# Comparative Work Index (Berry and Bruce Method)

Work index of a test ore by grinding it for the same time as a reference ore of known work index (Berry and Bruce comparative method), with both size reductions.

**Method:** Wills and Finch; Wills' Mineral Processing Technology; ...

## Input parameters

Unit system: SI

| Parameter | Value | Unit |
|---|---|---|
| Work index of the reference ore | 13.000 | kWh/t |
| Reference feed 80 % passing | 1,700.0 | µm |
| Reference product 80 % passing | 140.00 | µm |
| Test ore feed 80 % passing | 1,750.0 | µm |
| Test ore product 80 % passing | 165.00 | µm |

## Calculated results

| Parameter | Value | Unit |
|---|---|---|
| Work index of the test ore | 14.522 | kWh/t |
| Energy input (same for both) | 7.8340 | kWh/t |
| Hardness relative to the reference | 1.1171 | |

**Notes for this case**

- Valid when the two ores are ground to similar product size distributions in the same mill, for the same time, with equal masses (Wills).

## Formula and method

$$W_{it} = W_{ir} \frac{10/\sqrt{P_{80r}} - 10/\sqrt{F_{80r}}}{10/\sqrt{P_{80t}} - 10/\sqrt{F_{80t}}}$$

### Variables

| | | |
|---|---|---|
| $W_{ir}$ | Work index of the reference ore | J/kg |
| $F_{80r}$ | Reference feed 80 % passing | m |
| $P_{80r}$ | Reference product 80 % passing | m |
| $F_{80t}$ | Test ore feed 80 % passing | m |
| $P_{80t}$ | Test ore product 80 % passing | m |
| $W_{it}$ | Work index of the test ore | J/kg |
| $W$ | Energy input (same for both) | J/kg |
| $W_{it}/W_{ir}$ | Hardness relative to the reference | - |

### Method and standards

Equal energy in Bond's equation for both ores.

### Assumptions and limits

- Same mill, time and mass for both ores.

### References

- Wills and Finch
- Wills' Mineral Processing Technology
- 8th ed. (Butterworth-Heinemann, 2016)
- ch. 5
- eq. 5.8 (Berry and Bruce, 1966)

## Report details

| | |
|---|---|
| Report reference | FCC-9JZM-SYVH (the same inputs always give the same reference) |
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| Calculator | Comparative Work Index (Berry and Bruce Method) |
| Method last reviewed | 17 November 2026 |
| Software release | FireCAD Calc, release of 17 November 2026 |
| Release checks | 3 reference cases of this calculator, computed independently, are checked on every release |

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

### This calculator online

https://calc.firecad.com/civil/mining-minerals/berry-bruce-work-index

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.