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## Hydrogen Environment Embrittlement on Austenitic Stainless Steels from Room Temperature to Low Temperatures

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Hydrogen environment embrittlement (HEE) on austenitic stainless steels SUS304, 304L, and 316L in the high pressure hydrogen gas was evaluated from ambient temperature to 20 K using a very simple mechanical properties testing procedure. In the method, the high-pressure hydrogen environment is produced just inside the hole in the specimen and the specimen is cooled in a cooled-alcohol dewar and a cryostat with a GM refrigerator.

The effect of HEE was observed in tensile properties, especially at lower temperatures, and fatigue properties at higher stress level but almost no effect around the stress level of yield strength where almost no strain-induced martensite was produced. So, no effect of HEE on austenitic stainless steels unless the amount of the ferrite phase is small.

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