

## Improving Cyclohexane Yield from Hydrogenation Benzene with a Modified Multistage Separation Design

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Table S1. Mass and energy balances of the modified process

| Data                                      | Unit              | Benzene  | Hydrogen | Mix Feed | Steam In | Steam Out   | Mix Feed Heated | Top Product Conversion Reactor | Bottom Product Conversion Reactor | Top Product Conversion Reactor Cooled | Water In    | Water Out | Top      | Bottom       | Product Splitter to Recycle |
|-------------------------------------------|-------------------|----------|----------|----------|----------|-------------|-----------------|--------------------------------|-----------------------------------|---------------------------------------|-------------|-----------|----------|--------------|-----------------------------|
| Total Phase Properties                    |                   |          |          |          |          |             |                 |                                |                                   |                                       |             |           |          |              |                             |
| Vapour Fraction                           |                   | 0        | 1        | 0.672072 | 1        | 0.808030878 | 0.92538249      | 1                              | 0                                 | 0.006088297                           | 0           | 0         | 1        | 0            | 1                           |
| Temperature                               | <i>F</i>          | 100      | 120      | 98.79137 | 430      | 427.1519408 | 300             | 1349.358196                    | 1349.358196                       | 120                                   | 77          | 77.72732  | 120      | 120          | 120                         |
| Pressure                                  | <i>psia</i>       | 335      | 335      | 310      | 340      | 330         | 330             | 329.0625011                    | 329.0625011                       | 310                                   | 320         | 310       | 310      | 310          | 310                         |
| Molar Flow                                | <i>lbmole/hr</i>  | 155      | 310      | 465.0794 | 1000     | 1000        | 465.0793922     | 162.8293922                    | 0                                 | 162.8293922                           | 900000      | 900000    | 0.991354 | 161.8380385  | 0.079308293                 |
| Mass Flow                                 | <i>tonne/year</i> | 48107.48 | 2988.962 | 51103.49 | 71583.18 | 71583.18071 | 51103.49264     | 51104.29448                    | 0                                 | 51104.29448                           | 64424862.64 | 64424863  | 87.98945 | 51016.30503  | 7.039156329                 |
| Heat Flow                                 | <i>kJ/h</i>       | 3644694  | -114553  | 3528563  | -1.1E+08 | -110137950  | 6503049.532     | 6503041.86                     | 0                                 | 5827554.506                           | 1.16831E+11 | -1.2E+11  | -19704   | -5807850.553 | -1576.31627                 |
| Std Gas Flow                              | <i>STD_m3/h</i>   | 1662.382 | 3324.764 | 4987.998 | 10725.05 | 10725.04601 | 4987.997879     | 1746.352723                    | 0                                 | 1746.352723                           | 9652541.409 | 9652541   | 10.63231 | 1735.720409  | 0.850585088                 |
| Vapour Phase Properties                   |                   |          |          |          |          |             |                 |                                |                                   |                                       |             |           |          |              |                             |
| Phase Mass Flow (Vapour Phase)            | <i>tonne/year</i> | <empty>  | 2988.962 | 4097.791 | 71583.18 | 57841.42033 | 40452.23642     | 51104.29448                    | 0                                 | 87.98945411                           | <empty>     | <empty>   | 87.98945 | 0            | 7.039156329                 |
| Phase Molecular Weight (Vapour Phase)     |                   | <empty>  | 2.426523 | 3.29938  | 18.0151  | 18.01510048 | 23.65483155     | 78.98603117                    | 78.98603117                       | 22.33714723                           | <empty>     | <empty>   | 22.33715 | 22.33714723  | 22.33714723                 |
| Phase Actual Gas Flow (Vapour Phase)      | <i>ACT_m3/h</i>   | <empty>  | 164.3143 | 172.2962 | 716.154  | 595.7528079 | 293.888067      | 267.8076378                    | 0                                 | 0.549262812                           | <empty>     | <empty>   | 0.549263 | 0            | 0.043941025                 |
