



YACHTING



YOUR PAINT GUIDE

ABOVE AND BELOW THE WATERLINE

SET SAIL FOR THE HORIZON AND ENJOY RELAXING DAYS AT SEA!

After months on shore, the summer season is approaching and so is the dream of lazy summer days at sea - feel the wind in your hair, hear the engine roar or let the sail catch the summer breeze. The marinas are waking up and are soon filled with people and activity.

Our aim is to give you the best solution for an easy and efficient preparation of your boat that will last throughout the entire season.

Founded in Norway, Jotun is a world leader in marine products. We have been developing innovative products for the harshest environments since 1926 and our painting systems have been tested in every ocean in the world.

Jotun Yachting has developed this guide to help boat owners enjoy the yachting life. Discover our products, follow the instructions and learn from the useful application hints and you will soon be able to set sail for the horizon.

CONTENT

- 4** **Primers and Undercoats**
Waterproof film and adhesion to subsequent coats
- 10** **Antifouling**
Keeping the hull clean and protected against fouling
- 20** **Topcoats**
Protects your boat and enhances its beauty
- 26** **Wood Treatment and Varnishes**
Beautiful appearance and well-protected surfaces
- 32** **Osmosis**
Osmosis and Fibre glass Hull Treatments
- 36** **Fillers**
Repairs and scratch removal in the hull
- 38** **Bilges and Engines**
Maintenance of special areas
- 40** **Boat Care, Additives and Thinners**
Cleaning, polishing and other boat care
- 48** **Health, Safety and Environment**
Remember to protect yourself and the environment
- 50** **Colour Cards**
The Jotun Yachting colour selection

PRIMERS AND UNDERCOATS

A perfect paint result is the result of careful surface preparation. Regardless of whether the surface is new or previously painted, Jotun's primers and undercoats will secure a perfect foundation for the topcoat. The key is a consistent use of Jotun's systems.

A primer is a product developed to provide adhesion to the substrate to be painted, while undercoat is a link layer between the primer and the finishing coats (whether antifouling or topcoat). They can be either one-component or two-component products.

There are several Jotun Yachting primers that can be used on any part of the boat. The difference between them is the degree of hardness, their waterproofing properties, adhesion properties to different substrates, anti corrosive properties, ease of application and volume solids/high build properties. The choice of product will have an effect on the paint system's long term durability.



PRODUCTS



ANTIPEST is a two-component epoxy, suitable as a long exposure undercoat for epoxy and polyurethane systems and designed to prevent osmosis in fibre glass hulls. AntiPest can be used both as primer for all types of substrates, including steel, fibre glass, aluminium and marine timber, and as well as intermediate adhesion undercoat, for polyurethane or antifoulings on top of epoxy primers. The ideal product for priming gelcoat before applying antifouling.



EPOXY YACHT HB Two-component, epoxy mastic primer, with impressive waterproofing properties. The ideal primer for a perfect anti-corrosive protection system for steel, and against osmosis in fibre glass hulls. A waterresistant product and thanks to its special adhesion properties, it can be applied on top of corroded surfaces once they are clean. Due to its extreme hardness, it provides a high resistance to abrasion and long durability.



VINYL PRIMER One-component, vinyl modified primer and sealer, aluminium pigmented for increased water resistance. Good adhesion to wood and previously applied antifoulings, thus being the ideal sealer. Fast drying product.



VINYL PRIMER SPRAY One-component, aluminium pigmented vinyl modified primer specially developed for areas to be coated with Aqualine Optima, such as stern drives, flaps, outboard engines, propellers, etc. Fast drying product.



Guide to the use of Primers and Undercoats

PAINT SYSTEM FOR UNDERWATER HULLS

On top of new substrate or totally sanded/blasted surface:

		FIBRE GLASS	ALUMINIUM	WOOD	STEEL
1	Cleaning	High pressure fresh water washing and degrease if necessary			
2	Preparation	Dry sanding with P120 - P150 grade	Mechanical	Dry sanding with P80-P150 grade	Mechanical
	Apply			5-15x Clipper 1	
3	Apply	AntiPest	AntiPest	Vinyl Primer	Epoxy Yacht HB
4	Apply	AntiPest	AntiPest	Vinyl Primer	Epoxy Yacht HB
5	Apply	AntiPest			AntiPest
6	Apply	Antifouling	Antifouling	Antifouling	Antifouling
7	Apply	Antifouling	Antifouling	Antifouling	Antifouling

PAINT SYSTEM FOR TOPSIDES AND EXTERIOR AREAS

On top of new substrate or totally sanded/blasted surface:

		FIBRE GLASS		ALUMINIUM		WOOD	STEEL	
1	Cleaning	High pressure fresh water washing and degrease if necessary						
2	Preparation	Dry sanding with P120-150 grade		Mechanical		Dry sanding with P80-P150 grade	Mechanical	
3	Apply	AntiPest	Vinyl Primer	AntiPest	Vinyl Primer	Clipper 1 (5-15 coats wet-on-wet until total absorption)	Epoxy Yacht HB	
4	Apply	AntiPest	Vinyl Primer	AntiPest	Vinyl Primer	Vinyl Primer	AntiPest	Vinyl Primer
5	Apply	TopGloss, TopGloss BR	TopGloss BR, TopOne	TopGloss, TopGloss BR	TopGloss BR, TopOne	TopGloss BR, TopOne or Shipolin	TopGloss, TopGloss BR	TopGloss BR, TopOne
6	Apply							

- One thick coat with primer may be accepted but be aware that this may result in an uneven surface, affecting the final finish.
- TopGloss BR may be applied on both Vinyl Primer and AntiPest, but Vinyl Primer is recommended for best finish. TopGloss may only be applied on AntiPest.

Application advice

1. PREPARATION

Before starting any job, the waterline must be protected as well as any other area which is not to be painted. This can be done with solvent resistant plastic.

2. PROTECTION

It is also important to protect yourself with proper overalls, gloves, goggles and mask. Adhere to safety instructions on back labels and technical data sheets.



3. STIRRING

It is essential to thoroughly stir any type of paint, but it is even more critical for two-component products. If not, correct drying will not be achieved and it will not provide the expected protection. It may also cause adhesion problems with the subsequent coats. For up to three litre cans, use a wooden/metallic stirrer and for bigger can sizes, use a mechanical stirrer. The stirrer should be completely clean to avoid contamination of the paint.



4. SURFACE PREPARATION

It is absolutely essential to apply paints on top of totally cleaned surfaces, and on a proper surface profile as this aids adhesion. Basic steps to follow are:

- Wash with fresh water to remove dust, salts and other contamination. If grease or oil are present then the surface must be degreased.
- Sand the surface with dry medium grade paper (P150–P180) for fibre glass and even coarser for wooden surfaces. On steel substrates, blasting is the best method but when not possible, matt the surface with very coarse grade paper or any other mechanical method. Always avoid polishing the metal as this will impair adhesion of the paint.
- Apply the necessary coats of primers as specified in the table on p. 7.
- Finally, apply the topcoat or the antifouling, depending on the area being treated.



5. APPLICATION TOOLS

- Roller: A medium or short sized mohair roller, resistant to solvent is recommended. A foam roller may also be used, but with this type of roller there will be more air entrapment, so extra brushing work to remove air will be needed.
- Brush: For small areas or touch up works, it should also be solvent resistant. It is important to only use a good quality brush as its will not loose fibres which may then be left on the paint film.
- Spray: Airless spray is the best method for priming, due to its better wetting properties, the film formation and thickness applied without dilution etc. Alternatively, conventional spray can be used as well, but more coats will be necessary to achieve the specified film thickness and protection. Spray application may only be done by professionals.



6. APPLICATION

Apply the recommended coats. Avoid applying under adverse conditions such as strong wind, high sunlight/heat (specially at noon in summer time), low temperatures or high humidity or rain. It is not recommended to add solvents as these reduce the thickness applied and there will be more risk of sagging, splashes, etc.

However, if necessary to apply paint in strong wind or in high temperatures, it is possible to add between 5% and 10% (maximum) of solvent. Only use Jotun thinners and carefully read the product specific technical data sheet prior to use.



HINTS FOR SUCCESSFUL PRIMING

- Do not apply primers in very high or very low temperatures, in strong sunlight or strong wind.
- Wet the surrounding floor area to avoid dust on wet paint.
- Stir the product thoroughly and repeat during application.
- Use high quality solvent resistant rollers and brushes (mohair or foam type).
- Consider the pot life of the product after mixing two-component products.
- Check the minimum and maximum recoating interval as stated in the technical data sheets. This is a critical factor when using two-component products.

ANTIFOULING

As a proud boat owner, you want your boat to perform at its best throughout the entire season. The way to facilitate this is to prevent fouling on the hull. Hence, it is incremental to choose the correct antifouling quality according to your type of boat and usage. This will also reduce the CO₂-emissions and thus, the environmental impact.

WHY DO WE USE ANTIFOULING?

The most common maintenance carried out with paints is the application of antifouling. This is necessary for perfect sailing as it is more difficult to keep the hull clean once fouling starts. Fouling will lead to loss of speed, increased fuel consumption, damage to the paint system, blocking of water pipelines, etc.

THE BASIC PURPOSES OF THE ANTIFOULING ARE:

- Prevent or reduce any animal or algae fouling
- Secure minimal friction and thus, maximize speed and performance
- Reduce fuel consumption by reducing friction
- Avoid fouling penetrating the paint, and improve protection of the hull

By securing a clean hull throughout the season, the fuel consumption can be reduced and thus, minimizing CO₂-emission.



