



QP Factor Technical Brochure

Applications:

- Crack Leak-Sealing Quality Assurance
- Joint Leak-Sealing Quality Assurance
- Re-Injectable Tube System Quality Assurance
- Pressure Testing in the Absence of Hydrostatic Pressure
- Quantification of Leak Severity
- Predictive Measure of Substrate Condition
- Comparator Metric to Poured Concrete

CCG Procedure (Comparison of Pre and Post Chemical Grouting)

- 1) QP Factor readings to be taken from pre-determined locations (suggested to start with most significant water flow areas and scaled outward)
- 2) Pre-chemical grout readings to be notated and performed to QP Factor specifications.
 - a. Note: Hydrostatic pressures will relocate once sealed, and full-length measurement is recommended due to this.
 - b. All QP Factor test sites are to be clearly marked and plugged full-depth with QP Packer following pre-grout test.
- 3) Chemical grouting procedures to be performed per manufacturer specifications.
- 4) Post-chemical grout readings to be notated and performed to QP Factor specifications
- 5) Pre and Post-chemical grout analysis to be provided to client, project manager, inspector, and/or engineer for analysis.

CCG Specification:

Chemical Grouting Leak-Sealing Quality Assurance:



- 1) Drill 1/2" (13mm) holes in pre-determined spacing by engineer and contractor. Drill holes between chemical grouting port locations.
- 2) Insert 1/2" (13mm) x 10" (250mm) mechanical packer to maximum depth so as to not restrict water flow from testing equipment to the crack or joint.
- 3) Connect QP Factor testing equipment to 1/2" x 10" (13x250mm) testing packer and take readings of water flow at constant 150psi pressure.
- 4) Enter Location Number of port on touchscreen display for accurate record keeping of results.
- 5) From Configuration screen, set number of readings and time between readings as desired. 30-second reading at each port is the desired metric.
- 6) After pressure and flow readings are taken, plug QP Factor drill hole to full-depth (bottom) with the same mechanical packer used for water test.
- 7) Insert QP Factor flash drive to download data at the end of each day.

** QP Factor ports are not to be injected with chemical grouts for any reason **

- 8) Following chemical grouting, and final cure of chemical grout, per manufacturer's recommendations, remove plugged QP Factor ports.
- 9) Repeat steps 2-7 for comparison to pre-chemical grouting results.
- 10) Print QP Factor graphical analysis and review with all quality assurance personnel on the project.
- 11) If results are acceptable for QA/QC, all QP Factor holes may be patched. If future testing is anticipated, plug all QP Factor holes with QP Factor Ports for future access.

CPC Procedure (Comparison to Poured Concrete)

- 1) QP Factor readings to be taken Post Chemical Grouting and compared to a 1/2 depth 'Dead Hole' (not intersecting crack or joint) to determine relative behavior to poured concrete.
- 2) Test sites for Comparison to Poured Concrete can be taken arbitrarily-spaced to client and inspector preferences.
- 3) Comparison readings to poured concrete dead hole to be provided to client, project manager, inspector, and/or engineer for analysis.



CPC Specification:

Chemical Grouting Leak-Sealing Quality Assurance:

- 1) After Leak-Seal Chemical Grouting has been performed, drill ½" (13mm) holes in pre-determined locations by engineer and contractor. Drill holes between chemical grouting port locations.
- 2) In another location deemed consolidated and non-leaking (Dead Hole), drill (1) ½" (13mm) hole ½ depth of the concrete substrate.
- 3) Connect QP Factor testing equipment to ½" x 10" (13x250mm) testing packer and take readings of water flow at constant 150psi pressure at the Dead Hole to establish baseline QP Factor of substrate.
- 4) Enter Location Number of port on touchscreen display for accurate record keeping of results.
- 5) From Configuration screen, set number of readings and time between readings as desired. 30-second reading at each port is the desired metric.
- 6) After pressure and flow readings are taken from Dead Hole, obtain the readings from the pre-determined locations in step 1.
- 7) Insert QP Factor flash drive to download data at the end of each day.

** QP Factor Dead Hole is not to be injected with chemical grouts for any reason **
- 8) Print QP Factor graphical analysis and review with all quality assurance personnel on the project.
- 9) If results are acceptable for QA/QC, all QP Factor holes may be patched. If future testing is anticipated, plug all QP Factor holes with QP Factor Ports for future access.

R-ITS Procedure / Specification (Re-Injectable Tube):

- 1) Prior to chemical grout injection of installed Re-Injectable Tube System, connect QP Factor system to supply line. Inject until water is exiting the terminal end. Then plug terminal end and run 1 minute of QP Factor testing on the R-ITS system.