| Phase Z Factor (Vapour Phase)             |                   | <empty>  | 1.008027 | 1.006922 | 0.90064  | 0.902839019 | 0.976151466     | 0.984504905                    | 0.984504905                       | 0.975050524                           | <empty>     | <empty>   | 0.975051 | 0.975050524  | 0.975050524                 |
| Phase Cp/Cv (Vapour Phase)                |                   | <empty>  | 1.414198 | 1.403239 | 1.442829 | 1.439211163 | 1.20876813      | 1.037339869                    | 1.037339869                       | 1.354443383                           | <empty>     | <empty>   | 1.354443 | 1.354443383  | 1.354443383                 |
| Phase Viscosity (Vapour Phase)            | <i>cP</i>         | <empty>  | 0.009335 | 0.008974 | 0.016391 | 0.016334325 | 0.017589888     | 0.025925775                    | 0.025925775                       | 0.014764287                           | <empty>     | <empty>   | 0.014764 | 0.014764287  | 0.014764287                 |
| Phase Mass Heat Capacity (Vapour Phase)   | <i>kJ/kg-C</i>    | <empty>  | 11.87166 | 8.92969  | 2.198105 | 2.19014796  | 2.340882833     | 3.445465496                    | 3.445465496                       | 1.659155423                           | <empty>     | <empty>   | 1.659155 | 1.659155423  | 1.659155423                 |
| Phase Thermal Conductivity (Vapour Phase) | <i>W/m-K</i>      | <empty>  | 0.179244 | 0.168006 | 0.041655 | 0.04130837  | 0.108425651     | 0.096328296                    | 0.096328296                       | 0.033398695                           | <empty>     | <empty>   | 0.033399 | 0.033398695  | 0.033398695                 |
| Liquid Phase Properties                   |                   |          |          |          |          |             |                 |                                |                                   |                                       |             |           |          |              |                             |
| Phase Mass Flow (Liquid Phase)            | <i>tonne/year</i> | 48107.48 | <empty>  | 47005.7  | <empty>  | <empty>     | 10651.25622     | 0                              | 0                                 | 51016.30503                           | <empty>     | <empty>   | 0        | 51016.30503  | 0                           |
| Phase Molecular Weight (Liquid Phase)     |                   | 78.11    | <empty>  | 77.56598 | <empty>  | <empty>     | 77.24291979     | 78.9790035                     | 78.9790035                        | 79.33303907                           | <empty>     | <empty>   | 79.33304 | 79.33303907  | 79.33303907                 |
| Phase Mass Density (Liquid Phase)         | <i>kg/m3</i>      | 859.7371 | <empty>  | 857.0587 | <empty>  | <empty>     | 721.168545      | 21.78157873                    | 21.78157873                       | 773.3135983                           | <empty>     | <empty>   | 773.3136 | 773.3135983  | 773.3135983                 |
| Phase Actual Liquid Flow (Liquid Phase)   | <i>m3/s</i>       | 0.001774 | <empty>  | 0.001739 | <empty>  | <empty>     | 0.000468336     | 0                              | 0                                 | 0.002091928                           | <empty>     | <empty>   | 0        | 0.002091928  | 0                           |
| Phase Viscosity (Liquid Phase)            | <i>cP</i>         | 0.510482 | <empty>  | 0.506641 | <empty>  | <empty>     | 0.153544256     | 0.008071578                    | 0.008071578                       | 0.520651888                           | <empty>     | <empty>   | 0.520652 | 0.520651888  | 0.520651888                 |
| Phase Mass Heat Capacity (Liquid Phase)   | <i>kJ/kg-C</i>    | 1.572002 | <empty>  | 1.573825 | <empty>  | <empty>     | 2.119783314     | 3.445416124                    | 3.445416124                       | 1.776946232                           | <empty>     | <empty>   | 1.776946 | 1.776946232  | 1.776946232                 |
| Phase Thermal Conductivity (Liquid Phase) | <i>W/m-K</i>      | 0.127672 | <empty>  | 0.127486 | <empty>  | <empty>     | 0.09705045      | 0.002631095                    | 0.002631095                       | 0.118504367                           | <empty>     | <empty>   | 0.118504 | 0.118504367  | 0.118504367                 |
| Phase Surface Tension (Liquid Phase)      | <i>dyne/cm</i>    | 25.97147 | <empty>  | 25.8646  | <empty>  | <empty>     | 12.57261154     | 0                              | <empty>                           | 21.20057552                           | <empty>     | <empty>   | 21.20058 | 21.20057552  | 21.20057552                 |