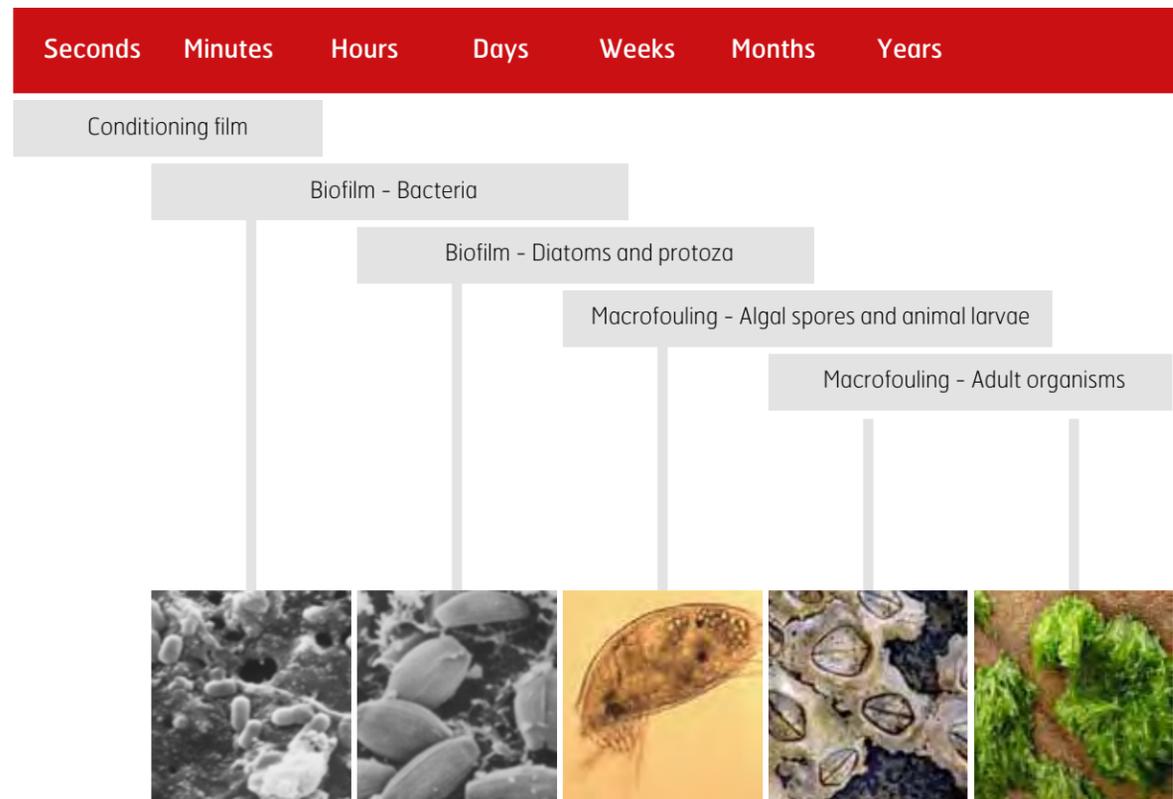
Why does fouling occur?

Fouling growth depends on several factors like water quality, temperature, salinity and water depth in the harbour. There may be large differences in marinas located near to each other due to grey water spillage, pollution of the port by various contaminants, no regeneration of the water, any nearby rivers, rain fall, vegetation, etc.

The number of species also has an influence. Antifouling products are intended to protect against up to 4,000 different types of fouling species living in the oceans. They can be classified as:

- Macro fouling: including animals and algae
- Micro fouling: normally referred to as slime, which is a viscous mixture of bacteria and other microscopic organisms

How does fouling occur?



As a consequence, it is very important to choose the correct antifouling for your boat. Take into consideration type of use of the boat and in what kind of waters the boat is used and moored.

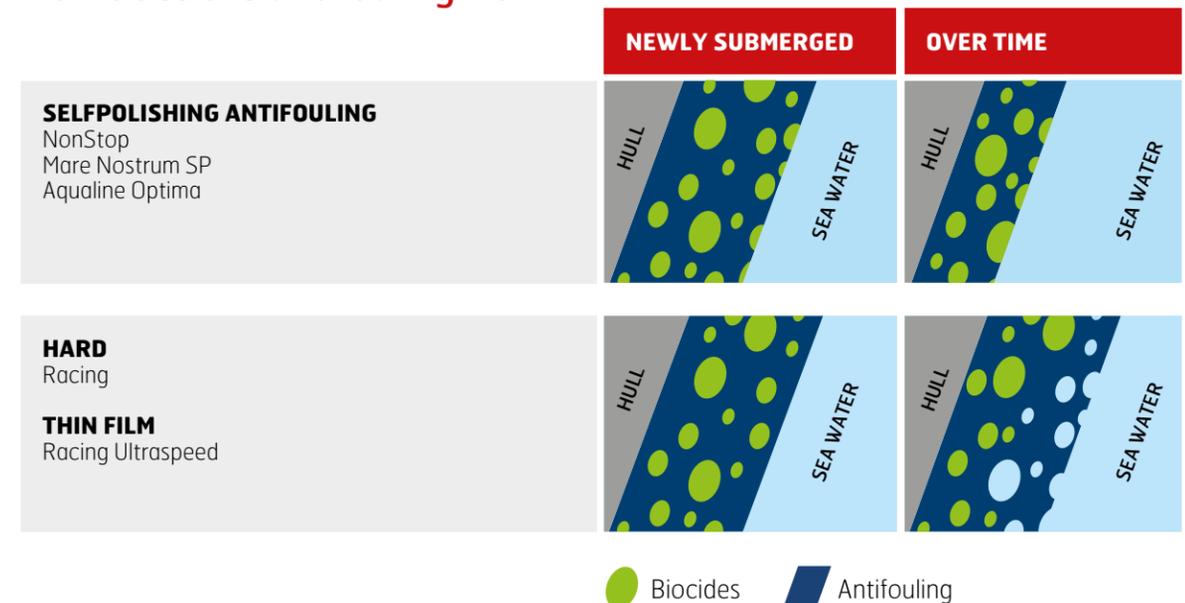
Antifouling technology

There are many different types of antifouling in the market and they may be divided into three main groups:

TYPE OF ANTIFOULING	FIBRE, STEEL, WOOD	ALUMINIUM
SELFPOLISHING The biocide and the resin are dissolved in a predictable manner. As a result there is always a new fresh layer of antifouling in contact with the sea water keeping a regular leaching rate of the biocides throughout the whole service life of the product. All round technology for most types of boats. Ideal for cruisers and sailing lovers.	NonStop Aqualine Optima Mare Nostrum SP	White and grey Black and grey White
HARD Here the binder is insoluble, so the leaching rate of the biocide is not constant and the performance of the product decreases progressively throughout the season. Especially suitable for speed boats. Abrasion resistant product. Easy to sand. May be polished to give a smooth surface.	Racing	White and grey
THIN FILM This is a hard antifouling with very low volume solids. After application it leaves a thin, hard and smooth film. Especially suitable for regatta sailing yachts.	Racing Ultraspeed	

Some antifouling products may not be available in your country. Please contact your local Jotun office for detailed information.

How does the antifouling work?



Choose the ideal antifouling

It is important to identify the ideal antifouling to fit with the existing paint system on the boat. There are three approaches to secure a correct choice:

1. If you know what antifouling that is currently applied on the boat, follow the compatibility table on page 18.
2. If the current antifouling is unknown, apply a sealing coat with Vinyl Primer prior to applying the antifouling.
3. If the current paint system is damaged, remove coat by coat until a complete and undamaged coat is identified. (paint or original substrate). Sand the substrate and apply primer according to the recommended paint system for that particular substrate prior to applying antifouling.

In order to choose the correct antifouling for your boat and usage, it is important to consider type of boat, usage frequency, geographic location, current antifouling, and whether the boat is frequently transported by trailer. Also keep in mind environmental aspects and local regulations.

AREA OF USE	SELF POLISHING			HARD	THIN FILM
	NonStop	MareNostrum SP	Aqualine Optima		
				Racing	Racing Ultraspeed
Motor boats	★★★★	★★		★★	
Sailing boats	★★★★	★★		★★	★
Regatta sailing boats	★★	★		★★*	★★★★
Speed boats (45 knots+)	★★	★★		★★★★	
Aluminium and light metal parts	★★★★ White/Grey	★★ White	★★★★	★★ White/Grey	
Propellers, flaps, etc (not made of light metal)	Same antifouling as for the main hull or Aqualine Optima				
High fouling areas	★★★★	★	★★★★	★★	
Fresh water areas (lakes)	Antifouling is normally not recommended for use in freshwater areas				

Key: ★★★★★ Excellent ★★ Good ★ Suitable

Aqualine Optima should not be applied on the hull.

*Jotun Yachting recommend wet sanding of the surface after application.



Paint Systems

On top of new substrates or completely paint free hulls:

		FIBRE GLASS	ALUMINIUM	WOOD	STEEL	LIGHT WEIGHT METALS
1	Cleaning	High pressure fresh water washing and degrease if necessary				Degrease with Jotun Thinner no7 (Xylen)
2	Preparation	Sanding with P120 - P150 grade	Mechanical	Sanding with P150 - P180 grade	Mechanical	Sanding with P150 - P180 grade
3	Apply			5-15 x Clipper I		
4	Apply	3 x AntiPest	2 x AntiPest	2 x Vinyl Primer	2 x Epoxy Yacht HB	2 x Vinyl Primer Spray
5	Apply				AntiPest	
6	Apply	2 x Antifouling*	2 x Antifouling* NonStop White/Grey, Racing White/Grey, Mare Nostrum SP White	2 x Antifouling*	2 x Antifouling*	3 x Aqualine Optima

* Racing Ultraspeed require a sealer coat of Vinyl Primer on top of any epoxy primer for adhesion properties. Refer to TDS for detailed information.

On old paint systems: wash thoroughly with fresh water before you start. If the already applied antifouling is unknown, you need to apply a sealer coat of VinylPrimer to get adhesion.If the already applied antifouling is known, please consult the compatibility chart on page 18.

