

CRACKING AND SPLITTING IN TIMBER – AN EXPLANATION

With the changing weather, you may notice that your wooden playground / fitness equipment changing.

Timber is a natural product; it is affected by the environment and the natural conditions it is exposed too far more than a manmade product would be - for example a plastic or a steel structure. Particularly during the summer when temperatures are high and atmospheric moisture contents are low cracking can occur.

Many people deem that their equipment has defects, a conclusion that is reached because of the appearance of cracks and splits in the timber. In fact, this is very rarely the sign of a defect, it is simply the timber responding to its surroundings.

TIMBER AND WATER CONTENT

The key to understanding the behavior of wood is to learn about the water content within timber, and how this affects the way wood reacts in different surroundings.

Fresh wood from a recently cut tree may contain water content up to 50% of its weight. The two types of water that are contained naturally in the wood are known as free water and bound water.

The free water is held in the capillaries of the wood and can be easily absorbed and expelled from the wood. It is therefore, the 'first' water to leave the wood during the drying process whereas, 'bound' water is held within the wood by bonded hydrogen atoms and takes much longer to leave.

Wood can generally be worked when it reaches around 25-30% water content – which is known as the fibre saturation point (FSP). Kiln dried timber (with a moisture content of around 16%) such as Safalog and our planed all round sections, our preferred choice for several reasons.

The benefits of kiln dried timber include:

- Organisms and insects that cause decay usually cannot survive or damage wood with a low moisture content and prefer green timber.
- Kiln dried wood is much stronger than green wood in most cases.
- Preservatives penetrate kiln dried wood far better than they do in green wood.

During the pressure treatment process which impregnates water borne chemicals into the cellular structure of the timber, moisture content can often increase again.

WHY DOES TIMBER SPLIT AND CRACK?

While kiln dried wood carries a range of helpful properties, it can still demonstrate signs of cracking and splitting. This is particularly common during the summer months and can be attributed to the dramatic changes in the atmosphere and humidity, and significant fluctuations in temperature. This is because the wood is attempting to match its environment.

ACHIEVING EQUILIBRIUM

Wood alters in a bid to match its environment in terms of moisture and temperature. This is known as an equilibrium and whenever there are changes in the environment, the timber will seek to match them itself.

Often during the summer, the air moisture content is constantly moving up and down, as well as the temperature, and the wood tries to match this. If the moisture content drops, the wood will dry out further as it looks to reach an equilibrium – which can cause it to crack and split.

Many people instantly assume that this means the wood is damaged, and that the timber is defective. However, this is not the case and is simply a case of the natural product adjusting to its environment.

When the inner core of the timber is wetter and has a higher moisture content than the outer section, the cracks will be evident. Once the wood's core has also dried out to the level of the atmosphere it is in, these cracks and splits will disappear or heal.

CAN YOU PREVENT TIMBER CRACKING AND SPLITTING?

With modern day processes and engineering, we can omit many of the causes of cracking by x-raying sections to identify flaws in the wood before the material is introduced to manufacturing processes. Alternatively smaller sections which have less inherent stress can be glued and laminated together to form strong durable laminated sections, such as Safalog.

However, because a natural material is being used and the cracking / splitting is a natural process of timber as it adjusts to environment factors, it cannot be totally prevented.

TIMBER PRESERVATIVE

Preservative treatments provide wood with added durability. However, it's a mistake to assume that all pressure treated wood is the same. Whilst one piece of treated wood may look very much like any other, the level of preservative protection could be very different. That is because the British Standard for wood preservation – BS 8417, requires that the loading and penetration of preservative, impregnated into the wood, is tailored to the desired end use.

HAZARD CLASS 4

Timbers used within the playground and leisure industries fall within those destined for Use in Class 4 situations - "structural and/ or permanently exposed to wetting in either ground or freshwater contact" as described in BSEN335.

TREATMENT PROCESSES AND PRESERVATIVE CHEMICALS

The chemicals used in wood preservatives comply with current EU regulations. They contain specifically targeted biocides, that are designed to present a minimum hazard to the wider environment. The process of treating timber, is a combination of applying vacuum and pressure phases whilst the timber is submerged in chemical within a pressure vessel. After the process is

complete, the treatment provides an effective ‘envelope’ protection around the timber including any pre-machining such as holes and joints. It is important during the life of the timber that the treatment envelope is always maintained as any damage to this will weaken the treatment barrier and enable mold and insect attack to start, ultimately lead to the decay of the timber or rotting.

Special attention should always be given to posts which have been installed into grass and the potential affects of damage caused by strimmer’s. Timber structures on steel post feet can eliminate this issue and maybe worth considering.

IN CONCLUSION - DON'T PANIC WHEN YOU SEE A CRACK APPEARING

It might seem, as though cracks and splits are a sign of poor quality timber, but as already explained this simply is not the case. If you monitor the movements of your timber, you will notice that as the seasons change, splits / cracks will appear and heal.

Timbers should only be changed, if the cracking / splitting exceed 8mm as this will form a potential finger entrapment as covered within the European Standards of EN1176.

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