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## Diamond shines

How Austria's light aircraft  
gem aims to keep its sparkle



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# SHINING DIAMOND

Diamond Aircraft is fast emerging as Europe's GA leader. One the eve of the Aero 2007 show in Friedrichshafen, owner Christian Dries explains how

MURDO MORRISON / WIENER NEUSTADT

**C**hristian Dries likes surprises, but for his management team at Diamond Aircraft, they have taken a bit of getting used to. When the owner and chief executive of the Austrian light aircraft manufacturer announced in 2003 at an award ceremony in Canada that the company's next project would be a light jet, he admits that "no one knew about it". Two years earlier, when he declared that Diamond would be designing a twin-engined development of its four-seat DA40 trainer – the DA42 Twin Star – "not even my chief engineer was aware".

Not that Dries is a man who talks first and thinks later. Since taking over what is now Diamond Aircraft in 1990 – as a tiny, cash-strapped maker of motor gliders based at the site of a wartime Messerschmitt factory – the company has built a reputation for taking concepts and turning them rapidly into successful programmes, pioneering both diesel engine technology with German engine maker Thielert (see box) and composite design. Diamond has become the biggest general aviation player outside the USA, trebling in size since 2001 when Dries began to run the business full time. Now the company is more than doubling in capacity again,

with a new factory coming on stream in China and a massive expansion planned for the main plant at Wiener Neustadt, near Vienna to cope with a bulging orderbook and expanding product line.

For a relatively small company, Diamond's new product development has been prolific. The launch of the two-seat DA20 primary trainer in the early 1990s was followed by the DA40 later that decade, and by the all-composite DA42 and D-Jet in the 2000s.

## Light jet tests

The Williams FJ33-powered single-engined very light jet has been in test flight since April and goes into production at Diamond's site in London, Ontario early next year. Two years ago, the company made a move into the homeland security and surveillance sector with a series of customised DA42s known as MPP, or Multi Purpose Platform, able to field cameras, sensors and other equipment.

At next week's Aero 07 show in Friedrichshafen, Germany, Diamond will land its latest model, the DA50, a larger single-engined aircraft than the DA40 and pitched against the Cirrus SR22. The aircraft was due to begin flight testing last week (*Flight International*, 3-9 April). But

the company's ambitions do not stop there. Diamond has a growing propulsion business, producing around 200 engines a year mostly for small unmanned air vehicles and light sport aircraft. Dries promises a move into larger engines that will see "an increase in production to very big figures in the near future". It has even developed its own flight-training devices for the DA42, approved to Level 5, which it builds at the rate of almost one a week at a factory near Frankfurt, Germany.

Dries, who until 2001 also had a business importing Mitsubishi cars to Germany, is reluctant to say how much he has invested into Diamond in the past 16 years. In fact, financial details about the privately run company are hard to come by. A passionate private pilot who is regularly the first to fly the company's new products, he recounts how at a recent meeting in Brussels of European general aviation dignitaries to discuss priorities for revitalising the sector, he was the only one to arrive by private aircraft; the others came by airline. Diamond's order and delivery figures, however, are clearly impressive. With around 3,500 Diamonds in service, the company increased deliveries by a third last year against an industry average for piston-engine aircraft of 11.6% (General Aviation Manufacturers Association).

Production at Wiener Neustadt – where 630 people are employed – is around five DA42s and three DA40s a week. The factory in Canada, which has just under 500 staff, produces an additional six DA40s a week for the North American market. But from the middle of next year, Ontario will focus solely on the D-Jet, with the twin- and single-engine production moving to Austria, where the plant is being expanded to cope (production of the DA20 Katana – currently in Canada – and the HK36 Super Dimona motor glider, both in low double figures a year, will shift to a new factory in Croatia).

