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| **** AGUA = | **1000** | kg /m3 |
| 1 m3 = | **1000** | Litros |

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| --- | --- | --- | --- | --- |
| D1 | **102** | mm | 0,008171  | m2 (A1) |
| Q | **235** | Lt /min | 0,0039  | m3 /s |
| y1 | **5,4** | m |  |  |
| h2 | **5** | m |  |  |
| D2 | **38** | mm | 0,001134  | m2 (A2) |
|  v1 =Q /A1 |  **v1** | **0,4793** | **m/s** |
|  v2 =Q /A2 |  **v2** | **3,4535** | **m/s** |
|  |  |  |  |  |
|  | y2 =((g\*(y1-h2)+(v1^2-v2^2)/2)/g)\*100 |
|  |  | **y2** | **-19,6782**  | **cm** |

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| **AGUA** |  |  |
| **c** AGUA = | **1,0**  | cal /gr-ºC |
| **HIELO** |  |  |
| **c** HIELO = | **0,5**  | cal /gr-ºC |
| **** HIELO = | **0,92**  | gr /cm3 |
| **L*f***HIELO = | **80,0**  | cal /gr |
| **CORCHO** |  |  |
| **k** CORCHO = | **0,0004**  | cal/ cm-s-ºC |
| **** CORCHO = | **0,15**  | gr /cm3 |

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| --- | --- | --- | --- | --- |
| t INT | **-15,0**  | ºC | -15,0  | ºC |
| t EXT | **20,0**  | ºC | 20,0  | ºC |
| x | **50**  | cm |  |  |
| y | **50**  | cm | 11.000,0  | cm2 (A) |
| z | **30**  | cm | 75.000,0  | cm3 (Vol) |
|  | **2,0**  | días | 69.000,0  | gr (m) |
|  | **18,0**  | horas | 237.600,0  | s (t) |
| Q = m \*(cHIELO\*abs( tINT) +L*f* HIELO +cAGUA\*abs( tEXT)) |
|  |  | ** Q** | **7.417.500**  | **cal** |
|  | Esp = t\* (A \*k \*(abs(t EXT) + abs(t INT)) / Q |
|   |   | **e** | **4,9330**  | **cm** |

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| **PATM =** | **101325**  | Pa |
| ** MADERA =** | **810**  | kg /m3 |
| ** ALUMUNIO =** | **2700**  | kg /m3 |
| ** AGUA =** | **1000**  | kg /m3 |

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| a MAD | **190**  | mm | 0,0069  | m3 (VM) |
| aALUM | **95**  | mm | 0,0009  | m3 (VA) |
|  |  |  | 5,5558  | kg (mM) |
|  |  |  | 2,3149  | kg (mA) |
|  |  |  | 54,4467  | N (wM) |
|  |  |  | 22,6861  | N (wA) |
|  |  |  | 67,2182  | N (EM) |
|  |  |  | 8,4023  | N (EA) |
|  |  | F = wM +wA -EM -EA |  |
|  |  | **F** | **1,5124**  | **N** |

|  |  |  |
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| **ALUMINIO** |  |  |
| **c** ALUM = | **0,2100**  | cal /gr-ºC |
| **** ALUM =. | **2,7000**  | gr /cm3 |
| **MERCURIO** |  |  |
| **c** MERC = | **0,0330**  | cal /gr-ºC |
| **** MERC = | **13,6000**  | gr /cm3 |
| **PLOMO** |  |  |
| **c** PLOMO = | **0,0310**  | cal /gr-ºC |
| **** PLOMO =. | **11,4000**  | gr /cm3 |
| **P.fusión** PLOMO =. | **327,00**  | ºC |

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| mALUM | **150,0**  | gr |  |  |
| vMERC | **395,0**  | cm3 | 5.372,0000  | gr |
| T1 | **20,0**  | ºC |  |  |
| mPLOM | **230,0**  | gr |  |  |
| T2 | **320,0**  | ºC |  |  |
| T3 = (T1\*(mALUM\*cALUM +mMERC\*cMERC ) +mPLOM\*cPLOM\*T2) |
|  (mALUM\*cALUM +mMERC\*cMERC +mPLOM\*cPLOM) |
|  |  | **T3** | **29,9071**  | **ºC** |