Cold Fusion Gas Control

Earlier, it was indicated that deuterium and/or hydrogen should be provided to cathodes where cold fusion reactions can occur in small, high pressure gas puffs. The reason is that only about 10^{15} atoms reacting per second are needed for each kilowatt of power. This is unusual in that it is only a millionth of the quantity of gas ordinarily dealt with in conventional power and heating systems. It was also indicated that, for continuous generator operation, helium reactant gas produced in the reactions will need to be removed from cold fusion generators so that there is room to add more deuterium/hydrogen gas.

It is recommended that the gas handling system be composed of four (4) separate gas source and collection manifolds that are able to be mated directly to the generator's reaction chamber. Each of the manifolds necessarily includes high-pressure-rated tubing and fittings, gas measurement chambers, temperature and pressure sensors, mechanical and electric valves to control gas flow, and cooling chambers that can provide cooling to the tubing and pipes connected to the reaction chamber, thus protecting the sensors and valves from high temperature in the reaction chamber.

INSERT FIGURES 1-4 SEPARATELY

Figure 1 is an example of a deuterium/hydrogen gas supply manifold whose purpose is to provide predetermined, controlled, small quantities of deuterium and hydrogen gas to the generator's reaction chamber. Figure 2 is an example of an inert carrier gas (e.g., argon) manifold. This manifold can provide predetermined quantities of carrier gas to the reaction chamber during start-up and maintenance periods. Figure 3 is an example of a reaction gas manifold that enables reactant gas (e.g., helium) to be quantified, temporarily stored and periodically extracted from the generator according to applicable standards and regulations.

Figure 4 is a design for a gas measurement and evacuation manifold that can enable gases to be extracted from the reaction chamber and the gas manifolds during start-up and maintenance periods. Additional details on design of the gas handling system can be found in patent application US 2018/0087165A1.

The above photograph provides some examples of high-pressure components of the type that can be used to build cold fusion generator gas handling systems. The small storage tank to the left is about the size needed for deuterium to power a car about a year. The mechanical valves and fittings shown are available from High Pressure Equipment Company (click on www.highpressure.com/) in Erie, Pennsylvania. An example of a normally-closed, high pressure, electric solenoid valve is also shown in the photograph. This type of valve is available from Clark Cooper (click on www.clarkcooper.com) in Roebling, New Jersey. To the right of the electric valve is an electronic pressure sensor of the type available from ASCO Valve, Inc. (click on www.ascovalve.com) in Florham Park, NJ. At the far right is a specially designed gas chamber for quantifying helium reactant gas produced by the generator. The measurement chamber includes an electronic interface and operates by similar principles as the stand-alone Binary Gas Analyzer (Model BGA244) from Stanford Research Systems, Inc. (click on www.thinksrs.com/products/bga244.html) in Sunnyvale, California.