SCGC HDPE H112PC
AN INNOVATION BEYOND PE100

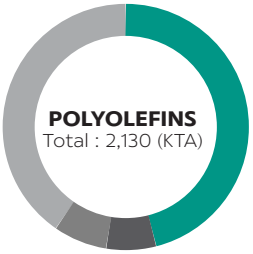
About SCG Chemicals or SCGC

SCG Chemicals or SCGC is one of the leader in sustainable chemical innovations and manufacturing in Thailand and ASEAN that offers a full range of petrochemical products ranging from upstream production of olefins to downstream production of 3 main plastics resins: polyethylene, polypropylene, and polyvinyl chloride including finished products.

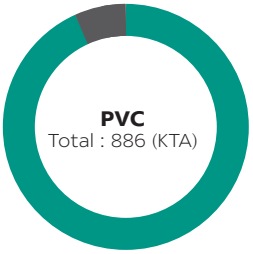
SCGC is committed to conducting business in line with Environmental, Social, and Governance (ESG) and achieving Sustainable Development Goals (SDGs). SCGC is developing new technology and innovation to create high value added products (HVA) and holistic service solutions concerning growing areas such as circular economy, medical & healthcare, and electric vehicle (EV) to better meet diverse places and emphasis demands sustainable environmental stewardship.

OUR PRODUCTION CAPACITY (AS OF 2021)

TOTAL CAPACITY : 3,016 KTA (PE / PP / PVC)



HDPE	980 KTA
LLDPE	140 KTA
LDPE	150 KTA
PP	860 KTA



PVC	850 KTA
PVC Paste	36 KTA

ESG Strategic Directions

"INNOVATION THAT'S REAL"

SCGC
HDPE H112PC

Nowadays polyethylene pipe has been used beyond performance boundaries, ranging from severe environment to replacement of other materials in some applications. Conventional polyethylene pipe cannot fulfill all those extreme conditions and dynamic requirements. These challenge polyethylene producers to develop further generations to the world.

With SCGC's advanced technology, **SCGC™ HDPE H112PC** is an innovation with notable higher pressure and abrasion resistance, leading you to maximum pipe performance beyond PE100 for sustainable future.

SCGC™ HDPE H112PC has been classified as PE112 by accredited laboratory (Element). In addition, the product has been registered in PIPA and TISI to ensure your supreme confidence.

TIS. 2559 - 2554

PIPA PLASTICS INDUSTRY PIPE ASSOCIATION OF AUSTRALIA LIMITED

Nordic ISSTA-CERT Approval

NSF

PPI Plastics Pipe Institute

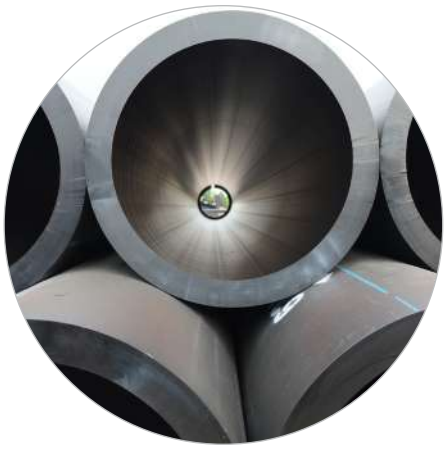
Design for Sustainability

SCGC™
The Innovation For Sustainable Future

SCG Chemicals Business, SCGC is committed to do the business along continuous innovation creating for better living and sustainable development. We strive to add value for our customers, employees, and all stakeholders based on world-class standards that align with good corporate governance and environmental standards.

Customer Values

SCGC™ HDPE H112PC is not only material innovation beyond PE100, it also creates a number of benefits to customers including, installation process, and cost efficiency.

