormezzio Terre Rosse Colmata (LI)	0565 276640 0565 276640	info@ormeggioterrerosse.it www.ormeggioterrerosse.it	-	575	-	6-10	1,8-3	64	1,5/2.000	-	-	-	-	-
40	Porto di Cecina Cecina (LI)	0586 620602 0586 622795	info@portodicecina.it www.portodicecina.it	9	536	15	max 40	-	-	-	-	-	-	-	-
41	La Marina di Scarlino Scarlino (GR)	0566 867001 0566 866252	info@marinadiscarlino.it www.lamarinadiscarlino.it	72	950	59	2-40	4	100	6/6.800	9.050/10,3	19.650	50/60	80/90	170
42	Marina di Punta Ala Punta Ala (GR)	0564 922217 0564 921086	info@marinadipuntaala.com www.marinadipuntaala.com	9	893	90	6-28	4,5	100	-	-	-	-	-	-
43	Marina di San Rocco Marina di Grosseto (GR)	0564 330075 0564 33093	info@portodellamaremma.it www.portodellamaremma.it	9	557	54	max 14	max 2,5	20	4,5/5.500	7,5/8.000	-	35/45	55/65	-
44	Marina Cala Galera Cala Galera (GR)	0564 833010 0564 831186	info@marinacalagalera.com www.marinacalagalera.com	9	670	60	6-50	3,5-6	320	-	-	-	50	65	135
45	Club Nautico Marina di Carrara Marina di Carrara (MS)	0585 785150 0585785364	club.nautico@tin.it www.clubnauticomarinadicarrara.it	74	190	10	27	2,5-5,5	7	2.100	3.300	6.900	18	24	36
46	Porto di Rio Marina Rio Marina (LI)	0565 925050	- www.rioservice.it	16	100	15	15	4	45	-	-	-	34	56	-
CENTRAL TYRRHENIAN SEA															
47	Riva di Traiano Civitavecchia (RM)	0766 30201 0766 500696	direzione@rivaditraiano.com www.rivaditraiano.com	9	1180	113	9-42	2,5-6	120	4.000	7.000	15.000	35	60	120
48	Porto del Tirreno Civitavecchia (RM)	0184 489209 -	ufficiopresidenza@grup pocozziparodi.it www.grup pocozziparodi.it	-	400	-	8-90	8	-	-	-	-	-	-	-
49	Porto Odescalchi S. Marinella (RM)	0766 513005 0766 513005	info@marinadisantamarinella.com www.marinadisantamarinella.com	9-16	285	31	max 15	max 5	40	3,7/4.900	6.600	12.100	35/80	75/100	120/170
50	Porto della Concordia Fiumicino (RM)	06 68216756	info@iniziativeportuali.it www.iniziativeportuali.it	-	1445	-	16-60	4,5	-	-	-	-	-	-	-
51	Porto Romano Fiumicino (RM)	6522724 06 56188236	marina@portoromano.com www.portoromano.com	73	200	30	10-30	max 3,5	70	6/6.200	6,5/7.000	14/15.000	40/54	44/62	95/130
52	Porto turistico di Roma Ostia Lido (RM)	06 56188243 06 9848034	direzione.porto@portodioroma.com www.portoturisticodiroma.net	74	794	83	8-53	3,5-4,5	400	3.400	5.500	11.500	35	55	95
53	Porto Capo d'Anzio Anzio (RM)	06 98499311 06 98499345	info@capodanzio.com www.capodanzio.com	-	1080	-	-	-	-	-	-	-	-	-	-
54	Marina di Nettuno Nettuno (RM)	06 9805404 0773 547336	segreteria@marinadinettno.it www.marinadinettno.it	9	970	93	6-40	min 3	600	-	-	-	35	70	105
55	San Felice Circeo San Felice Circeo (LT)	0773 546184 0771 311013	info@circeoprino.it www.circeoprino.it	9	380	-	max 20	2,5-2,7	70	4.700	8.000	16.200	60	90	200
56	Base Nautica Flavio Gioia Gaeta (LT)	0771 464580	info@basenautica.com www.basenautica.com	9	250	25	4,5-60	7	100	6/7.000	9/10.000	16/17.000	50/60	70/80	130/140
SOUTHERN TYRRHENIAN SEA															
57	Pinetamare Castel Volturno (CE)	- -	- www.portomarinadipinetamare.it	-	1200	120	80	7,5	400	-	-	-	-	-	-
58	Nautica Sud Cantieri M. di Maglietta (NA)	081 5261140 081 5261140	info@sudcantieri.it www.sudcantieri.it	72	150	-	50	2-8	80	-	-	-	-	-	-
59	Mergellina Napoli	081 7611633 081 5523450	- www.incampania.com	9	50	-	10-30	1,5-10	50	-	-	-	-	-	-
60	Borgo marinaro Napoli	081 7645517	ormeggiatori1@virgilio.it	-	60	15	max 22	6	-	-	-	-	-	-	-
61	Marina di Vigliena Napoli	081 2457531	info@marinadivigliena.it	-	853	-	12-80	4-10	-	-	-	-	-	-	-
62	Marina Porto Salvo Ischia (NA)	081 3334070 081 3331252	info@marinaischia.it www.marinaischia.it	74	100	20	5-40	2,5	-	8.800	13.500	26.900	150	190	280
63	Cala degli Aragonesi Casamicciola, Ischia (NA)	081 980686 081 995666	- www.caladegliaragonesi.it	9	150	16	7-20	max 4	-	5/6.000	8/9.000	16/17.000	60/80	90/110	170/190
64	Marina di Procida Procida	081 8969668 081 8969668	info@marinadi-procida.com www.marinadi-procida.com	6	491	49	7-30	1,5-3,5	-	3.110	6.040	11.280	40	82	152
65	Marina di Capri Capri (NA)	081 8377602 081 8375318	info@portoturisticodicapri.com www.portoturisticodicapri.com	71	300	15	8-65	2-9	70	8/25.000	11/13.000	20/36.000	110/150	130/220	270/450
66	Castellammare di Stabia Marina di Stabia (NA)	081 8716871 081 8727963	info@marinadistabia.it www.marinadistabia.it	69	900	100	9-80	3,5-6,5	220	5,4/5.600	8,4/9.500	15,7/18.900	80/90	85/100	160/190
67	Marina d'Arechi Salerno (SA)	089 2788801 089 2788809	- www.marinadarechi.com	74	1000	100	10-50	3,5-7	-	-	-	-	-	-	-
68	Porto di Agropoli Agropoli (SA)	0974 824545 0974 824710	www.oneonline.it/rca/luoghi/porto.html	16	900	150	3-40	max 4	-	-	-	-	-	-	-
69	Porto di Camerota Marina di Camerota (SA)	0974 939813 0974 939184	info@portodicamerota.it www.portodicamerota.it	9	400	40	5-36	max 4,20	200	3.000	3.850	8.350	50	70	150
70	Marina di Maratea Maratea (PZ)	0973 877307 0973 877115	info@portoturisticomaratea.com www.marateaporto.it	6	600	20	45	max 7,5	40	4/4.500	5/5.500	7/7.500	35/80	40/110	80/150
71	Porto Riva di Scidro Belvedere Marittimo (CS)	0985 849411	belvedere@guardiacostiera.it	12	300	30	6,50-20	max 2,5	18-20	5/6.000	7/7.500	12/13.000	45/55	70/80	110/120
72	Marina Carmelo Vibo Valentia Marina (VV)	0963 572630 0963 575539	info@marinacarmelo.it www.marinacarmelo.it	12-16	260	30	4,5-72	max 7,5	360	1,5/2.000	2/3.000	3/4.000	25/35	35/45	60/80
73	Marina Stella del Sud Vibo Valentia Marina (VV)	0963 573202 0963 573202	info@marinastelladelsud.it www.marinastelladelsud.it	16-10	250	40	6-60	10	500	2/3.500	3/4.000	5/5.500	35/50	45/65	90/120
74	Porto turistico di Tropea Tropea (VV)	0963 61548 0963 609112	info@portoditropea.it www.tropea.biz	9	620	100	5-50	2,7-4	150	2.200	3.200	5.600	40	50	90
75	Marina di Diamante Diamante (CS)	0985 876075	diamante@guardiacostiera.it	14	310	-	7,5-22	-	80	-	-	-	-	-	-
76	Darsena Turistica Cetraro Cetraro (CS)	0982 798274 0982 91300	info@portocetraro.it www.portocetraro.it	10	500	30	40	40	50	2.000	3.000	5.500	34	46	86
77	Porto di Amalfi Pontile M. Coppola Amalfi (SA)	089 857538	info@portoamalfi.com www.portodiamalfi.com	13	300	40	35	11	12	-	-	-	72	80	120

How much will it cost me?

From the dataset provided by INGEMAR/Giornale della Vela, an original and interesting analysis to estimate the mooring costs of your next yacht.