Table S1 (continued)

|                                           |            |            |                           |                                |              |                                  |                                      |               |              |               |                       |                          |                        |                       |              |
|-------------------------------------------|------------|------------|---------------------------|--------------------------------|--------------|----------------------------------|--------------------------------------|---------------|--------------|---------------|-----------------------|--------------------------|------------------------|-----------------------|--------------|
| Data                                      | Unit       | Purge      | Product Splitter to Mixer | Bottom Product to Separator-02 | Purge-02     | Bottom Product to Heat Exchanger | Bottom Product to Component Splitter | Benzene Out 1 | SD-5         | Benzene Out 2 | Mix Product to Cooler | Mix Product After Cooler | Methane (Side Product) | Cyclohexane (Product) | Steam In-02  |
| Total Phase Properties                    |            |            |                           |                                |              |                                  |                                      |               |              |               |                       |                          |                        |                       |              |
| Vapour Fraction                           |            | 1          | 1                         | 0.004354492                    | 1            | 0                                | 0.000354869                          | 0.00533912    | 0            | 0             | 0                     | 0                        | 1                      | 0                     | 0            |
| Temperature                               | F          | 120        | 120                       | 120.1171737                    | 120.1171737  | 120.1171737                      | 130                                  | 150           | 150          | 150           | 150                   | 110                      | 280,019172             | 527,1951731           | 200          |
| Pressure                                  | psia       | 310        | 310                       | 269.389444                     | 269.389444   | 269.389444                       | 269.4                                | 269.4         | 269.4        | 269.4         | 269.4                 | 269.4                    | 554,4791271            | 554,4791271           | 269,4        |
| Molar Flow                                | lbmole/hr  | 0.91204537 | 0.07939216                | 161.8380385                    | 0.704722461  | 161.133316                       | 161.133316                           | 65.76268608   | 95.37062996  | 32.42601419   | 62.94461577           | 62.94461577              | 3,693230536            | 59,25138524           | 170          |
| Mass Flow                                 | tonne/year | 80.9502978 | 7.046666901               | 51016.30503                    | 61.75188058  | 50954.55315                      | 50954.55315                          | 20338.65759   | 30615.89556  | 10409.40449   | 20206.49107           | 20206.49107              | 397,3562809            | 19809,13479           | 12169,14072  |
| Heat Flow                                 | kJ/h       | -18127.637 | -1577.934844              | -5807850.553                   | -14883.07533 | -5792967.477                     | -5735698.455                         | 666557.7434   | -6287795.356 | -2137850.421  | -4149944.935          | -4246571.985             | -130089,5333           | -2662737,541          | -21657323,96 |
| Std Gas Flow                              | STD_m3/h   | 9.78172851 | 0.851484566               | 1735.720409                    | 7.558180813  | 1728.162228                      | 1728.162228                          | 705.307834    | 1022.854394  | 347.7704941   | 675.0839003           | 675.0839003              | 39,61006742            | 635,4738328           | 1823,257822  |
| Vapour Phase Properties                   |            |            |                           |                                |              |                                  |                                      |               |              |               |                       |                          |                        |                       |              |
| Phase Mass Flow (Vapour Phase)            | tonne/year | 80.9502978 | 7.046666901               | 61.75188058                    | 61.75188058  | 0                                | 5.056684347                          | 39.33330505   | <empty>      | <empty>       | <empty>               | <empty>                  | 397,3562809            | <empty>               | <empty>      |
| Phase Molecular Weight (Vapour Phase)     |            | 22.3371472 | 22.33735895               | 22.052497                      | 22.052497    | 22.052497                        | 22.25554035                          | 28.19271536   | <empty>      | <empty>       | <empty>               | <empty>                  | 27,07692621            | <empty>               | <empty>      |
