



### CHEMSET™ INJECTION 101

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#### PRODUCT

Chemset Injection 101 is a chemical anchor system based on polyester mortar. The two parts are dispensed and mixed in one action through a static mixing nozzle, which allows accurate mixing with no mess.

#### DESCRIPTION

Chemset 101 products are a cost effective solution for anchoring jobs close to edges where there is a need to avoid bursting stress on the surrounding substrate. Chemset 101 is suitable for nominal loads in benign environments. Chemset 101 mortar can be used to fix starter bars, wall ties, threaded studs, bolts and large screws into concrete, brickwork, masonry and stone. Fixtures can be installed into hollow block work using Chemset 101 in conjunction with the appropriate sleeve or sieve.

Chemset 101 provides rapid cure with adequate working time in temperate climates.

#### RECOMMENDED USES

- \* Fixing to solid concrete, solid brick, hollow brick, masonry.
- \* Suited for structural fixings.
- \* Holding down fixings.
- \* Securing stainless steel fixings into mildly corrosive environments or where minimal chemical resistance is required.
- \* Suitable for fixing wall ties, starter bars, deformed rebar, studs, bolts and large screws.
- \* Suitable for situations where anchor is subjected to cyclic loading.

#### FEATURES & BENEFITS

- \* Stress free anchoring allows for close to edge applications.
- \* Allows for close anchor spacing between fixing parts.
- \* Fast Cure
- \* Integrated system allows for ease of dispensing.
- \* Metered System - reduces waste
- \* For a partially used cartridge, simply change nozzle and re-use.
- \* High strength.
- \* Suitable for vertical, horizontal and overhead applications.
- \* Nozzle also acts as a hole depth gauge.
- \* Compatible with carbon steel, stainless steel, deformed bars, threaded studs, zinc plated and galvanised bolts.
- \* Can be used in solid concrete and masonry structures.
- \* Suitable for hollow block structures when used with appropriate sleeves or sieves.

- \* Suitable for immersion in water when fully cured.
- \* Low shrinkage - allows for large anchors to be installed.
- \* Fire Rated - information available from Ramset Technical Services on request.

#### TYPICAL PROPERTIES

Typical properties after 7 days cure at 25°C and 50% RH

Appearance	A: Beige thixotropic paste B: Green thixotropic paste
Mixed colour appearance	light grey thixotropic paste
Viscosity (mixed material)	Approx. 80,000 cps at 25°C
Density (mixed material)	Approx. 1.55kg/litre
Flammability	Flammable uncured
Service temp. (cured)	-10°C to +80°C
Heat distortion temp.	Approx. 85°C
Hardness	> 80 Shore D
Minimum Installation temperature	Substrate temp. 0°C Mortar temp. 15°C
Recommended maximum installation temperature	Ambient temp. 43°C Mortar temp. 30°C
Water absorption ASTM D570	< 2% (10 days at 25°C)
Modulus of elasticity	> 3 GPa
Chemical composition	Polyester
Tensile strength BS2782	> 15MPa
Compressive strength AS1012.9 AS 2073 using 80mm cubes	> 60MPa
Flexural strength ASTM C 348-86, BS 6319	Approx. 15 MPa

#### PRECAUTIONS

- \* Do not install anchors when the Chemset mortar temperature is less than 15°C.
- \* Do not install anchors when substrate temperature is less than 0°C.
- \* At temperatures below 15°C Chemset Injection 101 should be warmed or stored in temperatures of 20-25°C for 24 hours prior to use to improve product flow and cure.
- \* Avoid excessive pressure being applied to the dispensing gun. Excessive pressure applied to the dispensing gun may result in mortar loss from the back of the cartridge.
- \* Use only the correctly mixed mortar - incorrect mix ratio will cause a reduction of the physical properties of the cured system.
- \* Always ensure hole is properly cleaned. Hole may be damp but must be free from water.



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- \* Do not expose mortar to moisture or water for at least 24 hours after installation to allow for maximum curing.
- \* Do not dilute mortar with any solvents and/or other chemicals.
- \* Always use Ramset ISNP nozzles, other nozzles may cause ineffective mixing and reduce the properties of the mortar.
- \* Do not install into uncured concrete.
- \* Do not remove spiral mixer from nozzles.
- \* Do not cut or shorten nozzles.
- \* Not suitable for use in diamond cored holes without roughening.