During the last decades, mass-production boatyards have managed to significantly reduce the purchase prices of yachts. In real terms, the same amount of capital today can purchase a brand-new yacht much larger than it did ten or twenty years ago. In addition to that, another factor is at play: in the aftermath of the 2007/2008 global crisis, the second-hand market has been offering a huge amount of yachts at bargain prices. In such favourable conditions for buyers, it is difficult to resist the temptation to scale up the size of one's own dreams, sometimes purchasing a yacht much bigger than necessary, with the risk of crashing one's dreams against the solid wall of upkeep costs... The preliminary estimate of upkeep costs is not a simple task but is paramount for many yacht owners. One of the main components of upkeep costs, maybe the main one in Italy, is the cost of mooring.

It is also one of the most difficult to estimate for anyone who isn't a professional of the nautical sector but rather is just a "weekend yachtman" and can hardly know an answer to the following question:

"How much should I expect to pay, on average, to rent a mooring space for my future yacht?"

Second question, particularly crucial during the yacht selection phase:

"How much more mooring cost should I expect to pay for the coming years, if I now choose to buy a yacht one metre longer than I need?"

These are relevant questions because, as we all know, the cost of mooring cumulated year after year can reach significant values quite soon: in just 5-10 years it can become even comparable to the purchase cost of the yacht itself.

To get good answers to the preceding questions is harder than it looks, for various reasons. First of all because of the vast variety of marinas: by moving from one marina to another one, mooring costs can radically change. This is due to "regional" factors (i.e.: a marina in Liguria and one in Basilicata usually have parameters and costs completely different from each other) as well as "micro-zone" factors within each region (i.e.: in Liguria a berth in Genova-Prà and one in Portofino share with each other neither similarities nor costs). The wide variety of marinas is a first obstacle to an analysis of market data: the required data sample has to be large enough to deal with the wide heterogeneity of marinas. Another intricate point is the relationship between the size of a yacht and the cost of its berth. Intuitively, we all know that a relationship does exist: the larger the yacht, the higher its berth cost. But: how much? It is difficult to grasp the nature of this relationship, because there are several cost items simultaneously at play: all of them related to yacht size, but each one of them related in its own, peculiar way. Here are just few examples:

- There are cost items that might vary in direct proportion to the water surface area occupied by the yacht. One of these cost items is the cost of the **governative concession paid by the marina for the water space assigned to it. This cost has to be distributed to each yacht berth, according with the surface occupied by the yacht.** For average hull shapes (i.e. except those with extreme beam/length values) the occupied surface area – hence its cost – increases as the square of the yacht length "L": a relationship like $(X)=(a) \times (L^2)$, where "X" is the cost of the occupied area and "a" represents a parameter.
- There might be other cost items that, on the other hand, should plausibly vary in inverse proportion to the surface area occupied by the yacht. This might be the case, for instance, of costs related to sea infrastructures: piers, mooring posts, water taps, electricity plugs etc. These . will be more numerous – hence, likely, more costly – if the area is occupied by a lot of small berths, than in the case of the same area occupied by few, large berths.
- And there are still other different cost items, whose value might vary in proportion to the number of customers which exploit the marina's facilities in an average day. Some **examples: the cost of the infrastructures on the ground (such as car-parking, common rooms, toilets etc.) or the costs of ground personnel in charge of various customer services (linesmen, receptionists, etc.).** What might be the relationship between the number of customers of the marina and the average size of its berths (which, in turn, is related to the average length of the yachts moored there)?...

All this boils down to say that a relationship between yacht size and berth cost does exist, as we all know... but is too complicated to be grasped by intuition only: some form of objective, quantitative approach is necessary. This, in turns, requires the availability of a good market dataset to work with. Here comes to rescue the rich data set provided by INGEMAR and Giornale della Vela, just published in INGEMAR's booklet. It offers berth cost data for yacht lengths of 9, 12 and 18 metres and it covers 240 Italian marinas located in some of the best and most interesting places in Italy. This data set was exploited by performing some easy number-crunching on it and conducting a simple quantitative analysis, whose description and results are summarized below.

The analysis made use of a reduced data set, constituted only by the data of those marinas which had provided the full tern of costs for the three length categories: 9, 12 and 18 metres. This reduced data set covers 156 marinas out of the 240 listed in the full data set. For each of the three categories the average cost and its standard deviation were calculated, obtaining some initial results as this one:

On average, one has to spend 5,000€/year for the berth cost of a 12 metre yacht.

This is an average value and, of course, the dispersion of market data around it is fairly high, as it should be expected just for geographical reasons, among others. How much high? The standard deviation is about **2,000€/year**. Therefore a second, simple result is obtained:

For the same 12 metre yacht, about two out of three marinas in Italy offer berths at a cost comprised in the range 3,000-7,000€/year.

For marinas in the remaining third of the sample: about half of them charge more than 7,000€/year (among them: the most famous marinas of Costa Smeralda in Sardinia...); the other half charge less than 3,000€/year (these are generally those marinas located in the least-favoured areas of the Country).

The full results of the calculations are shown in the table below:

Berth dimensions	9	12	18
Average + 1Std Dev	4.7	7.1	13.4
Average – 1Std Dev	1.8	2.8	4.7
Standard Deviation	1462	2183	4343
AVERAGE	3287	4940	9045
Re-based to 100	67	100	183

The full table shows the average berth costs corresponding to 9 and 18 metre lengths: 3,300 €/year ca. and 9,000 €/year ca. , respectively.

An additional information is shown on the last line of the table: rebasing to 100 the average berth cost for 12 metre, the average cost of 9 metres is 67 and for 18 metres 183. This is quite interesting, because it suggests that the relationship between berth cost, "C", and yacht length, "L", is not a simple one – as it is actually to be expected, for the reasons described in the first part of this document. In fact the relationship is:

- neither linear. If it were linear and assuming 100 as the cost of 12 metre, then the cost of 9 metres should have been $(100) \times (9/12) = 75$, instead of 67, the real value; and the same holds for 18 metre: its cost should have been $(100) \times (18/12) = 150$, instead of 183, the real value.
- nor quadratic (as previously discussed, it would be quadratic if the cost depended, for example, just on the surface occupied by the yacht). If it were quadratic, in fact, the cost of 9 metres should have been $56 = [100 \times (9/12)^2]$ instead of 67; and the same holds for 18 metre: its cost should have been $225 = [100 \times (18/12)^2]$ instead of 183.

If the relationship between cost, "C", and length, "L", is neither linear nor quadratic, then... what might it be? If we knew it, we could use it to interpolate costs within the ranges 9-12 metre and 12-18 metre. This means that starting from the Ingemar/Giornale della Vela dataset **we would be able to obtain average berth cost estimates for yachts of any length between 9 and 18 metres:** in other words, we would be able to provide a reasonable answer to the two questions proposed at the beginning of this document.

The model used to find this relationship is simple and straightforward. Its starting point is the empirical evidence

just found, which suggests that the relationship between berth cost, "C", and yacht length, "L", might be located sort of "midway" between a linear and a quadratic relationship. Therefore the envisaged relationship should be something like:

$$C = (a)(L^z)$$

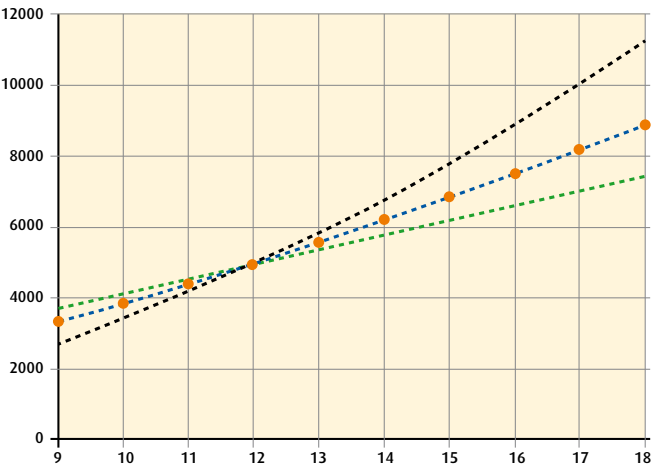
with "a" and "z" representing the parameters of the model that we need to identify; "z" will be somewhere between 1 (linear model) and 2 (quadratic model).

Through a trivial linear regression analysis of the data sample, the values of "z" and "a" were determined. Prior to the regression, the data sample was normalized in order to get a homogeneous input to the linear regression step.

The linear regression analysis produced the following result:

- The estimated value of the exponent "z" is **1.4: it confirms the expectations, being comprised between 1 and 2.**
- The estimated value of the constant "a" is **4.9**
- The model: **$C=(4.9)(L^{1.4})$** allows us to estimate the average cost of a berth of any length (between 9 and 18 metres), with a central "pivot-point" based on the average cost of the 12 metre berth (5,000€/year) previously found at the beginning of the analysis.

The following graph depicts the relationship: yacht lengths are represented on the horizontal axis, average berth costs on the vertical axis. The cost estimate provided by the model is represented by the blue line with orange dots.



The two dashed lines are just there for comparison: they represent the linear model (in green) and the quadratic model (in black) – both contradicted by empirical data, as previously shown.

In numbers: the model indicates that, compared to buying a 12 metre yacht, to buy a yacht one meter longer (shorter) entails an increase (reduction) of 600 €/year ca. of the berth cost.

(Similar considerations can immediately be drawn from the chart, for any yacht length in the 9-18 metres range) The precision of the model **$C=(4.9)(L^{1.4})$** looks rather satisfactory: on average the model can explain **90%** of the berth cost in terms of the yacht length.

