



JOTUN

Jotun Protects Property

YOUR GUIDE TO MAINTENANCE

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THE BENEFITS OF A GOOD MAINTENANCE PLAN

A maintenance plan that includes a regular programme of scheduled work can help towards achieving optimal efficiency, minimised costs and the maximum degree of safety for a hydrocarbon processing industry (HPI) asset.

Planned maintenance work is normally undertaken during two scenarios:

A shutdown when the facility is offline.

Typically a limited shutdown (sometimes called a turnaround) is carried out every two to three years, followed by a major turnaround every five years. During a minor turnaround, limited sections of the facility will be offline. However, during a major turnaround, a significant portion (and sometimes all) of the facility will be offline.

During a shutdown, coating work can be split into onsite and offsite maintenance. All coating work will be done on substrates at ambient temperatures – known as ambient maintenance. Onsite maintenance will typically require manual surface preparation, while offsite maintenance can allow for substrates to be blasted. The aim is to provide maintenance to such a standard that it will last until the next planned shutdown.

The main reason for a shutdown is for maintenance on process-critical components that cannot be done while the asset is in operation. However, this time can also provide an opportunity for painting maintenance to be carried out.

Shutting down a HPI facility can mean a revenue loss of up to US\$12 million every day, so all activity during a shutdown needs to be efficient. A clear plan of priorities is required, together with agreement on what maintenance can be done while the facility is offline and what can be managed while it is operational.



THE BENEFITS OF A GOOD MAINTENANCE PLAN

Day-to-day maintenance.

This happens while a facility is operational to ensure no unplanned shutdowns occur and that processes can run optimally. During day-to-day maintenance, parts of the facility will be hot and others at ambient temperatures, so both ambient maintenance and high temperature maintenance will be considered.

Aside from ambient and high temperature maintenance, areas of the facility may require passive fire protection (PFP). For these sections it's important to consider a PFP product that provides the best fireproofing protection in the fastest possible time.

Jotun's Thermosafe and maintenance products allow for more paintwork while the facility is running. This means that the focus during a shutdown can be on work that can only be done while the facility is offline. Allowing for more daily maintenance can also help prioritise critical jobs during shutdown.

In this e-book, we look at the benefits of a good maintenance plan and share some considerations, both for limiting unplanned shutdowns and for maximising the impact of a planned shutdown by painting, coating or fireproofing as much of the asset as possible to the highest standards.

Jotun's Thermosafe and maintenance products allow for more paintwork while the facility is running.

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THE MAINTENANCE CHALLENGE

There is a lot to be planned and considered to ensure facilities limit their downtime to the absolute minimum, from ongoing maintenance during operations to tight scheduling and time pressures during any shutdown.

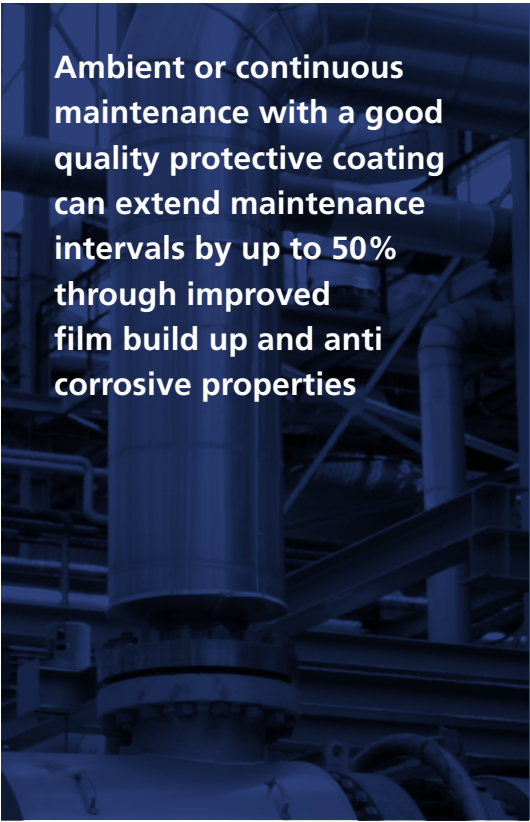
When making a maintenance plan, the most process-critical areas, such as reactors and distillation columns, are given top priority. However, a good coating or fireproofing can save time and effort in both the long and short term. An appropriately coated facility can provide significant performance improvements so it's important to identify the critical areas for maintenance. Jotun can help with advice on the critical areas to paint, coat or fireproof and recommend appropriate systems.