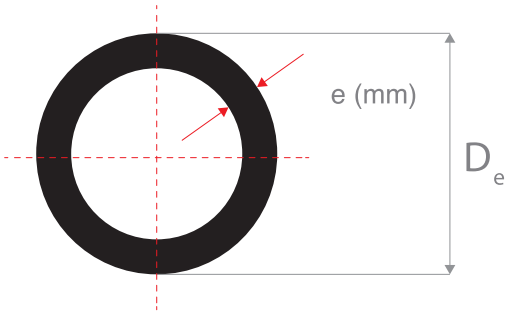


Sustainable Development

SCGC™ HDPE H112PC is created through the research and development superior strength performance, providing longer life time service than traditional PE100, resulting in less material consumption for sustainable future.

SCGC™ HDPE H112PC

Key Benefits: 10% Higher Pressure Withstanding



$$MOP = \frac{20\ (MRS)}{C \times (SDR - 1)} \qquad SDR = \frac{D_e}{e_n}$$

Remarks:

MOP	=	Maximum Operating Pressure (bar)	SDR	=	Standard Dimension Ratio
MRS	=	Minimum Required Strength	C	=	Safety Factor
D_e	=	Diameter (mm)	e_n	=	Nominal Wall Thickness (mm)

Basically, the operating pressure is aligned with thickness and strength of materials as shown in this equation. With MRS 11.2 MPa of **SCGC™ HDPE H112PC**, the operating pressure is 10% higher than conventional PE100.