We received and are pleased to publish this document prepared by Guido Guzzetti, a friend of ours much fond of sailing as well as fond of quantitative analysis.

239 MARINA D'ITALIA/SOUTHERN TYRRHENIAN SEA, CENTRAL & SOUTHERN ADRIATIC

PORTS AND RESORTS	TELEPHONE - FAX	E-MAIL - WEB	VHF CHANNEL	TOTAL No. BERTHS	No. TRANSIT BERTHS	METRIC LENGTHS	DEPTH IN METRES	MAXIMUM LOAD IN TONNES	ANNUAL RENTAL			DAILY RENTAL (HIGH SEASON)		
									9 METRES	12 METRES	18 METRES	9 METRES	12 METRES	18 METRES
78 Porto di Maiori Maiori (SA)	340 5815990 089 814211	maiori@guardiacostiera.it -	16	110	5	18	1-4	0	2.900	5.200	6.600	64	97	128
79 Porto di Palinuro Palinuro (SA)	0974 931604 0974 938294	info@palinurocoop.com www.palinurocoop.com	12	150	25	30	1,5-7	0	3.500	3.700	6.000	40	50	150
MAR IONIO														
80 Porto delle Grazie Rocella Jonica (RC)	0964 863213 -	info@portodellegrazie.it www.portodellegrazie.it	16	430	60	4,5-12	2,5	15	-	-	-	-	-	-
81 Marina Laghi di Sibari Sibari (CS)	0981 79027 0981 79147	info@marina-sibari.it www.marina-sibari.it	16-9	170	20	4-30	2,8	50	1/1.400	2/2.200	3,5/4.000	25/30	40/45	70/80
82 Marinagri – Marina di Policoro Policoro (MT)	0835 960111 0835 960004	- www.marinagri.it	74	750	28	8-30	5	100	2.400	3.600	6.200	25	35	60
83 Marina di Taranto Taranto	099 4609454 099 4717148	info@molosanteligio.com www.molosanteligio.it	8	254	-	6-40	6-12	-	2,3/2.500	3,3/3.500	6,0/6.500	30/40	40/50	80/90
84 Porto degli Argonauti Marina di Pisticci (MT)	0835 470218 -	info@argonauti.com www.portodegliargonauti.it	74	450	25	8-30	3-4	80	2.600	3.200	5.000	25	30	50
85 Darsena Fontanelle Gallipoli (LE)	0833 263535 0833 263535	info@darsenafontanelle.it www.darsenafontanelle.it	-	120	11	5-18	max 2,5	40	2,5/3.000	3,7/4.200	7.300	30	40/55	90
86 Marina Tricase Tricase (LE)	331 1839040 0833 775217	info@marinaitalia.it www.marinatricase.it	250	250	4-16	1,5-4,5	7	2.950	4.200	9.000	50	70	90	-
87 Porto turistico Santa M. di Leuca Santa Maria di Leuca (LE)	0833.758687 0833.758235	info@portodileuca.it www.portodileuca.it	12	760	-	40	7,5	100	-	-	-	-	-	-
88 Porto Gaio Gallipoli (LE)	0833 202204	info@portogaio.it www.portogaio.it	8	120	12	40	4,5	65	3.600	5.700	10.500	49	74	133
89 Porto Maruggio Campomarino Muggio (TA)	099 9716535	maruggio@guardiacostiera.it	10	232	23	181	1,8	0	4.000	6.000	11.000	40	80	150
90 Porto Turistico Ciro Marina Ciro Marina (KR)	0962 36328 -	ciromarina@guardiacostiera.it -	16	342	10	18	4,5	0	600	700	800	10	15	20
SOUTHERN ADRIATIC														
91 Marina di Brindisi Brindisi (BR)	0831 411516 0831 414381	info@marinadibrindisi.it www.marinadibrindisi.it	8	638	64	6-35	3-11	100	2/3.000	3/4.000	7/8.500	15/25	30/40	70/85
92 ● Porto di Trani Dars. Com. Trani (BA)	0883 509263 0883 492059	trani@gurdiacostiera.it www.comune.trani.bt.it	16	350	30	4-25	4,5	34	2/2.500	3/3.500	8/9.000	15/25	30/40	75/100
93 Porto Torre Vado Torre Vado (LE)	0833 758580	santamariadileuca@guardiacostiera.it www.torrevado.info	16	200	10	max 10	2-3	5	-	-	-	-	-	-
94 ● Porto Turistico di Bisceglie Bisceglie (BA)	080 3954845 080 3954845	info@bisceglieapprodi.it www.bisceglieapprodi.it	16	500	0	25	1-3,5	10	2.800	4.300	9.300	40	59	119
95 Puerto del Sol Porto Cesareo	0833 560485	torrecesarea@guardiacostiera.it	71	300	20	15	2	100	2.000	3.000	-	-	-	-
96 Porto di San Foca Melendugno (LE)	0832 881183 0832 840831	info@portodisanfoca.it www.portodisanfoca.it	12	500	20	25	1,5-8	0	2.200	3.800	8.400	30	48	110
CENTRAL ADRIATIC														
97 Marina di Rodi Garganico Rodi Garganico (FG)	0884 965294 0884 919224	marinadirodi@garganico@cidonio.it www.marinadirodi@garganico.it	9	310	34	8-45	4,5	100	4.470	5.898	11.457	11/34	19/54	28/78
98 Marina del Gargano Manfredonia (FG)	0884 542500 0884 542500	info@marinadelgargano.it www.marinadelgargano.it	74	658	70	10-60	3,5-70	160	-	-	-	-	-	-
99 Marina di Vieste Vieste (FG)	0884 701821 0884 704957	info@marinadivieste.it www.marinadivieste.it	6	643	64	5-60	4	-	2.600	5.000	9.800	40	60	115
100 Porto Turistico Le Marinelle San Salvo (CH)	0873 801736 0873 801736	- www.lemarinelle.com	14	180	-	6-16	2-2,5	-	2.800	4.300	-	30	47	-
101 Marina di San Pietro Termoli (CB)	0875 705398 0875 709259	marinadisani Pietro@myc.it www.myc.it/marinadisani Pietro	13-16	300	25	8-30	3,5-4,5	45	3,8/5.000	6.600	12.600	42	60	130
102 Marina S.veva Montenore di Bisaccia (CB)	0873 450091 0873 450091	info@smmspa.com www.marinassveva.com	10	400	-	7,5-20	2,5-4,5	-	2/3.000	3/4.000	6.700	30	45	80
103 Marina del Sole Fossacesia (CH)	0872 608305 0872 608305	marinadelssole@marinadelssole.com www.marinadelssole.com	10-16	404	50	max 12	1,5-2,9	15	3.350	4.200	-	45	60	-
104 ◆ Marina di Pescara Pescara	085 454681 085 4546833	- www.marinape.com	6	1000	100	6-50	3	100	2.778	4.550	8.140	25	44	76
105 Marina di Porto S. Giorgio Porto San Giorgio (AP)	0734 675263 0734 675263	info@marinaportosangiorgio.it www.marinaportosangiorgio.it	14	814	86	8-50	max 4	100	2.250	2.900	6.900	30	40	85
106 Porto Turistico di Numana Numana (AN)	071 9330847 071 933981	info@portodinumana.it www.turismonumana.it	11	780	-	max 25	max 2,2	-	3.000	5.200	7.200	25/30	40/50	55/70
107 ◆ La Marina Dorica Ancona	071 54800 071 54801	info@marinadorica.it www.marinadorica.it	8	1280	120	max 21	2,5-3,5	40	1.945	4.480	5.920	29	52	99
108 Gestiport Senigallia Senigallia (AN)	071 7929669 071 7929669	info@gestiport.it www.gestiportsenigallia.it	11	260	26	7-18	max 1,8	40	1/1.500	1,5/2.000	3/3.500	15/20	20/25	25/30
109 Marina dei Cesari Fano (PU)	0721 800279 0721 813854	info@marinadeicesari.it www.marinadeicesari.it	8	400	44	8-40	max 3	75	2.400	4.300	8.700	25	50	100
110 Porto di Baia Vallugola Gabicce Mare (PU)	0541 958134 0541 838140	vallugola@vallugola.com www.vallugola.com	9	150	10	4-18	max 2	3,5	4.100	5.000	9.500	40	60	100
111 Marinucci Yachting Club Termoli (CB)	0875 702238 0875 709259	info@marinuccinautica.it www.myc.it	16-9	100	50	5-25	1-3	45	5.000	9.400	18.600	50	70	145
112 Circolo Nautico Sambenedettese San Benedetto del Tronto (AP)	0735 584255 0735 594675	info@circolonautico.info www.circolonautico.info	13	580	0	8-24	3-4	0	1.700	2.500	5.000	35	50	100
113 Le Cinque Vele Contrada Torrenova (MC)	338 2680066 0733 884102	- www.lecinquevele.it	16	265	10	16	2	25	3.500	4.200	-	32	48	-
114 Marina Cala delle Sirene Manfredonia (FG)	0884 581439 0884 090039	info@caladellesirene.com www.caladellesirene.com	6	150	10	4-25	2,5	10	2.700	4.200	8.700	-	-	-
115 Marina di Mattinata Mattinata (FG)	0884 550121 0884 594114	info@mazzonemarine.it www.mazzonemarine.it	16	100	0	15	2-5	20	3.200	3.900	-	14	22	-
116 Portorose Roseto degli Abruzzi (TE)	085 8990258 -	info@porto-rose.net www.porto-rose.net	16	150	18	13	1	35	1.800	2.400	3.800	30	45	-

The symbols beside the numbers mean: ▲ port under construction ◆ in part supplied with Ingemar mooring structures ● fully supplied with Ingemar mooring structures.