| Phase Actual Gas Flow (Vapour Phase)      | ACT_m3/h   | 0.50532179 | 0.043987522               | 0.450004339                    | 0.450004339  | 0                                | 0.037137047                          | 0.238959426   | <empty>      | <empty>       | <empty>               | <empty>                  | 1,385826325            | <empty>               | <empty>      |
| Phase Z Factor (Vapour Phase)             |            | 0.97505052 | 0.975051184               | 0.976349318                    | 0.976349318  | 0.976349318                      | 0.9764212                            | 0.989628901   | <empty>      | <empty>       | <empty>               | <empty>                  | 0,925620573            | <empty>               | <empty>      |
| Phase Cp/Cv (Vapour Phase)                |            | 1.35444338 | 1.354444543               | 1.343906965                    | 1.343906965  | 1.343906965                      | 1.335525036                          | 1.360516594   | <empty>      | <empty>       | <empty>               | <empty>                  | 1,234174974            | <empty>               | <empty>      |
| Phase Viscosity (Vapour Phase)            | cP         | 0.01476429 | 0.014764407               | 0.014467579                    | 0.014467579  | 0.014467579                      | 0.014599396                          | 0.018511775   | <empty>      | <empty>       | <empty>               | <empty>                  | 0,015903733            | <empty>               | <empty>      |
| Phase Mass Heat Capacity (Vapour Phase)   | kJ/kg-C    | 1.65915542 | 1.659132561               | 1.694777646                    | 1.694777646  | 1.694777646                      | 1.709879828                          | 1.230750085   | <empty>      | <empty>       | <empty>               | <empty>                  | 2,364255007            | <empty>               | <empty>      |
| Phase Thermal Conductivity (Vapour Phase) | W/m-K      | 0.0333987  | 0.033398509               | 0.033525888                    | 0.033525888  | 0.033525888                      | 0.034083754                          | 0.030107735   | <empty>      | <empty>       | <empty>               | <empty>                  | 0,046295809            | <empty>               | <empty>      |
| Liquid Phase Properties                   |            |            |                           |                                |              |                                  |                                      |               |              |               |                       |                          |                        |                       |              |
| Phase Mass Flow (Liquid Phase)            | tonne/year | 0          | <empty>                   | 50954.55315                    | 0            | 50954.55315                      | 50949.49646                          | 20299.32428   | 30615.89556  | 10409.40449   | 20206.49107           | 20206.49107              | <empty>                | 19809,13479           | <empty>      |
| Phase Molecular Weight (Liquid Phase)     |            | 79.3330391 | <empty>                   | 79.58355762                    | 79.58355762  | 79.58355762                      | 79.60390878                          | 78.10029913   | 80.79007537  | 80.79007537   | 80.79007537           | 80.79007537              | <empty>                | 84,13809908           | <empty>      |
| Phase Mass Density (Liquid Phase)         | kg/m3      | 773.313598 | <empty>                   | 773.9373588                    | 773.9373588  | 773.9373588                      | 768.4004503                          | 808.5317293   | 724.8274123  | 724.8274123   | 724.8274123           | 746.7222087              | <empty>                | 329,0907691           | <empty>      |
| Phase Actual Liquid Flow (Liquid Phase)   | m3/s       | 0          | <empty>                   | 0.002087712                    | 0            | 0.002087712                      | 0.002102547                          | 0.000796119   | 0.001339386  | 0.000455391   | 0.000883995           | 0.000858075              | <empty>                | 0,001908724           | <empty>      |
| Phase Viscosity (Liquid Phase)            | cP         | 0.52065189 | <empty>                   | 0.52383624                     | 0.52383624   | 0.52383624                       | 0.487513397                          | 0.375317458   | 0.457090203  | 0.457090203   | 0.457090203           | 0.618759984              | <empty>                | 0,03794911            | <empty>      |
| Phase Mass Heat Capacity (Liquid Phase)   | kJ/kg-C    | 1.77694623 | <empty>                   | 1.776572126                    | 1.776572126  | 1.776572126                      | 1.806773492                          | 1.741894439   | 1.95242845   | 1.95242845    | 1.95242845            | 1.818165141              | <empty>                | 11,30054025           | <empty>      |
| Phase Thermal Conductivity (Liquid Phase) | W/m-K      | 0.11850437 | <empty>                   | 0.118789671                    | 0.118789671  | 0.118789671                      | 0.117459973                          | 0.118178496   | 0.112618786  | 0.112618786   | 0.112618786           | 0.118004877              | <empty>                | 0,025367405           | <empty>      |
| Phase Surface Tension (Liquid Phase)      | dyne/cm    | 21.2005755 | <empty>                   | 21.28362342                    | 21.28362342  | 21.28362342                      | 20.68319382                          | 21.58240248   | 18.06676217  | 18.06676217   | 18.06676217           | 20.38013546              | <empty>                | 0,189376457           | <empty>      |

