

MILLENNIUM

PIPELINE DESIGN

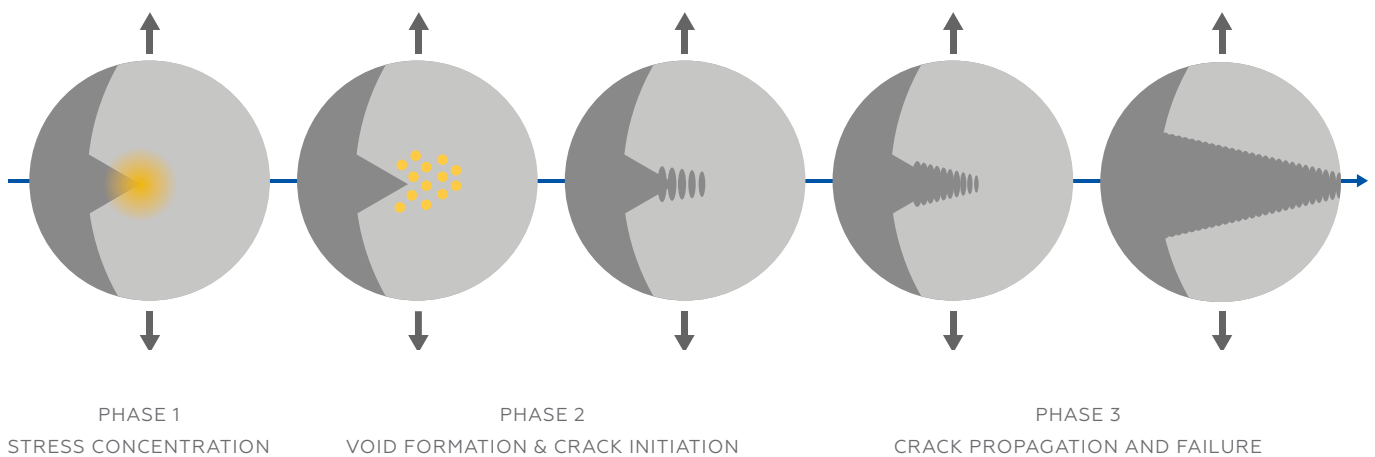
COMPARISON OF DESIGN FACTORS OF CONVENTIONAL PE100 AND MILLENNIUM®

Iplex's Millennium® pipe may be confidently designed with reduced design factors to those nominated for conventional PE100 pipe.

EXAMPLE COMPARISON OF DESIGN

Installing conventional PE100 pipe using AS/NZS 4130 Design factor f_3 for horizontal direction drilling (HDD) installation method requires a design factor of 1.2. Applying f_3 typically results in 'one higher' pressure class being selected for HDD installations (e.g. instead of using PN16 – PN20 would be specified).

The diagram below shows hypothetically the scenario of PE100 pipe suffering Slow Crack Growth mean time to failure due to severe surface damage in 10 years, comparing the usage of conventional PE100 pipe, the effects of increasing the wall thickness to PN20 and using Iplex Millennium®.



| | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL TIME TO FAILURE |
|---|---------|---------|---------|-----------------------|
| PE100 PN16 | 0 Y | 6-9 Y | 1-4 Y | 7-13 Y |
| DESIGN OPTION 1 PE100 PN20 (f_3) | 0 Y | 6-9 Y | 1-5 Y | 7-14 Y |
| DESIGN OPTION 2 MILLENNIUM® PN16 | 0 Y | 60-90Y | 1-4 Y | 61-94 Y |

By applying design factor f_3 in design option 1, the hypothetical time to failure is increased by only one year. However by substituting Millennium® pipe (design option 2) in place of design factor f_3 the hypothetical time to failure is increased to between 61 and 94 years.

Installing Millennium® pipe made from Qenos HCR193B resin in areas of high damaged risk provides greater service life than that achieved by increasing wall thickness.

The information contained in this document should serve as a guide only and is subject to change without notice. For more information please contact Iplex Pipelines Australia Pty Ltd.