239 MARINA D'ITALIA/NORTHERN ADRIATIC

PORTS AND RESORTS	TELEPHONE - FAX	E-MAIL - WEB	VHF CHANNEL	TOTAL No. BERTHS	No. TRANSIT BERTHS	METRIC LENGTHS	DEPTH IN METRES	MAXIMUM LOAD IN TONNES	ANNUAL RENTAL			DAILY RENTAL (HIGH SEASON)		
									9 METRES	12 METRES	18 METRES	9 METRES	12 METRES	18 METRES
NORTHERN ADRIATIC														
117 Portoverde Misano Adriatico (RN)	0541 615023 0541 611445	info@portoverde.net www.portoverde.net	-	350	20	max 20	2,5-3,5	20	4/4.500	6/6.500	10/11.000	40/50	50/60	90/100
118 Marina di Rimini Rimini	0541 29488 0541 439043	- www.marinadirimini.com	69	622	63	max 35	5	100	3.000	5.500	12.000	25	40	90
119♦ Marina di Cattolica Cattolica (RN)	0541 830789 0541 488021	info@marinadicattolica.it www.marinadicattolica.it	12	140	-	10-32	-	100	4340	6210	18.480	-	-	-
120 Onda Marina Cesenatico (FO)	0547 81677 0547 75747	ondamarina@tiscali.it web.comune.cesenatico.fc.it/turismo	11	300	25	max 23	3,5	50	-	-	-	-	-	-
121 Marina di Cervia p. village Cervia (RA)	0544 71709 0544 973845	info@mdcresort.it www.mdcresort.it	10	280	20	5-21	-	60	-	-	-	-	-	-
122 Marinara Marina di Ravenna (RA)	0544 531644 0544 531709	info@marinara.it www.marinara.it	10	1152	73	4-30	max 4,5	16	3.400	4.800	7.450	40	55	90
123♦ Marina degli Estensi Lido degli Estensi (FE)	0533 328428 0533 328428	info@portomarinaestensi.it www.ilportomarinadegliestensi.it	16-9	300	-	7-25	4	50	3.300	4.400	8.400	35	60	100
124 Porto Barricata Porto Tolle (RO)	0426 89125 0426 89125	info@portobarricata.it www.portobarricata.it	9-16	300	10	5-13	max 1,90	250	2.600	3.700	-	30	50	-
125 Marina di Portolevante Pto Viro (RO)	0426 666047 0426 666047	info@marinadiportolevante.it www.marinadiportolevante.it	9	525	50	6-25	2,5	30	2.750	3.900	6.200	30	40	75
126 Marina di Albarella Rosolina (RO)	0426 332600 0426 332270	porto@albarella.it www.marcegagliatourism.com	9	455	45	6-25	3,5	50	3/3.500	4,5/5.000	8.750	35	50/60	110
127 Marina di Brondolo Chioggia (VE)	041 490950 041 5542927	info@marinadibrondolo.it www.marinadibrondolo.it	9	200	10	17	2,5/4	20	2/3.000	4/4.500	7/8.000	30/40	40/50	90/110
128● Darsena Le Saline Chioggia (VE)	041 400530 041 5500655	info@darsenalesaline.com www.darsenalesaline.com	9	450	30	5-35	3/5	35	3.100	4.800	9.700	35	55	115
129● Darsena Mosella Sottomarina di Chioggia (VE)	041 404993 041 405392	info@darsenamosella.it www.darsenamosella.it	-	220	20	max 16	max 3	40	2.900	4.500	-	30	50	-
130 Marina di Chioggia Valli di Chioggia (VE)	041 499722 041 5585009	info@marinadichioggia.com www.marinadichioggia.com	-	190	-	15	1,5/2,5	160	2.600	4.050	-	30	45	-
131● Vento di Venezia Isola della Certosa (VE)	041 5208588 041 5222497	info@ventodivenezia.it www.ventodivenezia.it	72	100	35	20	max 2,5	20	2/3.000	4/5.000	7/8.000	35/50	50/60	90/110
132 Darsena Dec Mestre (VE)	041 5310161 041 5312219	dec@darsena.it www.dec@darsena.it	-	250	10	5-17	1,5	12	3.500	5.600	-	30	45	-
133 Marina di Lio Grando Cavallino-Treporti (VE)	041 966044 041 5300872	marinadiliogrando@libero.it www.marinadiliogrando.com	3	200	10	4-60	1,5/6	12	2.800	4.400	8.900	30	50	110
134 Marina del Cavallino Cavallino-Treporti (VE)	041 968045 041 5370365	info@marinadelcavallino.com www.marinadelcavallino.com	69	400	40	6-25	2,5	50	3.500	5.300	11.100	40	60	135
135● Santelena Marina Venezia	041 5301478 041 5309077	info@marinasantelena.com www.marinasantelena.com	-	300	-	10-30	-	-	-	-	-	-	-	-
136● Marina Fiorita Cavallino-Treporti (VE)	041 5301478 041 5309077	info@marinafiorita.com www.marinafiorita.com	77	160	30	6-50	4/6,5	-	2.700	4.100	7.900	30	50	100
137● Marina di Portegrandi Quarto d'Altino (VE)	0422 789046 0422 789046	info@portegrandi-yachting.it www.marinass.it	9	311	31	8-20	3,40	6,5-60	2.650	4.000	7.500	30	50	90
138 Marina del Faro Faro-Plave, Cavallino (VE)	041 968076 041 5370404	info@marinadelfaro.it www.marinadelfaro.it	-	110	10	7-16	2,3	15	2/3.500	4/5.000	-	30/45	45/60	-
139 Nautica Dal Vi Lido di Jesolo (VE)	0421 91616 0421 971486	ndalvi@dalvi.it www.dalvi.it	-	450	28	4-17	3,5/4,5	25	3/4.000	4/5.000	-	30/45	45/60	-
140● Porto Turistico di Jesolo Lido di Jesolo (VE)	0421 971488 0421 972568	info@portoturistico.it www.portoturistico.it	77	650	50	5-30	2-4,5	100	3/3.500	4/4.500	8/8.500	50/60	70/80	120/130
141 Mariclea Club Eracle Mare (VE)	0421 66261 0421 66438	info@mariclea.com www.mariclea.it	9-16	187	18	5-13	-	10	3.000	4.500	-	35	55	-
142● Marina 4 Porto S. Margherita (VE)	0421 260469 0421 261254	info@marina4.com www.marina4.com	16	450	40	4-25	max 3,30	40	3/4.000	4/5.000	9/10.000	30/50	50/70	100/120
143 Darsena dell'Orologio Caorle (VE)	0421 84207 0421 217113	info@darsenaorologio.com www.darsenaorologio.com	-	480	20	25	3	20	3.000	4.500	9.400	55	70	120
144 Darsena San Giorgio Venezia	041 5210723 339 4787488	segreteria@compvela.com www.compagniadellavela.org	16	70	20	6-15	2,2-2,4	-	-	-	-	-	-	-
145 Marina Uno Lignano Sabbiadoro (UD)	0431 428677 0431 428677	info@marina-uno.com www.marina-uno.com	10	420	40	7-18	2,5/3	20	3/3.550	4,6/5.400	6.800	35/40	45/55	70
146 Marina Punta Verde Lignano Sabbiadoro (UD)	0431 427131 0431 427290	info@marinapuntaverde.it www.marinapuntaverde.it	9	270	13	6-20	2,5	20	2.620	4.070	6.250	30	50	70
147♦ Marina Punta Faro Lignano Sabbiadoro (UD)	0431 70315 0431 70573	info@marinapuntafaro.it www.marinapuntafaro.it	9	1200	60	5-35	2,5-4	80	3.700	4,8/6.300	9,6/12.000	50	75	135
148 Darsena porto vecchio Lignano Sabbiadoro (UD)	0431 723183 0431 724763	- www.lignanosabbiadoro.com	9	400	40	4,50-16	2,3-4	20	3.000	4.450	6.700	35	50	35/65
149 Marina Punta Gabbiani Aprilia Marittima (UD)	0431 528000 0431 528300	info@marinapuntagabbiani.it www.marinapuntagabbiani.it	9	300	25	7-25	max 3	80	2.700	5/5.600	6/7.900	-	50/55	70/80
150 Marina Capo Nord Aprilia Marittima (UD)	0431 535303 0431 53524	info@marinacaponord.it www.marinacaponord.it	9	650	65	8-20	max 2,5	60	2.700	3.350	6.100	35	45	65
151 Aprilia Marittima Aprilia Mar.-Latisana (UD)	0431 53123 0431 53458	circolo.velico@apriliamarittima.it www.cvam.it	9	680	70	7-25	2,5	60	2/2.500	3/3.500	5/5.000	30/40	40/50	50/60
152 Portomaran Marano Lagunare (UD)	0431 67409 0431 640642	portomaran@portomaran.com www.portomaran.com	9	500	30	5,5-17	max 30	20	1/2.000	2,5/3.000	3,5/4.200	25/30	35/40	45/50
153 Cantieri Marina San Giorgio S. Giorgio di Nogaro (UD)	0431 65852 0431 65854	info@cantierimarina.it www.cantierimarina.it	-	300	30	4-26	4,5	80	2/12.600	3/3.500	5/7,6.200	25/30	35/45	50/60
154 Shipyard & Marina Sant'Andrea San Giorgio di Nogaro (UD)	0431 622162 0431 621504	info@marinasantandrea.it www.marinasantandrea.it	9	150	20	max 30	4,5	100	2.500	3/3.800	6,6/7.200	20	30	40
155 Marina di Aquileia Aquileia (UD)	0431 91041 0431 919241	info@marinadiquileia.it www.marinadiquileia.it	-	294	6	8-18	2,5	50	1,5/1.680	2,2/2.300	3.700	15	25/30	50
156● Porto San Vito Grado (GO)	0431 83600 0431 85926	info@portosanvito.it www.portosanvito.it	-	165	16	7-20	3	50	3/3.500	4,5/5.000	8/8.500	30/40	60/70	90/100
157● Marina Hannibal Montalcone (GO)	0481 411541 0481 40446	info@marinahannibal.com www.marinahannibal.com	9	328	40	20	10	300	3/3.560	3,9/7.100	7.800	45/50	55/85	95