#### INSTALLATION INSTRUCTIONS:

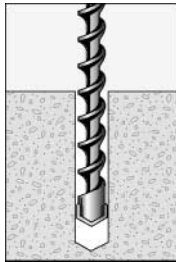
Read the "Precautions" section of these instructions prior to use.

Setting and technical data provided applies to:

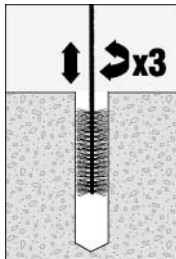
- \* Holes drilled with Rotary Hammers using drill bits toleranced in accordance with DIN8035, and where holes have been cleaned using a brush and air pump.
- \* Always wear safety glasses or goggles.

#### SOLID SUBSTRATES

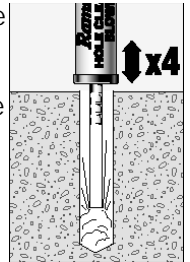
- 1 Drill hole using correctly sized rotary hammer drill bit to the specified depth. (see chart No. 2 for threaded studs).



- 2 Clean hole with correctly sized hole cleaning brush (See Chart No. 2) with stiff nylon or wire bristles. Using a combination Push/Pull and twisting (rotation) motion, ensure the sides of the hole are scrubbed at least 3 times for the full depth of the hole.

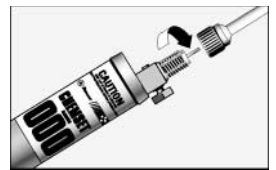


3. Remove debris, dust etc. from the hole using a hole cleaning blower with at least 4 swift pumps, alternatively a strong blast of compressed air may be used.



4. Reinforcing bars, internally threaded sockets, threaded rods or studs to be used should be cleaned and free from oil, grease, flaking rust or debris. Threaded rods or studs should be chisel ended to prevent them unthreading from the cured mortar.
5. Ensure that holes are dry. If holes have been left for a prolonged period since drilling, re-cleaning in accordance with '2 & 3' above is recommended.

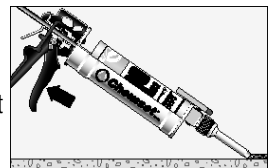
6. Using only Ramset ISNP mixing nozzles (other nozzles may cause ineffective mixing and reduce the properties of the mortar) remove nut from the cartridge and attach the mixing nozzle (screw down tight)



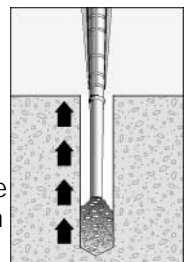
7. Mount assembled cartridge into the Ramset Universal Applicator.



8. Open the orange valve. (Turn so arrow points forward). Squeeze the handle so the mortar is dispensed out of the nozzle until an even, uniform light grey colour is achieved. (Approximately 5-6 trigger pulls should be adequate). The initial mortar flow is unsuitable for fastening and must not be used. This initial flow should be disposed of into empty packaging or similar materials.



9. The mortar must be injected without creating air pockets. To achieve this, insert the mixing nozzle to the base of the hole and inject from the base out. If hole for studs has been drilled to the correct depth, nozzle will go to bottom and no further.





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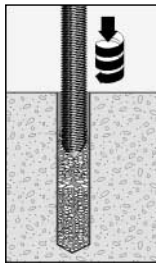
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10. Slowly withdraw the nozzle as the hole fills with each squeeze. Use an extension tube for deep holes. Chart 5 lists the number of trigger pulls required to dispense just enough resin for each hole/stud size.

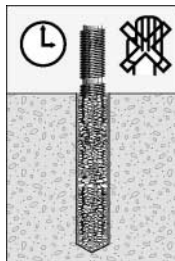
11. Once the required fill is obtained release pressure by pressing rear trigger and wipe off excess material.



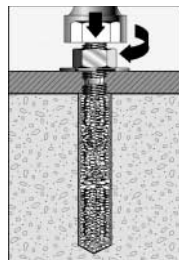
12. Push the stud into the hole using a slow twisting motion. Wipe away the excess material.



