To evaluate the performance of the ejector–expansion refrigeration cycle (EERC) using zeotropic mixtures, a numerical study is conducted.This improvement rises at high condensing temperature or low evaporating temperature.The exergy analysis shows that the compressor and ejector contribute the most exergy destruction, and the cycle exergy efficiency achieves a maximum value with MFt of 0.7.A constant–pressure two–phase ejector model for zeotropic mixtures is established.