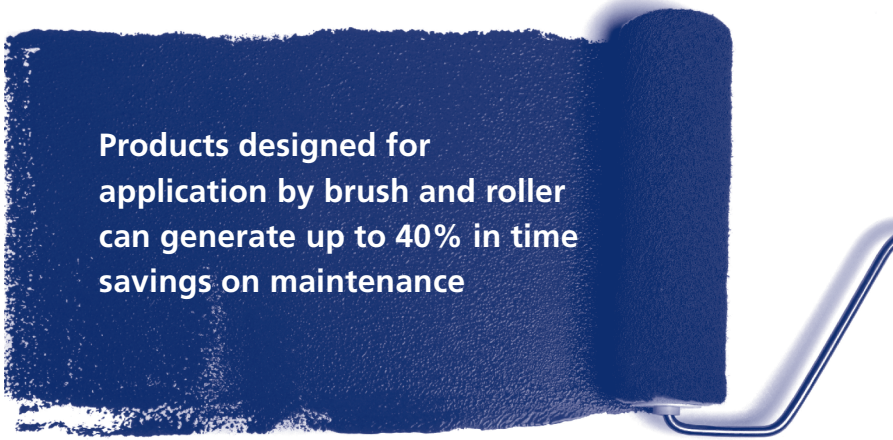
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THE VALUE OF A GOOD PLAN

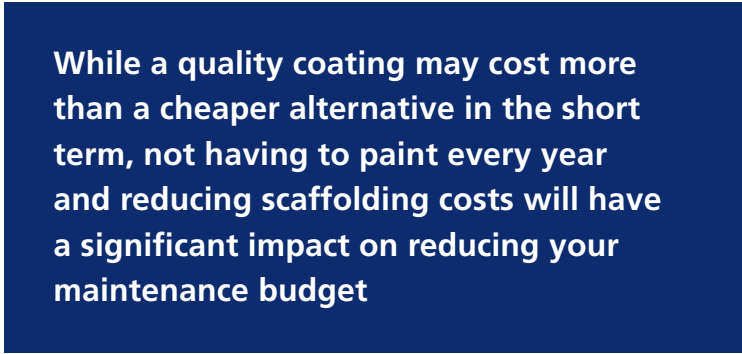
Below are some facts about the importance of paint work as part of an effective maintenance plan:



Ambient or continuous maintenance with a good quality protective coating can extend maintenance intervals by up to 50% through improved film build up and anti corrosive properties



Products designed for application by brush and roller can generate up to 40% in time savings on maintenance



While a quality coating may cost more than a cheaper alternative in the short term, not having to paint every year and reducing scaffolding costs will have a significant impact on reducing your maintenance budget

An older facility will require more maintenance than a new one, and as assets age, the need and complexity of their maintenance requirements increases. There are more than 6,000 HPI facilities worldwide, with an average age of between 25-30 years and some more than 100 years old. Adding coating or fireproofing consideration to a scheduled maintenance plan can help reduce asset unpredictability and provide significant financial, performance and safety benefits. This is important for all HPI facilities but critical for older sites.

TOP FOUR TIPS

1. Location, Location, Location

The location of a facility will have a significant bearing on the maintenance plan to be adopted. A facility located near to the sea, for example, may be expected to have different corrosion issues to one inland, and a facility in a cold climate has different challenges to a hot climate. Humidity may also have to be considered.

In addition to the location of the facility, different parts of the asset can also be impacted in their own way. For example, a wall facing wind-blown deposits may corrode at a greater rate than one in a sheltered area. It's important to consider how corrosion is impacting each area of an asset.

2. Prioritise the programme of work

Identifying in advance the critical areas for paint, coating or fireproofing work can save considerable time and costs. While the focus of a planned shutdown is usually the maintenance of process-critical components, it can afford time for some essential additional work. Identifying which areas can be painted while the plant is live and which need to be done during a shutdown allows greater focus on those areas.

3. Keeping it safe

When undertaking maintenance, safety is the number one priority. For example, where a passive fire protection (PFP) coating is required, using one that does not require an additional mesh, such as Jotachar, avoids the need for knives or scissors to cut the mesh and reduces work-related risks.

Furthermore not needing the additional installation of a mesh means that non-destructive testing (NDT) can be carried out through the coating without removing it. This reduces the risk of damaging the coating during the process.

4. Prepare properly

Undertaking as much preparation work as possible before a shutdown can minimise downtime. For example, Jotatemp 540 Zinc is excellent for use on standard pipe sections that can be pre-painted and stored on site as part of ambient maintenance work, allowing them to be ready to install should replacements be needed.



