

THE SCIENCE BEHIND THE ENGINEERING

How we use heat and pressure to produce lightweight, robust components for the Typhoon and F-35 aircraft.

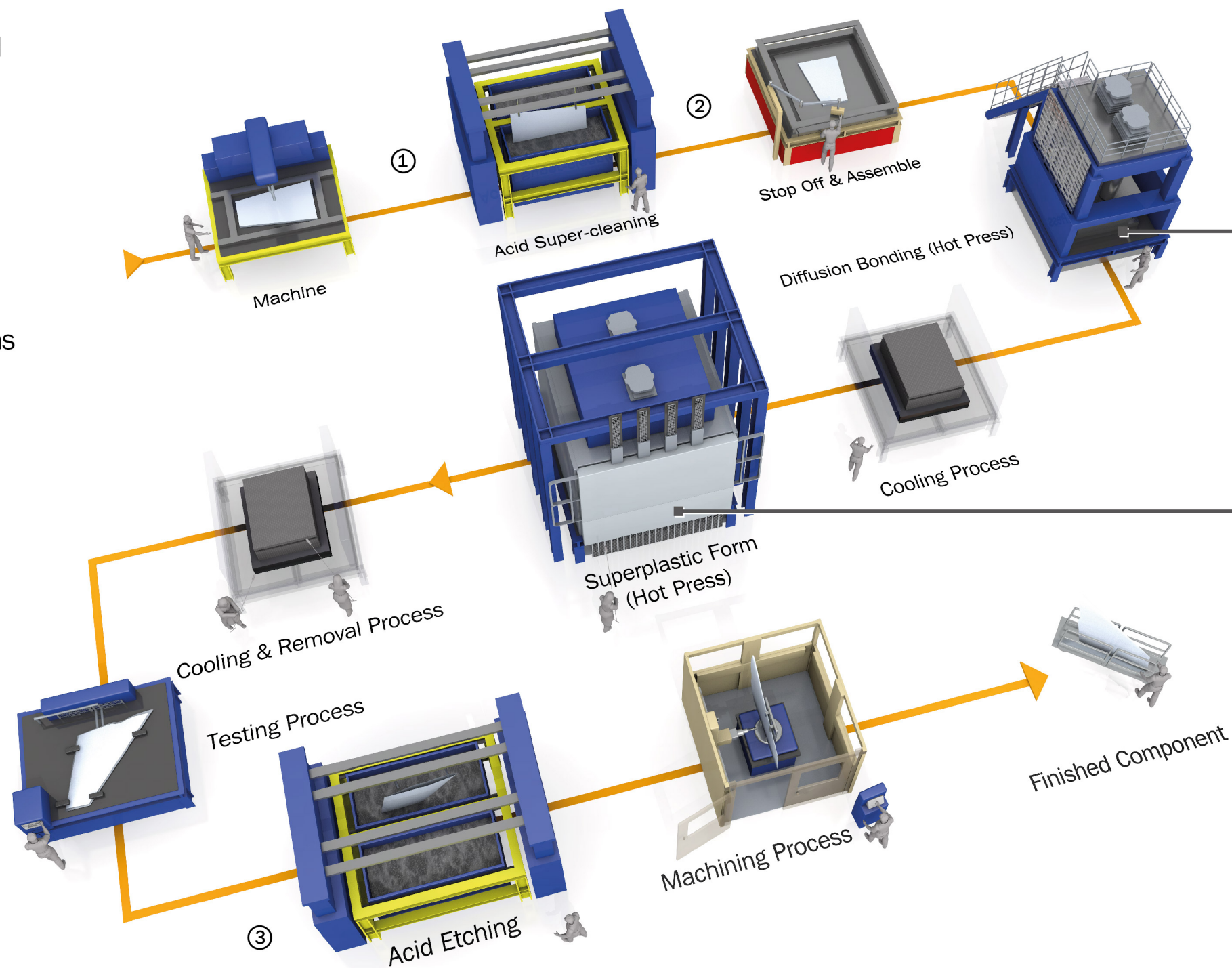
In this example four sheets of titanium are transformed into a Typhoon Foreplane.

Located to the front of the aircraft the foreplanes are central to the aircraft's performance and agility.

The process that turns the science into reality is known as **Diffusion Bonding & Superplastic Forming.**

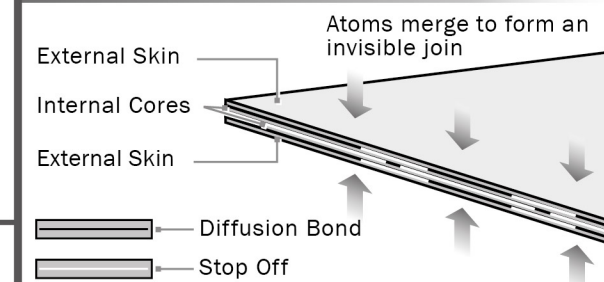
1. Using pure acid to clean the part ready for the next stage.
2. Silk screening is used to mark where bonding is not required. These 'Stop Off' points allow the sheets in the bonded pack to separate during superplastic forming and this creates the super strong internal structure.
3. After titanium has been exposed to heat and oxygen, a brittle outer layer is formed on the surface of the part, known as alpha-case. This is removed by chemical cleaning.

Component manufacture from start to finish

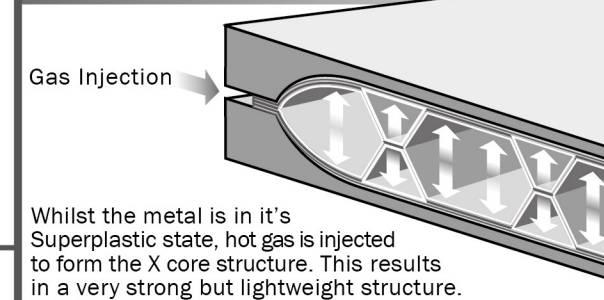


The Process

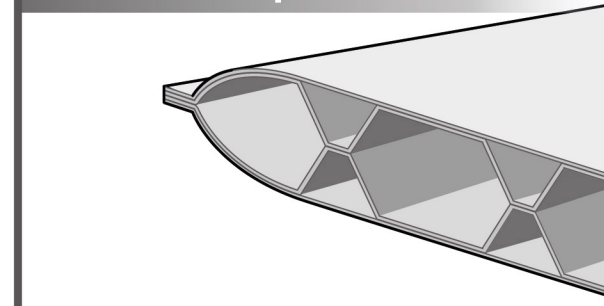
Diffusion Bonding



Superplastic Forming



Finished Component



Finished Typhoon Foreplane

