

Company Name Not Available Bedford, MA USA Case Name: Methanol-Production-02_10_20_KMSoriano_FINAL.hsc

Unit Set: SI10

Date/Time: Mon Feb 17 22:43:50 2020

| 6 7 8 | Workbook: | Case (Mair | n) | | | |
|-------------|---|--------------------|--------------------|--------------------|---------------------|---------------|
| 9 10 | | Ma | | | Fluid Pkg: | |
| 11 | Name | Stream 1 | Stream 2 | Stream 11a | Stream 11b | Stream 18 |
| 12 | Vapour Fraction | 0.0000 * | 1.0000 * | 1.0000 | 1.0000 | 0.0000 |
| 13 | Temperature (C) | 20.00 * | 35.00 * | 802.1 | 172.8 | 86.76 |
| 14 | Pressure (kPa) | 1.000e+04 * | 110.0 * | 4540 | 4520 * | 4520 |
| 15 | Molar Flow (kgmole/h) | 391.0 | 1190 * | 1190 | 1190 | 801.2 |
| 16 | Mass Flow (kg/h) | 1.721e+04 * | 2660 | 2660 | 2660 | 1.992e+04 |
| 17 | Liquid Volume Flow (m3/h) | 20.85 | 34.16 | 34.16 | 34.16 | 23.18 |
| 18 | Heat Flow (kJ/h) | -1.585e+08 | -3.602e+06 | 2.354e+07 | 1.180e+06 | -2.067e+08 |
| 19 | Name | Stream 15 | Stream 10 (purge) | Stream 8 | Stream 3 | Stream 6 |
| 20 21 | Vapour Fraction | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 22 | Temperature (C) Pressure (kPa) | 37.60 4500 | 31.10 4500 | 48.87 5240 | 48.78 * 5240 * | 33.42 5240 |
| 23 | ` ' | 1210 | 1.000e-02 * | 8654 | 8657 | 9048 |
| 24 | Molar Flow (kgmole/h) Mass Flow (kg/h) | 3899 | 0.1206 | 1.044e+05 | 1.044e+05 * | 1.216e+05 |
| 25 | Liquid Volume Flow (m3/h) | 35.72 | 3.440e-04 | 297.7 | 297.8 | 318.6 |
| 26 | Heat Flow (kJ/h) | -1.289e+07 | -898.1 | -7.724e+08 | -7.726e+08 | -9.311e+08 |
| 27 | Name | Stream 4 | Stream 9 | Stream 7 | Stream 5 | Stream 20 |
| 28 | Vapour Fraction | 1.0000 | 0.9529 | 1.0000 | 1.0000 | 1.0000 |
| 29 | Temperature (C) | 250.0 * | 100.6 | 225.0 * | 250.0 * | 39.09 |
| 30 | Pressure (kPa) | 5000 | 4930 | 5170 * | 5100 | 101.3 |
| 31 | Molar Flow (kgmole/h) | 8264 | 8264 | 9048 | 9048 | 1.171 |
| 32 | Mass Flow (kg/h) | 1.216e+05 | 1.216e+05 | 1.216e+05 | 1.216e+05 | 12.52 |
| 33 | Liquid Volume Flow (m3/h) | 286.7 | 286.7 | 318.6 | 318.6 | 3.767e-02 |
| 34 | Heat Flow (kJ/h) | -8.908e+08 | -9.474e+08 | -8.745e+08 | -8.670e+08 | -6.797e+04 |
| 35 | Name | Stream 23 | Stream 22 | Stream 13b | Dummy | Stream 13 |