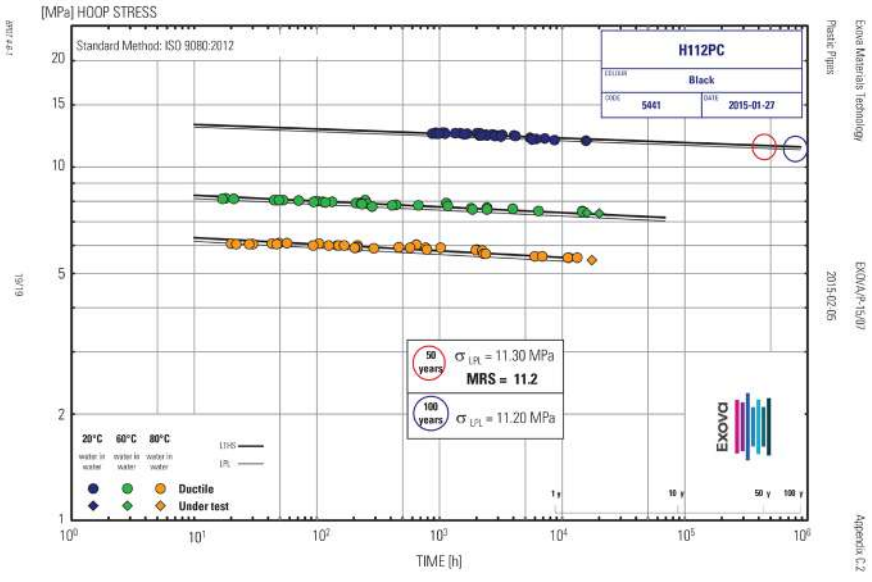
10% Thickness Reduction

Faster Welding Installation

More Hydraulic Flow Volume

Improve Project Efficiency

REGRESSION ANALYSIS ACCORDING TO ISO 9080 OF THE BLACK PE PIPE COMPOUND SCGC™ HDPE H112PC

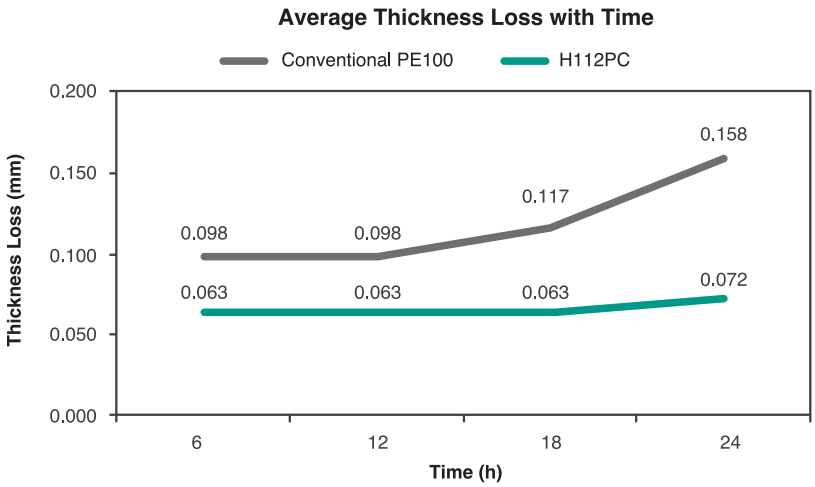


CLASSIFICATION
MRS = 11.2 MPa

SCGC™ HDPE H112PC

Key Benefits: 50% Better Abrasion Resistance

In mining industry, PE pipe has been used as tailing and water management pipeline in both open pit and underground mining which have different requirements. **Tailing pipeline** is used to transfer the sediment slurry, which abrasion resistance is the key benefit of PE Pipe.



From our technical study and mining simulation, **SCGC™ HDPE H112PC** shows 50% better abrasion resistance than convention PE100.

Remarks:

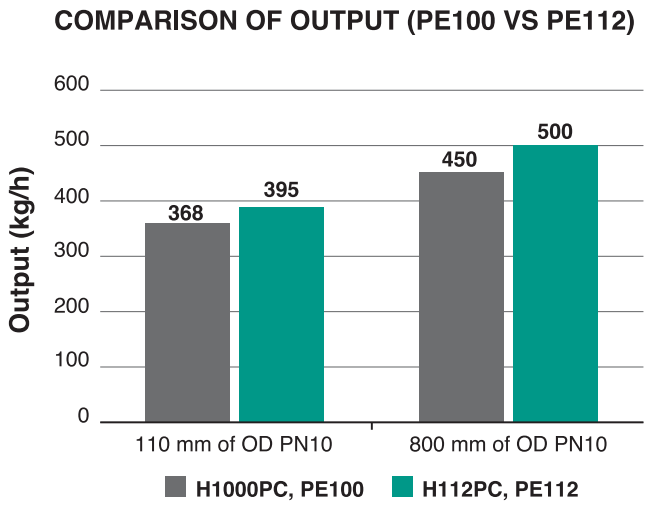
1. Sand Slurry test method modified from the Saskatchewan erosion studies. [1],[2]
2. Measure thickness loss after sand slurry continuously circulated
3. Material & Condition:
   - Silica sand slurry
   - 48 mesh, 0.5-1.0 mm., 25% wt.
   - Velocity of slurry 4.0 m/s
   - Change media every 6 hrs.

[1] J.B. Goddard, Abrasion Resistance of Piping Systems, Technical Note 2.116, Advanced Drainage Systems INC., November, 1994.
[2] Haas, D.B. and Smith, L.G., Erosion Studies — A Report to Dupont of Canada, Ltd., Saskatchewan Research Council, E75-7, September, 1975.

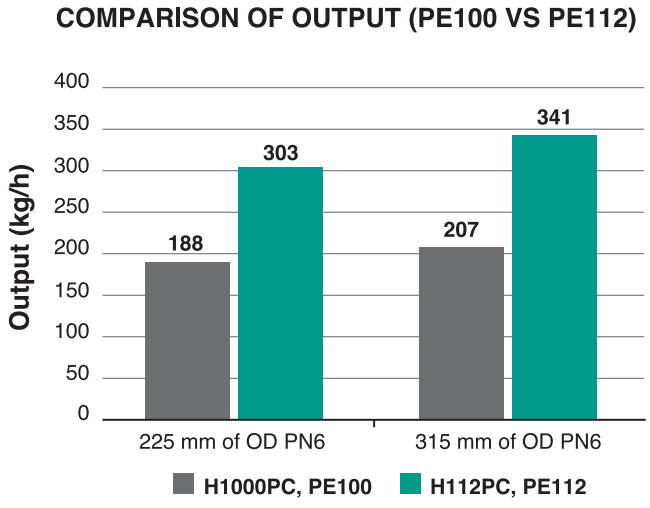
SCGC™ HDPE H112PC

Key Benefits: Up to 10% Higher Output

Higher output from SCGC™ HDPE H112PC can increase production efficiency that led to shorten project time and resource saving.