PRODUCTS	AREA OF USE	COVERAGE per coat	CLEANING	DRYING TIME			COLOUR
				23°C	15°C	10°C	
 <p>NONSTOP Very efficient, top-class selfpolishing antifouling product, based on advanced hydrating binders, assuring a totally active surface which is continuously renewed.</p>	For all types of boats, providing an excellent result throughout the entire season. Only white and grey colours are recommended for aluminium hulls.	10 m ² /ltr.	Jotun Thinner no.7 (Xylene)	Recoating interval: 8 h Launching time, min: 12 h Launching time, max*: 9 mth	10 h 16 h 9 mth	12 h 24 h 9 mth	<ul style="list-style-type: none"> ● Black ● Grey ● White ● Dark blue ● Blue ● Red
 <p>RACING Advanced hard antifouling that provides a hard, smooth and polishable surface. No chalking.</p>	Can be used on most types of boats, but specially developed for speed boats (40 knots+). Only white and grey colours are recommended for aluminium hulls.	10 m ² /ltr.	Jotun Thinner no.7 (Xylene)	Recoating interval: 8 h Launching time, min: 12 h Launching time, max*: 9 mth	10 h 16 h 9 mth	12 h 24 h 9 mth	<ul style="list-style-type: none"> ● Black ● Grey ● White ● Dark blue ● Blue ● Red
 <p>RACING ULTRASPEED Thin-film hard antifouling which provides a very smooth surface.</p>	<p>Specially developed for regatta sailing boats. Its smooth surface enhances speed. The product dries quickly and does not require polishing, permitting fast haul-outs. Not recommended for aluminium hulls.</p> <p>Stir well before applying and occasionally during the painting process.</p>	10 m ² /ltr.	Jotun Thinner no.7 (Xylene)	Recoating interval: 1 h Launching time, min: 3 h Launching time, max*: 3 mth	2 h 4 h 3 mth	3 h 6 h 3 mth	<ul style="list-style-type: none"> ● Copper ● Dark grey* <p>*After a few weeks in water</p>
 <p>MARE NOSTRUM SP Efficient selfpolishing anti-fouling based on special binders, assuring an active surface.</p>	For all types of boats, providing a good result. Only white colour is recommended for aluminium hulls.	10 m ² /ltr.	Jotun Thinner no.7 (Xylene)	Recoating interval: 8 h Launching time, min: 12 h Launching time, max*: 9 mth	10 h 16 h 9 mth	12 h 24 h 9 mth	<ul style="list-style-type: none"> ● Black ● Dark blue ● Red ● White
 <p>AQUALINE OPTIMA A new generation protection for drives and other light-metal components below the waterline. Unique effect against fouling throughout the entire season and outstanding hiding power.</p> <p>NEW</p>	For drives, propellers, flaps and other light-metal components below the waterline. It is important that the surface is cleaned and degreased (using Jotun Thinner no 7) prior to application of Vinyl Primer and Aqualine Optima.	10 m ² /ltr.	Jotun Thinner no.7 (Xylene)	Apply 2-3 coats with 15-20 minutes interval			<ul style="list-style-type: none"> ● Black ● Grey

* Under the condition that the boat is well protected or stored indoors.

Selfpolishing antifoulings/hard antifoulings

OLD ANTIFOULING IN GOOD CONDITIONS	NEW ANTIFOULING			
	SELPOLISHING ANTIFOULINGS		HARD ANTIFOULINGS	
	NonStop	Mare Nostrum SP	Racing	Racing Ultraspeed
NonStop, Mare Nostrum SP Other selfpolishing antifoulings*	Apply directly	Apply directly	Apply directly	Wet sand + Vinyl Primer
Racing Other hard antifoulings*	Wet sand + new coat	Wet sand + new coat	Wet sand + new coat	Wet sand + Vinyl Primer
Racing Ultraspeed and other thin film antifoulings	Wet sand + Vinyl Primer	Wet sand + Vinyl Primer	Wet sand + Vinyl Primer	Wet sand + new coat
Unknown	Wet sand + Vinyl Primer	Wet sand + Vinyl Primer	Wet sand + Vinyl Primer	Complete removal

*Except Seajet 034, Hempel Glide Cruise and Hempel Glide Speed. A sealer coat of Vinyl Primer must be applied when overcoating these.

Apply directly	Apply directly once the surface is dry and clean.
Wet sand + new coat	Wet sand with a medium grade sand paper and rinse well with fresh water. Apply new coat once the surface is dry and clean.
Wet sand + Vinyl Primer	Wet sand with a medium grade sand paper and rinse well with fresh water. Apply one sealer coat of Vinyl Primer.
Complete removal	Do not apply any paint. Complete removal of existing paint is necessary.

How much antifouling do I need?

Preventing fouling is not just a question of the antifouling itself, but also the application and thickness of each coat. It is important to have enough paint for the surface to be painted, in order to achieve proper protection.

	MOTOR BOAT							SAILING BOAT							LARGE KEEL BOAT						
Length (m)	4	6	7,5	9	11,5	13	15	4	6	7,5	9	11,5	13	15	6	7,5	9	11,5	13	15	
Length (ft)	15	20	25	30	38	43	49	15	20	25	30	38	43	49	20	25	30	38	43	49	
Area (m ²)	8	12	20	24	34	60	73	6	9	14	22	34	40	50	13,5	21	28	38	60	75	
Litres required	2	3	5	6	8,5	14	17	1,5	2,5	3,5	5,5	8,5	10	12,5	3,5	5,5	7	9,5	14	75	
Cans 0,75 l.	3	4	7	8	12	19	23	2	4	5	8	12	14	17	5	8	10	13	19	24	

The figure shows paint consumption for two coats. Only indicative amounts, the accuracy will decrease as the size of the boat increases.

Application advice

1. PREPARATION

Before starting any job, the waterline must be protected as well as any other area which is not to be painted. This can be done with solvent resistant plastic tape.

2. PROTECTION

It is also important to protect yourself with proper overalls, gloves, goggles and mask. Adhere to safety instructions on back labels and technical data sheets.



3. STIRRING

It is essential to thoroughly stir any type of paint but it is even more critical in the case of antifoulings as some ingredients, such as copper and zinc, will have a tendency to settle during shelf life. Use a mechanical or wooden/metallic stirrer. The stirrer must be perfectly clean to avoid contamination of the paint.



4. APPLICATION TOOLS

- Roller: Use a mohair type roller, this must be solvent resistant. For thin film antifoulings a short haired roller has to be used.
- Brush: For small areas or touch up works. This should also be solvent resistant.

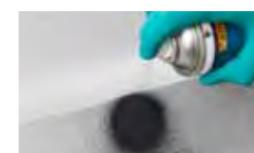
5. APPLICATION

Apply the total calculated quantity of litres, even if this requires several coats, otherwise the applied thickness will not be enough. Areas with more friction are the fore part, water line and aft part, near the propellers. An extra coat on those areas is recommended to increase fouling protection.



Avoid applying in adverse weather conditions, like strong wind, strong sunlight, high temperatures (especially at noon in summer time), low temperatures or high humidity or rain. It is not recommended to add solvents to antifoulings as this will reduce the thickness applied and increase the risk of sagging, splashes, etc.

6. PROPELLERS, RUDDERS, FLAPS



These parts are produced from different materials, the most common being bronze or light alloys, less often they are aluminium and rarely steel. In the case of aluminium or light alloys, only Aqualine Optima or antifoulings in white or grey colours should be used.

TOPCOATS

Topcoats provide the first impression of your boat and gives it a distinct character. Even an old worn down surface can look all-new with the correct choice of product. Topcoats are also an important barrier to the elements and provides the hull with the protection it needs. Other important features are high gloss, UV protection, a scratch resistant surface and outstanding durability.

All Jotun products offers these characteristics, while being easy to use and apply. Jotun offers both one- and two-component solutions, based on different needs and surfaces.

TWO TYPES OF FINISHES

Topcoats are available in two different one-component products and two two-component product. The main difference is the degree of gloss, elasticity and application properties. This will also have an effect on the long term durability of the system.

PRODUCTS



TOPGLOSS Two-component polyurethane topcoat, providing a very high gloss level and an exceptional hardness which gives extra protection against abrasion. A professional finish can be achieved, even with roller or brush. Very good levelling properties as well as gloss and colour retention. Gloss level 90*.



TOPGLOSS BRUSH AND ROLLER Two-component polysiloxane topcoat with a unique gloss level and exceptional surface hardness. Provides the surface with high scratch resistance. Specially developed for brush and roller application. Outstanding spreading rate, hiding power, colour durability and optimal drying time. Gloss level up to 95*. The product is offered in 12 ready-made colours in an updated and contemporary colour package.

NEW



TOPONE One-component enamel, based on urethane modified alkyd binder, giving very good application properties when applied by roller or brush. Provides a glossy finish and good abrasion resistance, while staying flexible. Ideal for wooden boats. Gloss level 85*.



SHIPOLIN One-component rapid dry, alkyd based thixotropic topcoat for pleasure boats with excellent brush and roller application properties, giving a high gloss surface. To be used on deck house and other steel or wooden constructions above water line. Gloss level 80*

* Gloss units. Some products may not be available in your country. Please contact your local Jotun office for detailed information.



Paint Systems

ONE-COMPONENT SYSTEMS

On top of new substrate or completely sanded.

		FIBRE GLASS	ALUMINIUM	WOOD	STEEL
1	Cleaning	High pressure fresh water washing and degrease with BoatWash if necessary			
2	Surface preparation	Dry sand with P120 - P150 grade	Mechanical	Dry sand with P80 - P150 grade	Mechanical
3	Apply	Vinyl Primer		Clipper I (5-15 coats wet-on-wet until total absorption)	
4	Apply	Vinyl Primer			
5	Apply	Vinyl Primer			
6	Apply	TopOne or Shipolin			
7	Apply	TopOne or Shipolin			

TWO-COMPONENT SYSTEMS

On top of new substrate or completely sanded.

