# junior®
## light coextruded dripline

**JUNIOR**®, the result of SIPLAST research, is the technological answer to the new requirements of the drip irrigation market. It is versatile, reliable and cheap.

**JUNIOR**®, consists of a polyethylene pipe with an incorporated dripper manufactured by a coextrusion process, in compliance with the quality system standard ISO 9001.

**JUNIOR**®, offers excellent resistance to the thermal and mechanical stresses and keeps unchanged its characteristics. The most important innovation is the dripper that controls the flow rate. The technology applied to design and production, has permitted to obtain a dripper with excellent hydraulic characteristics in order to reach longer branch lengths, with high emission uniformity performance.

### Technological characteristics:

• The dripper is only 32 mm long and implies minimum pressure losses allowing longer branch lengths;

• Dripper's filter reduces clogging possibilities with low water quality;

• The labyrinth of the turbulent flow dripper , designed to grant the emission uniformity, secures lower flow variations when varying working pressure;

• The drip points of the dripper enable a quickly and easy installation without checking the emission point position and secure pipe depletion at the end of the irrigation cycle.

### Applications

**JUNIOR**® dripline
is successfully used:

• in vegetables and flowers crops;
• in greenhouses and in the open field;
• on ground with zero or minimum slope;
• in irrigation cycles with fertilizer.



The turbulent flow of the labyrinth produces vortices which avoid sedimentations
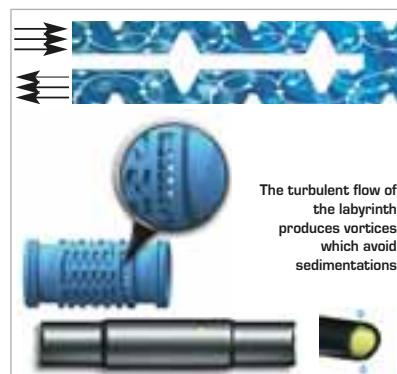
### JUNIOR® is available:

• in 16 and 20 mm diameter;
• flow rate:         Ø 16 mm (1.60 lph), (2,10 lph) and (3.60 lph)
                     Ø 20 mm (1.60 lph);
• wall thickness:   Ø 16  35 mil (0.90 mm) 44 mil (1.10 mm);
                     Ø 20  35 mil (0.90 mm) 47 mil (1.20 mm);
• with uniform spacing between drippers (15 cm minimum);
• with variable spacing (groups of drippers).

### Dripper characteristics

| Nomin. Diam. (mm) | Nomin. Flow rate (lph at 1 bar) | Labyrinth dimensions (mm) Depth. | Width. | Length. | Inlet Filter Area (mm²) | No. of holes | Recommended filtration efficiency (Mesh) | Flow equation k | x | Dripper colour |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1.60 | 0.85 | 0.8 | 94 | 4.3 | 5 | 155 | 0.57 | 0.46 | Gray |
|  | 2.10 | 0.90 | 0.9 | 70 | 12 | 20 | 120 | 0.66 | 0.50 | Azure |
|  | 3.60 | 1.25 | 1.2 | 94 | 6.3 | 5 | 120 | 1.13 | 0.50 | Beige |
| 20 | 1.60 | 0.9 | 0.8 | 110 | 6.0 | 7 | 155 | 0.57 | 0.46 | Gray |

### PE pipe characteristics

| Nomin. Diam. (mm) | Pipe inside diam. (mm) | Pipe outside diam. (mm) | Pipe thickness (mm) | Pipe thickness (mil) | Max working pressure (bar) |
|---|---|---|---|---|---|
| 16 | 13.8 | 15.6 | 0.90 | 35 | 3.0 |
|  |  | 16.0 | 1.10 | 44 | 4.0 |
| 20 | 17.7 | 19.5 | 0.90 | 35 | 3.0 |
|  |  | 20.1 | 1.20 | 47 | 4.0 |