| 36 | Vapour Fraction | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 37 | Temperature (C) | 39.09 | 101.3 | 31.04 * | 250.0 | 31.10 |
| 38 | Pressure (kPa) | 101.3 | 110.0 | 4500 * | 5000 | 4500 * |
| 39 | Molar Flow (kgmole/h) | 390.4 | 409.6 | 821.2 * | 0.0000 | 820.5 |
| 40 | Mass Flow (kg/h) | 1.251e+04 | 7400 | 2.116e+04 | 0.0000 | 2.114e+04 |
| 41 | Liquid Volume Flow (m3/h) | 15.72 | 7.427 | 24.74 | 0.0000 | 24.71 |
| 42 | Heat Flow (kJ/h) | -9.411e+07 | -1.147e+08 | -2.205e+08 | 0.0000 | -2.203e+08 |
| 43 | Name | Stream 8a | Stream 14 | Stream 12 | Stream 19 | |
| 44 | Vapour Fraction | 1.0000 | 0.8998 | 1.0000 | 0.0015 | |
| 45 | Temperature (C) | 31.10 | 31.00 * | 31.10 | 87.63 | |
| 46 | Pressure (kPa) | 4500 | 4860 | 4500 * | 500.0 | |
| 47 | Molar Flow (kgmole/h) | 8654 | 8264 1.216e+05 | 8654 | 801.2 | |
| 48 49 | Mass Flow (kg/h) Liquid Volume Flow (m3/h) | 1.044e+05 297.7 | 286.7 | 1.044e+05 297.7 | 1.992e+04 | |
| 50 | Liquid Volume Flow (m3/h) Heat Flow (kJ/h) | -7.772e+08 | -9.846e+08 | -7.772e+08 | 23.18 -2.067e+08 | |
| 51 | Treat new (North) | 7.7720.00 | | | 2.0070.00 | |
| 52 | | | Compositions | | Fluid Pkg | g: All |
| 53 | Name | Stream 1 | Stream 2 | Stream 11a | Stream 11b | Stream 18 |
| 54 | Comp Mole Frac (CO2) | 1.0000 * | 0.0000 * | 0.0000 | 0.0000 | 0.0000 |
| 55 | Comp Mole Frac (CO) | 0.0000 * | 0.0000 * | 0.0000 | 0.0000 | 0.0000 |
| 56 | Comp Mole Frac (Hydrogen) | 0.0000 * | 0.9863 * | 0.9863 | 0.9863 | 0.0011 |
| 57 | Comp Mole Frac (H2O) | 0.0000 * | 0.0137 * | 0.0137 | 0.0137 | 0.5096 |
| 58 | Comp Mole Frac (Methanol) | 0.0000 * | 0.0000 * | 0.0000 | 0.0000 | 0.4894 |
| 59 | Name | Stream 15 | Stream 10 (purge) | Stream 8 | Stream 3 | Stream 6 |
| 60 | Comp Mole Frac (CO2) | 0.0254 | 0.2176 | 0.2176 | 0.2176 * | 0.2514 |
| 61 | Comp Mole Frac (CO) | 0.0001 | 0.0311 | 0.0311 | 0.0311 * | 0.0297 |
| 62 | Comp Mole Frac (Hydrogen) | 0.9695 | 0.7476 | 0.7476 | 0.7476 * | 0.7153 |
| 63 | Comp Mole Frac (H2O) | 0.0009 | 0.0009 | 0.0009 | 0.0009 * | 0.0008 |
| 64 | Comp Mole Frac (Methanol) | 0.0041 | 0.0029 | 0.0029 | 0.0029 * | 0.0028 |
| 65 66 | | | | | | |
| 66 67 | | | | | | |
| 67 68 | | | | | | |
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Company Name Not Available Bedford, MA