		FIBRE GLASS		ALUMINIUM		WOOD	STEEL	
1	Cleaning	High pressure fresh water washing and degrease with BoatWash if necessary						
2	Preparation	Dry sand with P120 - P150 grade		Mechanical		Dry sand with P80 - P150 grade	Mechanical	
3	Apply	AntiPest	Vinyl Primer	AntiPest	Vinyl Primer	Clipper I (5-15 coats wet-on-wet until total absorption)	Epoxy Yacht HB	
4	Apply	AntiPest	Vinyl Primer	AntiPest	Vinyl Primer	Vinyl Primer	AntiPest	Vinyl Primer
5	Apply	TopGloss, TopGloss BR	TopGloss BR	TopGloss, TopGloss BR	TopGloss BR, TopOne	TopGloss BR	TopGloss, TopGloss BR	TopGloss BR
6	Apply	TopGloss BR		TopGloss BR		TopGloss BR		

- One thick coat with primer may be accepted but be aware that this may result in an uneven surface, affecting the final finish.
- TopGloss BR may be applied on both Vinyl Primer and AntiPest, but Vinyl Primer is recommended for best finish. TopGloss may only be applied on AntiPest.

PAINT SYSTEM

On top of existing paint system in good condition.

		ON TOP OF TWO-COMPONENT PRODUCTS	ON TOP OF ONE-COMPONENT PRODUCTS
1	Cleaning	High pressure fresh water washing and degrease with BoatWash if necessary	
2	Surface preparation	Light sanding with fine sand paper as P280-P360 and removal of dust	
3	Apply	TopGloss BR or TopGloss	TopOne or Shipolin
4	Apply	TopGloss BR or TopGloss	TopOne or Shipolin

Application advice

HOW MUCH PAINT WILL I NEED?

The necessary amount of paint is depending on the area to be painted. A simple way to calculate the area is by measuring the distance from the waterline to the deck and multiply it by the total length. This has to be multiplied by the two sides of the boat plus the area of the aft part. Since boats have different design, this calculation is only an estimate.

By dividing this area by the spreading rate of each product (information available in the can and the technical data sheets), you can establish the number of litres required to paint the boat. As a quick guide, please refer to the below table of approximate number of litres required for each boat type.

	MOTOR BOAT							SAILING BOAT						
Waterline length (m)	4	6	7,5	9	11	13	15	4	6	7,5	9	11	13	15
Waterline length (ft)	13	20	25	30	36	43	49	13	20	25	30	36	43	49
Area (m ²)	8	12	20	24	34	46	58	6	9	14	22	34	46	58
Cans 0,75 l.	1	2	3	3	5	6	8	1	2	2	3	5	6	8

COLOURS

Historically, paint producers have had a limited range of colours available for customers to choose from. Although the most common colours are white and dark blue, there is a wide variety of shades of these colours, and nowadays a large range of colours can be seen on all types of boats.

Jotun Yachting now offers a new colour range with more colours than ever before. In addition, Jotun Yachting can offer special colours thanks to the Jotun Multicolour System.

Application advice

HOW TO PAINT?

For professional applicators, the best method for applying topcoats is by conventional spray. This method will provide a very smooth and glossy finish as it requires high dilution and paint is “transported” by air which helps to level the surface. It requires the correct equipment and a certain expertise to get the desired finish. In addition some protection of adjacent areas is necessary to avoid dry spray contaminating the rest of the boat. However, brush and roller are very effective methods, very easy to use and they will provide a very good and professional finish.

1. PREPARATION

Before painting it is recommended to protect all areas which are not going to be painted. Use a solvent resistant plastic. In the case of spray application there will be lot of paint mist, thus it is important to carefully protect the underwater area as well as the deck.

Note: If the antifouling has already been applied, protect all the underwater area to avoid dust, paint mist and any other type of contamination that may affect the performance of the antifouling.

2. PROTECTION

It is also important to protect yourself with proper overalls, gloves, goggles and mask. Adhere to safety instructions on back labels and technical data sheets.



3. STIRRING

It is essential to thoroughly stir any type of paint, but this is even more critical with two-component products, as drying will not be correct and it will not provide the expected gloss and hardness. For up to three litre cans, use a wooden/metallic stirrer and for bigger can sizes, use a mechanical stirrer. The stirrer must be totally clean to avoid contamination of the paint.



4. APPLICATION TOOLS

- Spray: Recommended for professionals but not always possible.
- Roller: A medium or short sized mohair roller, resistant to solvent, is recommended. Alternatively a foam roller can be used, but with this type there will be more air entrapment, requiring extra brushing work to achieve perfect finish. It is important to use a good quality brush in order to avoid loosing fibers that may be left on the paint film. Different types of rollers provide different film thickness. In general, mohair rollers will provide more film thickness than a foam roller.

5. SURFACE PREPARATION

Regardless of the application method, a professional finish can be achieved as long as the surface preparation is undertaken correctly. All areas to be painted must be washed with fresh water to remove dust, salts and other contamination. If grease or oil is identified the surface must be degreased with BoatWash.

Once the surface is clean and dry, sand it to obtain adhesion and a smooth and flawless surface. The surface should be matt or semi-glossy, then follow the system below:

1. Apply one primer coat as per the specification chart.
2. If the surface has defects due to scratches, holes, etc. apply filler as necessary. Allow to dry and carefully sand with a P240 – P360 degree sand paper.
3. After the filler, apply an extra coat of primer to seal the filler and prevent any solvent and resin entrapment which may affect the final gloss.
4. Sand with P360-P400 sand paper. Thoroughly clean the surface before topcoating.
5. Finally, apply the topcoat.

6. APPLICATION

Apply by roller. Directly after roller application, gently brush the paint’s surface in a vertical direction using a wide, high quality brush. This is known as the «roll and tip» method. For spray application, Jotun can be contacted for detailed information on the technique to be used. When using roller or brush, apply two coats of the topcoat. By doing this, the levelling properties are increased, thus obtaining a high gloss finish, more uniform thickness and better durability and resistance.

Apply the recommended coats. Avoid applying under adverse conditions such as strong wind, high sunlight/heat (specially at noon in summer time), low temperatures or high humidity or rain. It is not recommended to add solvents as these reduce the thickness applied and there will be more risk of sagging, splashes, etc. However, if necessary to apply paint in strong wind or in high temperatures, it is possible to add between 5% and 10% (maximum) of solvent. Only use Jotun thinners and carefully read the product specific technical data sheet prior to use.

The best finish is obtained by crossing coats: the product has to be applied first in diagonal or horizontal direction and then re-paint vertically. By doing this, better leveling will be achieved, air can be more easily released and there will be a more uniform finish. It is advisable to use good quality brushes and rollers in order to avoid fibres on the wet paint. This working method should be repeated for all the following coats.

HINTS FOR A PERFECT FINISH

- Do not apply paint in very high or very low temperatures, in strong sunlight or in strong wind.
- Wet the floor around to avoid dust on wet paint.
- Stir the product thoroughly and every now and again during application.
- If possible share the job between two people.
- Use high quality rollers, preferably mohair type or foam type.
- For the last coat an absolutely clean or new brush should be used.
- Apply by roller and re-paint directly by brush.
- Keep the brush at 45° angle to avoid brush marks.

WOOD TREATMENT AND VARNISHES

Wood is a natural material which gives a warm and sophisticated impression of your boat, but it needs a high quality varnish to enhance and protect its beauty. Most people are mainly concerned about the gloss level of the varnish, however it is important to remember that the varnish is the only protection the wood has against the marine environment.

The sea, sun and wind are all affecting the wood throughout the season and thus, varnishes have to be efficient and provide the following characteristics:

- Protect the wood against its main enemy - UV light - which attacks the natural fibers in the wood.
- Protect the wood against sea water, rain, wind and dust.
- Preserve and enhance the wood's natural beauty.

The best way of achieving a perfect result when varnishing is to allow enough time for preparations and pay attention to detail. Make sure you have as much time for the preparations as for the varnishing itself and to have high quality brushes. Remember that it is easier to achieve a perfect finish if you have someone to help you!



A good basis for varnishing

Before applying any varnish it is advisable to increase protection by applying a penetrating wood oil. The main purpose of this product is to increase the waterproof barrier of the system, to provide good protection against fungus and roots and leave a well prepared substrate for proper varnishing.

Jotun Yachting offers two traditional one-component varnishes, and one cross-over product which is a combination of oil and varnish.

DIFFERENT TYPES OF VARNISHES AND WOOD TREATMENT PRODUCTS



CLIPPER I Conserving oil for wooden boats, interior and exterior above the waterline, with very good penetrating effect. Ideal foundation for treatment with Jotun Yachting varnishes.

Substrate to be dry and free of contamination. Wash oily tropical hardwood with Jotun Thinner No 18. Sand with P60 – P80. Remove existing varnishes and loose wood fibres. Apply 5-15 coats, wet-on-wet, depending on surface absorption.



CLIPPER II High gloss, long oil alkyd varnish, with exceptional hardness and very good penetration properties. Gives a professional, clear finish. Contains UV filters to protect wood against sunlight. Very good levelling and gloss retention.

Substrate to be dry and free of contamination. To be applied on Clipper I or on old surfaces previously coated with Clipper II in good condition.



BENAR MARINE Moisture release, long oil, high gloss wood treatment. Provides a varnish finish effect with very high penetration and breathing properties, allowing humidity to be released without peeling off and to move together with wood without cracking.

Substrate to be dry and free of contamination. To be applied on Clipper I or on old surfaces previously coated with Benar Marine in good condition.



RAVILAKK Urethane, high gloss varnish with exceptional hardness and high flexibility. Gives a professional finish, with a light golden shade. Its UV filters enhance the natural beauty of the wood, while preventing it to get darker. Very good levelling and gloss retention.

Substrate to be dry and free of contamination. To be applied on Clipper I or on old surfaces previously coated with Ravilakk in good condition.