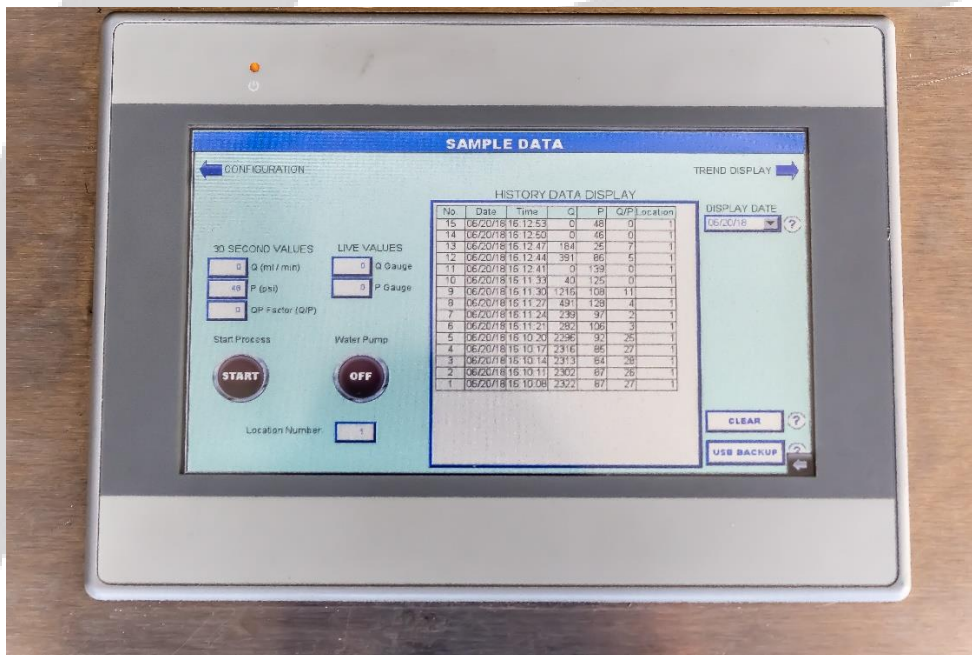
- 2) Be sure to notate Location Number on touchscreen display to ensure accurate record keeping for each section of R-ITS.
- 3) Insert QP Factor flash drive to download data at the end of each day.
- 4) Next, perform chemical grouting of acrylic grout through the R-ITS system per manufacturers recommendations. Note: R-ITS must be flushed with water successfully prior to full product cure to ensure an open R-ITS tube for re-injectable functionality, and for QP Factor testing functionality post-chemical grout injection. If the tube is filled with cured product, both R-ITS and QP Factor are rendered useless.
- 5) Following full cure, repeat steps 1-3 for comparison of pre-injection R-ITS performance and post-injection R-ITS performance.
- 6) Print QP Factor graphical analysis and review with all quality assurance personnel on the project.



Pelican Waterproofed Case



Touchscreen Display, Power, Fuse, Battery Terminal, and USB Drive



Sample Data Screen



SAMPLE DATA

TREND DISPLAY

HISTORY DATA DISPLAY

VALUES

Q Gauge

P Gauge

Imp

No.	Date	Time	Q	P	Q/P	Location
15	06/20/18	16:12:53	0	48	0	1
14	06/20/18	16:12:50	0	46	0	1
13	06/20/18	16:12:47	184	25	7	1
12	06/20/18	16:12:44	391	86	5	1
11	06/20/18	16:12:41	0	139	0	1
10	06/20/18	16:11:33	40	125	0	1
9	06/20/18	16:11:30	1216	108	11	1
8	06/20/18	16:11:27	491	128	4	1
7	06/20/18	16:11:24	239	97	2	1
6	06/20/18	16:11:21	282	106	3	1
5	06/20/18	16:10:20	2296	92	25	1
4	06/20/18	16:10:17	2316	85	27	1
3	06/20/18	16:10:14	2313	84	28	1
2	06/20/18	16:10:11	2302	87	26	1
1	06/20/18	16:10:08	2322	87	27	1

DISPLAY DATE: 06/20/18

Q/P Calculations on Data Screen

Disclaimer: QP Factor is a designed and intended to perform as a supplement to the chemical grout manufacturer's best practice recommendations. In no way, expressed or implied, is the QP Factor designed to over-rule manufacturer recommendations on chemical grout installation techniques. QP Factor is designed solely as a data collection system to analyze water permeability characteristics of the substrate. Any change in chemical grout performance including, but not limited to, shrinkage, de-bonding, de-compression, or degradation will alter the QP Factor results over time. Regular maintenance of tested structures is recommended to identify these performance alterations. In no way is QP Factor correlated to the warranty or performance over time of the chemical grout or application.