Diamond's biggest expansion has been in China. Orders for DA40s from flying schools prompted Diamond to set up a joint venture to produce the piston single for Asia, with the 30,000m<sup>2</sup> (323,000ft<sup>2</sup>) factory at Binzhou, 350km (220 miles) south of Beijing, opening in December last year. The plant will initially build part-assembled aircraft for final assembly in Austria until Chinese and European certification is achieved. But Dries expects it to be manufacturing around 270 aircraft next year and to reach its capacity of 1,000 units a year by 2010. He sees Asia, the Middle East and the CIS as huge markets both for training aircraft and personal transport. "We are breaking into new countries. We have just received an order from Ukraine for DA42s and Russia will be very exciting," he says.

**Diamond expects orders for its D-Jet to reach 500 by the time production starts early next year**



DIAMOND AIRCRAFT

Diamond owner Christian Dries surprised his chief engineer when he announced plans for the DA42 Twin Star trainer



DIAMOND AIRCRAFT

Diamond is the only manufacturer to fit Thielert's Centurion 1.7 jet-fuel piston engine as original equipment. The engine is offered as an option to the Textron Lycoming IO-360 gasoline engine on the DA40, with the diesel-powered versions sold mostly in Europe. However, the DA42 comes only with the Thielert engine. Although two-thirds of DA40 production uses the Lycoming engine, Dries says that "in the long run, 90% of our output will be diesel engines". Coming up with the diesel version of the DA40 in 2001 was one of the company's "big breakthroughs".

## Vibrant sector

The launch of the \$1.4 million D-Jet took Diamond into one of the most vibrant and talked-about sectors of general and business aviation – very light jets. Dries prefers to describe it as a "personal jet", with the emphasis as much on the environment and comfort of the pilot as the passengers. The cabin is in a two-plus-three configuration, with a three-seat bench and a pressurised internal luggage compartment behind it. The first two production aircraft are being prepared to join the prototype in flight test in the next two months, and Dries expects orders to reach 500 by the time production starts. Unlike rivals such as Eclipse Aviation, however, the orderbook



DIAMOND AIRCRAFT

Diamond has built from motor glider manufacturer to become the biggest GA player outside North America

**The MPP venture is "demystifying this stuff that used to be the preserve of the military"**

CHRISTIAN DRIES, DIAMOND AIRCRAFT



DIAMOND AIRCRAFT

is not dependent on large single air-taxi orders, he says. The biggest customer is South Dakota-based on-demand operator Point2Point, which is taking delivery of DA42s and has options on D-Jets.

The launch of the airborne sensing business has been low key. Diamond has developed six versions of DA42s and is using them as demonstrators or on one-off contracts. It has around 15 orders, but Dries expects this to increase massively by next year with half of DA42 production – more than 100 aircraft a year – being MPP variants. Diamond has worked with suppliers such as Scotty, Riegl and Vexel to incorporate equipment on to the airframe and Dries says the aircraft's benefits over a helicopter – traditionally used for much of this sort of work – is that it can fly for longer and is quieter and cheaper at less

than €100 (\$133) a month to operate. "It is also a very forgiving airframe. That's why it's so good for aerial work," he says.

## Market potential

Potential markets include everything from police to environmental surveys, TV production companies to border and oil pipeline control. "We helped the City of Vienna record where all its trees were," says Dries, who claims that he had the MPP aircraft "in mind right from the start [of DA42 development], but I could not tell anyone because no one would believe the market was there". At first he had trouble convincing sensor equipment companies to work with Diamond. "Three years ago, sensors were incredibly expensive and no one wanted to deal with me. So I bought something from Russia and installed it,

and then everyone came to me and asked me to take their systems," he says.