TEAK OIL Vegetable teak oil designed to protect the teak deck from oxidation and degradation caused by environmental agents. Can also be used on other wooden surfaces.

Substrate to be dry and free of contamination. Wash oily tropical hardwood with Jotun Thinner No 18. Apply one coat of Teak Oil by brush. After 15 minutes remove the excess oil with a dry, clean cloth. If necessary apply a second coat of Teak Oil after one hour.



TEAK CLEANER A waterbased cleaner for teak and other hardwoods. Teak Cleaner is designed to clean and restore weathered teak and other hardwoods. Restore the natural colour of the woods.

Shake Teak Cleaner well before use. Apply to the surface and let it work for 5–20 minutes. Rinse well with fresh water. Protect the wood with Jotun's Teak Sealer or Teak Oil.



TEAK SEALER Waterbased sealer based on wood oil for teak and other hardwoods. Provides a waxy surface which protects against water and dirt/stain and prevents the surface drying and cracking.

Clean the surface with Teak Cleaner and rinse well with fresh water. Shake Teak Sealer well before use. Apply with brush or roller until the wood is saturated. Wipe off excess after 30 minutes.

The ideal varnish

PRODUCT	WOOD EXTERIORS	WOOD INTERIORS
Ravilakk	★★★	★★★
Clipper II	★★★	★★★
Benar Marine	★★★	★

Key: ★★★ Excellent ★★ Good ★ Suitable

Paint Systems

On top of new or totally sanded wood.

		ONE-COMPONENT SYSTEM		
1	Cleaning	High pressure fresh water washing and degrease with BoatWash if necessary		
2	Preparation	Sand first with a P80–P180 grade sand paper, followed by P240–P320 grade		
3	Apply	Clipper I (5-15 coats wet-on-wet until total absorption)		
4	Apply	Ravilakk	Clipper II	Benar Marine
5	Apply	Ravilakk	Clipper II	Benar Marine
6	Apply	Ravilakk	Clipper II	Benar Marine
7	Apply	Ravilakk	Clipper II	Benar Marine
8	Type of finish	Gold glossy finish	Clear glossy finish	Clear glossy finish

To achieve a very high gloss when applying Ravilakk or Clipper II, it is advisable to apply one coat per day with sanding in between with a fine grade sandpaper (P320–P400).

Benar Marine may show some degree of stickiness over time but this will not affect its recoating properties and the product may be over coated after 24 hours. Application may be done by applying very thin coats, brushing carefully.

ON TOP OF AN OLD SYSTEM:

Before any application, product compatibility must be checked. If the product type is unknown carry out a simple test using an epoxy or polyurethane solvent (i.e. Jotun Thinner No. 17 or Jotun Thinner No. 18) and a clean cotton cloth. If solvent attacks the varnish (soft or wrinkles), it is a one-component product. If the paint withstands the solvent (with only minor loss of gloss) this means it is a two-component product. Old two-component varnishes must be removed.

Application advice

1. PREPARATION

Before starting, mask and protect surrounding areas not to be varnished with solvent resistant tapes or plastics (such as 3M).

Note: If the antifouling has already been applied, protect all the underwater area to avoid dust, paint mist and any other type of contamination that may affect the performance of the antifouling.

2. PROTECTION

It is also important to protect yourself with proper overalls, gloves, goggles and mask. Adhere to safety instructions on back labels and technical data sheets.

3. STIRRING

It is essential to thoroughly stir any type of paint. This is even more critical when dealing with two-component products, since they will not dry properly and not provide the expected gloss and hardness otherwise. For up to three litre cans, use a wooden/metallic stirrer and for bigger can sizes, use a mechanical stirrer. The stirrer should be completely clean to avoid contamination of the paint.

4. APPLICATION TOOLS

- Brush: The preferred method due to its properties of application and easy access to small areas. Must be solvent resistant. It is important to use a high quality brush to avoid it loosing fibres which may be left on the surface.
- Roller: A medium or short sized mohair roller, resistant to solvent should be used. Alternatively a foam roller can be used, but with this type there will be more air entrapment, so extra brushing work will be necessary to achieve a perfect finish.

5. SURFACE PREPARATION

Regardless of the application method, the key factor for achieving a professional finish is a correct surface preparation. All areas to be painted must be washed with fresh water to remove dust, salts and other contamination. If the surface has stains of grease or oil, it should be degreased. Once the surface is clean and dry, sand it to obtain adhesion and a smooth, flawless surface.

For previously varnished surfaces in good condition, sand with P280-P320 and remove all dust from sanding. Surfaces with minor damages, sand with P280-P320 and repair the damaged area before new varnish is applied. Small damages and scratches may be repaired by filling the damage with multiple layers of the varnish used for the rest of the boat. Finish by sanding the repaired damage to achieve a smooth surface for the continued varnish application. For surfaces in poor condition, all varnish needs to be removed by scraping or sanding the surface, possibly with the help from a hot air gun.

6. APPLICATION

On top of new wood, apply several coats of varnish to protect the surface. To achieve good protection, apply 4-5 coats of one-component varnishes. Apply thin coats to obtain a glossy and smooth finish. It is advisable to sand between coats to remove possible dust inclusions. This will achieve a better leveling and a uniform thickness, and thus better resistance and durability.

Apply the recommended coats. Avoid applying under adverse conditions such as strong wind, high sunlight/heat (specially at noon in summer time), low temperatures or high humidity or rain. It is not recommended to add solvents as these reduce the thickness applied and there will be more risk of sagging, splashes, etc. However, if necessary to apply paint in strong wind or in high temperatures, it is possible to add between 5% and 10% (maximum) of solvent. Only use Jotun thinners and carefully read the product specific technical data sheet prior to use.

THE RECOMMENDED APPLICATION SYSTEM IS:

1. Apply 5-15 coats of Clipper I, wet-on-wet, as per the application guide.
2. Apply a first coat of Jotun Yachting varnish which should be diluted with 10% and 15% of the recommended Jotun thinner. This will help penetration.
3. Apply three to four coats of the product. If long lasting protection is desired, a total number of 10-15 very thin coats should be applied.
4. As more coats are applied sand the surface with a fine grade to avoid defects and dust inclusions that may be visible on the following coats.
5. Follow the drying times and the recoating intervals as stated in the technical data sheet of each product. A rule of thumb is to apply one coat per day.

The best finish is obtained by applying thin coats in the same direction as the grain of the wood. Although not necessary, it is advisable to sand between coats with a very fine grade sandpaper to remove wood fibres, dust and other defects. By doing this, a uniform thickness will be achieved and the finish will be defect free for the following coats. Use good quality brushes and rollers in order to avoid fibres on the wet paint.



HINTS FOR A PERFECT VARNISH RESULT

- Do not apply in very high or very low temperatures, under strong sunlight or in strong wind.
- Wet the floor around to avoid dust on wet paint.
- Stir the product thoroughly and every now and again during application.
- Use high quality rollers, mohair type or foam type.
- Apply thin coats following the direction of the wood grain.
- Apply 5-15 coats of Clipper I, wet-on-wet. If Clipper I is not available, the first coat of varnish can be diluted 10-15% to improve the penetration.
- After the first coat, it may be necessary to sand with a medium to fine grade sandpaper to remove wood defects.
- Apply the product by brush at 45° angle to avoid brush marks.

OSMOSIS

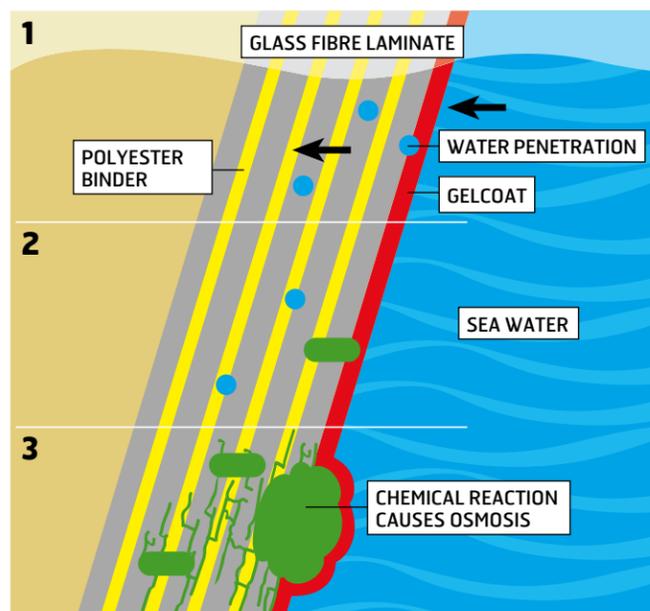
Osmosis is recognized as the main enemy of fibre glass hull boats. Osmosis occurs as a result of water vapour and humidity transmission through the gelcoat layer, affecting the fibre glass lamination and its structural resistance.

THE OSMOSIS PROCESS

Osmosis is the natural process of liquids to equal the differences in pressure between the humidity content of the hull and the sea water. The gelcoat is not a totally waterproof barrier, as many people believe, so humidity will penetrate through the gelcoat down to the fibre glass laminate.

Other factors that contribute to the development of osmosis, are water and moisture in the bilges. This moisture will also penetrate the laminate from inside, thus enabling osmosis to occur. The speed of the osmosis process and the damage it may cause is depending on several factors, such as production speed, glass fibre quality, water temperature etc. Osmosis is a potential problem for gelcoat hulls in the same way corrosion threaten steel and aluminium hulls. To prevent osmosis, it is important to apply a correct paint system as soon as possible.

How does osmosis occur?



Osmosis is the process where water is transported through a film, e.g gelcoat, from an area with high concentration of water to an area with low concentration of water in order to achieve equal water concentration in the two areas. These areas may be in the polyester binder itself (yellow area), in the glass fibre laminate (grey area) or between the glass fibre laminate and the gelcoat (red area). After some time, both sides of the membrane (gelcoat) have an equal concentration of water, which will create blisters with an hydraulic pressure behind the gelcoat.



