



## Unsupported Palladium Alloy Membranes

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**Summary:** A cost-effective method to produce thin, durable, support-free palladium and palladium alloy membranes

**Description:** This work provides a method to produce free-standing palladium (Pd) and Pd alloy membranes that are thin, permeable to hydrogen, and durable. These membranes have been tested for as long as 360 hours without an observed increase in leak rates or decreases in permeability. Single gas testing of the unsupported foils produce hydrogen permeabilities equivalent to thicker membranes produced by cold-rolling. Defect-free films as thin as 7.2 microns can be fabricated, with ideal hydrogen/nitrogen selectivities as high as 40,000. Homogeneous membrane compositions may also be produced using these methods.

### Main Advantages of this Invention

- Thin membranes that are capable of selectively transporting hydrogen in the absence of support media
- Capable of withstanding temperatures and pressure cycles encountered in typical applications
- Well-controlled, efficient, and economic production method

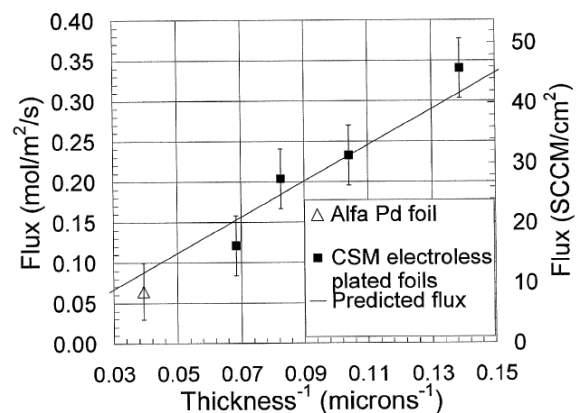
### Potential Areas of Application

- Fuel cells
- Hydrogen production

**ID number:** 8002

**Intellectual Property Status:** US 9,004,715

**Opportunity:** We are seeking an exclusive or non-exclusive licensee for marketing, manufacturing, and sale of this technology.



*Pure hydrogen flux as a function of inverse thickness  
For pure Pd membranes at 673 K with 220 kPa feed  
pressure.*

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