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OAK FRAME HOMES



Contemporary and Traditional Self-builds

1: One of the benefits of an oak frame self-build is the instant character which this natural material brings — case in point, this new home by Oakwrights, which looks as if it could have stood on this site for centuries; 2: A glazed gable end provides a connection between inside and out on this home by The Complete Oak Home; 3: Showcasing how oak can create a characterful interior is this self-build designed by Rodenck James Architects — the frame was provided by Carpenter Oak Ltd; 4: Oak frame is versatile enough to create contemporary spaces, as this home by Carpenter Oak & Woodland goes to show

Modern-Day Oak Framing

One of the biggest challenges faced by the oak framing industry in the past decade is increasingly stringent Building Regulations, and the drive to create airtight, highly insulated new homes — but it's arguably a challenge which has been met with full gusto. In traditional oak framing, the frame would be exposed both inside and out, with infill panels — typically of wattle and daub and lathe, or brick — in between. However, the problem with this technique in the modern housebuilding arena is one of cold bridging — the concept that cold can be transferred into the house (and heat can escape) when materials bridge outside to inside.

The solution adopted by most involves keeping the frame as an internal feature and wrapping it within an insulated and airtight envelope — an 'encapsulation' system, as it is often referred to — which can in turn be clad in a range of materials including timber, brick, flint and stone. "While oak frame was used as long as 700 years ago, technically modern-day oak frame houses are very different — they've been brought into the 21st century with modern construction techniques," comments Andy Parker of The Complete Oak Home.

SIPs (structural insulated panels) are typically used, however many of the larger companies provide their own systems. Welsh Oak Frame offer their Eco Wall system; Border Oak provide a number of options, including their Artisan Cassette Panel which is designed to meet Level 4 of the Code for Sustainable Homes as standard. Oakwrights provide three options too: WrightWall Natural, WrightWall Light and their 3i Infill Panel System. "WrightWall Natural is our premium wall and roof closed panel system, providing an exceptional thermal performance using 100% recyclable materials. It delivers an airtight encapsulation system using breathable cellulose fibre," explains Alex Edey, Oakwrights'...

An Oak Renaissance

Self-build has been a driving force in the revival of this ancient building method. We explore what to consider before building using this natural material, and how oak framing has evolved in the 21st century

There's no denying it — oak framing is going through a renaissance, and its popularity shows no signs of abating. But why has this ancient building method become the backbone of many an individual home of the late 20th and 21st century? "Unlike many of our modern homes where everything is covered up by plasterboard, the appeal of oak frame is about the intrigue and interest of seeing the structure on show; it's also about the craftsmanship which goes into creating the frame," says Paul Edmunds of Welsh Oak Frame. "Many people have a connection with this tactile material too."

The versatility of oak frame — it can suit both a traditional and contemporary home (cast your eyes over the images above if

you need proof) — is another big draw. No two oak frame homes are exactly alike — it's a building method which lends itself to creating a unique, one-off home which, after all, is what self-build is all about. "The main styles are 'traditional', which have lots of timber and tend to look like medieval buildings, 'barn' which have more of an open feel, with less timber but plenty of curved pieces, and 'contemporary' which has a modern look with less curved timber and perhaps stainless steel connections," explains Westwind Oak's Rupert Newman.

"There are different levels of exposure which can be achieved with oak framing too — you can have just the basic principal members on show, or you can increase the content of oak by exposing the floor joists and rafters for example," adds Paul Edmunds.

Where to Start

The starting point is arguably choosing to build in oak frame in the first instance. While it's not impossible to choose a designer or architect to design a home for you and then opt to build in oak frame, deciding on oak frame from the outset and designing and detailing the house accordingly is by far the more cost-effective and successful option. So too is choosing a designer or architect, then a contractor, with experience building using this material.

"There are two main things to bear mind: one relates to the design and the other to the construction," explains Andy Parker of The Complete Oak Home. "To begin, the most efficient oak frame homes are those based on an understanding of span and bays (of which an experienced designer will have a working knowledge of the possibilities and limitations) — oak frame design is based on a grid system. It's worth noting though that, just because it's based on a grid system, does not mean that the house has to be rectangular or square — curved forms can also be created."

"Further along the process, during the construction drawings, then it's about understanding oak as a construction material. If you want to build a 15m-long masonry wall, for example, architects, designers and builders all know you'll need expansion joints; the material is well understood. Oak frame is less well understood by generalist architects and builders and yet the architectural detailing and the execution are crucial to lasting quality."

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Encapsulations Manager. "WrightWall Light is the Oakwrights standard wall and roof system; designed and detailed specifically to achieve high levels of insulation and airtightness."

The third option allows the frame to be expressed externally. "The 3i Infill Panel System is Oakwrights modern-day solution to an age-old problem. The 3i System works as a floating panel within the oak frame. Highly insulated and with advanced weather resistance, the system is designed to fit within and allow for movement of the traditional oak frame home, delivering enhanced thermal performance," says Bill Keir of Oakwrights.

"The beauty of the 3i panel is that it maintains the look of a traditional 'half-timbered' house externally, but is far more energy efficient and weatherproof. It has been thoroughly tested and approved by TRADA (the Timber Research and Development Association) and is accepted by the NHBC. The 3i panel system achieves a U value of 0.25W/m²K for the whole wall not just through the centre of the panel."

