

WEPD – Type I [70, 35, 12]

This is a database of known weight enumerator parameters for singly-even binary self-dual [70, 35, 12] codes.

The possible weight enumerators of a singly-even binary self-dual [70, 35, 12] code are given in [5] as

$$W_{70,1} = 1 + 2\alpha x^{12} + (11730 - 2\alpha - 128\beta)x^{14} + (150535 - 22\alpha + 896\beta)x^{16} + \dots ,$$
$$W_{70,2} = 1 + 2\alpha x^{12} + (9682 - 2\alpha)x^{14} + (173063 - 22\alpha)x^{16} + \dots ,$$

where $\alpha, \beta \in \mathbb{Z}$.

See the links below for lists of known values of (α, β) for $W_{70,1}$ and $W_{70,2}$.

- [W_{70,1} known parameters](#) (from [1–10])
- [W_{70,2} known parameters](#) (from [8, 9])

References

- [1] A. D. Bracco, A. M. Natividad, and P. Solé. On quintic quasi-cyclic codes. *Discrete Appl. Math.*, 156(18): 3362–3375, 2008. doi: [10.1016/j.dam.2008.01.013](https://doi.org/10.1016/j.dam.2008.01.013).
- [2] R. Dontcheva. New binary [70, 35, 12] self-dual binary [72, 36, 12] self-dual doubly even codes. *Serdica Math. J.*, 27(4):287–302, 2001.
- [3] S. T. Dougherty, J. Gildea, A. Korban, and A. M. Roberts. Codes over a ring of order 32 with two Gray maps, 2023. (in progress).
- [4] M. Gürel and N. Yankov. Self-dual codes with an automorphism of order 17. *Math. Commun.*, 21(1): 97–107, 2016.
- [5] M. Harada. The existence of a self-dual [70, 35, 12] code. *Finite Fields Appl.*, 3(2):131–139, 1997. doi: [10.1006/fta.1996.0174](https://doi.org/10.1006/fta.1996.0174).
- [6] H. J. Kim and Y. Lee. Extremal quasi-cyclic self-dual codes over finite fields. *Finite Fields Appl.*, 52: 301–318, 2018. doi: [10.1016/j.ffa.2018.04.013](https://doi.org/10.1016/j.ffa.2018.04.013).
- [7] H. J. Kim, W.-H. Choi, and Y. Lee. Construction of reversible self-dual codes. *Finite Fields Appl.*, 67, 2020. doi: [10.1016/j.ffa.2020.101714](https://doi.org/10.1016/j.ffa.2020.101714).
- [8] A. M. Roberts. Constructions of extremal and optimal self-dual and Hermitian self-dual codes over finite fields using circulant matrices. Master’s thesis, University of Chester, Chester, UK, 2020. https://drive.google.com/file/d/1CMjnuBvQtrXOY8foy6_gfXOcFFuHAaFs/view.
- [9] N. Yankov, M. H. Lee, M. Gürel, and M. Ivanova. Self-dual codes with an automorphism of order 11. *IEEE Trans. Inform. Theory*, 61(3):1188–1193, 2015. doi: [10.1109/TIT.2015.2396915](https://doi.org/10.1109/TIT.2015.2396915).
- [10] A. Zhdanov. Quasi-cyclic self-dual codes of length 70, 2017. [arXiv:1704.01512](https://arxiv.org/abs/1704.01512).