Machine brand : Battenfeld-Cincinnati



Machine brand : Shanghai Sanlei

Remarks:

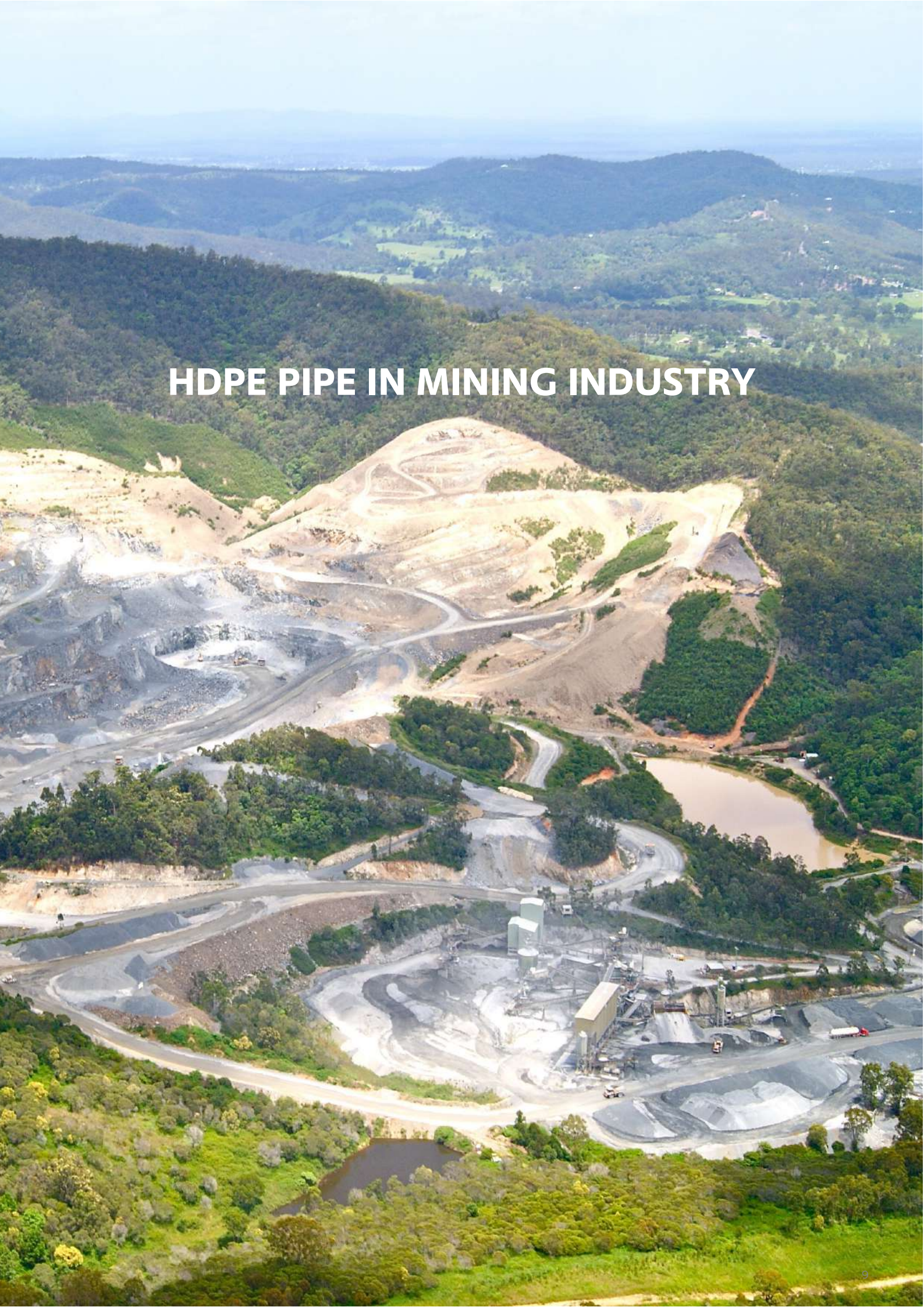
The above result is provided based on specific conditions of certain customers without warranties of any kind. Please be advised to perform inspection and/or test of the product for your particular purpose before use.