Case Name: Methanol-Production-02_10_20_KMSoriano_FINAL.hsc

Fluid Pkg:

All

Unit Set: SI10

Compositions (continued)

Date/Time: Mon Feb 17 22:43:50 2020

Workbook: Case (Main) (continued)

| 10 | | | | | • ` ` | | | | |
|----------|---------------------------|-------------------|--------------|---------------------------------|-------------------------------------|-----------------------|-----------|------------|--------------|
| 11 | Name | | Stream 4 | | Stream 9 | Stream 7 | Stream | 5 | Stream 20 |
| 12 | Comp Mole Frac (CO2) | | 0.227 | 78 | 0.2278 | 0.2514 | | 0.2514 | 0.0029 |
| 13 | Comp Mole Frac (CO) | | 0.032 | 26 | 0.0326 | 0.0297 | | 0.0297 | 0.0000 |
| 14 | Comp Mole Frac (Hydrogen) | | 0.640 | 09 | 0.6409 | 0.7153 | | 0.7153 | 0.7121 |
| 15 | Comp Mole Frac (H2O) | | 0.048 | 83 | 0.0483 | 0.0008 | | 0.0008 | 0.0000 |
| 16 | Comp Mole Frac (Methanol) | | 0.050 | 05 | 0.0505 | 0.0028 | | 0.0028 | 0.2850 |
| 17 | Name | | Stream 23 | | Stream 22 | Stream 13b | Dummy | | Stream 13 |
| 18 | Comp Mole Frac (CO2) | | 0.000 | 00 | 0.0000 | 0.0375 * | | 0.2278 | 0.0374 |
| 19 | Comp Mole Frac (CO) | | 0.000 | 00 | 0.0000 | 0.0001 * | | 0.0326 | 0.0001 |
| 20 | Comp Mole Frac (Hydrogen) | | 0.0000 | | 0.0000 | 0.0004 * | | 0.6409 | 0.0004 |
| 21 | Comp Mole Frac (H2O) | | 0.0001 | | 0.9965 | 0.4786 * | 0.0483 | | 0.4787 |
| 22 | Comp Mole Frac (Methanol) | | 0.9998 | | 0.0035 | 0.4835 * | 0.0505 | | 0.4834 |
| 23 | Name | | Stream 8a | | Stream 14 | Stream 12 | Stream 19 | | |
| 24 | Comp Mole Frac (CO2) | | 0.2176 | | 0.2278 | 0.2176 | | 0.0000 | |
| 25 | Comp Mole Frac (CO) | | 0.0311 | | 0.0326 | 0.0311 | | 0.0000 | |
| 26 | Comp Mole Frac (Hydrogen) | | 0.7476 | | 0.6409 | 0.7476 | 0.0011 | | |
| 27 | Comp Mole Frac (H2O) | | 0.000 | 09 | 0.0483 | 0.0009 | 0.5096 | | |
| 28 | Comp Mole Frac (Methanol) | | 0.002 | 29 | 0.0505 | 0.0029 | | 0.4894 | |
| 29 | | | | | Energy Stream | • | | Fluid Pk | g: All |
| 30 | | | | | Lifergy Otteam | . | | T Idia i K | y. / iii |
| 31 | Name | | K-202Q | | E-201Q | ST-Q | E-203Q | | E-201-Q |
| 32 | Heat Flow | (kJ/h) | 2.714e+0 | 07 | 2.236e+07 | 2.272e+05 | | 3.721e+07 | 7.516e+06 |
| 33 | Name | | DC-701QC | | DC-701QR | 1Q | R-201 | | |
| 34 | Heat Flow | (kJ/h) | 6.318e+0 | 07 | 6.094e+07 | 4.813e+06 | | -2.380e+07 | |
| 35 | | | | | Unit Ops | | | | |
| 36 | | | | | | | | | |
| 37 | Operation Name | Оре | eration Type | | Feeds | Products | | Ignored | Calc Level |
| 38 | K-202 Compressor | | sor | Stream 2 | | Stream 11a | | No | 500.0 * |
| 39 | | | | K-20 | | a, - | | | |
| 40 | K-100 | -100 Compressor | | Stream 8a | | Stream 8 | | No | 500.0 * |
| 41 | | | 1Q | | Ctroom 445 | | | | |
| 42 | E-100 Cooler | | Stream 11a | | Stream 11b | | No | 500.0 * | |
| 43 | | | | | 0 | E-201Q | | | |
| 44 | E-203 Cooler | | St | | am 9 | Stream 14 | | No | 500.0 * |
| 45 46 | 2 5616. | | 0.1 | | om 11h | E-203Q | No | | 2500 * |
| 46 47 | ST 201 | Refluxed Absorber | | Stream 11b Stream 13b Stream 15 | | Stream 18 | | | |
| 47 | ST-201 | | | | | Stream 15 | | | 2500 * |
| 48 49 | | | | | | ST-Q Stream 13 | | | |
| 50 | S-201 Separator | | r | | ream 15 Stream 13 ream 14 Stream 12 | | No | | 500.0 * |
| 51 | | | | | am 14 am 1 | Stream 12 Stream 6 | | | |
| 52 | MIX-100 Mixer | | | | | Sucani 0 | No | | 500.0 * |
| 53 | | | | Stream 3 Stream 4 | | Stream 9 | | | _ |
| 54 | E-202 Heat Exch | | nanger | | am 6 | Stream 7 | No | | 500.0 * |
| 55 | | | | — | am 7 | Stream 5 | | | |
| 56 | E-201 Heater | | | | 01-Q | Oli Galli O | No | | 500.0 * |
| 57 | | | | | am 19 | Stream 22 | | | |
| 58 | | Distillation | | DC-701QR | | Stream 20 | No | | |
| 59 | DC-701 | | | | | Stream 23 | | | 2500 * |
| 60 | | | - | | | DC-701QC | | | |
| 61 | | on Reactor R- | | am 5 | Dummy | | | | |
| 62 | R-201 Conversion | | | | Stream 4 | | No | 500.0 * | |
| 63 | | | | | R-201 | | | | |
| 64 | TEE-100 Tee | | Str | | am 12 | Stream 10 (purge) |) No | | 500.0 * |
| 65 | | | | | | Stream 8a | | | |
| 66 | VL-201 | Valve | | Stre | am 18 | Stream 19 | | No | 500.0 * |
| 67 | RCY-1 | Recycle | | | am 8 | Stream 3 | | No | 3500 * |
| 68 | RCY-2 | Recycle | | | am 13 | Stream 13b | | No | 3500 * |
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