



JOTUN

GLASSFLAKE REINFORCED COATINGS

Ultimate long-life protection for
the harshest, most aggressive conditions



Glassflake reinforced coatings

Exceptional
strength

Unrivalled
impermeability

WHAT ARE GLASSFLAKE REINFORCED COATINGS?



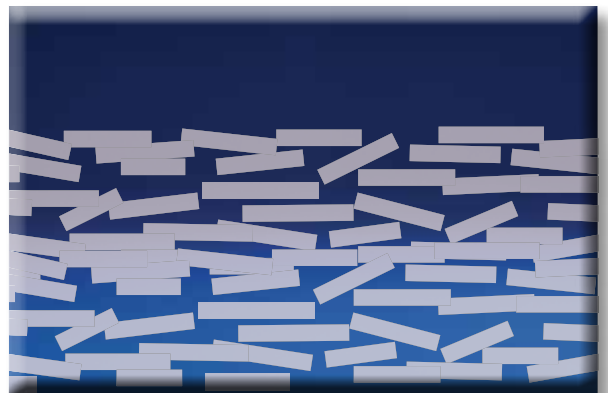
The basis of glass is silica (sand) and other minerals. Sand is inert, everlasting and stable.



These are melted together at very high temperatures to form glass.



Flakes of the glass provide a consistent barrier that is totally impervious to moisture, providing high levels of chemical resistance. The glassflake is inert in most environments and non-hazardous.



The flakes are incorporated into the coating where they overlap, stratify and reinforce.

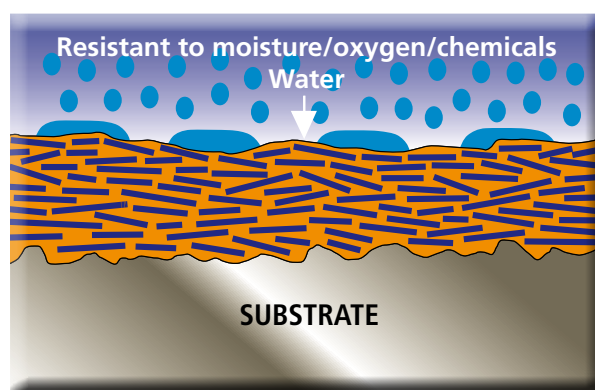
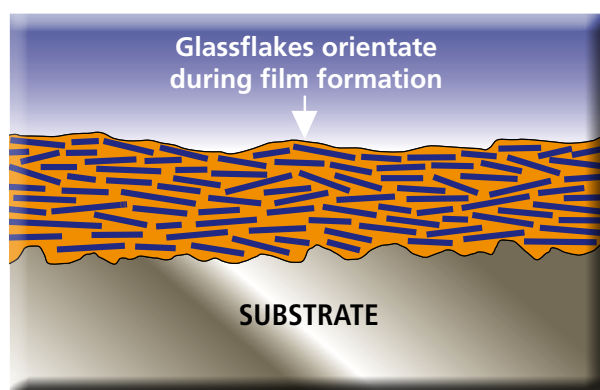


Network Rail case history

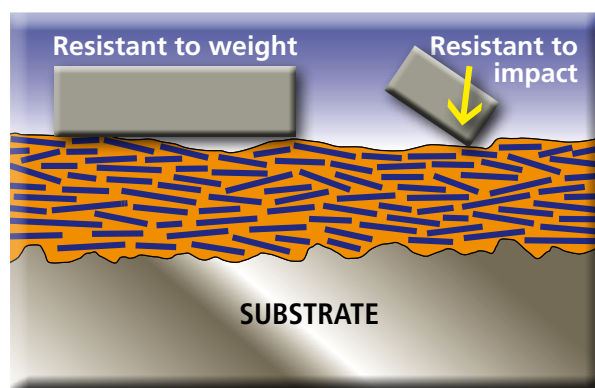
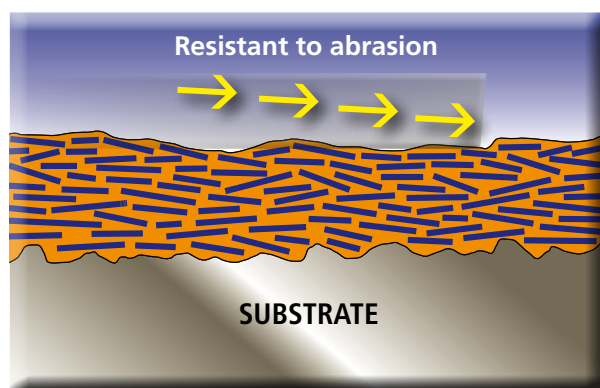
"The use of Jotamastic 87 GF on existing structures has proved very successful, due to the design of some of our structures it is not always possible to grit blast all areas so having a system that lends itself to manual preparation and high pressure water jetting means we can apply the same product to all areas of the structure regardless of preparation methods, we have also found the product performs very well over prepared old existing coatings which is of a real benefit especially during short track possessions."