The use of glazing is another ideal way of showcasing the oak frame, too. "It is still possible to expose the oak frame using glazing — large areas of glass allow the frame to be seen both inside and out," adds Paul Edmunds of Welsh Oak Frame.

Choosing an Oak Frame Company

All oak frame companies offer a bespoke service. Some are small, while others are well established as design and build businesses, catering mostly to the self-build market. Perhaps one of the biggest differences between them is the production method they use: some use machine cutting while others stay with traditional handmade work. Computer-controlled cutters are faster and potentially more accurate, but they usually require the oak to be planed beforehand, which can give the wood a slightly different look. On the other hand, machine cutting can sometimes achieve levels of complexity which would not be easy to replicate traditionally. Some who utilise computer-controlled cutters may still hand cut and scribe curved timbers, however.

The other key difference of note is the service offered. It's a misconception that all oak frame companies provide a full build or 'package' service — only a handful do. Many, however, will often allow you to choose the level of service you require — be it to supply, deliver and assemble the frame on site, or to build the



One-Off Homes

1: A contemporary sunroom and oak frame combine in this project by Carpenter Oak & Woodland; **2:** Exposed ceiling joists and chamber beams create a cottage feel in this self-build by Welsh Oak Frame; **3:** An oak frame, by Oakmasters, and timber cladding combine, bringing warmth to the vaulted ceiling in this striking new build; **4:** This illustration from Welsh Oak Frame highlights the many elements which can go into creating an oak frame home

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WESTWIND OAK

house to a weathertight shell, allowing you to project manage the groundworks prior and internal fit-out after, for example. Some can even just supply an oak frame, ready for your own builders or contractor to erect on site. Some self-builders will choose to take on tasks such as cleaning the oak frame once installed, too. ("Although, never underestimate the work that goes into cleaning the oak frame," advises Paul Edmunds.)

So, establishing the build route you hope to take can often influence your decision. One company who offer something rather different is The Complete Oak Home — they're not an oak frame manufacturer, but oak frame experts who design and build oak frame homes, either recommending or using your own chosen oak frame supplier.

The designs can also vary from supplier to supplier, from styles which draw influence from traditional manor houses, farmhouses and cottages, to striking contemporary homes. Most suppliers are happy to work in any style, but some arguably have a signature style which may suit your own preferences.

Types of Frame

"All oak frames are built on a grid. They mainly comprise of cross frames, wall frames and roof frames," says Rupert Newman of Westwind Oak (one of their projects is shown above) and author of *Oak-Framed Buildings*. "The loads from the roof and floors are

carried into the cross frames and then into the foundations. The cross frames can be made in many ways depending on the look that needs to be achieved and how the building is going to be used."

One of the most common types of frame are those based on post and beam construction, but cruck frames and aisled frames are also popular. "Cruck frames are made with curved timber to form the shape of the roof. They have a very medieval feel about them," explains Rupert. "Aisled frames have a central cross frame and two aisles running off either side. These are especially useful when a large span is needed. While interrupted tie beam frames are made by cutting the middle section out of a tie beam (the beam that runs between the two wallpates) and jointing the cut ends into a vertical post, which is then jointed into the main rafter and floor beam. This type of frame is very useful when the upstairs height is an issue as they provide more usable space."

Working with the Characteristics of Oak

One key consideration when building an oak frame home is shrinkage — it is, of course, one of the key characteristics of using green oak. "The shrinkage of a green oak frame should be taken into account with the design and you can expect a maximum shrinkage across the grain of around 7.5% from green oak to the point at which it stabilises at in a heated house," advises self-builder Alison Farrell-Price, who has just completed her second oak frame house (read her top tips on page 167).

It's worth noting that shrinkage is negligible across the length of the timber — all the action occurs tangentially (effectively tightening the skin of the timber) and radially (along its diameter). As the frame dries out over the initial 10 years of installation, it moves and shrinks — but after this period is usually stable.

Again, it's something which the oak frame industry has successfully addressed and where expert knowledge of oak frame during the architectural design and the construction is crucial. "There's various options when it comes to the interface between oak frame and the internal finishes, for example," says Andy Parker. "A plasterboard finish can run behind the frame, or we can create an architectural 'shadow gap' — as the oak shrinks, the neat gap formed emphasises the oak frame."

What about Cost?

"The most common misconception regarding oak frame homes is that they are beyond normal self-builders' budgets," says Rupert Newman of Westwind Oak. "Although it is true to say that they are more expensive than a standard softwood frame building, they are comparable with any good-quality construction technique."

Designer Pete Tonks takes up the story: "There is a common perception that it is the reserve of grand country houses. Yes, oak frame does introduce added cost into a project but you have to balance this with the presence and aesthetic that this brings.

"If you plan on building a project with a full oak frame throughout, this could add around 20-25% to your build costs. From my experience, you should allow between £1,400-£2,000/m² as an overall development budget if a full oak frame is incorporated. I have seen many clients projects valued upon completion at 20-25% over market value so you could say that the investment is worth it."

"We have clients completing sizable oak frame homes for £150,000-£200,000," concludes Paul Edmunds. **H**