

Handled by
 Mattias Svedberg

ATT: Mr. YONG SUNG LEE
 Hyosung Chemical
 PP/DH Performance Unit
 235, Banpo-daero, Seocho-gu
 06578 Seoul
 South Korea

DETERMINATION OF THE LONG-TERM HYDROSTATIC STRENGTH ISO 9080:2012-evaluation of the natural PP-R pipe grade TOPILENE R200P from Hyosung Chemical Corporation

ABSTRACT

The aim of this project was to determine the long term hydrostatic strength of the natural PP-R pipe grade TOPILENE R200P according to ISO 9080 and then MRS-classify it according to ISO 12162. The ISO 9080-evaluation of the pipe grade gives the following 50 years-strength values at 20 and 70°C.

ISO 9080 STRENGTH VALUES			
T	TIME	σ_{LPL}	σ_{LTHS}
20°C	50 yrs	12.72 MPa	13.45 MPa
70°C	50 yrs	3.33 MPa	3.78 MPa

By its LPL value of 12.72 MPa at 20°C and 50 years the PP-R pipe grade TOPILENE R200P has a minimum required strength (MRS) classification of 12.5 MPa and is thereby designated PP-R 125 according to ISO 12162:2009.

Miner's rule calculations have been performed according to ISO 13760:1998 for application classes 1, 2, 4 and 5 given in ISO 10508:2006. The resulting design hoop stresses, using σ_{LTHS} for TOPILENE R200P, are summarised below.

RESULTING DESIGN HOOP STRESSES AND CONFORMITY CHECK WITH APPLICATION CLASSES			
APPLICATION CLASS [ISO 10508]	TOPILENE R200P USING σ_{LTHS}	ISO 15874-2¹⁾ [PP-R]	RESULT [PASS/FAIL]
1	3.10 MPa	3.02 MPa	PASS
2	2.52 MPa	2.12 MPa	PASS
4	3.38 MPa	3.29 MPa	PASS
5	2.42 MPa	1.89 MPa	PASS
Cold water (20°C, 50 yrs)	9.61 MPa	6.93 MPa	PASS

¹⁾ Table A.2 in ISO 15874-2