Lee Wade, UK Network Rail

A BARRIER TO CORROSION, IMPACT AND ABRASION



The glassflakes orientate as the film forms. The reinforcement of the glassflakes combines with the strength of specially formulated resins creating impermeable protection against abrasion and corrosion however hostile the environment.



The glassflakes add great strength to the coatings as the enhanced elongation and compression qualities provide superior resistance to the most severe abrasion and impact.

Why glassflake?

Ultimate protection in the harshest environments
No exposure too extreme
No planned lifetime too long



EXTREME EXPOSURE – Protection against the heat of the desert, the cold of the night, the abrasion from sand and sand storms



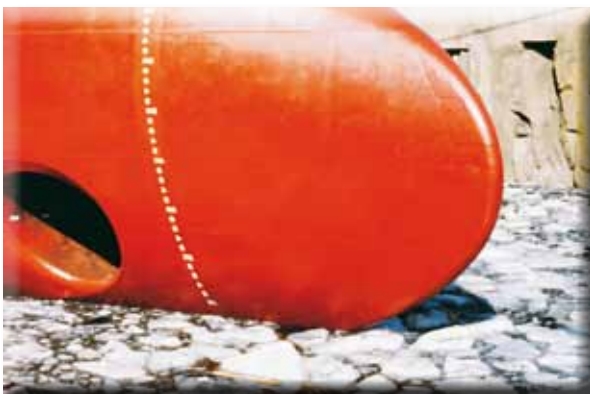
EXTREME EXPOSURE – Proven in extreme conditions in the offshore sector, providing total protection for decades without maintenance



EXTREME EXPOSURE – Protection against high levels of impact, weight and abrasion that no traditional coating can provide



TOUGH EXPOSURE – Protection against attack from chemicals, acids, alkali, fresh and salt water – anything nature and industrial environments can provide



TOUGH EXPOSURE – Protection against exceptionally cold winters, abrasion from severe icing, the potential of high impact



TOUGH EXPOSURE – Protection of areas of high traffic against abrasion, the elements and heavy wear and tear

What to expect

Protection for extended project lifetimes
Minimum maintenance. Less downtime.
Easy application. Prequalified documented standards

High expectations with Jotun's range of glassflake reinforced coatings are fulfilled.

Long project lifetime expectations

Jotun glassflake reinforced coatings applied to offshore installations in the harshest environment of the North Sea have proven to provide protection for more than 30 years.

Minimum maintenance

Lasting protection including areas inaccessible at maintenance.

Easy to apply

Easier to apply, single coats up to 1500 microns, faster drying – lower downtime and application costs.

Less downtime

Less downtime at new construction – costs resulting from commissioning delays are significantly less.

Prequalification & documentation

Prequalified products, documented and approved to international standards. Coating advisors qualified, experienced and trained to global standards.

Lifetime v Exposure

	LIFETIME EXPECTATIONS			
	<15 years	15–25 years	25–40 years	>40 years
EXTREME EXPOSURE	Jotamastic 87 GF	Marathon Range	Baltoflake Range	
TOUGH EXPOSURE	Jotamastic 87 GF		Marathon Range	Baltoflake Range

Experience on Ekofisk 1980 – 2006

ConocoPhillips

Baltoflake – proven for 20 to 30 years coating lifetime under cellar deck and on jackets

July 1980 Applied as deck screed 2./4T helideck

1982 Applied EkoA & AlbF helidecks

1986 First jacket coated offshore: 16/11S

1988 First jacket coated on land: EkoK

Post 1988 Applied to all jackets from land

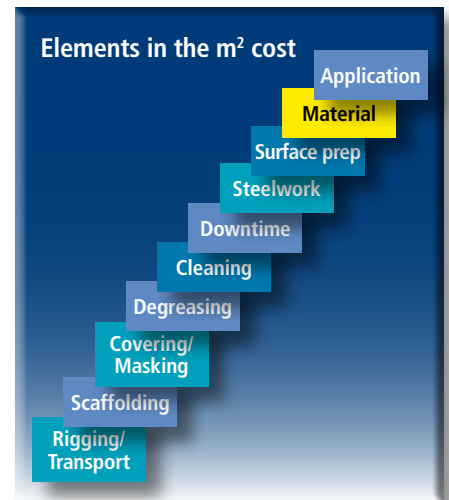
Low Life Cycle Cost

Achieve long term financial benefits

Investment in corrosion protection is about calculating the costs over the design life of the project – Life Cycle Cost analysis (LCC)
– the investment in new construction today and maintenance in the future.

