Job description for compressible packers and injection tubes

1. Place the packer in a suitable cleaned hole (rinsed with water). There should be no concrete, bore compound/paste or dust left in the hole before placing the packer to avoid slipperiness. Use packers with diameters for holes according to specification. When injecting in the floor/sole, the hole could be filled with water and the injection hose should be filed with concrete before starting to inject to avoid air pockets.

2. Tighten the external injection tube so that the packer is correctly expanded according to specifications depending on dimension and diameter. The cone part of the external tube must be set against the packer to be able to push the lock washers correctly. Recommended tightening torque according to page 2. Then the rubber sleeve will compress 20 - 25 mm axially. Do not use too small packers. (Ref point no.1.) Tighten the external tube another time just before the injection starts.

3. All packers in one injection face should be placed before injection starts.

4. When grouting (injecting), all time when packers are placed in the boreholes, and especially when tubes are removed, extreme care should be taken. Stay in secure distance from the packer-tubes, and **DO NOT STAND DIRECTLY BEHIND THE PACKER/TUBE!** This work can be dangerous, specially using high injection pressure or when the hydrostatic water pressure in the rock is high.

5. If grout material leaks out from one borehole to another borehole when grouting, please be aware that pressure can also build up in other holes in addition to the hole that is injected at the time. In case of communication between one hole to another, the other hole/packer should be grouted/injected at the same time.

6. Let the rock ”rest” for 10 – 15 minutes after injection to let the pressure decrease/fall before removing the injection tube.

7. When using **high injection pressure** please make sure the packer, dimensions and the other components are approved for the pressure used (see page 2). Secure all injection pipes in the safety hook with a wire/chain and to the rock before grouting operation is started

   If injection/grouting pressure higher than 60 bar is used special attention should be taken concerning ball valve, quick couplings and type of hose that is used. Type G/C-packer-valves should not be used at more than 100 bar because the check valve then might reverse and cause leak*****. If a single packer is not enough to withstand the pressure, a double packer might do the job. Generally small packers (38 – 51mm) can take higher pressure than bigger packers (54 – 63mm) because the surface pressure increases more than the friction between rubber and rock when bigger dimensions are used.

   Packer dimensions more than 63mm should not be used on higher pressure than 40 - 50 bar.

8. If rock conditions are bad, double packers or hydraulic packers should be used.

9. If the packer starts sliding out of the hole during injection, the injection must stop, the injection tube should be further tightened so that the rubber sleeve on the packer gets more expanded. If this does not help, another packer should be placed into the hole in front of the first packer. If this still does not help, the injection must be completely ended, the injection tube should be secured and the hole filled with grout.

10. Do not expose the packer to direct sunlight and avoid temperatures above 50° C.

***** GX-version of packers with a different check valve is available for High Pressure grouting that better resist leakage.

Miscellaneous: When installing packer on injection tube, always use thread tape between packer and tube. If eventual reuse of injection tubes always ensure that all threads are cleaned from cement and well lubricated so that entire tightening torque is transferred to packer.

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Job description for compressible packers and injection tubes

GMA Injectionspackers, intended use and restrictions

GMA Part.nr	Packer model Type	Diameter innertube mm	Outside Packer Ø mm	Drill-hole Ø mm	Intended use area Hole Ø (mm) Min.	Max.	Tightening torque Nm	Max injection pressure Bar*
8000x32	G-32/GU-32	20x2,5	29,5	32	31	33	90 - 120	65
8000x34	G-34/GU-34	20x2,5	31,5	34	33	36	90 - 120	65
8000x36	G-36/GU-36	20x2,5	33,5	36	35	38	90-120	65
8000x38	G-38/GU-38	25x3	35,5	38	37	40	90 - 120	65
8000x41	G-41/GU41	25x3	38,5	41	40	43	90 - 120	65
8000x45	GX-45/GU-45	25x3	42,5	45	44	47	90 - 120	65
8000x48	GX-48/GU-48	25x3	45,5	48	46	50	100 - 120	65
8000x51	GX-51/GU-51	25x3	48,5	51	50	53	100 - 120	65
8000x54	GX-54/GU-54	25x3	51,5	54	53	56	100 - 120	50
8000x57	GX-57/GU-57	25x3	54,5	57	56	59	100 - 120	50
8000x60	GX-60/GU-60	25x3	57,5	60	59	62	100 - 120	50
8000x63	GX-63/GU-63	25x3	60,5	64	62	65	100 - 120	50
8000x66	GX-66/GU-66	25x3	63,5	66	65	69	120-150	40
8000x70	GX-70/GU-70	25x3	67,5	70	69	73	120-150	40
8000x75	GX-75/GU-75	25x3	72,5	75	74	78	120-150	35
8000848HD	GX-48 HD	25x3	45,5	45	44	47	120-150	90-100
8000854HD	GX-54 HD	25x3	51,5	54	52	56	120 - 150	90 - 100
8000857HD	GX-57 HD	25x3	54,5	57	55	59	120 – 150	90 - 100
8000860HD	GX-60 HD	25x3	57,5	60	58	62	120 – 150	90 - 100
8000863HD	GX-63 HD	25x3	60,5	64	61	65	120 - 150	90 - 100

80007xx = G-packers (G/C-nose)
xx = dimension (mm)

80008xx= GX-packers (GX nose)

80005xx= GU-packers (open)

* Maximum injection pressure for **GU-packers** is determined by friction between the drill hole and the packer, technically the packer material can restrain a higher pressure than table shows. More info see TDS for GU-packer.

80008xxHD = GXHD-packers (GX-nose, high pressure model lock washer)

Note: Other sizes and models of mechanical packers available on request, including double packers

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