13. Do not touch anchor until mixture has gelled and do not load the anchor until curing is complete as per chart 1.



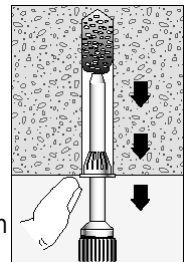
14. Attach fixture and tighten nut in accordance with tightening torque (see Chart No.2)



#### OVERHEAD INSTALLATIONS

For overhead installation into solid substrate, prepare hole and cartridge as per installation instructions, solid substrate 1 to 8; page 2.

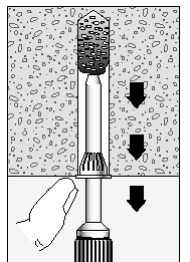
9. Insert correct retaining collar into hole, see Chart No.4



10. The mortar must be injected without creating air pockets. To achieve this while holding the retaining collar against substrate, insert mixer nozzle to the base of the hole and inject from the base out.

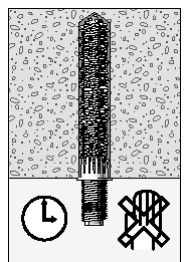
11. Slowly withdraw the nozzle as the hole fills with each squeeze while continuing to hold the retaining collar against the substrate. Use an extension tube for deep holes.

12. Once the required fill is obtained release pressure by pressing rear trigger and wipe off excess material.



13. Still holding the retaining collar, push the stud into the hole using a slow twisting motion. Wipe away excess material.

14. Do not touch anchor until mixture has gelled and do not load anchor until curing is complete as per Chart No.1



15. Attach fixture and tighten nut in accordance with recommended tightening torque.



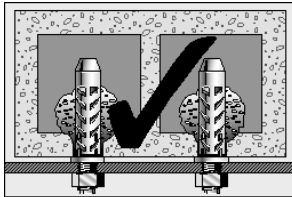
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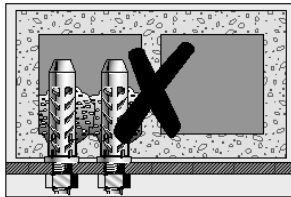
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#### HOLLOW BLOCK, HOLLOW BRICK AND HOLLOW CORE PANELS

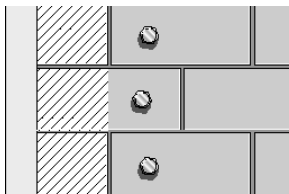
##### Fixing positions Hollow Block



Correct Installation



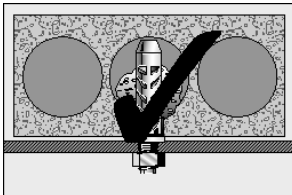
Incorrect Installation – not recommended



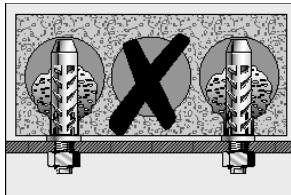
Do not fix in shaded areas.

1. One fixing per block cavity only.
2. Minimum edge distance - block

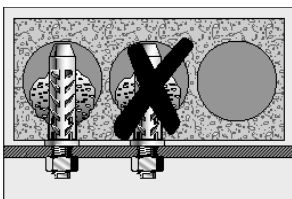
##### Fixing positions Hollow Brick



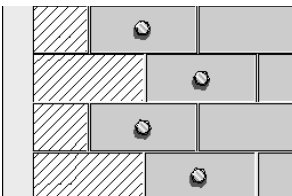
Correct Installation



Performance will be significantly reduced



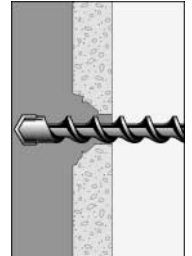
Incorrect installation – not recommended



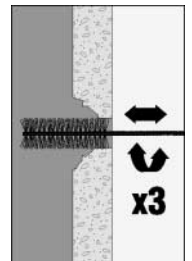
Do not fix in shaded areas.

1. Only one fixing recommended per brick.
2. Minimum edge distance - 1 brick

1. Drill hole using correctly sized drill bit through wall of hollow block or brick, see Chart No.3.

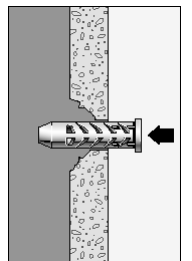


2. Clean hole with correctly sized hole cleaning brush (See chart No.2) with stiff nylon or wire bristles. Using a combination Push/Pull and twisting motion, ensure the sides of the hole are scrubbed at least 3 times for the full depth of the hole.