There are many different factors to be considered when choosing a protective paint system:

- The cost of maintenance is decided at the new construction stage.
- The cost per square metre at maintenance is higher than at new construction.
- Different coatings have different lifetimes.
- The longer the lifetime of a coating the greater potential for savings.
- It is false economy to calculate only the cost per square metre of the paint. It is essential to take all other costs into account – surface preparation, application costs, material costs and other costs – for the lifetime of the structure.



Based on information received of:

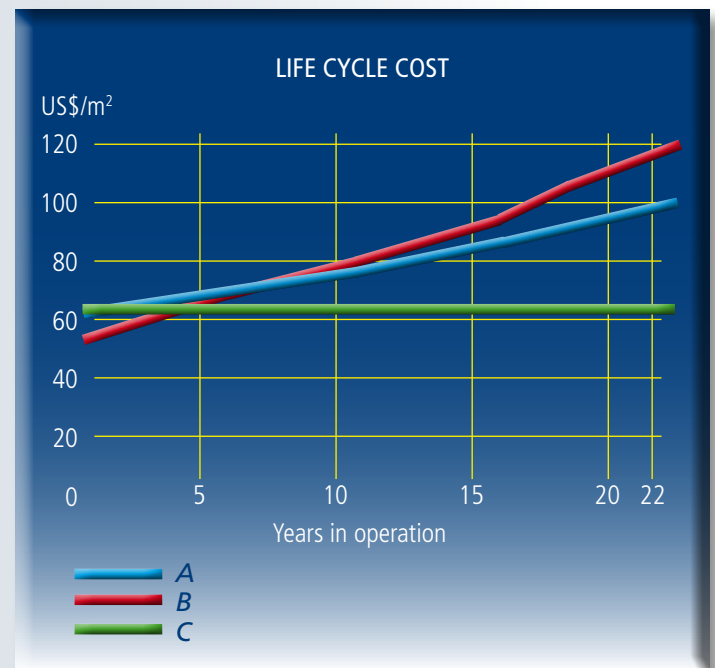
- breakdown development
- a bi-annual maintenance frequency
- and based on Norwegian costs

the results of the total cost evaluation are shown on the graph

System B initially is by far the cheapest but will exceed Systems A and C in cost after some 5 years. The cost differential continues to increase after that point.

System C is initially more expensive and involves very low maintenance requirement. Ultimately it will be the most cost effective system. Plus, the longer the life of the system, the greater the difference.

In an environmental Life Cycle Assessment, System C also shows the best results with the lowest rate of pollution from raw material, production and use/re-use stages.



25 year Life Cycle Cost (LCC) analysis:

Corrosion rate and cost levels in locations such as the North Sea and based on accumulated technical experience covering the lifetime of selected coating systems.

Glassflake Reinforced Coatings provide extended lifetime/lower LCC/up to 50% cost savings over 25 years LCC analysis.

A wide choice of products

Individual benefits with each product
Tailor-made solutions to meet different
lifetime expectations and special usage areas

BALTOFLAKE RANGE

POLYESTER COATING

Exceptionally long maintenance intervals

The ultimate protection – paint and forget.

Walk on after just 3 hours

With Baltoflake you can walk on the surface only three hours after application.

Fast drying, fewer coats

Baltoflake's faster drying and fewer coats mean less downtime.

Spray up to 1500 microns in a single coat

Baltoflake coatings can be sprayed in a single coat to give a dry film thickness up to 1500 microns on a vertical steel surface without sagging.

Solvent free

Baltoflake solvent free coatings create immense strength and protection against water, chemicals, solvents, abrasion or mechanical attack, outperforming traditional protection such as metallizing and epoxy coatings.

MARATHON RANGE

EPOXY COATING

High solids, two-pack coatings developed for long lifetime exposure, anti-corrosive and anti-abrasion protection. Long track record of success on offshore structures including splash zones, underdeck, decks and above water areas and on pilings and bridges. Marathon is also a non-skid coating when used with appropriate aggregate.

User friendly

Standard 65:1 airless spray simplifies application (low temperatures: twin feed or heated equipment may be required).

Excellent substrate wetting and adhesion

Substrate wetting is directly related to the coating's ability to adhere to the substrate. Good adhesion reduces risk of undercutting and coating damage.