239 MARINA D'ITALIA/NORTHERN ADRIATIC & SARDINIA

PORTS AND RESORTS	TELEPHONE - FAX	E-MAIL - WEB	VHF CHANNEL	TOTAL No. BERTHS	No. TRANSIT BERTHS	METRIC LENGTHS	DEPTH IN METRES	MAXIMUM LOAD IN TONNES	ANNUAL RENTAL			DAILY RENTAL (HIGH SEASON)		
									9 METRES	12 METRES	18 METRES	9 METRES	12 METRES	18 METRES
158●Nautec Mare Monfalcone (GO)	0481 790416 0481 44042	nautecc@spin.it www.nautecmare.com	-	200	5	max 20	2,3	64	2/2.500	2,5/3.000	4/4.500	15/20	20/30	40/50
159 Marina Lepanto Monfalcone (GO)	0481 45555 0481 44082	info@marinalepanto.it www.marinalepanto.it	-	250	10	5-28	max 2,3	70	3/4.000	5/5.500	9.500	-	-	-
160 Darsena San Marco Grado (GO)	0431 81548 0431 877774	info@darsenasanmarco.it www.darsenasanmarco.it	9	110	-	5-20	3-6	40	3.200	3.400	5.000	35	40	60
161 Marina San Giusto Trieste	040 303036 -	info@marinasangiusto.it www.marinasangiusto.it	12-14	226	67	24	5-15	25-200	3.700	5.700	11.200	50	70	130
162 Porto San Rocco Muggia (TS)	040 273090 040 9279203	infoport1@portosanrocco.it www.portosanrocco.it	74-16	525	50	8-60	11	160	3.250	4.250	8.200	50	60/70	120
163 Darsena Fusina Fusina (VE)	041 5470055 041 5470050	info@campingfusina.com www.campingfusina.com	16	152	10	16	1,3-2,5	10	1.700	3.400	5.100	20	35	55
164 Darsena Navigare 2000 Grado (Go)	041 5470050 333 6696797	darsena.navigare2000@libero.it www.navigare2000grado.it	16	120	12	5-10	2,5-3	0	3.000	4.730	7.730	50	60	80
165 Industria Nautica Venezia Venezia	041 698268 041 5470808	info@industrianauticavenezialt.it www.industrianauticavenezialt.it	16	40	5	8-18	4	75	4.200	6.800	9.900	39	51	84
166 Marina Primero Grado (GO)	0431 896900 0431 896901	info@tenuta-primero.com www.tenuta-primero.com	16	271	27	24	2,5	80	3.000	4.750	7.700	50	60	80
167 Marina Stella Palazzolo dello Stella (UD)	0431 896901 0431 589288	info@marinastella.it www.marinastella.it	16	80	5	20	2,5-3,5	80	3.800	4.900	9.800	50	75	135
168 Marina Venice Boat Service Chioggia (VE)	041 490091 041 490033	info@veboat.com www.veboat.com	16	60	3	6-22	1-3	35	2.500	3.300	6.800	30	50	70
169 Nautica Boat Ser: Michelangelo Group Jesolo (VE)	0421 980016 -	info@michelangelogroup.it www.michelangelogroup.it	16	30	5	25	3-7	20	3.800	5.500	8.500	38	52	102
170 Porto Fossone Rosolina (RO)	0426 68281 0426 68281	info@portofossone.com www.portofossone.com	9	165	15	15	1-3	40	1.300	2.800	4.100	30	70	100
171 Porto Turistico di Volano Codigoro (FE)	0533 355209 0533 355209	info@nauticamondo.it www.nauticamondo.it	5	90	6	5-12	3-3,5	12	-	-	-	-	-	-
172 Marina di Cortellazzo Cortellazzo (VE)	0421 980356 0421 980356	info@marinadicortellazzo.it www.marinadicortellazzo.it	16	129	5	15	1	15	3.100	4.500	5.300	37	55	62
173 Porto Turistico San Felice Chioggia (VE)	041 5500488 041 5500488	info@portosanfelice.it www.portosanfelice.it	9	500	60	6-30	3,5	0	2.900	4.500	9.000	30	48	100
SARDINIA														
174 Marina di Villaputzu Porto Corallo di Villaputzu (CA)	393 9238334 178 2723664	info@marinadivillaputzu.it www.marinadivillaputzu.it	74	400	100	30	max 4	50	1.500	2.200	4.000	25	45	80
175 Marina di Capittana Quartu S. Elena (CA)	070 805460 070 805420	marinadicapittana@tiscali.it www.marinadicapittana.it	74	500	20	4-27	2-8	40	3.360	4.650	8.500	20/55	30/80	45/130
176 Marina di Villasimius Villasimius (CA)	070 7978006 070 797137	info@marinavillasimius.it www.marinavillasimius.it	9	800	100	4-60	max 6,5	30	2,5/3.300	4,3/4.800	7/8.200	35/45	50/60	85/100
177 Marina di Perd'è Sali Perd'è Sali - Sarroch (CA)	070 9253145 070 9253145	marinadiperdesali@virgilio.it www.marinadiperdesali.it	74	227	-	max 13,50	max 1,20	4,5	2.300	4.000	-	35	65	-
178 Marina del Sole Cagliari	070 3837951 070 3837951	marinadelsole@tiscalinet.it www.marinadelsol-santelmo.com	13	150	max 30	6-12	5-8	12	1,2/2,0	1,6/2,0	3,5/4.000	11/20	15/20	34/50
179 Su Portu Nou Teulada Marina Teulada (CA)	070 9283705 070 9283705	info@marinaditeulada.it www.marinaditeulada.it	9 - 16	248	25	6,5 - 30	2 - 4	-	1,8/1.900	2,5/3.000	5,0/5.500	40/45	65/70	110/115
180 Marina Piccola Poetto (CA)	070 6051940 070 371485	motomarsarda@tiscali.it www.sardegna.net	74	290	35	25	2-2,7	20	-	-	-	-	-	-
181 Marina di Bonaria Cagliari	070 300240 -	marinadelsol@tiscali.it www.alsardina.it	-	302	-	30	5-10	-	-	-	-	-	-	-
182 Porto turistico S. Antioco Sant'Antioco (CI)	349 1393324 0781 83666	info@solkimar.com www.comune.santantioco.ca.it	64	300	-	30	3,5	-	700/1.200	1,3/2.000	2,3/4.000	10/40	25/70	40/100
183 Marine Sifredi Carloforte (CI)	0781 857008 0781 857228	info@marinesifredi.it www.marinestifredi.it	15	250	100	60	2-4,5	70	-	2.814	3.435	-	50/60	100/110
184 Marina di Portoscuso Portoscuso (CI)	0781 507248 0781 507248	m.portoscuso@tiscali.it www.marinadicapittana.it	9	390	30	4-25	2,5-4,5	15	2.000	2.600	4.550	15/20	20/30	30/45
185 Porto di Buggerru Buggerru (CI)	0781 54428 0781 54424	portoscuso@guardiacostiera.it -	16	350	-	10	1-3	-	-	-	-	-	-	-
186 Porto turistico di Torregrande Torregrande (OR)	0783 22189 0783 22189	torremarina@tin.it www.marineoristanesi.it	9	400	40	7-30	max 2,5	60	1.800	2.800	5.750	30	45	90
187 Cala dei Sardi Golfo di Cugnana (OT)	0789 1876125 -	info@caladeisardi.it www.caladeisardi.it	8	140	50-60	5-60	6,8	-	2.770	5.233	10.972	22	41	82
188 Porto di Alghero Alghero (SS)	079 9893117 079 9893117	info@portodialghero.com www.portodialghero.com	9	300	-	50	-	-	-	-	-	34/40	50/59	125/145
189 Porto Conte Marina Porto Conte - Alghero (SS)	079 942013 079 942013	info@portocontemarina.it www.portocontemarina.it	9	300	30	3-22	1,5-3,5	30	1,5/2.850	3.450	5.300	55/70	80/100	140/160
190 Porto Mannu Stintino (SS)	079 523381 -	stintino@guardiacostiera.it -	9	215	-	21	2,5	-	-	-	-	-	-	-
191 Porto di Castelsardo Castelsardo (SS)	079 479010 079 479174	info@portodicastelsardo.com www.portodicastelsardo.com	9	800	70	6-30	max 4,5	50	1.100	1.650	4.000	26	40	80
192 Marina Isola Rossa Trinità d'Agultu e Vignola (OT)	079 694055 079 694177	info@portoissolarossa.com www.portoissolarossa.com	9-16	433	55	27	7	-	1.700	3.000	6.500	30/35	25/30	80/95
193 Marina S. Teresa S. Teresa di Gallura (OT)	0789 751452 0789 753170	portostg@tin.it www.portosantateresa.com	12	700	400	4-35	2-5	100	1,7/2.000	3/3.500	7/7.500	35/40	60/65	126/140
194 Porto di Palau Palau (OT)	0789 708435 0789 708435	portopalau@tiscali.it www.palau.it	9	400	40	1,5/18	1,5/4	60	2,5/3.000	4,5/5.000	9/9.500	15/30	25/50	100/120
195 Porto di Cannigione Cannigione (OT)	0789 88422 0789 88422	coop.sardamar@tiscali.it -	11	200	-	5-25	1-3,5	20	-	-	-	-	-	-
196 Luxury Yachting Resort Portomassimo La Maddalena (OT)	0789 734033 0789 734033	info@portomassimo.it www.portomassimo.it	9	120	-	50	3,5	-	-	-	-	20/1002	35/200	75/360
197 Marina di Cala Mangiavolpe La Maddalena (OT)	0789 736709 -	lamaddalena@guardiacostiera.it www.lamaddalena.it	16-11-9	120	-	24	1,5-6	-	-	-	-	-	-	-
198 Porto turistico di Cala Gavetta La Maddalena (OT)	0789 730121 0789 728287	cgavetta@yahoo.it www.portocalagavetta.it	74	130	15	32	10	-	-	-	-	-	-	-
199 Marina del Ponte La Maddalena (OT)	0789 726034 0789 726034	marinadelponte@alice.it www.marinadelponte.com	9	160	-	25	6	-	-	-	-	-	-	-

