S. Department of Commerce
Malcolm Baldrige
Secretary

National Bureau of Standards
Ernest Ambler, Director

National Bureau of Standards

Certificate

Standard Reference Material 1890

Stainless Steel for Pitting or Crevice Corrosion

This Standard Reference Material is intended for use in evaluating metallic surgical implant materials for pitting or crevice corrosion as specified by the ASTM Test Method F746-81. This test applies only to passive metals and alloys. This SRM consists of four 316L stainless steel rods and tapered polytetrafluoroethylene collars. Each rod and collar can only be used for one test. The surface of the rod should be lightly polished with 600 grit SiC paper before testing as required in the ASTM test method.

The initial corrosion potential of this SRM, as measured against a saturated calomel electrode at 37° C, upon immersion in a saline electrolyte is

$$-0.249 \pm 0.008 \text{ volt.}$$

The final corrosion potential at the end of one hour is

$$-0.130 \pm 0.005 \text{ volt.}$$

The critical potential for pitting or crevice corrosion was found to be

$$0.00 \pm 0.05 \text{ volt.}$$

The uncertainties of the initial and final potentials are the standard deviations of tests on five and four specimens, respectively. The uncertainty of the critical potential is the range within which all measurements fell.

The preparation of specimens and the measurements leading to certification were performed by Anna C. Fraker and Ann C. Van Orden of the Metallurgy Division, Center for Materials Science.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by R.K. Kirby.

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George A. Uriano, Chief
Office of Standard Reference Materials

Supplemental Information

The 316L stainless steel rods are in the cold worked condition. The microstructure of transverse sections are shown in the photomicrographs included with the SRM.

The chemical composition of the stainless steel is provided for information only:

Cr	(17.2) wt. %	W	(0.05) wt. %
Ni	(13.8)	N	(0.029)
Mo	(2.2)	P	(0.020)
Mn	(1.8)	C	(0.017)
Si	(0.42)	Nb	(0.01)
Cu	(0.16)	Al	(>0.005)
Co	(0.14)	Sn	(>0.005)
V	(0.09)	S	(<0.003)