SCGC™
HDPE H112PC
Technical Information

Grade	SCGC HDPE H112PC			
	ISO standard	Method	ASTM standard	Method
Color	Black	-	Black	-
Classification	MRS 11.2 MPa (PE112)	ISO 12162:2009 ISO 9080:2012	HDB 1600 psi (PE4710)	ASTM D2837
Melt Flow Rate (190℃, 5 kg)	0.20 g/10min (190℃, 5 kg)	ISO 1133:2011	7 g/10min (190℃, 21.6kg)	ASTM D1238
Density Compound	0.960 g/cm^3 (Compound)	ISO 1183-1:2004 (A)	0.948 g/cm^3 (Base resin)	ASTM D1505
Tensile Strength at Yield	24 MPa	ISO 527-2:2012	> 3500 psi	ASTM D638
Resistance to Slow Crack Growth	> 1000 hours (Notch Pipe Test)	ISO 13479:2009	> 500 h (PENT test)	ASTM F1473
Resistance to Rapid Crack Propagation (RCP) Resistance	Pc,s4 >10 bar	ISO 13477:2008	-	-
Standard Compliance	ISO 4427-1 EN 12201-1 ISO 4437-1 EN 1555-1 AS/NZ 4131		ASTM D3350 (445574C) NSF/ANSI 14	

Remarks: The given values are typical value measured on the product. Values herein are not to be constructed as a product specification.

