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*Science and Technology for Tomorrow's Aerospace Force*

## **Success Story**

### ROYAL DANISH AIR FORCE ADOPTS JP-8+100 AS STANDARD FUEL



The Royal Danish Air Force (RDAF) has adopted the AFRL-developed +100 thermal stability fuel additive for use in the majority of their aircraft. This move ensures North Atlantic Treaty Organization (NATO) aircraft, refueling in Denmark, will receive the best available fuel, whether JP-8 or JP-8+100. This is a significant move towards ensuring the interoperability of NATO forces and reducing engine maintenance costs for participating aircraft utilizing +100.



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## Accomplishment

The RDAF converted to JP-8+100 primarily to alleviate concerns about coking in aircraft engines and fuel systems. To insure interoperability with other nations, many of which have yet to adopt the +100 additive, the RDAF chose to inject the additive in the fuel when pumped from the fuel truck to the aircraft. This differs from the US procedure of adding the +100 additive to the fuel as it is loaded from storage tanks onto the fuel truck. The RDAF purchased Hammonds Technical Services, Inc. fuel additive injection system, modified their refueling trucks, and began operating their aircraft on JP-8+100 in November 1999 at Skrydstrup Airbase. Danish aircraft operating on JP-8+100 include the F-16 Fighting Falcon, the C-130 Hercules, the Gulfstream G-III, and the Canadair CL-604 Challenger. After only two months of using the additive, the Danes, through visual inspection, saw cleaner engines.

## Background

The Propulsion Directorate's Fuels Branch developed the +100 fuel additive for use in JP-8, the Air Force's primary aviation fuel, in response to increasing thermal demands on the fuel. As engine technology advances, the fuel increasingly serves a dual function. The fuel's primary purpose is to provide propulsive energy, but additionally, the fuel is used as a coolant to extract heat from aircraft airframe and engine systems. Because of this role as a coolant, fuel temperatures rise and there is a tendency for the fuel to form deposits (called coke) that accumulate on engine components. These deposits degrade the performance of components, increase maintenance costs, and in extreme cases, pose a safety hazard. The +100 fuel additive effectively reduces the tendency to form harmful deposits. The technology was transitioned to San Antonio Air Logistics Center Special Fuels Branch who leads the Air Force implementation of JP-8+100. The additive, now used at 59 locations worldwide, is gaining wide acceptance, having flown approximately 1 million flight hours in more than 2,000 USAF aircraft. The additive is also used commercially in police helicopters.

Propulsion Directorate  
Technology Transition  
Support to the Warfighter

## Additional information

To receive more information about this or other activities in Air Force Research Laboratory, contact the TECH CONNECT AFRL/XPTT, (800) 203-6451 and you will be directed to the appropriate Laboratory expert. (00-PR-01)