Kiwa report LC 26132

Determination of the oxygen permeability

Plastics piping systems with an oxygen barrier layer

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Test report No.	LC 26132
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Requested by	Modus Plastik Metal A.Ş. Dilovası/Kocaeli (TR)
Performed request	Determination of the oxygen permeability of the barrier pipe
Reference document(s)	ISO 17455 — Plastics piping systems – Determination of the oxygen permeability of the barrier pipe (ISO 17455: 2005 + C1: 2007) EN ISO 21003-2 — Multilayer piping systems for hot and cold water installations inside buildings; Part 2: Pipes (ISO 21003-2: 2008 + A1: 2011)
Tested product(s)	MODUS PEXA Oxygen Barrier pipe, 16 x 2,0 mm
Conclusion(s)*	The products investigated meet the requirements for all tested and evaluated aspects as detailed in this report.

* The conclusions are not part of the accreditation scope L015.

Authorised by

Mr A.J. Rikers, Coordinator Lab C

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Overview test results

Characteristic	Test method / Reference standard	Requirement	Measured	Passed*
Pipe or piping system				
Oxygen permeability	ISO 17455	@40 °C: $F_{ox,\ day} \leq 0{,}32$ mg $O_2/m^2 \cdot$day (ISO 21003-2)	@40 °C: $F_{ox,\ day} = 0{,}05$ mg $O_2/m^2 \cdot$day	Yes

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Sample description

Pipe(s) :

Manufacturer	:	Modus Plastik Metal A.Ş.
Production location	:	Dilovası/Kocaeli (TR)
Commercial name	:	MODUS PEXA
Type of material/construction	:	PE-Xa/EVOH pipe
inner layer	:	PE-Xa
inner adhesive layer	:	Not specified
barrier layer	:	EVOH
outer adhesive layer	:	Not specified
Outer layer	:	Red Masterbatch
Nominal dimensions	:	16 × 2,0 mm
Marking	:	PE-Xa/EVOH SDR 8/S 3.5-16x2,0 Class CW,1,2,4/10 BAR Class 4/8 bar Tmax=95°C SKZ A 884 GOST 32415 / DIN 4726/DIN 1689/EN ISO 15875 14/08/2025 14:49:09 EXT NO 9/1 www.modusgroup.com.tr 001 M
Date of production	:	14-08-2025
Other aspects	:	None

Appearance

Colour inside/outside	:	Natural/red
Surface	:	Smooth
Defects/damage	:	None
Discolorations	:	None
Remarks	:	None

Sampling information

Sampled by	:	Sent by manufacturer
Date of sampling	:	Not specified
Received at Kiwa lab	:	01-10-2025
Registered by	:	Mr J.P. Hendrikx

Assembly

Length of pipe(assembly)	:	(20 ± 0,5) m
Number of fittings in assembly	:	None

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Oxygen permeability

Test Method

ISO 17455: 2005 — Plastics piping systems – Determination of the oxygen permeability of the barrier pipe

Sample preparation, conditioning and apparatus

The sample preparation, conditioning, used measuring devices and test equipment are all in accordance with ISO 17455.

Test parameters

Used method (ISO 17455)	:	Dynamic test method (method I)
Test temperature	:	(40 ± 0,5) °C
Conditioning period	:	1 h (e_{min} < 3 mm)
Number of test assemblies	:	1
Length of pipe(assembly)	:	(20 ± 0,5) m
Number of fittings in assembly	:	None
Free pipe length of assembly	:	(20 ± 0,5) m
Internal diameter of the pipe	:	11,6 mm
External diameter of the pipe	:	16,2 mm
Oxygen detection limit	:	0,1 µg O_2/l
Test run O_2 measuring time	:	1 h + 5 h
Date of test	:	24-11-2025
Test performed by	:	Mr B. Bonekamp
Test location	:	Kiwa Lab C, Apeldoorn (NL)

Test results

Test run No.	Oxygen uptake (ppb/h)	Atmospheric pressure (mbar) Initial	Atmospheric pressure (mbar) End	(Corrected) Oxygen permeation $F_{ox,\,day}$ (mg O_2/m^2·day)
14	1,38	1016	1015	0,07
15	0,86	1015	1013	0,04
16	0,46	1013	1012	0,02
Avg. Oxygen permeation (mg O_2/m^2·day)				0,05

Remarks

Oxygen permeability results smaller than 0,10 mg O_2/m^2·day are not subjected to the statistical requirement of an absolute 5% repeatability.