HDPE PIPE IN MINING INDUSTRY

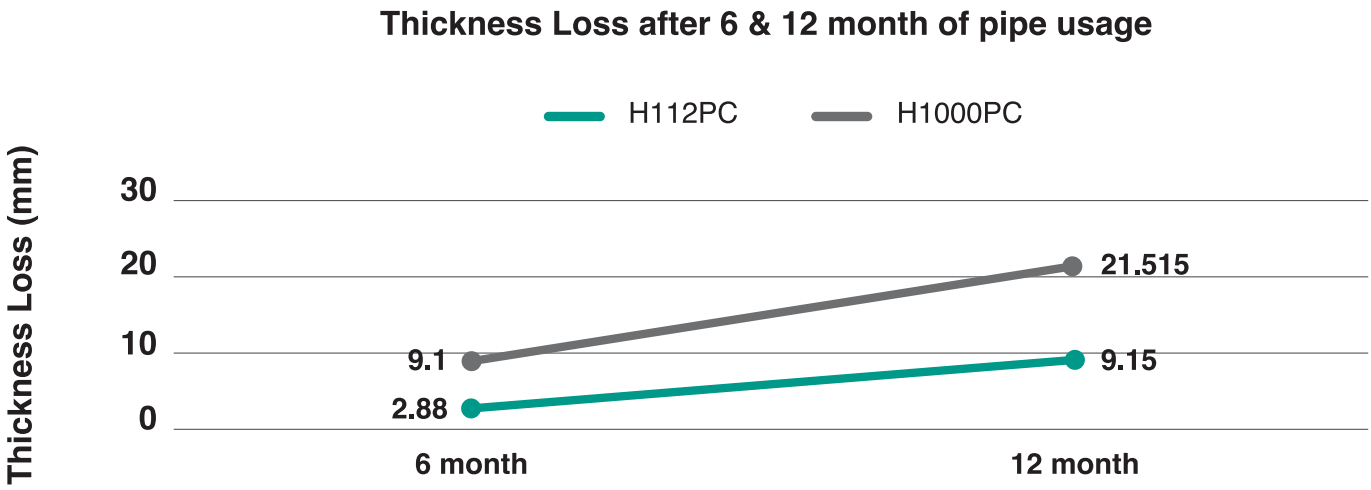


Project Reference: PT Amman Mineral Nusa Tenggara Project

PT AMMAN MINERAL NUSA TENGGARA (AMNT) operates an open-pit copper-gold mine located in southwestern part of Sumbawa Island, West Nusa Tenggara, Indonesia.

SCGC™ HDPE H112PC has been installed at this off shore line with the 1,117 mm. of OD and 110 mm. of wall thickness

From PT Amman Mineral Nusa Tenggara Project, the result of thickness loss is more than 50% better performance compared to conventional PE100, led to longer used for the pipeline.



Wall Thicknesses Table for PE112

Nominal outside diameter	Pipe series[a]																	
	SDR 8		SDR 10		SDR 12,2		SDR 15		SDR 19		SDR 23,4		SDR 29		SDR 36		SDR 45,5	
	S 3,5		S 4,5		S 5,6		S 7,1		S 8,9		S 11,2		S 14,1		S 17,8		S 22,4	
	Nominal pressure (PN)[b]																	
	PN 25		PN 20		PN 16		PN 12,5		PN 10		PN 8		PN 6		PN 5		PN 4	
	Wall Thickness [c],[e] mm																	
	e_{min}	e_{max}	e_{min}	e_{max}	e_{min}	e_{max}	e_{min}	e_{max}	e_{min}	e_{max}	e_{min}	e_{max}	e_{min}	e_{max}	e_{min}	e_{max}	e_{min}	e_{max}
25	3.1	3.6	2.6[e]	3.0														
32	4.0	4.5	3.3	3.8	2.7[e]	3.1	2.3[d,e]	2.7										
40	5.0	5.7	4.1	4.7	3.3	3.8	2.7[e]	3.1	2.3[d,e]	2.7								
50	6.2	7.0	5.1	5.8	4.1	4.7	3.3	3.8	2.7[e]	3.1	2.3[d,e]	2.7						
63	7.8	8.7	6.4	7.2	5.2	5.9	4.2	4.8	3.4	3.9	2.7[e]	3.1	2.3[d,e]	2.7				
75	9.3	10.4	7.6	8.5	6.2	7.0	5.0	5.7	4.0	4.5	3.2	3.7	2.6[e]	3.0				
90	11.2	12.5	9.1	10.2	7.4	8.3	6.0	6.7	4.8	5.4	3.9	4.4	3.1	3.6				
110	13.6	15.1	11.1	12.4	9.0	10.0	7.3	8.2	5.9	6.6	4.7	5.3	3.8	4.3				
125	15.5	17.2	12.6	14.0	10.3	11.5	8.3	9.3	6.7	7.5	5.4	6.1	4.3	4.9				
140	17.3	19.2	14.1	15.7	11.5	12.8	9.3	10.4	7.5	8.4	6.0	6.7	4.8	5.4				
160	19.8	21.9	16.2	18.0	13.1	14.6	10.6	11.8	8.5	9.5	6.9	7.7	5.5	6.2				
180	22.3	24.7	18.2	20.2	14.7	16.3	11.9	13.2	9.6	10.7	7.7	8.6	6.2	7.0				
200	24.8	27.4	20.2	22.4	16.4	18.2	13.2	14.7	10.7	11.9	8.6	9.6	6.9	7.7				
225	27.8	30.7	22.7	25.1	18.4	20.4	14.9	16.5	12.0	13.3	9.6	10.7	7.7	8.6				
250	30.9	34.1	25.2	27.9	20.5	22.7	16.5	18.3	13.3	14.8	10.7	11.9	8.6	9.6				
280	34.6	38.2	28.2	31.2	22.9	25.3	18.5	20.5	14.9	16.5	12.0	13.3	9.6	10.7				
315	39.0	43.0	31.8	35.1	25.8	28.5	20.8	23.0	16.8	18.6	13.5	15.0	10.8	12.0	8.7	9.7	7.7	8.6
355	43.9	48.4	35.8	39.5	29.0	32.0	23.5	26.0	18.9	20.9	15.2	16.9	12.2	13.6	9.8	10.9	7.8	8.7
