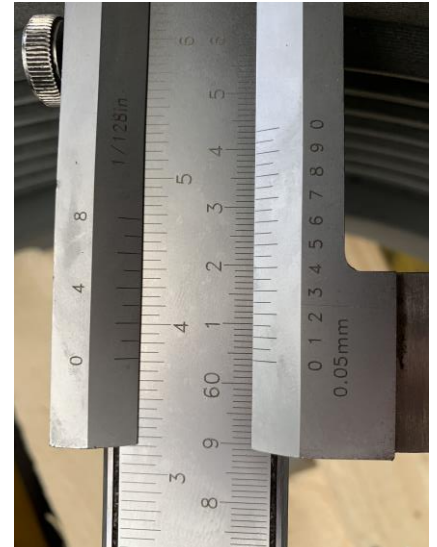


Innovative technology for pipe protection

## Dimensional Stability Test @ + 66°C & -36°C\*

Tested protectors: 24" x 0.688" Protector sets (Exquip)  
 Protector Material: Exquip Polypropylene  
 Issue Date: 06-FEB-2020  
 Revision: 0

### Validation Procedure:



\*deviating from the applicable standards (see references) we performed cold temperature test at -36°C due to the size restrictions of our freezers.

**2 3/8" up to 13 3/8" -> max. -50°C**

**14" up to 30" -> max. - 36°C**

	Name	Position	Signature
Tested by	J.-P. Kroll	Man. Dir. Engineering	<i>Jean-P. Kroll</i>
Reviewed by	T.J. Kroll	Managing Director	<i>Tom J. Kroll</i>

## Dimensional Stability Test @ + 66°C & -36°C

### Test description:

Thread diameter and seal diameter of test pieces were measured and recorded at ambient temperature. Test pieces were soaked in water bath (+66°C) or put in the freezer (-36°C) for more than 2 hours to fully reach specified temperature. When required temperature was reached, thread and seal diameter were measured and recorded again. As a last step, test pieces were stabilized at ambient temperature again, thread and seal diameter were recorded and each total variation has been noted in the below sheets:

Sample @ -36°C	Temp.(°C)	Thread Height (mm)	Var. on the diam. (mm)	Total Abs. Var. (mm)	Engagement (%)	RESULT
24"x0.688" PIN-Prot.	+ 21	4.7	0.00	0.00	100	OK
	-36		-1.33	1.33	85.9	OK
	+21		-0.27	0.27	97.1	OK

Sample @ +66°C	Temp.(°C)	Thread Height (mm)	Var. on the diam. (mm)	Total Abs. Var. (mm)	Engagement (%)	RESULT
24"x0.688" PIN-Prot.	+21	4.7	0.00	0.00	100	OK
	+66		0.80	0.80	91.5	OK
	+21		0.42	0.42	95.5	OK

Sample @ -36°C	Temp.(°C)	Thread Height (mm)	Var. on the diam. (mm)	Total Abs. Var. (mm)	Engagement (%)	RESULT
24"x0.688" BOX-Prot.	+21	4.7	0.00	0.00	100	OK
	-36		-1.36	1.36	85.5	OK
	+21		-0.10	0.10	98.9	OK

Sample @ +66°C	Temp.(°C)	Thread Height (mm)	Var. on the diam. (mm)	Total Abs. Var. (mm)	Engagement (%)	RESULT
24"x0.688" BOX-Prot.	+21	4.7	0.00	0.00	100	OK
	+66		1.10	1.10	88.3	OK
	+21		0.37	0.37	96	OK

### Test results:

After each dimensional stability test cycle, the recorded variations of the seal and thread diameter showed that the thread engagement always stayed above 50% throughout the tests and therefore the samples passed the dimensional stability tests.



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## References

- API Specification 5CT, 10th Edition, Annex I
- General technical information for Exquip protectors (Exquip standard)  
(<https://www.exquip.de/en/quality/23-general-technical-information-for-exquip-protectors>)
- IADC/SPE 17209 & 11396