### Connecting systems and accessories
**see pag. 23**

# junior®
## light coextruded dripline

### Flow rate (lph) related to the pipe thickness (mil) and pressure (bar)

| Press. (bar) | 16 mm 35 mil 1.60 lph | 16 mm 44 mil 1.60 lph | 16 mm 35 mil 2.10 lph | 16 mm 44 mil 2.10 lph | 16 mm 35 mil 3.60 lph | 16 mm 44 mil 3.60 lph | 20 mm 35 mil 1.60 lph | 20 mm 47 mil 1.60 lph |
|---|---|---|---|---|---|---|---|---|
| 0.5 | 1.21 | 1.15 | 1.53 | 1.42 | 2.61 | 2.55 | 1.21 | 1.14 |
| 1 | 1.61 | 152 | 2.08 | 1.98 | 3.57 | 3.51 | 1.61 | 1.51 |
| 1.5 | 1.98 | 1.92 | 2.58 | 2.47 | 4.35 | 4.27 | 1.98 | 1.91 |
| 2 | 2.29 | 2.22 | 3.03 | 2.99 | 5.06 | 4.92 | 2.30 | 2.21 |
| 2.5 | 2.57 | 2.50 | 3.41 | 3.30 | 5.66 | 5.50 | 2.58 | 2.49 |
| 3 | 2.81 | 2.72 | 3.73 | 3.63 | 6.22 | 6.05 | 2.82 | 2.71 |

### Pressure - flow rate relation

| Diameter (mm) | Flow rate (lph) | Pressure (bar) 1 | 1.5 | 2 | 2.5 | 3 |
|---|---|---|---|---|---|---|
| 16 | 1.60 | 1.61 | 1.98 | 2.29 | 2.57 | 2.81 |
| 16 | 2.10 | 2.08 | 2.58 | 3.03 | 3.41 | 3.73 |
| 16 | 3.60 | 3.57 | 4.35 | 5.06 | 5.66 | 6.22 |
| 20 | 1.60 | 1.61 | 1.98 | 2.30 | 2.58 | 2.82 |
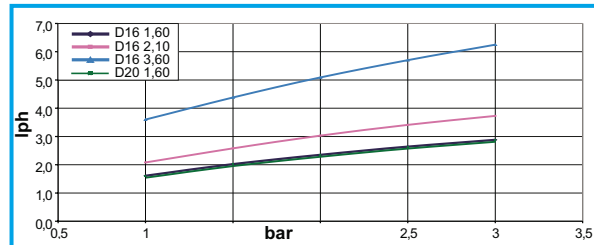
Calculated on the average of 25 drippers