Extreme abrasion and impact resistance

Minimises damage to the coating when the structure is in operation.

JOTAMASTIC 87 GF

EPOXY MASTIC COATING

All corrosive environments

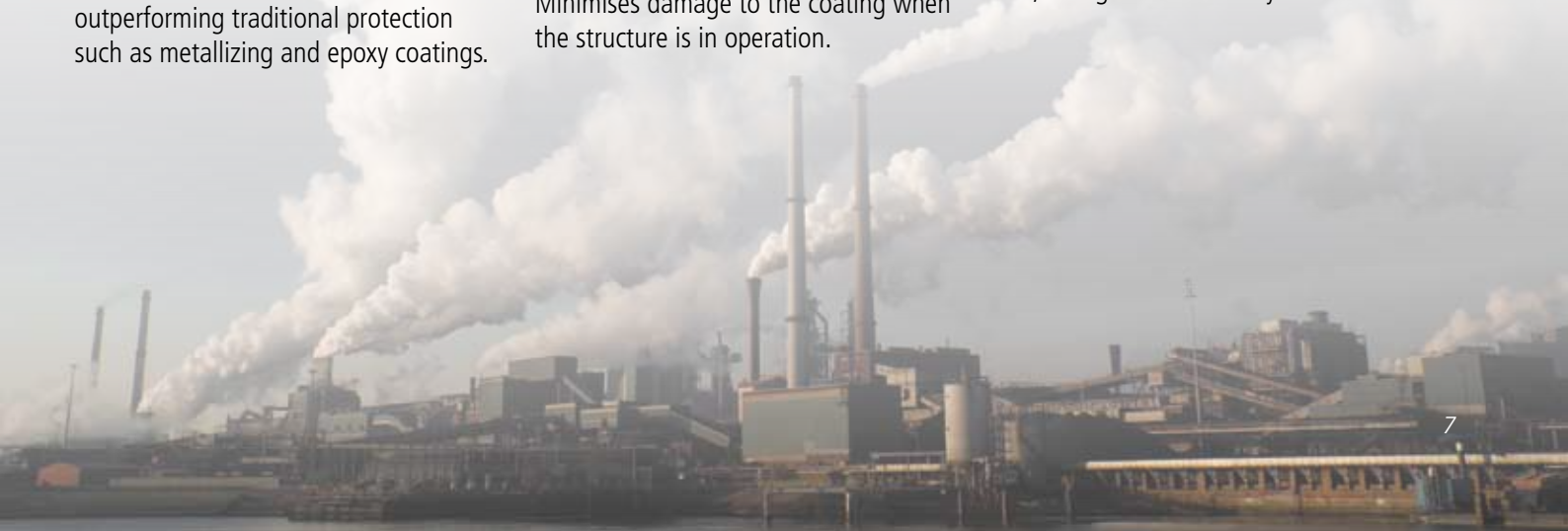
Industry, Marine, Offshore – protects steel in all environments – cold, heat, wind, rain, sand, salt and chemical laden – whatever nature or man can provide.

High surface tolerance

Jotamastic 87 GF is simply the best. Compared to other modified epoxies it penetrates deeper into the substrate. Adhesion is superior and it is moisture tolerant. Can be applied faster and more easily on less well prepared surfaces delivering real savings.

Low surface preparation

Applied on any sound substrate – Jotamastic 87 GF excels when applied on clean and sound surfaces prepared to minimum St 2. When surface preparation standard is low, this reduces preparation time, down time and cost. Where surfaces are prepared by water jetting, Jotamastic 87 GF can even be applied on early flash rust, saving time and money.



The Baltoflake range

Quick curing, high build, abrasion resistant glassflake reinforced polyester coating

BALTOFLAKE

- The original Baltoflake
- DFT range: 600 – 1500 microns
- Typical system:
2 x 600 – 750 microns
Can be applied 1 x 1500 microns
- More than 20 years' practical experience in splash zone protection in the North Sea

BALTOFLAKE S2000

- Smooth, durable surface
- DFT range: 500 – 1000 microns
- Typical system:
1 – 2 coats x 750 microns
Can be applied 1 x 1000 microns
- Dry to recoat: 2 hours

Burj Khalifa Dubai U.A.E.

Internal steel structure of the tallest building in the world is protected with Baltoflake



Typical example

A typical example of Baltoflake's combination of speed, high levels of protection and minimum disruption:

Grit blasted during the night.

0500 hrs Netting on, helicopter landed.

0700 hrs Netting off, blast cleaning to Sa 2½ continues to completion.