HOW TO DETECT AND TREAT A HULL AFFECTED BY OSMOSIS

It is not always easy to detect osmosis in a hull. Only when blistering can be seen, it is easy to check if the hull has osmosis. If the blistering, blisters (usually of different sizes) contain a brown coloured liquid with a vinegar odour, it is reason to believe that the hull has osmosis and an osmosis treatment must be initiated. If blisters are dry and hard, they are the consequence of air or solvent retention during the painting works, which has no effect on the fibre glass.

If blisters are not visible, this does not mean that hull is osmosis free: as we seen in the "Osmosis procedure" explanation, the osmosis process requires a certain time before blisters are likely to appear. Furthermore preventive treatments will not stop the osmotic process, so it is advisable to get the hull inspected by a professional who may confirm the osmosis problem. If so, a repair treatment should be initiated as soon as possible to avoid the progression of osmosis.

If a full osmosis treatment has to be carried out, the gelcoat must be removed completely, the hull must be left to dry and the Jotun Yachting Osmoshell system should be applied to the fibre glass before any primer or antifouling. The most important key point is to rebuild enough thickness with epoxy products which will be much more waterproof than gelcoat.



PRODUCTS



OSMOSHELL Unique special filler for repairs of major osmosis damage. Contains glass flakes to provide exceptional hardness. Should be applied by professionals. Jotun's recommended product for major osmosis damages.



EPOXY YACHT HB Two-component, epoxy mastic primer, with impressive waterproofing properties, being the ideal primer for a perfect anti-corrosive protection system for steel, and against osmosis in fibre glass hulls. Thanks to its special adhesion properties, it can be applied on top of corroded surfaces once they are clean. Due to its extreme hardness, it provides a high resistance to abrasion and long durability.

PAINT SYSTEM WITH OSMOSHELL

Recommended painting process for an osmosis treatment of a fibre glass hull

1	Cleaning	High pressure fresh water washing and degrease with BoatWash if necessary
2	Preparation	Remove the existing paint and gelcoat completely and rinse the hull with fresh water (warm if possible) adding some abrasive material(*)
3	Preparation	Let the hull dry (less than 1% water In the fibre glass), wash with fresh water every week
4	Apply	Apply a first coat of Osmoshell with a smooth spatula to fill in all defects, hollows etc.
5	Apply	1.000 microns (1 mm) with Osmoshell by tooth and smooth spatula after surface preparation
6	Apply	One coat of Finishing Filler** if necessary to achieve a smooth surface
7	Apply	AntiPest
8	Apply	Antifouling

Small osmosis damage may be repaired with Epoxy Repair.

Osmoshell is a solvent-free epoxy coating, reinforced with glass flakes, giving a very high structural resistance, being virtually waterproof. This is a curative coating system for hulls affected by osmosis.

(*) If abrasive material cannot be used, coarse sanding with P40 – P80 dry paper is recommended in order to ensure proper roughness and full adherence of the system.

(**) Finishing Filler is recommended to obtain a smooth surface. It is not needed in terms of water resistance, but Osmoshell will leave certain roughness after application and should not be sanded to avoid film thickness reduction. Finishing Filler can be easily sanded to get a smooth surface.

PAINT SYSTEM WITH EPOXY YACHT HB

An alternative repair coating system to Osmoshell is to apply several coats of Epoxy Yacht HB, a high build epoxy coating. Apply 8-10 coats depending on application method, before application of AntiPest. This process is slower and will provide less thickness, but is much easier to apply (roller only) and the final result will be a good alternative to Osmoshell, in terms of water resistance.

Painting process for an osmosis repair system of a fibre glass hull

1	Cleaning	High pressure fresh water washing and degrease with BoatWash if necessary
2	Preparation	Remove the existing paint and gelcoat completely and rinse the hull with fresh water (warm if possible) adding some abrasive material(*)
3	Preparation	Let the hull dry (less than 1% water In the fibre glass), wash with fresh water every week
4	Apply	800 microns (8-10 coats) Epoxy Yacht HB applied with brush or roller
5	Apply	One coat of Finishing Filler** if necessary to achieve a smooth surface
6	Apply	AntiPest
7	Apply	Antifouling

(*) If abrasive material can not be used, coarse sanding with P40 – P80 dry paper should be carried out in order to assure a proper roughness and full adherence of the system.

(**) Finishing filler is recommended to obtain a smooth surface. It is not needed in terms of water resistance, but Epoxy Yacht HB is a high build coating which may leave certain roughness after application. Epoxy Yacht HB should not be sanded to avoid film thickness reduction. Finishing Filler can be easily sanded to get a smooth surface. Moisture content of the hull has to be less than 1% before application of any coating.

FILLERS

Fillers are necessary for the repair of any hull imperfections, caused by collision or construction defects. These products can be applied at a very high film thickness and have very good sanding properties. Fillers are quite hard coatings, in order to resist damage, but must still be quite flexible enough not to crack, particularly on sailing boats.

THEIR MAIN CHARACTERISTICS ARE:

- To level out and smooth the hull surface.
- To help sanding works with minimum loss of thickness and volume.

There are different types of fillers, however Jotun Yachting recommends the use of two-component epoxy fillers due to its generally better waterproof barrier, low water absorption and degree of solvent resistance, compared to polyester fillers. Their hardness and flexibility are also significantly better. For underwater areas, only epoxy fillers can be used.

It is important to note that fillers have to be applied between coats of primers (sandwich technique), in order to secure a total sealing of the filler coat. By doing this, the risk of water absorption and low gloss areas on subsequent coats due to solvent absorption is avoided.

FILLER COLOURS

Each component of Jotun Yachting fillers have different colours in order to help mixing. Usually the components have contrasting colours; thus, the mixing is correct when a homogenous colour is achieved and no traces of the original component colours can be seen.

TYPES OF FILLERS

Jotun Yachting has three types of epoxy fillers and one gelcoat repair kit made with polyester filler. These are suitable for different types of use. Lightweight Filler is an ultra-light weight fairing compound for big repairs, Finishing Filler is a filler for smooth finishes and relatively small defects and Epoxy Repair, is a filler for spot repairs. The main difference between them is the type of finish they provide, their degree of hardness and waterproof properties. All of them are very easy to sand.

GELCOAT FILLER SYSTEM

Gelcoat repair system (for topsides maintenance):

1	Cleaning	Surface has to be rinsed with fresh water and left to dry
2	Paint system	Apply on top of the gelcoat
3	Apply	Gelcoat Filler (necessary number of coats to repair the damage)

PRODUCTS



LIGHTWEIGHT FILLER Two-component, ultra light weight (0,57 kg/l), epoxy filler compound for high film thickness application. It can be applied up to 30 mm. and fill very big areas, without having a big impact in the total weight of the boat. It is very easy to sand, but is more porous and leaves a more irregular surface than Finishing Filler, so it has to be recoated with Finishing Filler after sanding and prior the epoxy primer application.



FINISHING FILLER Two-component epoxy filler, for finishing jobs. Can be applied up to 3 mm of film thickness, leaving a very smooth surface without pores. Can be sanded easily and provides a very smooth and uniform surface. Although it has a low absorption degree of water or humidity, it is necessary to seal the filler with an epoxy coating. Suitable as filler system in osmosis treatments and repairs.



EPOXY REPAIR Two-component, high density, epoxy finishing filler, for small damages and cracks. It can be applied in relatively high film thickness (up to 20mm) and is suitable for repairing, holes and pores. Can be sanded easily and provides a smooth surface. Needs to be recoated with an epoxy coating.



GELCOAT FILLER Two-component polyester filler, for small damages and scratches. It is a coloured paste, very easy to apply and can be directly applied on weathered gelcoat, once it is clean and sanded. Fast drying and can be sanded easily to provide a smooth and bright surface.



FARM 80 is a gap-filling compound for small to medium size gaps on wooden boats.

Some products may not be available in your country. Please contact your local Jotun office for detailed information.

Filler system

1. SURFACE PREPARATION

Must always be applied on top of a dry and clean epoxy primer. If overcoating interval is exceeded, the primer has to be sanded.

2. FILLERS

Jotun Yachting fillers are all two-component epoxies (except Gelcoat filler). Their mixing ratio is 1:1 both by weight and volume, so it is very easy to get the correct mixing proportion for any quantity needed. Once applied and dry, the filler has to be sanded before re-painting with an epoxy primer or between filler layers.

NB. All fillers are more porous than epoxy paints, so in case of heavy rain after filler application, they may absorb some humidity. Therefore, it is necessary to let them dry for a couple of days before overcoating in order to help evaporation and drying.

BILGES AND ENGINES

1. BILGES

Bilges are usually a problem area due to the high quantity of water and oil remaining inside them. In fact, the bilges of boats create problems due to a combination of difficult access, narrow spaces, content of seawater, content of fresh water (rain, cleaning, etc.), oil and fuel content due to leakages. Furthermore, they may host the starting point of osmosis problems, if the fibre glass is not correctly protected (see Osmosis chapter).

Paints and coatings for those areas must meet the following requirements:

- To create a waterproof barrier.
- To provide enough water, oil and fuel resistance.
- High durability due to difficult access to their narrow spaces.

One-component products have been commonly used due to the easy application and fast drying time, but Jotun Yachting recommends using two-component products that will result in worry-free bilges.

2. ENGINES

Obviously the engine is a key element in yachting and for safety but only proper maintenance will keep the engine in optimal condition. The exterior of an engine may not be particularly attractive. The solution is simple: paint the engine to keep it looking like new. This will protect it against corrosion by seawater and will also facilitate cleaning and further maintenance.

Paints for engines must provide the following features:

- Resistance against water, oils and fuel.
- Resistance against engine high engine temperatures.
- High durability due to difficult access to all parts of the engine.