Table S1 (continued)

|                                           |            |              |              |              |
|-------------------------------------------|------------|--------------|--------------|--------------|
| Data                                      | Unit       | Steam Out-02 | Steam In-03  | Steam Out-03 |
| Total Phase Properties                    |            |              |              |              |
| Vapour Fraction                           |            | 0            | 0            | 0            |
| Temperature                               | F          | 183,0156007  | 60           | 64,93456402  |
| Pressure                                  | psia       | 269,4        | 269,4        | 269,4        |
| Molar Flow                                | lbmole/hr  | 170          | 1000         | 1000         |
| Mass Flow                                 | tonne/year | 12169,14072  | 71583,18071  | 71583,18071  |
| Heat Flow                                 | kJ/h       | -21714592,98 | -130148079,5 | -130051452,4 |
| Std Gas Flow                              | STD_m3/h   | 1823,257822  | 10725,04601  | 10725,04601  |
| Vapour Phase Properties                   |            |              |              |              |
| Phase Mass Flow (Vapour Phase)            | tonne/year | <empty>      | <empty>      | <empty>      |
| Phase Molecular Weight (Vapour Phase)     |            | <empty>      | <empty>      | <empty>      |
| Phase Actual Gas Flow (Vapour Phase)      | ACT_m3/h   | <empty>      | <empty>      | <empty>      |
| Phase Z Factor (Vapour Phase)             |            | <empty>      | <empty>      | <empty>      |
| Phase Cp/Cv (Vapour Phase)                |            | <empty>      | <empty>      | <empty>      |
| Phase Viscosity (Vapour Phase)            | cP         | <empty>      | <empty>      | <empty>      |
| Phase Mass Heat Capacity (Vapour Phase)   | kJ/kg-C    | <empty>      | <empty>      | <empty>      |
| Phase Thermal Conductivity (Vapour Phase) | W/m-K      | <empty>      | <empty>      | <empty>      |
| Liquid Phase Properties                   |            |              |              |              |
| Phase Mass Flow (Liquid Phase)            | tonne/year | <empty>      | <empty>      | <empty>      |
| Phase Molecular Weight (Liquid Phase)     |            | <empty>      | <empty>      | <empty>      |
| Phase Mass Density (Liquid Phase)         | kg/m3      | <empty>      | <empty>      | <empty>      |
| Phase Actual Liquid Flow (Liquid Phase)   | m3/s       | <empty>      | <empty>      | <empty>      |
| Phase Viscosity (Liquid Phase)            | cP         | <empty>      | <empty>      | <empty>      |
| Phase Mass Heat Capacity (Liquid Phase)   | kJ/kg-C    | <empty>      | <empty>      | <empty>      |
| Phase Thermal Conductivity (Liquid Phase) | W/m-K      | <empty>      | <empty>      | <empty>      |
| Phase Surface Tension (Liquid Phase)      | dyne/cm    | <empty>      | <empty>      | <empty>      |

Table S2. Composition of process streams based on HYSYS simulation

| Data                         | Unit | Benzene | Hydrogen | Mix Feed    | Steam in | Steam out | Mix Feed Heated | Top Product Conversion Reactor | Bottom Product Conversion Reactor | Top Product Conversion Reactor Cooled | water in | water out | Top      | Bottom   | Product Splitter to Recycle |
|------------------------------|------|---------|----------|-------------|----------|-----------|-----------------|--------------------------------|-----------------------------------|---------------------------------------|----------|-----------|----------|----------|-----------------------------|
| Composition                  |      |         |          |             |          |           |                 |                                |                                   |                                       |          |           |          |          |                             |
| Comp Mole Frac (Benzene)     |      | 1       | 0        | 0.333277786 | 0        | 0         | 0.333277786     | 0.333174676                    | 0.33317804                        | 0.333174676                           | 0        | 0         | 0.007934 | 0.335167 | 0.007934379                 |
| Comp Mole Frac (Hydrogen)    |      | 0       | 0.975    | 0.649889041 | 0        | 0         | 0.649889041     | 0                              | 0                                 | 0                                     | 0        | 0         | 0        | 0        | 0                           |
| Comp Mole Frac (Nitrogen)    |      | 0       | 0.005    | 0.003401119 | 0        | 0         | 0.003401119     | 0.009714404                    | 0.009739224                       | 0.009714404                           | 0        | 0         | 0.400405 | 0.007321 | 0.4004051                   |
| Comp Mole Frac (Methane)     |      | 0       | 0.02     | 0.013429526 | 0        | 0         | 0.013429526     | 0.038357914                    | 0.038440328                       | 0.038357914                           | 0        | 0         | 0.576849 | 0.035059 | 0.576849351                 |
| Comp Mole Frac (H2O)         |      | 0       | 0        | 0           | 1        | 1         | 0               | 0                              | 0                                 | 0                                     | 1        | 1         | 0        | 0        | 0                           |
| Comp Mole Frac (Cyclohexane) |      | 0       | 0        | 2.53E-06    | 0        | 0         | 2.53E-06        | 0.618753006                    | 0.618642408                       | 0.618753006                           | 0        | 0         | 0.014811 | 0.622453 | 0.01481117                  |