1245 hrs Painting commenced.

Weather sunny/cloudy, 14°C.

Steel temperature 17°C.

Mixture 2 vol % catalyst.

1 coat 600 microns Baltoflake.

Volume of paint used 160 litres.

1330 hrs First coat completed.

1415 hrs Commenced application of second coat. Carborex 20 grit sprinkled on 600 microns coat. Volume of paint used 160 litres.

1500 hrs Operation completed.

1630 hrs Surface dry to walk on. Netting on.

1800 hrs Helicopter landed.

What a customer has to say:

"Our main conclusions concerning Glassflake Polyester systems are:

- 20 – 30 years coating lifetime under cellar deck and on jackets
- Very few problems in tanks and vessels"

Andrew Greig

ConocoPhillips Norway

Norwegian Corrosion Federation 18.04.2006



The Marathon range

High solids, two-pack epoxy coating reinforced with glassflakes

MARATHON

- NORSOK pre-qualified
- High build: 200 – 400 µm
- Tested by STATOIL in pressure vessels:
2 coats x 200 µm

MARATHON XHB

- High film thickness, up to 1000 µm with standard airless spray equipment
- Low VOCs
- Solventless coating with 96% volume solids

Kola Bridge across Kola Bay in Murmansk, Russia.

The 2500m long by 22m wide bridge has four lanes and two sidewalks. The total length of the bridge metal spans is 1,470m with a painted area of 178,920 sq.m of metal requiring 250,215 litres of paint and thinners to be used.

2 coats of 250 microns Marathon were used for the underwater surfaces.



Jotamastic 87 GF

Two-pack surface tolerant, glassflake reinforced, abrasion resistant, high solids epoxy mastic coating

APPLICATION

- 80% volume solids – less environmental impact – safer
- Surface tolerant
- Apply by brush and roller
- Apply from -5°C to 40°C with 2 different curing agents
- Very good adhesion, compatible with all substrates in typical maintenance situations
- Blast clean, spot hand and power tool preparation

PERFORMANCE

- Provides all the time and cost saving benefits of Jotamastic 87 plus the hard-wearing resistance of glassflakes
- Long term protection
- For both new construction and in/out-of service maintenance

Nanhai 2 semi-submersible rig drydocked at Youlian Shipyard in China and was protected with Jotamastic 87 GF and a topcoat of Hardtop AS.



In high traffic areas where speed of maintenance is usually essential, Jotamastic 87 GF provides the solution. It can be applied up to 350 microns in a single coat directly to St 2 prepared surfaces, saving time when it counts

Steel walkways

Typical areas of high traffic, subject to heavy wear and tear. Jotamastic 87 GF, the ideal solution for protection.

Product	Baltoflake	Baltoflake S2000	Marathon	Marathon XHB	Jotamastic 87 GF
Generic type	Polyester, GF	Polyester, GF	Epoxy, GF	Epoxy, GF	Epoxy mastic, GF
Solids level	Solvent less	Solvent less	High solid	Solvent less	High solid
DFT range (microns)	600–1,500	500–1,000	200–400	400–1,000	Std. 200–350 WG. 200–300
Min. curing temperature (°C)	10	10	10	10	-5
Dry to recoat @ 23°C	2h	2h	12h	10h	Std. 10h WG 5h
Min. surface treatment	Sa 2½	Sa 2½	Sa 2	Sa 2	St 2



◀ Pampa Melchorita

Owner: PERU LNG – a consortium led by Hunt Oil (USA) which also includes partners Repsol YPF (Spain), SK Energy (South Korea) and Marubeni (Japan).

Type: Gas Export Pier and Jetty Project

Expected life time 30 years. Pier is 1.3 km long, 550 x 30m long pile (14,000 TM steel).

Baltoflake used on piers and approx. half of the 6,000 TM steel platform structure.

Paint system:

Pier piles: 2–4 coats Baltoflake, 750–1000 microns each to a total of 2750 microns

Pier platform: 1 coat Baltoflake, 750 microns

Development Driller 2 ▶

Owner: Transocean

Type: Semi-sub Rig 185

Built at: Jurong Shipyard Limited, Singapore

Year: March 2002

Paint system:

Main deck of pper hull:

1 coat Barrier 40 µm

1 coat Jotamastic 87 GF (Red) 200 µm

1 coat Jotamastic 87 GF (Grey) 200 µm



▲ The Cargo Launch Barge

Owner: National Petroleum Construction Company

Deployed for offshore operation in Abu Dhabi

Built at Cochin Shipyard in India.

Paint system:

Marathon on decks and hull



Jotun worldwide

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