3. Hollow block studs, threaded studs or threaded rod to be used should be cleaned and free from oil, grease, flaking rust or debris.
4. Ensure that holes are not wet. If holes have been left for a prolonged period since drilling, recleaning in accordance with '2' above is recommended.

5. Insert correct sleeve or sieve into hole, see Chart No. 3



6. Using only Ramset ISNP mixing nozzles (other nozzles may cause ineffective mixing and reduce the properties of the mortar) remove nut from cartridge and attach a mixing nozzle (screw down tight).
7. Mount assembled cartridge into the Ramset Universal dispenser gun.
8. Open the orange valve. (Turn so arrow points forward). Squeeze the handle so the mortar is dispensed out of the nozzle until an even, uniform light grey colour is achieved. (Approximately 5-6 trigger pulls should be adequate). The initial mortar flow is



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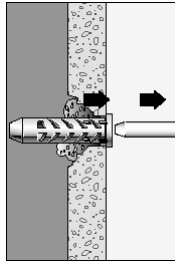
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unsuitable for fastening and must not be used. This initial flow should be disposed of into empty packaging or similar containers.

9. The mortar must be injected through the sieve or sleeve, to achieve this insert mixer nozzle to approximately 1/2 depth of the sleeve or sieve and inject mortar.

10. Inject mortar until the sleeve/sieve is filled to 3/4 of depth, slowly withdraw nozzle and complete filling.

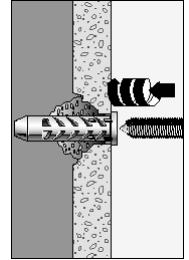
11. Once the required fill is obtained release the pressure by pressing rear trigger and wipe off excess material.



12. Push the stud into the hole using a slow twisting motion. Wipe away excess material.

13. Do not touch the anchor until the mixture has gelled and do not load the anchor until curing is complete as per Chart No.1

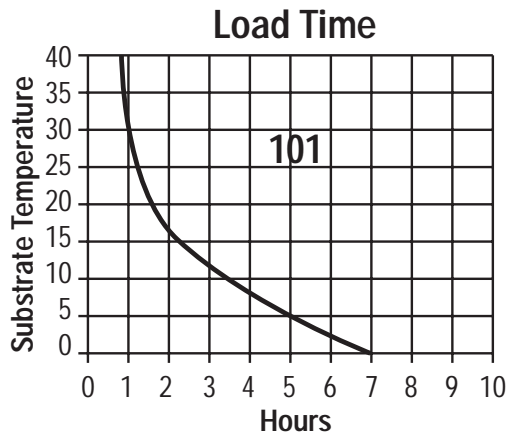
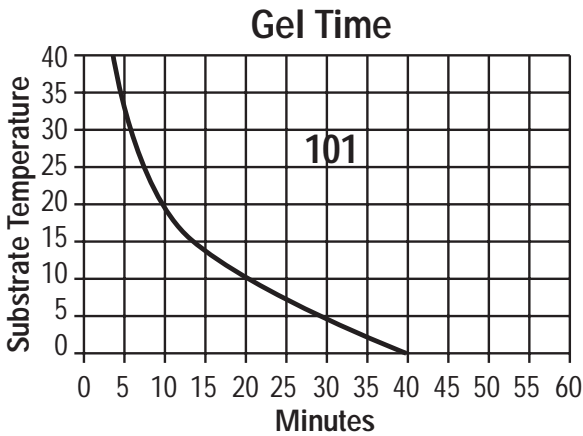
14. Attach fixture and tighten nut in accordance with recommended tightening torque.



#### CLEAN UP

Clean up uncured resin with Ramset Solvent SVGPL4. Do not use solvent on skin.