COLOURS

It is very common to paint the engine using the corporate colours of the engine manufacturer. Should you wish to change the colour of the engine, the Jotun Multicolour tinting system can provide any colour you desire.

TYPES OF FINISHES

All Jotun Yachting finishes (see Topcoats chapter) can be used for engine maintenance. After application of a two-component primer, such as AntiPest or Epoxy Yacht HB, it is possible apply TopGloss, TopGloss BR, TopOne and Shipolin. On top of Vinyl Primer apply TopOne or Shipolin.



BOATCARE

As a boat owner, we are at our proudest when leaving the harbour in our shiny, newly polished boat for the first time in the new season! After a long winter storage, not only antifouling is to be applied but the rest of the boat also needs attention. Dust, dirt and yellowing are common challenges and chrome and other details needs polishing to regain its former beauty.

Jotun Yachting has a range of advanced products to cover the maintenance of all areas of the boat. Some products can be used in combination with others to provide a full maintenance and care system.

BOATCARE PRODUCTS AND SYSTEMS FOR FIBRE GLASS AND PAINTS

- Clean and remove impurities.
- Remove small scratches and damages.
- Restore the gloss and provide a protection layer to enamel or gelcoat.

BOAT CARE PRODUCTS FOR WOODEN SURFACES

- Clean and remove salts and stains.
- Restore the colour and appearance of the wooden substrates.
- Provides a protective layer on top of the wooden surface.

BOAT CARE PRODUCTS AND SYSTEMS FOR METALLIC SURFACES

- Clean and remove salts and stains.
- Remove oxidation or corrosion.
- Restore the gloss and provide a protection layer to the surface.

BOAT CARE PRODUCTS AND SYSTEMS FOR RUBBER SURFACES

- Clean and remove impurities.
- Remove stains.
- Restore the gloss and provide a protection layer to the surface.

BOAT CARE PRODUCTS FOR TEXTILES

- Clean and remove salts and stains.
- Remove mildew.
- Protect and impregnate.

Some products may not be available in your country. Please contact your local Jotun office for detailed information.



1. BOATCARE

PRODUCTS	AREA OF USE
 <p>BOATWASH Alkaline waterborne detergent for removing grease, salt and dirt without matting the surface. Biological degradable and can also be diluted with salt water, but it is important to rinse with fresh water afterwards. Suitable cleaner for gelcoat and wooden boats both outside and inside, and on painted or varnished surfaces. Can be used for cleaning the engine.</p>	<p>Normal cleaning: dilute with fresh water at a ratio of 1:50 – 1:100. Heavy cleaning: dilute with fresh water at a ratio of 1:20. Clean the surface using a brush or a sponge. Rinse well with fresh water. Cleaning of engine: Apply undiluted BoatWash on to the surface and leave to work for 5 – 10 min and rinse with fresh water. Very dirty areas use brush to clean.</p>
 <p>WATERLINE CLEANER An acid cleaner based on a hydrochloric acid. To be used for cleaning of the waterline. Efficiently removes yellowing, shells, barnacles and algae from the gelcoat.</p>	<p>Apply concentrated Waterline Cleaner on the area to be cleaned and leave to work for 2-5 min. If necessary, scrub the areas with shells, barnacles, etc., with a stiff brush. Rinse well with fresh water or use a sponge to remove the product. Wash with BoatWash and rinse well with water. Finally clean/wax the area with Gelcoat Cleaner and/or Hard Wax.</p>
 <p>GELCOAT CLEANER Cleaner based on nano-technology, for heavily weathered gelcoat and two-component paints. Eradicates small scratches and swirl marks. Act as a primer for Hard Wax. Extremely easy to polish. To be used on weathered gelcoat as well as surfaces painted with two-component topcoats.</p>	<p>Wash with BoatWash. Shake Gelcoat Cleaner well before use. Apply on the surface with a soft and moist cloth. For machine polishing, recommended rotating speed is 800-1500 rpm. Avoid Gelcoat Cleaner on rubber details. Polish small areas until the surface get a wet look. For the second polish, use polish paper or a clean cloth to achieve high gloss. Protect the surface with Hard Wax.</p>
 <p>HARD WAX A nano-technology based wax, specially developed for new and thoroughly cleaned surfaces, ensuring a deep mirror shine and long lasting protection. Can be degreased. To be used on gelcoat and two-component topcoated surfaces.</p>	<p>Wash with BoatWash. For older oxidised or flat surfaces: clean with Gelcoat Cleaner. Apply a thin layer of Hard Wax with a polish paper or a soft cloth and let it dry for 10-15 min. Polish with polish paper/cloth/microfiber cloth to obtain high gloss. Shake Hard Wax well before use. For machine polishing recommended rotating speed is 1000 rpm. Do not apply Hard Wax on hot surfaces or in direct sunlight.</p>
 <p>SHINY MARINE POLISH Wax polish based on a special combination of very fine polishing agent and synthetic wax. Shiny cleans, polishes and protects the surface in one operation. To be used on weathered gelcoat as well as surfaces painted with two-component topcoats.</p>	<p>Wash the surface with BoatWash and rinse well with fresh water. Apply a layer of Shiny Marine Polish on the surface with a soft cloth. Polish to desired cleaning effect and finish with a new clean cloth to high gloss. Surface can be washed after 24 hours. Do not apply Shiny on hot surfaces and direct sunlight.</p>
 <p>EASY WAX It is a nano-technology express liquid wax. The product is very easy to use and provide a mirror-like shine and good protection. To be used for a quick shine in between regular Hard Wax application. Can be applied directly on a wet surface after washing and will not leave white residue on rubber trim.</p>	<p>Wash with BoatWash. Spray Easy Wax directly on the wet surface, on small areas at the time. Wipe off with a soft cloth or microfiber cloth. Shake Easy Wax well before use. Do not apply Easy Wax on hot surfaces or in direct sunlight.</p>
 <p>RUBBING A heavy duty liquid polish suitable for both hand and machine polishing. To be used for rubbing and polishing of gelcoat. Excellent for removing small scratches, oxidized surfaces, dirt and stains.</p>	<p>Wash the surface with BoatWash and rinse well with fresh water. Apply a generous amount of Rubbing with a soft cloth or polish paper. Rub only small areas at the time with circular movements or machine polish at 1000-1500 rpm. After drying, polish with a soft cloth or polish paper to high gloss. Finishing treatment with Hard Wax. Shake Rubbing well before use and avoid contact with rubber and plastic details. Do not apply Rubbing on hot surfaces or in direct sunlight.</p>

PRODUCTS	AREA OF USE
 <p>CHROME POLISH Based on nano-technology leaving a high gloss surface with excellent water and stain protection. To be used for polishing of chrome and stainless steel details.</p>	<p>Wash the surface with BoatWash, rinse well with fresh water. Apply Chrome Polish with a soft cloth or polish paper and polish to desired effect. Complete with a new clean cloth or polish paper to high gloss. Shake Chrome Polish before use. For machine polishing, recommended rotating speed is app. 1000 rpm. Do not apply Chrome Polish on hot surfaces or in direct sunlight.</p>
 <p>RIB CLEANER An effective waterborne detergent based on a blend of surfactants and emulsifiers. Remove grease, salt and dirt without matting the surface. To be used for cleaning of RIB boats, fenders and other rubber details.</p>	<p>Wash with fresh water. For normal cleaning, dilute with 1:2 with water. For heavy cleaning, apply undiluted RIB Cleaner onto the surface. Clean the surface using a cloth or sponge. Shake RIB Cleaner well before use. Rinse well with fresh water before the product is dry.</p>
 <p>RIB SHINE A waterborne silicone emulsion for protection of rubber details. To be used for effective protection of RIB boats, fenders and other rubber details, providing the initial appearance and protecting the surface against weathering.</p>	<p>Clean the surface with RIB Cleaner. Rinse well with fresh water and let the surface dry. Shake well before use. Apply RIB Shine using a cloth or sponge. Do not apply RIB Shine on hot surfaces or in direct sunlight.</p>
 <p>TEXTILE CLEANER A waterbased concentrated alkaline cleaner based on a blend of surfactant, emulsifiers and water. The product does not contain solvents and is biodegradable. To be used for cleaning of sprayhoods, rugs, awnings and other textile products.</p>	<p>Shake Textile Cleaner well before use. For normal cleaning dilute Textile Cleaner with fresh water at a ratio of 1:3. Spray the product directly on to the textile or apply with a brush or a sponge, and leave to work for 10 min. Avoid contact with plastic windows. Rinse well with fresh water. For cleaning of plastic windows, use a dilution with fresh water at a ratio of 1:20. Do not let the product dry on the textile or plastic window. Areas with mould and green algae, use Mildew Remover.</p>
 <p>MILDEW REMOVER It is a waterbased product containing chloride for removing mould and green algae. To be used for cleaning of sprayhoods, rugs, awnings and similar items of cotton and nylon materials. The product should not be used on none colour fast textiles.</p>	<p>Shake Mildew Remover well before use. For normal cleaning, dilute with water 1:5 and apply using a cloth or spray pump. Heavy cleaning, apply undiluted product to the surface using sponge or spray pump. Let it work for 5-10 minutes and scrub with a moisten sponge, brush or cloth. Rinse well with fresh water. The product should be used within 12 months to achieve full effect.</p>
 <p>TEXTILE WATERSHIELD It is a quick drying, waterfree impregnation that gives a good water proof and dirt repellent surface. Protect the surface against ageing and wearing. To be used for sprayhoods, rugs, awnings and similar items of cotton and nylon materials.</p>	<p>Clean with Textile Cleaner or Mildew Remover. Rinse well with fresh water and let the surface dry. Apply a uniform layer of Textile Watershield on the surface and let it dry. Do not apply Textile Watershield in direct sunlight and avoid contact with plastic windows.</p>

2. ADDITIVES

For safety reasons, decks and access can be painted to create an anti-slip surface. The same type of topcoats used for topsides can be used for decks as they provide both high abrasion resistance and weathering resistance, however an anti-slip aggregate can be added to give a non-glossy and non-slip surface. For doing this, Jotun has developed a special additive for topcoats that can be added during the paint job in any proportion to achieve the desired anti-slip surface.