| Data                         | Unit | Purge    | Product Splitter to Mixer | Bottom Product to Separator-02 | Purge-02    | Bottom Product to Heat Exchanger | Bottom Product to Component Splitter | Benzene Out 1 | SD-5     | Benzene Out 2 | Mix Product to Cooler | Mix Product After Cooler | Methane (Side Product) | Cyclohexane (Product) | Steam In-02 |
|------------------------------|------|----------|---------------------------|--------------------------------|-------------|----------------------------------|--------------------------------------|---------------|----------|---------------|-----------------------|--------------------------|------------------------|-----------------------|-------------|
| Composition                  |      |          |                           |                                |             |                                  |                                      |               |          |               |                       |                          |                        |                       |             |
| Comp Mole Frac (Benzene)     |      | 0.007934 | 0.007934363               | 0.335166965                    | 0.008852257 | 0.336594114                      | 0.336594114                          | 0.824730999   | 0        | 0             | 0                     | 0                        | 0                      | 0                     | 0           |
| Comp Mole Frac (Hydrogen)    |      | 0        | 2.14E-14                  | 0                              | 0           | 0                                | 0                                    | 0             | 0        | 0             | 0                     | 0                        | 0                      | 0                     | 0           |
| Comp Mole Frac (Nitrogen)    |      | 0.400405 | 0.400423027               | 0.007321192                    | 0.362445855 | 0.005768041                      | 0.005768041                          | 0.014132994   | 0        | 0             | 0                     | 0                        | 0                      | 0                     | 0           |
| Comp Mole Frac (Methane)     |      | 0.576849 | 0.576831468               | 0.035059336                    | 0.612235396 | 0.032535035                      | 0.032535035                          | 0.007971813   | 0.049473 | 0.049472572   | 0.049472572           | 0.049472572              | 0.838013868            | 0.000321572           | 0           |
| Comp Mole Frac (H2O)         |      | 0        | 0                         | 0                              | 0           | 0                                | 0                                    | 0             | 0        | 0             | 0                     | 0                        | 0                      | 0                     | 1           |
| Comp Mole Frac (Cyclohexane) |      | 0.014811 | 0.014811143               | 0.622452507                    | 0.016466492 | 0.625102809                      | 0.625102809                          | 0.153164195   | 0.950527 | 0.950527428   | 0.950527428           | 0.950527428              | 0.161986132            | 0.999678428           | 0           |

| Data                         | Unit | Steam Out-02 | Steam In-03 | Steam Out-03 |
|------------------------------|------|--------------|-------------|--------------|
| Composition                  |      |              |             |              |
| Comp Mole Frac (Benzene)     |      | 0            | 0           | 0            |
| Comp Mole Frac (Hydrogen)    |      | 0            | 0           | 0            |
| Comp Mole Frac (Nitrogen)    |      | 0            | 0           | 0            |
| Comp Mole Frac (Methane)     |      | 0            | 0           | 0            |
| Comp Mole Frac (H2O)         |      | 1            | 1           | 1            |
| Comp Mole Frac (Cyclohexane) |      | 0            | 0           | 0            |

Table S3. Energy streams based on HYSYS simulation

|               |             |          |         |          |
|---------------|-------------|----------|---------|----------|
| Data          | <i>Unit</i> | Q-3      | Q-R1    | Q-C1     |
| Energy Stream |             |          |         |          |
| Heat Flow     | kJ/h        | 114460.8 | 1624754 | 170995.9 |