

| Calgon Carbon Corporation                      |                                   |  |  |   |                                    |                                    |
|--|-----------------------------------|--|--|---|------------------------------------|------------------------------------|
| Vapor Application Carbon Operation Suggestion  |                                   |  |  |   |                                    |                                    |
| Subsegment                                     | Application                       | LV                                       | Contact Time                                     | Other operation   | Carobn selection                   | Alternative                        |
| VOC treatment                                  | Air purification                  | 0.1-0.5 m/s<br>Upflow<br>Normal pressure | more than 3S                                     | R.H. < 40-50%<br>Suspended Solid<br>Mist control  | AP4-60, AP3-60                     | BPL                                |
|  | VOC Control                       |  |  |   | BPL 4X10                           | AP4-60, WS380/480                  |
|  | Odor control - Mercaptan          |  |  |   | BPL 4X10                           | ST1-X, Centaur                     |
|  | Solvent Recovery                  |  |  |   | WS380/480                          | WSC470/490                         |
|  | Gas Purification                  |  |  |   | BPL 4X10                           | AP4-60                             |
|  | Odor Control                      |  |  |   | MRX-P                              | MRX-M                              |
|  | Inorganic Gas remove              |  |  |   | ST1-X, Solcarb C3                  | Centaur                            |
|  | Alkaline Gas Adsorption           |  |  |   | Ammonasorb                         |                                    |
|  | Special Gas Adsorption            |  |  |   | URC                                | ABEK                               |
|  | Catalytic reaction                |  |  |   | OVC 4X8 LS                         | OLC AW, 607C                       |
| LNG application                                | Hg remove                         |  |  |   | HGR                                | CB                                 |
|  | Incinerition                      |  |  |   | WPA-O                              |                                    |
|  | Power plant                       |  |  |   | Fluepac                            |                                    |
|  | mercury remove                    |  |  |   |                                    |                                    |
| Liquid Application Carbon Operation Suggestion |                                   |  |  |   |                                    |                                    |
| Subsegment                                     | Application                       | LV                                       | Contact time                                     | Other operation   | Carobn selection                   | Alternative                        |
| Industrial & Food                              | Process water                     | 10-25 m/h                                | 4-20 min   | SS < 10. max 25.<br>Back wash 30%, 10-20 min<br>Dechlorinaiton 4-8 min. 1 a life            | F300D, 207CX,207C,<br>607C, OLC AW | Carbsorb 30<br>Carsorb 30AW,F300DR |
|  | Condensate water                  | 5-20 m/h                                 | 10-20 min. normal T<br>20-30 min 80-90 C         | Oil HC, inlet 0.5-5 10<br>max ppm.<br>Outlet 0.1-0.5 ppm<br>1-2 a life<br>Loading 15-40wt.% | 207C, 207CX, LSI                   | Carbsob30 AW<br>Carbsorb 40AW      |
|  | Amine purification                | 1-5 m/h (SGL)<br>5-10 m/h                | 15-20 min  | carbon depth 2.4-3 m  | SGL/ Sorbamine                     | BPL 4X10, F300, F300D              |
|  | Decolorisation                    | 2-10 m/h<br>> 0.5 m/h                    | 1-2 cp 0.5-2 h<br>8-10 cp 1-4 h<br>8-15 cp 2-8 h | sotherm or pilot test is priorit  | CAL, CPG, IPG, IPG AW.             | Powder: DCL 320, SPA 250           |
|  | Home Water Filter                 | 5-25 m/h                                 | 5-15 min   | Filter company has design   | 207C, OLC PlusE, OLC AW            | Carbsorb 40AW, F400D AW            |
|  | waste water                       | 1-15 m/h                                 | 20-60 min  | SS < 10.  | F300DR,F300 D                      | Carbsorb 30, Carbsorb 40           |
|  | H2O2 remove                       | 5-20 m/h                                 | 5-20 min   | Chemical reaction.<br>Concentration is a big  | F300D,F400D, Centaur               | Carbsorb 30, Carbsorb 40           |
| Drinking water                                 | O3 Remove                         | 5-20 m/h                                 | 5-20 min   |   |                                    |                                    |
|  | Dechlorisation                    | 10-25 m/h                                | 4-8 min  | Engineering company or<br>institution<br>provide design proposal                            | F400D, F300D,                      | carbsorb 30/40                     |
|  | T&O removal                       | 5-15 m/h 12*40                           | 6-12 min   |   |                                    |                                    |
|  | Pesticide removal                 | 7.5-18m/h 8*30                           | 10-15 min  |   |                                    |                                    |
|  | NOM and THM reduction             | 7.5 -20 m/h 8*20                         | 15-30 min  |   |                                    |                                    |
|  | Chlorinated Hydrocarbon           | 12-20 m/h 8*16                           | 10-20 min  |   |                                    |                                    |
|  | Odor Control- H2S remove<br>Vapor | 0.1-0.5 m/s                              | > 5 s  | Chemical reaction.<br>Concentration is a big concern  | ST1-X, Solcarb C3                  | Centaur                            |

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