The symbols beside the numbers mean: ▲ port under construction ◆ in part supplied with Ingemar mooring structures ● fully supplied with Ingemar mooring structures.

239 MARINA D'ITALIA/SARDINIA & SICILY

PORTS AND RESORTS	TELEPHONE - FAX	E-MAIL - WEB	VHF CHANNEL	TOTAL No. BERTHS	No. TRANSIT BERTHS	METRIC LENGTHS	DEPTH IN METRES	MAXIMUM LOAD IN TONNES	ANNUAL RENTAL			DAILY RENTAL (HIGH SEASON)		
									9 METRES	12 METRES	18 METRES	9 METRES	12 METRES	18 METRES
200 Marina dell'Orso Poltu Quatu (OT)	0789 99477 0789 99468	polquatu@tin.it www.poltuquatu.com	9	311	-	8-35	2-3	30	6.600	9.600	20.300	130	200	430
201 Porto Cervo Marina Portocervo (OT)	0789 905111 0789 91153	direzione@marinadiportocervo.com www.marinadiportocervo.com	9	700	100	120	1-6	200	-	-	-	90/100	115/130	350/400
202 Marina di Portisco Portisco (OT)	0789 33003 0789 33560	info@marinadiportisco.it www.marinadiportisco.it	69	589	83	4-90	max 11	70	6.200	7,8/9.600	16/17.800	100	130/140	270/290
203 Marina di Portorotondo Portorotondo (OT)	0789 34203 0789 34368	amministrazione@marinadiportorotond www.marinadiportorotondo.it	9	655	66	120	1-7	60	4.687	6.138	16.031	80	109	273
204 Porto Marana Punta Marana (OT)	0789 32008 0789 32089	portomarana@tiscali.it -	9	320	-	6-14	max 2	25	-	-	-	60/80	110/130	-
205 Baia Caddinas Baia Caddinas (OT)	0789 46813 0789 46813	info@marinadibaicaddinas.it www.marinadibaicaddinas.it	9	115	5	15	1,5-4	-	-	-	-	-	-	-
206 Marina di Olbia Olbia (OT)	0789 67121 0789 645842	info@marinadiolbia.it www.marinadiolbia.it	9	270	27	7,50-60	3-5	-	4.100	7.450	14.600	53/75	92/130	180/250
207 Marina Porto Ottiolu Ottiolu (OT)	0784 846211 0784 846209	info@marinaportottiolu.com www.marinaportottiolu.com	9-16	405	40	max 36	max 3	60	2/3.000	5,5/6.000	8/9.000	60/80	120/140	200/220
208 Marina di Puntaldia Puntaldia (NU)	0784 864590 0784 864594	info@marinadipuntaldia.it www.marinadipuntaldia.it	9	400	39	5-24	max 4	65	5.400	6.500	13.800	80/95	130/160	280/345
209 ♦ La Caletta La Caletta (NU)	0784 810631 0784 810631	cnclacaletta@tiscali.it www.circolonauticocalaletta.it	9	192	-	16	6	-	-	-	-	-	-	-
210 Marina di Baunei S. Maria Navarrese (OG)	0782 614020 0782 614198	info@portosantamaria-baunei.it www.portosantamaria-baunei.it	16-74	370	90	3-30	max 7,5	40	1.700	2.600	4.900	35	50	110
211 ♦ Marina di Arbatax Arbatax (OG)	0782 667405 0782 664359	- www.marinadiarbatax.it	9	500	250	max 85	8	200	1.800	2.700	5.100	40	50	115
212 ♦ Marina di Carloforte Carloforte	0781 854110 0781 854110	info@marinatour.it www.marinadicarloforte.com	11	100	0	25	5,5	0	2.000	2.400	3.450	40	55	115
213 Marina di Costa Corallina Olbia	0789 36176 0789 386020	info@spurlatta.it www.spurlatta.it	9	137	0	11	1,6	75	1.360	2.000	4.230	30	50	95
214 Marina Mamma Mahon Carloforte		info@marinatour.it www.marinadicarloforte.com	15	250	100	60	4	70	2.100	3.300	4.700	40	75	140
215 Marina Nido d'Aquila Isola La Maddalena	334 7109642	info@marinanidodaquila.it www.marinanidodaquila.it	9	120	120	18	2,4	0	2.500	4.000	5.800	54	72	108
216 Marina S.Elmo Alghero	3332214342 079980829	info@marinadisantelmo.it www.marinadisantelmo.it	9	100	40	60	5	400	-	-	-	-	-	-
217 ♦ Pontile Destriero Cannigione	0789 88485 0789 88546	www.pontiledestriero.com pontiledestriero@tiscali.it	9	100	5	35	3,2	0	-	-	-	-	-	-
218 Portus Karalis Cagliari	070 653535 070 6404898	www.portuskaralis.blogspot.com portuskaralis@gmail.com	9	140	20	90	2,5-10	0	2.780	6.200	11.200	36	80	155
SICILY														
219 Marina di Riposto - P. dell'Etna Riposto (CT)	095 7795755 095 7781112	info@portodelletna.com www.portodelletna.com	74	366	40	8-40	max 12	160	3.300	4.300	7.300	55	80	165
220 Marina del Nettuno Messina	090 344139 090 3710522	info.messina@marinadelnettuno.it www.marinadelnettuno.it	9	160	10	8-20	30	-	3/4.000	4/5.000	8/8.500	60/70	80/100	140/160
221 Marina del Nettuno Milazzo (ME)	090 9281180 389 5867236	info.milazzo@marinadelnettuno.it www.marinadelnettunomilazzo.com	9	160	10	8-20	8-10	-	3,5/4.000	4/5.000	8/8.500	60/70	80/100	140/160
222 Marina di Portorosa Furnari (ME)	0941 874560 0941 874655	info@marinadiportorosa.com www.marinadiportorosa.com	9	700	70	6-35	3	70	3.700	5.000	10.800	60	80	200
223 Darsena Turistica Santa Marina Salina (ME)	090 9843473 346 0220362	info@portodelleolie.com www.portodelleolie.com	11	120	20	0-30	3	-	-	-	-	60/70	80/100	140/160
224 Cala dei Normanni - Marina Arenella (PA)	091 540264 091 364360	info@caladeinormanni.it www.marinaarenella.it	16	90	-	6-21	4-7	50	3.800	5.000	7.500	45	80	150
225 San Nicola l'Arena San Nicola l'Arena (PA)	091 8125946 091 7744481	posta@maresud.it www.maresud.it	16-14	800	80	max 25	0,5-4	60	2,5/3.000	4/4.500	7/7.500	30/40	60/70	120/140
226 Marina di Cefalù Cefalù (PA)	338 7849155 091 934403	www.marina-service.net motomar@gimnet.com	9	150	120	6-40	1-5	20	-	-	-	30	60	110
227 Motomar Capo Gallo (PA)	091 453145 091 454024	www.motomarcdm.it	16	250	15	4-30	2-6	65	3.500	5.000	9.000	50	90	150
228 ♦ Marina Villa Igiea Porto Acquisanta (PA)	091 364123 091 364225	www.marinavillaigiea.com sanvitolocapo@guardiacostiera.it	74	379	40	6-65	10	100	3.462	4.926	8.400	42	88	155/205
229 ♦ Porto Turistico San Vito lo Capo (TR)	0923-974371 -	www.sanvitoweb.com	16	400	-	40	2-8	-	-	-	-	-	-	-
230 Boat Service Trapani Trapani	0923 29240 0923 873334	info@boatservicetrapani.it www.boatservicetrapani.it	-	130	20	4-35	1,5/5	200	2,5/3.000	3/3.500	4,5/5.000	20/30	30/40	40/60
231 ♦ Marina Arturo Stabile Trapani	0923 28191 0923 557170	info@marinastabile.com www.marinastabile.com	69	150	10	max 30	4,5	25	4.500	5.500	12.500	35	65	100
232 Marina Vento di Maestrale Trapani	0923 26874 -	info@ventodimaestrale.it www.marinaventodimaestrale.it	74	30	-	25	max 8	-	-	-	-	-	-	-
233 Porto nuovo Pantelleria	0923 911817 0923 913517	contatti@portodipantelleria.com www.portodipantelleria.com	16	80	10	30	max 4	150	-	-	-	-	-	-
234 Marina di Cala del Sole Licata (AG)	0922 1837137 0922 1837138	info@marinadicalaodelsole.it www.marinadicalaodelsole.it	74	1502	200	8-70	4,5-6,0	160	1.500	3.200	5.300	22/29	45/60	75/100
235 Porto turistico Marina di Ragusa Marina di Ragusa (RG)	0932 230301 -	info@ptmr.it www.portoturistico marinadiragusa.it	74	723	80	max 50	5	160	2.500	4.800	8.000	40	70	135
236 Marina Yachting Siracusa Siracusa	0931 419002 0931 1845104	info@marinayachtngs.it www.marinayachtngs.it	69	160	60	5-40	max 8	-	3.400	4.200	7.200	45	70	130
237 ▲ Marina di Archimede Siracusa	0931 200470 0931 200471	portodisiracusa@acquamarcia.it www.acquamarcia.it	-	600	-	10-70	-	-	-	-	-	-	-	-
238 Porto delle Eolie Santa Marina Salina (ME)	0909843473	info@portodelleolie.com www.portodelleolie.com	11	160	100	45	5,5	7	-	-	-	110	140	220
239 ♦ Porto Turistico Marzamemi Pachino (SR)	0931 841776	info@yachtmarzamemi.it www.yachtmarzamemi.it	9	150	0	20	2-7	0	2.650	3.700	5.400	50	80	150

