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The purpose of this paper is to classify all compact manifolds modeled on the 4-dimensional solvable Lie group Sol_1^4 . The maximal compact subgroup of $\text{Isom}(\text{Sol}_1^4)$ is $D_4 = \mathbb{Z}_4 \times \mathbb{Z}_2$. We shall exhibit an infrasolv-manifold with Sol_1^4 -geometry whose holonomy is D_4 . This implies that all possible holonomy groups do occur; $\{1\}$, \mathbb{Z}_2 (3 non-isomorphic ones), \mathbb{Z}_4 (all non-orientable), $\mathbb{Z}_2 \times \mathbb{Z}_2$ and $\mathbb{Z}_4 \times \mathbb{Z}_2$. Finally we will determine the unoriented cobordism classes of these manifolds. (Received July 03, 2012)