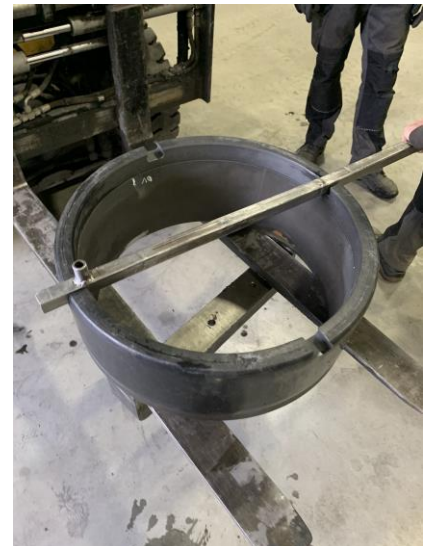


Innovative technology for pipe protection

Torque Test @ + 21 °C & +66°C

Tested protectors: 24" x 0.688" Protector sets (Exquip)
 Protector Material: Exquip Polypropylene
 Issue Date: 17-FEB-2020
 Revision: 0

Validation Procedure:



	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>

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Torque Test @ + 21°C & +66°C

Test description, comments & results:

Protectors have been installed on test connector at 21°C with a steel bar (recommended field installation practice, >180Nm). For 21°C-Tests, 15 Minutes after installation, Protectors break out torque has been checked with a torque key (>200 Nm, 200 Nm is limit of the torque keys used). Protectors have been deinstalled using a steel bar (recommended practice).

For 66°C, the connector with the installed protector (installed as above) has been put into a hot water bath for min. of 2 hours, taken out afterwards, torque check and deinstallation procedure as above.

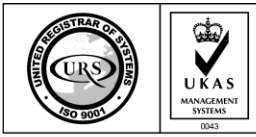
Manufacturers comment: for big diameter protectors, installation values only have theoretical value. Exquip strongly recommends field installation (and deinstallation) with steel bar and hammer by using the protectors dovetail slots, which showed the best results during many years of experience and testing.

Sample @ +21°C	Make-Up Torque @ 21°C (Nm)	Break Out Torque @ 21°C (Nm)	Requirement	Result / Surface Inspection of connector and protector threads
24"x0.688" PIN-Prot.	>180	>180	For information only	Connector and Protector in good condition; no damage to protector threads

Sample @ +21°C	Make-Up Torque @ 21°C (Nm)	Break Out Torque @ 21°C (Nm)	Requirement	Result / Surface Inspection of connector and protector threads
24"x0.688" BOX-Prot.	>180	>180	For information only	Connector and Protector in good condition; no damage to protector threads

Sample @ +66°C	Make-Up Torque @ 21°C (Nm)	Break Out Torque @ 66°C (Nm)	Requirement	Result / Surface Inspection of connector and protector threads
24"x0.688" PIN-Prot.	>180	>180	For information only	Connector and Protector in good condition; no damage to protector threads

Sample @ +66°C	Make-Up Torque @ 21°C (Nm)	Break Out Torque @ 66°C (Nm)	Requirement	Result / Surface Inspection of connector and protector threads
24"x0.688" BOX-Prot.	>180	>180	For information only	Connector and Protector in good condition; no damage to protector threads



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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