INGEMAR

Maritime Engineering

News



2015

Made in Italy
by Ingemar

Palau Carrara Trieste Khiran Stora Fiskardo Tremezzo
 Castellammare di Stabia Kuwait Imperia Lefkas Tripoli
 Venezia Marsaxlokk Bosa Brissago Piskera La Maddalena
 Maratona Aqaba Maratea Viareggio Karvavice Alassio
 Grado Tivat Trani Lixouri Procida Al Fintas Kerkyra Salerno
 Genova Podos Hamamet Sistiana Locarno Cagliari Volme
 Lacco Ameno Portofino Manfredonia Ghiffa Montecarlo
 Piskera Portofino Lixouri Procida Al Fintas Kerkyra Salerno
 Chios Bosa Maratea Viareggio Karvavice Alassio
 Villafraia Taranto Portofino Cala di Volpe Bari Jesolo
 Savona Sboia Portofino Novigrad Rab Bisceglie Aiaccio
 La Spezia Portoferraio Dammam Loano Montecarlo Hraklio
 Port Goccek Castiglioncello Casamicciola Kastela Mina
 Abdulla S. Margherita Ligure Kerkyra Methoni Livorno
 Jeddah Split Napoli Caorle Aci Trezza Taranto Salamina
 S. Teresa di Gallura Peiraias Rovinj Chioggia Vibo Valenza
 Mitilene Manfredonia Como Agios Kosmas Monfalcone

by Ingemar

Pontoons and structures over the water

INGEMAR
 Maritime Engineering



Favourable and strong winds blow in the direction of floating structures for moorings which, by virtue of their simplicity of installation and low impact on the environment and eco-systems, are finding ever more supporters especially at international level and in the new "luxury market" of many Middle Eastern countries.

The brilliant results of some important installations abroad and a national market which is slowly but surely recovering, has meant that the Ingemar Group has satisfactorily closed a complex but stimulating 2014 and with diverse and important acquisitions which augur well for the conclusion of this year.

Ingemar maintains its leadership position in Italy and advances on the international market, more demanding and selective, where design and operating ability, as well as a reputation as a solid and reliable partner, make the difference. New investments in the production sector, human resources and research and development, were all-important in determining both growth and success. The factory at Casale sul Sile has generated new areas with specialised equipment for the

production of very large elements in reinforced concrete; the technical division has been reinforced with the addition of young engineers with new expertise; diversification of our products has been increased again to follow and anticipate demands from the sector especially in the field of floating breakwaters and special structures. Pontoons of the "all-concrete" type and floating breakwaters in reinforced concrete have been employed at Venice, Salerno, in Iraq and Kuwait. Pontoons in steel and aluminium, with wooden finishing and floating units in concrete were used in diverse ventures for tourist landings and sports associations in Italy, Montenegro, Croatia and Saudi Arabia. Special structures were installed for tugboats, Venetian water-taxis, passenger ferries and working boats, satisfying specific functional requirements and unusual conditions of use. A vast array of references has been accumulated testifying to the versatility of production and operational capacity of the Ingemar Group so it can compete in the difficult Italian market and on the international markets with originality, experience and conviction.

Aquatic events: Ingemar’s pontoons boost nautical shows, sport events and yacht races

Notwithstanding the crisis in the yachting sector, a strong desire for recovery and some signs of improvement can be seen. The main yachting exhibitions combined with a renewed interest in sailing and watersports are a positive sign and Ingemar, as a technical sponsor, continues to support organisers and participants of these events. The Group’s continued presence over the years at the main sailing events is confirmation of their leadership at a national level. For the 2015 Genoa Boat Show the layout of the floating jetties was enlarged compared to previous years, principally due to many of the large shipyards returning to take part in the show.

Many other shows at both national and international level saw the permanent installation of Ingemar pontoons destined for future sailing events. Additionally this year saw temporary installations for Blu Roma at the port of Ostia, those for the historic sailing ships gatherings at the Riva shipyard at Sarnico and at Venice, the world canoeing and paracanoeing championships at the Idroscalo in Milan and the Trofeo TAN of the Naval Academy at Livorno. Ingemar also took part this year in the Istanbul, Dubai and Venice Boat Shows and will be present at METS in Amsterdam and at the Genoa Boat Show.



All-concrete pontoons and breakwaters: a positive trend in the Arabian gulf and in Italy

The deployment of all-concrete monolithic floating pontoons in reinforced concrete is widespread in northern Europe, the USA, Australia and now in the latest tourist ports of the Emirates as well as tropical countries. In Italy traditions and the conditions for installations in the past favoured the use of discontinuous floating elements with steel framed structures and wood finishings. However, the advantages in terms of stability, lifespan and aesthetics similar to fixed structures are encouraging investors towards the all-concrete type of construction where the aesthetic finishings are often enhanced through the use of wooden or composite flooring to cover the concrete walkways. At the Sabah Al Ahmad Sea City project in Kuwait construction continues, at the rate of 28 elements per week, on creating the new lagoons where Ingemar is involved in the executive planning, supervision and supply of the critical components for the pontoons and breakwaters: La’Ala Al-Kuwait Real Estate is responsible for their installation on site. The pontoon modules are between 3-4m in width with variable lengths of up to 20m; the fingers are up to 30x3m and the breakwaters 20x4x2m with a displacement of 65t. Many of the elements had to be designed ad hoc in order to follow the layout of the marinas and the need to construct large articulated platforms for refreshment areas with dimensions up to 16x16m. The first marina, with only

18 months in which to create it, was inaugurated on 16 April this year: 406 berths were installed for boats of between 10 and 40m lengths on pontoons and fingers anchored by pilings fixed to the sandy seabed. The second marina, which will take 633 boats, is nearing completion and could be operative at the beginning of 2016. Overall 17 km of floating structures for a total surface area of 40,000sqm will have been installed by Ingemar. A floating port on the island of Tronchetto in Venice is currently under construction for the new ACTV centre of operations: 600m of floating breakwaters, currently under construction at Ingemar’s Casale sul Sile factory, will protect the harbour. The new modules, 20x3m, will have a height of 2.05m and widths reduced to 3m. Displacement is 55t per module with a freeboard of 75cm; surface finishing will be concrete. The modules will be anchored to the seabed by steel pilings, one for each modular element. For the completion of the Marina d’Arechi at Salerno, 33 elements of all-concrete pontoons are under construction at Casale sul Sile: with dimensions of 12x3m they will be finished by the end of the year at the rate of 2 elements per week. The pontoons have a displacement of approximately 16t and a freeboard of 60cm. The surface finishing is of WPC (Wood Plastic Composite) which will harmonise with existing structures.