Jotatemp | 540 ZINC

Effective pre-planning with a well-considered strategy and management programme can ensure the most efficient use of resources, leading to significant cost and time savings for maintenance projects. As an example, scaffolding can be expensive to hire and construct, but by thoroughly planning and coordinating or aligning maintenance activities, the amount of scaffolding required, usage time and personnel involved can be greatly reduced.

SHUTDOWN AND DAY-TO-DAY MAINTENANCE – CRITICAL ELEMENTS



As previously mentioned, maintenance can be divided into two types – shutdown and day-to-day. Shutdown maintenance occurs when the facility is offline for a period of time. The intentions with day-to-day maintenance is to optimise productivity and ensure the facility remains online until the next planned shutdown.

Knowing what to paint or coat and when is critical and can help save both time and effort. Agreeing in advance on whether the programme will involve ambient maintenance, high temperature maintenance or PFP maintenance will determine what work can be performed and when.

Ambient maintenance

Jotun's Smart Pack products – Barrier Smart Pack, Jotamastic Smart Pack HB, Hardtop One – are specifically designed for brush and roller application on manually prepared substrates up to 60°C, making them perfect for on-site day-to-day and off-site ambient maintenance. They all help to extend maintenance intervals by up to 50%, furthermore, our products can lead to up to 40% time saving on maintenance.

High temperature maintenance

High temperature maintenance is undertaken on hot substrates above 120°C, where corrosion under insulation (CUI) can set in. Jotun's Thermosafe range of protective coatings, specifically Jotatemp 250, Jotatemp 540 Zinc and Jotatemp 1000 Ceramic, have been designed to prevent CUI in high temperature areas, allowing work to be carried out on live lines – so there is no need to wait until a shutdown. The products also complement each other. As an example, Jotatemp 540 Zinc's anti-corrosive qualities allow sections of the facility to be pre-painted and stored on site, ready for coating with Jotatemp 250 or Jotatemp 1000 Ceramic when required for service. This can greatly minimise costly downtime when there is a shutdown.

PFP maintenance

Fire can be a disaster for HPI facilities, so ensuring the best quality PFP in the quickest possible time is essential. Jotun's epoxy PFP coating, Jotachar, does not require the installation of extra mesh. The mesh is built in to the coating. This reduces application and repair time, avoids the costs of an additional mesh and makes non-destructive testing (NDT) of the substrate much quicker and easier. That's because there is no requirement to remove a mesh and coating to test the integrity and thickness of the steel underneath, replace it again and potentially damage the PFP. Not having to slice mesh during installation of the PFP also reduces the risks of cutting injuries from knives or scissors. PFP installation can be done in line with your planned maintenance on steel at ambient temperatures or during a shutdown.

There are two main types of PFP – cementitious fire protection and epoxy fire protection. Cementitious fire protection also has to be removed for NDT, which is challenging and risky. Another challenge with cementitious PFP is that it can loosen from the substrate and create a gap for corrosion, while large blocks of concrete at height can pose a safety concern.

Jotachar is an excellent choice as a replacement for cementitious PFP due to the time saved in its application and because spraying an epoxy PFP is typically a much 'cleaner' process than pouring on cementitious PFP.

CASE STUDY

OUTCOME: Extended maintenance intervals by five years. Scaffolding costs recouped in two years

HOW: Cost-effective solution to annual painting maintenance at chemical facility

WHERE: Asia

PRODUCT(S): Widespread use of a range of Jotun products throughout the asset

The customer, a chemical processing company, recognised the importance of coating but was focused on keeping product costs as low as possible. This led to cheaper, lower quality products being used and unfortunately the lower quality of the spray coating they were using and its performance limitations meant the plant had to be re-coated every year because of corrosion issues.

Furthermore, the annual costs of scaffolding to allow them to paint each year were significant.

The customer came to Jotun looking for a solution. They were introduced to our range of higher quality roller and brush coatings with a lifetime five times greater than the products they had been using previously.

While the cost of the new coating was more than the cheaper alternative, the customer was able to make a considerable cost saving overall. Previously, they had been spending 70% of the cost of Jotun's coating on scaffolding. However, by using Jotun products, the customer was able to recoup its scaffolding costs in just two years and greatly extend its maintenance intervals.



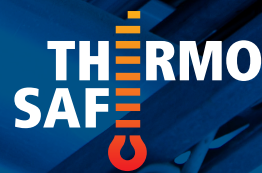
To find out more about Jotun's Thermosafe range of coatings and maintenance solutions designed for the extreme environments of onshore oil and gas facilities, visit the website or contact Kevin.

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www.jotun.com/thermosafe



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