### Ø 20 mm - Recommended branch length in meter, related to emission uniformity (E.U. %), at 1 bar

| Diameter (mm) | Flow rate (lph) | Slope (%) | E.U. (%) | Spacing (cm) 20 | 30 | 40 | 50 | 60 | 75 | 100 | 125 | 150 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1.60 | 2 | 95 | 31 | 36 | 39 | 41 | 43 | 44 | 46 | 46 | 47 |
| | | | 90 | 70 | 87 | 100 | 110 | 119 | 130 | 143 | 152 | 159 |
| | | | 85 | 88 | 110 | 127 | 142 | 154 | 169 | 189 | 203 | 213 |
| | | 0 | 95 | 45 | 59 | 72 | 83 | 94 | 108 | 130 | 150 | 169 |
| | | | 90 | 82 | 108 | 131 | 152 | 171 | 198 | 239 | 276 | 310 |
| | | | 85 | 102 | 134 | 162 | 187 | 211 | 244 | 294 | 340 | 382 |
| | | -2 | 95 | 57 | 78 | 96 | 118 | 92 | 63 | 56 | 54 | 53 |
| | | | 90 | 94 | 126 | 155 | 186 | 211 | 249 | 306 | 365 | 422 |
| | | | 85 | 114 | 153 | 188 | 224 | 255 | 300 | 368 | 437 | 500 |
| 16 | 2.10 | 2 | 95 | 27 | 32 | 35 | 37 | 38 | 40 | 41 | 42 | 43 |
| | | | 90 | 60 | 75 | 86 | 96 | 104 | 114 | 127 | 136 | 143 |
| | | | 85 | 75 | 95 | 111 | 124 | 135 | 149 | 167 | 181 | 192 |
| | | 0 | 95 | 38 | 50 | 60 | 69 | 78 | 90 | 109 | 126 | 141 |
| | | | 90 | 69 | 91 | 110 | 128 | 144 | 166 | 200 | 231 | 260 |
| | | | 85 | 86 | 112 | 136 | 158 | 178 | 206 | 248 | 286 | 322 |
| | | -2 | 95 | 47 | 63 | 81 | 94 | 112 | 95 | 54 | 51 | 49 |
| | | | 90 | 77 | 104 | 130 | 152 | 176 | 207 | 252 | 300 | 345 |
| | | | 85 | 94 | 126 | 158 | 184 | 213 | 250 | 305 | 360 | 414 |
| 16 | 3.60 | 2 | 95 | 21 | 26 | 29 | 32 | 34 | 36 | 38 | 40 | 41 |
| | | | 90 | 44 | 56 | 66 | 74 | 82 | 91 | 103 | 113 | 121 |
| | | | 85 | 56 | 71 | 84 | 95 | 104 | 117 | 134 | 147 | 159 |
| | | 0 | 95 | 27 | 35 | 42 | 49 | 55 | 64 | 77 | 89 | 100 |
| | | | 90 | 49 | 64 | 78 | 90 | 101 | 117 | 141 | 163 | 184 |
| | | | 85 | 60 | 79 | 96 | 111 | 125 | 145 | 175 | 202 | 227 |
| | | -2 | 95 | 30 | 43 | 55 | 62 | 73 | 84 | 111 | 91 | 58 |
| | | | 90 | 53 | 72 | 89 | 103 | 119 | 138 | 173 | 202 | 230 |
| | | | 85 | 65 | 88 | 108 | 126 | 144 | 168 | 210 | 244 | 278 |
| 16 | 1.60 | 2 | 95 | 40 | 43 | 45 | 46 | 47 | 48 | 48 | 48 | 48 |
| | | | 90 | 99 | 119 | 133 | 144 | 152 | 160 | 170 | 173 | 176 |
| | | | 85 | 127 | 154 | 174 | 189 | 201 | 215 | 230 | 237 | 243 |
| | | 0 | 95 | 71 | 93 | 112 | 130 | 146 | 169 | 203 | 231 | 260 |
| | | | 90 | 130 | 170 | 205 | 237 | 267 | 308 | 371 | 425 | 477 |
| | | | 85 | 160 | 209 | 253 | 292 | 329 | 380 | 458 | 524 | 589 |
| | | -2 | 95 | 93 | 86 | 62 | 57 | 55 | 53 | 52 | 52 | 51 |
| | | | 90 | 147 | 202 | 253 | 301 | 347 | 408 | 503 | 561 | 685 |
| | | | 85 | 183 | 250 | 310 | 368 | 421 | 493 | 592 | 673 | 762 |

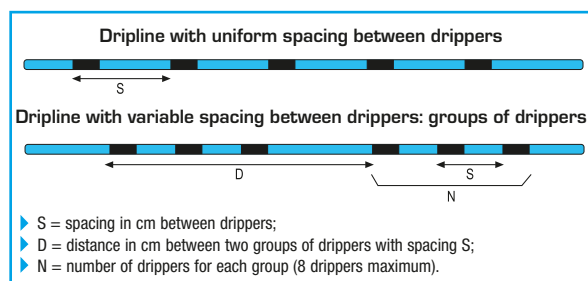Values shown in the chart are calculated with the KELLER - KARMELI EQUATION (1975)

*Field slope (- downhill; + uphill)*

$$E.U. = 100 \left(1 - 1.27 \frac{CV}{\sqrt{n}}\right) \frac{Q_{min}}{Q_{med}}$$

where  CV = 0.03 (coefficient of technological variation)  n = number of drippers for each plant

$Q_{min}$ = minimum flow rate (lph)  $Q_{med}$ = medium flow rate (lph)

For a better uniformity of delivery in each system point, it is recommended to use E.U. values, higher than or equal to 90%

### Junior® dripline is supplied in the following lengths:

**Dripline with uniform spacing between drippers**



S

**Dripline with variable spacing between drippers: groups of drippers**



D    S
N

▶ S = spacing in cm between drippers;
▶ D = distance in cm between two groups of drippers with spacing S;
▶ N = number of drippers for each group (8 drippers maximum).

| Outside diameter (mm) | Reel length (m) | Volume (m³) |
|---|---|---|
| 16 | 25 | 0.02 |
| 16 | 50 | 0.04 |
| 16 | 100 | 0,06 |
| 16 | 400 | 0.20 |
| 20 | 25 | 0.03 |
| 20 | 50 | 0.05 |
| 20 | 100 | 0.09 |
| 20 | 300 | 0.22 |