Floating structures for diverse uses and ad hoc construction: a winning expertise

Ingemar has always believed that, for the company's growth and the satisfaction of its technicians, it was essential to pay precise attention to the development of constructions on water, even outside the nautical sector, and allocate the necessary resources to designing specialised and made to measure elements. Over the years this capacity to diversify has successfully been applied to the transport, industrial and tourist sectors. Simultaneously to the fine-tuning of series production, the company began to employ diverse expertise covering a huge variety of sectors in engineering; this allowed Ingemar to take on directly, or as the main contractor, complex and challenging contracts. This willingness to diverge, when necessary, from series production has meant that Ingemar

can adapt itself to the various dimensions, performance and aesthetic requirements of each installation. Both floating and fixed installations for the Venetian water taxis, the tug boats at La Spezia, the tenders for the cruise ships at Portofino, the Iraqi naval vessels, the Saudi coastguard naval vessels and the floating restroom structures at Kuwait are some of the most recent implemetations within the special structures sector. Customising design and dimensions were the winning aspects in acquiring some of our commissions in the yachting sector, such as for the new marina at Porto Nogaro, the canoeing platform on the river Tiber, special pontoons for the islands of Sacca Sessola and San Michele in the Venetian lagoon and those at Porto Empedocle in Sicily.



Pontoons and floating jetties of the discontinuous type - a winning standard in constant evolution

Versatility of application, lightweight structure, minimum environmental impact combined with cost containment thanks to serial production continue to be the winning characteristics of floating pontoons with metal frames (galvanised steel or aluminium alloy), finishings in wood or WPC and discontinuous floating units (in concrete and rotational polyethylene). Their distribution in Italy was initially determined by the conditions at new locations, usually partially protected natural inlets originally used for commercial traffic or by fishing boats. The constant technical evolution and industrialisation of this type of product led to its installation in the most modern marinas, where continuous floating units in reinforced concrete or floating jetties were employed having widths, sturdiness and performance that were suitable for large yachts whose numbers are radically increasing throughout

the Mediterranean. It is for these mega yachts that the new elements supplied this year to Tivat, for the enlargement of Porto Montenegro, are destined: 110m of floating jetties up to 4m wide have been installed to increase capacity in this rapidly expanding marina. Ingemar is extremely proud as it is this marina, equipped with their pontoons, breakwaters and floating piers all "Made in Italy", which has been awarded the Yacht Harbour Association's Gold Anchor and the title of "Super Yacht Marina of the Year 2015". Steel pontoons have also been installed on the island of Krk in Croatia and aluminium ones for the Sea City Project in Kuwait. In Italy we have supplied new equipment to Chioggia, enlarged small landings in Sicily, Sardinia and around the Alpine lakes.



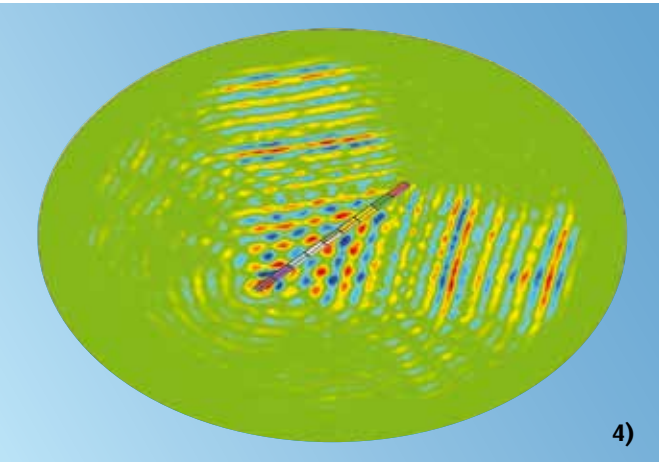
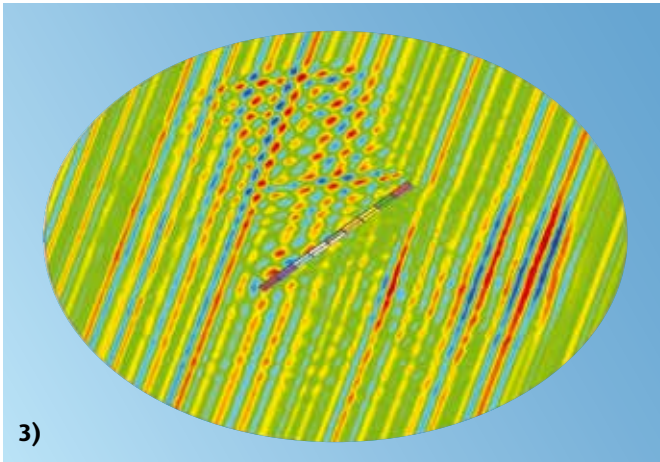
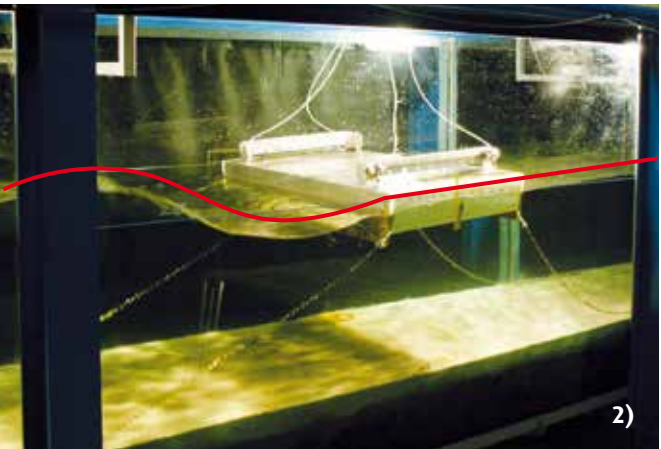
R&D: laboratory testing and sophisticated calculation programmes for second generation breakwaters

Floating breakwaters, which create additional mooring space, and the necessity to overcome current functional and end-use limitations, have always represented a challenge which Ingemar has confronted with growing success since their early days to the point that they are now at the forefront of this sector. The installation at Gocek in Turkey in 2013, with 280m of breakwaters using elements of 20x6x2.4m with a freeboard of 80cm and 130t of displacement, is probably the deployment of series elements with the greatest performance in the market to date. The final design of the elements was produced with the company's own teams whereas the wave flume testing, essential to define the capability to attenuate wave motion and the forces on anchorages, was carried out by the laboratory of Maritime Construction of the Università degli Studi di Padua with whom Ingemar has worked for many years.

Foreseeing a growth in commercial interest for these systems, which diminish wave motion, and to overcome their limitations, Ingemar is currently running a research programme for the next 13 months which will focus on the analysis and design of new elements with even greater width (8m) and displacement (150t), and using a new and revolutionary coupling system. In order to better understand the dynamic performance of the

elements, Ingemar has acquired new hydrodynamic software which will numerically analyse the effects of waves, wind and currents on floating structures. The numerical modelling is currently being developed by Ingemar's team of engineers from their technical department with support from the specialists who designed this software. The results will be compared with those from physical model tests on the same elements, conducted in the wave flume at the University of Padua, in terms of their capacity to diminish wave motion as well as to understand wave forces exercised on anchorage systems. Calibration of the numerical model and the physical model will then be closely analysed to evaluate the correct solutions for each application. This will allow Ingemar to further enlarge their range of services for clients and to supply each one with 'personalised' information concerning the site of installation and the effects of floating breakwaters from their production range.

- 1) Fig.1 Floating breakwater 20x8x2,40 - 150t anchored by piles
- 2) Fig.2 Floating breakwater 20x6x3,40 - 160t anchored by chains
- 3) Total wave elevation (incident, reflected and radiated) around 9 no. floating breakwaters Fig.1
- 4) Scattered wave elevation (reflected and radiated) around 9 no. floating breakwaters Fig.1



Ingemar's plant at Casale sul Sile expands production facilities for large reinforced concrete elements

For the past 10 years the Ingemar group's production has been concentrated at its factory at Casale sul Sile, halfway between Treviso and Venice, whereas the offices in Milan continue as the administrative and financial centre. The production site, owned by Ingemar T&S, comprises a surface area of 2,000 sqm of offices and plant and a further 5,000 sqm for the loading, moving and storage of materials as well as the construction of prefabricated elements within dedicated retractable warehouses.

Growing demand for pontoons and floating breakwaters in reinforced concrete, combined with tight schedules for completing design projects, has led to an increase of production facilities for these huge objects: parallel to

production equipment for pontoons up to 12x3x1,20m, a new prefabricated depot has been installed housing a large modular mould for the production of breakwaters up to 20x4x2,40m. An on-site crane covers almost the entire area so as to move materials and pour the castings.

This was an important investment for the company, not only considering the growth in demand for these huge structures, but also the conviction that only within a specially equipped area using a specialist workforce supervised by technical personnel is it possible to guarantee quality and the highest qualitative standards that are essential for the production of these large and complex structures.