PRODUCT	HOW TO USE
 <p>ANTISKID A mineral powder (silica) for mixing with all kind of Jotun Yachting topcoats and varnishes, for use on decks, floors, gangways and other areas where additional friction properties are required.</p>	Add to wet paint and apply by spray or sprinkled into the wet film during application. Stir the paint often during application.

3. THINNERS

Quick guide for solvents and thinners to be used with different Jotun Yachting products.

PRODUCT	TYPE	FOR USE WITH	JOTUN PRODUCTS
 <p>JOTUN THINNER NO. 2</p>	Alkyds and urethane alkyds	One-component topcoats and varnishes	Clipper I, Clipper II, Ravilakk, Benar Marine, Shipolin
 <p>JOTUN THINNER NO. 7</p>	Vinyl acrylics, urethane alkyds and polysiloxanes	One- and two-component topcoats, primers and antifouling	All antifouling, Vinyl Primer, TopOne or TopGloss BR
 <p>JOTUN THINNER NO. 12</p>	Polyurethane	Two-component topcoats and varnishes	TopGloss
 <p>JOTUN THINNER NO. 17</p>	Epoxy coatings	Two-component primers	Epoksy Yacht HB, AntiPest, Osmoshell
 <p>JOTUN THINNER NO. 18</p>	Polyurethanes, medium evaporation	Two-component topcoats and varnishes	TopGloss
 <p>JOTUN THINNER NO. 19</p>	Polyurethanes, fast evaporation	Two-component topcoats and varnishes	TopGloss

Jotun Thinner No. 17 and Jotun Thinner No. 18 can be used for cleaning tools and other equipment.

Do not add excessive solvent to coatings. Carefully check the coating manual and the technical data sheet of each product before adding any thinner. Solvents are having a direct effect in drying times, film formation and curing properties.

Important: Do not add any solvent to fillers. Solvents will affect drying times, film formation and water/solvent resistance properties.



BOATCARE SYSTEMS

To facilitate your choice of boat care products, we present a number of systems and some tips and hints that can help you achieve a perfect result. Best of luck!

FOR A PERFECT FINISH THROUGHOUT THE SEASON



1. Boatwash - dilute with water and clean with sponge.



2. Gelcoat Cleaner - polish with microfibre cloth, use wool pad if polishing with machine. Do not allow to dry on the surface.



3. Hard Wax - apply with microfibre cloth or lambs wool cloth. Allow to dry 10-15 min. Polish with microfibre cloth, or foam pad if using machine.



FOR QUICK AND EASY SEASON PREPARATIONS



1. Boatwash - dilute with water and clean with sponge.



2. Shiny Marine Polish - polish with microfibre cloth, use wool pad if polishing with machine.

THE QUICK ROUTE TO A SHINY SURFACE



1. Boatwash If necessary, wash with Boat Wash - dilute with water and clean with sponge.



2. Easy Wax - spray directly on the surface (which may be wet) and polish immediately with microfibre cloth.

FOR SCRATCH REMOVAL AND OXIDATION



1. Boatwash - dilute with water and clean with sponge.



2. Rubbing - apply generously with soft cloth or polishing paper, apply on small surfaces at a time. Machine polish with wool pad at 1000-1500 rpm.



3. Shiny Marine Polish - finish by polishing with microfibre cloth, use wool pad if polishing with machine.



FOR POWERFUL CLEANING AND REMOVING OF YELLOWING



1. Boatwash - dilute with water and clean with sponge.



2. Waterline Cleaner - remember to use protective eyewear and gloves. Apply with sponge, allow to dry 10 min and rinse thoroughly with fresh water.



FOR A BEAUTIFUL TEAK DECK



Teak Cleaner - apply with brush or roller and allow to dry for 15-20 min. If the surface is dirty, scrub with a short hair scrub. Rinse thoroughly with fresh water.



Teak Sealer/Teak Oil - apply with cloth or sponge and wipe off excessive fluid with microfibre cloth.

FOR AN ALL-NEW LOOKING SPRAYHOOD



1. Textile Cleaner - apply with cloth or sponge, allow to dry for 10 min, if necessary scrub gently, rinse thoroughly with fresh water.



2. Mildew Remover - to be used for removing mildew on coloured textiles. Apply with sponge or spray bottle, allow to dry for 10 min and scrub gently. Rinse thoroughly with fresh water.

FOR CLEANING AND PROTECTION OF RUBBER



1. Rib Cleaner - apply with cloth or sponge, scrub thoroughly and rinse with fresh water before the product has dried.



2. Rib Shine - apply with cloth or sponge and allow to dry.



3. Textile Watershield - apply by spraying on completely dry surface and allow to dry. Remember that seams are extra thick and will require slightly longer drying time after cleaning than the rest of the spray hood.

HEALTH, SAFETY AND ENVIRONMENT

In this section you find a number of advices aimed at helping you apply our products in a way that minimizes risk for health, safety and environment. The back labels on the cans provide you with symbols and warnings where you need to be extra cautious.

BEFORE YOU BEGIN

- Read the back label carefully. Safety data sheets are available at www.jotun.com
- Wear protective gear covering your whole body.
- Remove any rings, watches and bracelets before starting work.
- Always cover work area with protective sheets to prevent chemical runoff into the sea.
- Follow marina work regulations.
- Consider the weather, avoiding rain and strong winds.

DURING AND AFTER WORK

- Avoid inhalation.
- Wet sanding is recommended. Make sure your work area is properly ventilated.
- Consider using respiratory protection. This gear is required when spray painting.
- Avoid using hot air guns to strip old paint.

PROTECT YOUR EYES AND SKIN

- Always wear protective goggles (or visor) and chemical resistant gloves.
- Consider using a long handled brush or roller.
- Avoid stripping, sanding or painting directly above your face.
- Use soapy water (not paint thinner) to remove paint from skin.
- Immediately change any garments spattered with paint or thinner.

PROTECT THE ENVIRONMENT

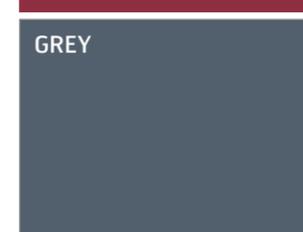
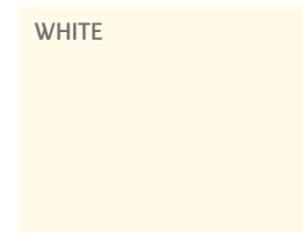
- For sanding, Jotun Yachting recommend using power tools connected to a vacuum cleaner, thus collecting up to 99% of the dust created.
- Choose the recommended brushes and rollers (minimize spatter and drip).
- Whether sanding wet or dry, always keep a clean rag handy.
- Immediately wipe off any spill.
- Dispose paint cans, excess paint and equipment at an approved waste management facility.



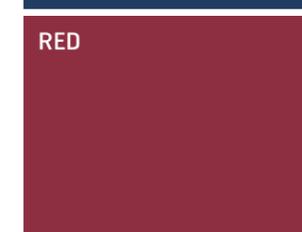
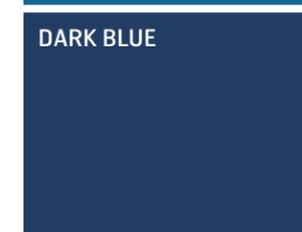
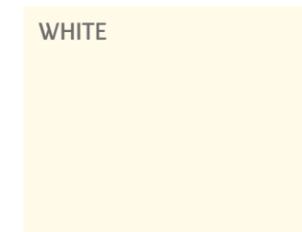
ANTIFOULINGS



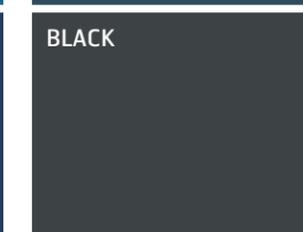
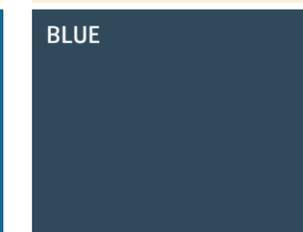
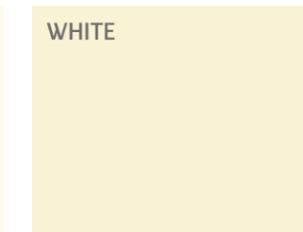
NONSTOP



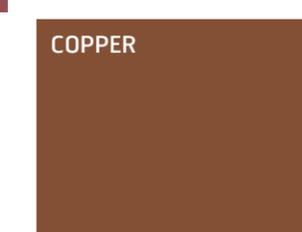
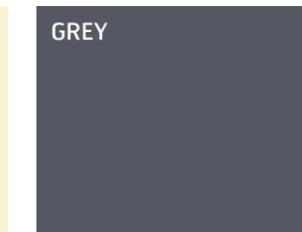
RACING



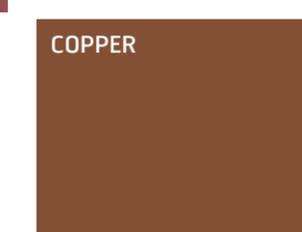
MARE NOSTRUM SP



AQUALINE OPTIMA



RACING ULTRASPEED



COLOURCARD

* Colour changes from copper to dark grey after some weeks of immersion. The printing process may render some of the colour samples imperfectly. We recommend testing the paint before committing to a colour.

foto: Tom Hoga for Askeboden



WWW.JOTUN.COM

JOTUN IBERICA S.A. | ESTÀTICA, 3 | POL. IND. SANTA RITA | 08755 - CASTELLBISBAL (BARCELONA) |
| PHONE +34 937 711 800 |