400	49.5	54.6	40.3	44.5	32.7	36.1	26.4	29.2	21.3	23.6	17.1	19.0	13.7	15.2	11.0	12.3	8.8	9.8
450	55.6	61.3	45.4	50.1	36.8	40.6	29.7	32.8	24.0	26.5	19.2	21.3	15.4	17.1	12.4	13.8	9.9	11.0
500			50.4	55.6	40.9	45.1	33.0	36.4	26.6	29.4	21.4	23.7	17.1	19.0	13.7	15.2	11.0	12.2
560			56.4	62.2	45.8	50.5	37.0	40.8	29.8	32.9	23.9	26.4	19.2	21.3	15.4	17.1	12.3	13.7
630			63.5	70.0	51.5	56.8	41.6	45.9	33.5	37.0	26.9	29.7	21.6	23.9	17.3	19.2	13.8	15.3
710			71.5	78.8	58.0	63.9	46.9	51.7	37.8	41.7	30.3	33.5	24.3	26.9	19.5	21.6	15.6	17.3
800			80.6	88.8	65.4	72.1	52.8	58.2	42.5	46.8	34.2	37.8	27.4	30.3	21.9	24.2	17.5	19.4
900					73.5	81.0	59.4	65.5	47.9	52.8	38.4	42.4	30.8	34.0	24.7	27.3	19.7	21.8
1000					81.7	90.0	66.0	72.7	53.2	58.7	42.7	47.1	34.2	37.8	27.4	30.3	21.9	24.2
1200							79.2	87.3	63.8	70.3	51.2	56.5	41.1	45.4	32.9	36.3	26.3	29.1
1400							92.4	101.8	74.4	82.0	59.8	65.9	47.9	52.8	38.3	42.3	30.6	33.8
1600							105.6	116.3	85.0	93.7	68.3	75.2	54.8	60.4	43.8	48.3	35.0	38.6
1800									95.7	105.4	76.8	84.6	61.6	67.9	49.3	54.4	39.4	43.5
2000									106.3	117.1	85.4	94.1	68.4	75.4	54.7	60.3	43.7	48.2

[a] : The calculated Individual value S according to ISO 4065 and nominal value according to ISO 497.
[b] : PN values are based on C = 1.25.
[c] : Tolerances in accordance with ISO 11922-1:1997, grade V, calculated from (0,1 e_{min}+0,1) mm rounded up to the next 0.1 mm. For certain applications for e > 30 mm, ISO 11922-1:1997, grade T , tolerances may be used calculated from 0,15 e_{min} rounded up to the next 0,1 mm.
[d] : The calculated value of e_{min} according to ISO 4065 is rounded up to the nearest value of 2,3.
[e] : For practical reason, minimum thickness greater values greater than the limits of 2,3 mm, 2,5 mm, 2,6 mm, 2,7 mm can be imposed.

Disclaimer: The wall thickness calculation above is only the calculation guideline according to ISO 4065, ISO 497 and ISO 3. The use of the wall thickness guideline and implementation thereof are subject to final decision of the user. The user shall bear all responsibility for the use of the wall thickness guideline and implementation into its operation or production line. It is advisable that the user seeks independent advice and, where appropriate, to conduct user's own testing and assessment of the wall thickness contained in the guidelines.

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