Diamond has also worked with German defence company Rheinmetall to develop an "optionally piloted" version of the DA42, the OPALE, or Optional Piloted Surveillance and Reconnaissance System. Regulations forbid the aircraft to operate unmanned in civil airspace, but Dries sees the aircraft, which can fly for 30h with a 500kg (1,100lb) sensor payload, as a "cheaper and more flexible alternative to the [General Atomics] Predator" unmanned air vehicle. Dries says the MPP venture is "demystifying this stuff that used to be the preserve of the military. When people realise what can be done at such a low cost," says Dries, "the market will explode. Lots of agencies want this capability. They just cannot pay military prices." ■

**ENGINES** MURDO MORRISON / ALTENBURG

## Thielert's mission to get GA running on diesel

Thielert Aircraft Engines' rapid climb to become a world leader in jet-fuel piston aero propulsion has been in close formation with that of its biggest customer, Diamond Aircraft. Now – having made its reputation as an original equipment supplier to the Austrian airframer – the German engine maker is firing up its retrofit business, particularly in the biggest general aviation market, North America.

Founded in 1999 by entrepreneur Frank Thielert, who 10 years earlier had started a Hamburg-based enterprise developing high-performance automotive racing engines using diesel technology, the breakthrough for the company came in 2001 when its Centurion 1.7 was selected by Diamond to power a diesel version of the single-engine DA40. Later that year the 135hp (100kW) engine became the sole option on the DA40's twin-engined sibling, the DA42 Twin Star.

Diamond's success – this year it will produce around 400 DA40s and 250 DA42s, with that figure ramping up next year when Chinese DA40 final assembly begins – has underwritten Thielert's growth. However, the company has continued on its mission to convert tens of thousands of private pilots and flying schools to diesel technology, winning US Federal Aviation Administration approval to re-engine Cessna 172 Skyhawks and

the Piper PA28-161 with the 1.7. Last year, it struck a deal with the world's largest Cessna reseller, Van Bortel Aircraft of Arlington, Texas, to install the Centurion 1.7 in nearly-new aircraft, and with US flight school American Flyers to re-engine 55 172s.

Thielert's revenues have grown fourfold in three years, from €15 million (\$20 million) to €72 million in 2006, with earnings before tax of more than €18 million – and aeroengines has overtaken the original automotive business in size. The company floated on the Frankfurt stock exchange in 2005 to fund further expansion. So far, it has sold over 1,500 of its Centurion 1.7 engines, with a successor, the 2.0, launched last year. The new engine, still rated at 135hp, but with larger capacity, will be used from now on in original equipment and retrofit installations. Output is running at 120 engines a month and, although Frank Thielert will not split original and retrofit production, Diamond's output figures mean it will be taking delivery of around 70 engines a month.

Last year saw a major expansion for Thielert, with the \$10 million acquisition of Dallas-based Superior Air Parts, which makes replacement parts for Continental and Lycoming general aviation piston engines, and a €6.4 million investment in a new 2,500m<sup>2</sup> (27,000ft<sup>2</sup>) factory in Altenburg, eastern Germany, just north of its

main plant in Lichtenstein, Saxony, and next to the regional airport. Production at the new factory began in December, with Thielert taking on around 50 staff, in addition to the 120 at Lichtenstein, in one of the most economically challenged parts of Germany.

The company's second model – the 350hp Centurion 4.0 targeted at the Cessna 206 – has gone into production. This year will see 350 retrofit kits being built, but Frank Thielert says annual output will reach a "minimum of 700 or 800". Although there is no obvious candidate, he is "very positive" about finding an airframer prepared to fit the engine as original equipment. However, the company would need "two or three years" before it could cope with serial production.

A Centurion 3.2 has also been developed – pitched at the smaller market of mid-size piston singles such as the Cessna 182 – but other priorities mean the engine will not reach production until at least 2008, says Frank Thielert.

A less-publicised part of Thielert's business is its defence activities. General Atomics Aeronautical Systems, another customer for the Centurion 1.7, will begin fitting the engine to Warrior unmanned air vehicles in August for delivery to the US Army. Frank Thielert says he has been "surprised" at the growth in the UAV sector.

"I expect this to be a \$70 million market [for engines] by 2010 with the potential for 1,500 engines," he says. "Defence is a significant part of our business."

**Thielert's success has been underpinned by Diamond's selection of its Centurion 1.7 engine**