CHART 1 – SETTING TIMES



NOTE: For ambient temperature below 15°C the mortar must be conditioned to a minimum of 15°C. See Precautions page 2

#### CHEMSET™ INJECTION SYSTEM THREADED STUDS AND INJECTION ROD INSTALLATION DETAILS

CHART 2 - SOLID SUBSTRATE INSTALLATION DETAILS

Anchor Size	Thread Size	Drill Size (mm)	Hole Cleaning Brush Size (mm)	Hole Depth in Substrate (mm)	Maximum Fixture Clearance Ø (mm)	Maximum Fixture Thickness (mm)	Tightening Torque (Nm)	Minimum Edge Distance (mm)	Minimum Anchor Spacing (mm)	Minimum Structural Thickness (mm)
8	M8	10	13	80	11	15	10	35	50	100
10	M10	12	13	90	13	25	20	40	60	115
12	M12	14	13	110	15	30	40	50	75	140
16	M16	18	20	125	19	40	95	65	95	160
20	M20	24	20	150	25	75	180	80	120	190
24	M24	26	26	160	30	105	315	95	145	200



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#### CHART 3 - OVERHEAD INSTALLATION

Anchor Size	Thread Size (mm)	Retaining Collar Order No.
8	M8	ISR08
10	M10	ISR10
12	M12	ISR12
16	M16	ISR16

#### CHART 4 - RECOMMENDED WORKING LOADS WITH CHEMSET™ GRADE 5.8 THREADED STUDS

Anchor Size	Thread Size	Recommended Working Load (kN)					
		20MPa		32MPa		40MPa	
		Tensile	Shear	Tensile	Shear	Tensile	Shear
8	M8	3.4	4.4	4.5	4.4	5.1	4.4
10	M10	4.5	7.1	6.0	7.1	6.8	7.1
12	M12	6.4	10.5	8.6	10.5	9.7	10.5
16	M16	10.1	19.8	13.5	19.8	15.3	19.8
20	M20	16.6	30.0	22.3	30.0	25.2	30.0
	M20	18.8	30.0	25.2	30.0	28.6	30.0
24	M24	24.4	43.4	32.7	43.4	37.0	43.4
	M24	32.1	43.4	42.9	43.4	48.6	43.4

For shear loads acting towards an edge(s) of the concrete the above capacities are not applicable. Contact a Ramset technical consultant for advice.

#### CHART 5 - FIXINGS PER CARTRIDGE

Anchor Size	Nominal Hole Ø (mm)	Nominal Hole Depth (mm)	Number of Fixings*			Trigger Pulls per Hole†	
			150ml	380ml	750ml	380ml	750ml
8	10	80	37	96	195	1	1
10	12	90	26	66	133	1	1
12	14	110	17	43	87	1.5	1.5
16	18	125	11	27	55	2.5	2
20	24	150	6	11	22	6	5
24	26	160	4	12	24	6	5

Note: \*Approximately based on continuous installation without interruptions or nozzle changes. †Trigger Pulls using Chemset™ Universal Applicator (CUA). Provided as a guide and will vary with temperature.

#### CHART 6 - RECOMMENDED WORKING LOADS WITH CHEMSET™ INJECTION ROD

Anchor Size	Thread Size	Recommended Working Load (kN)					
		20MPa		32MPa		40MPa	
		Tensile	Shear	Tensile	Shear	Tensile	Shear
12	M12	6.4	8.4	8.6	8.4	9.7	8.4
16	M16	10.1	15.6	13.5	15.6	15.3	15.6

For shear loads acting towards an edge(s) of the concrete the above capacities are not applicable. Contact a Ramset technical consultant for advice.



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**CHART 7 - HOLLOW BLOCK, HOLLOW BRICK AND HOLLOW CORE PANEL INSTALLATION DETAILS**

Anchor Size	Thread Size	Drill Size Sleeve (mm)	Sleeve Length (mm)	Sleeve Order No.	Drill Size Sieve (mm)	Sieve Length (mm)	Sieve Order No.
6	M6	—	—	—	12	90	ISM10
8	M8	12	64	ISS08	12	100	ISM10
10	M10	14	64	ISS10	16	120	ISM12
12	M12	16	64	ISS12	16	130	ISM12
16	M16	—	—	—	22	160	ISM16

**CHART 8 - RECOMMENDED WORKING LOADS IN HOLLOW SUBSTRATES**

Brick Type		10 Hole		Concrete		3 Hole		3Hole	
Comp Strength		22 MPa		25 MPa		38 MPa		49 MPa	
Recommended Working Load (kN)									
Anchor	Sleeve	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
M6	ISM10	2	2.2	1.5	2.2	2.5	2.2	3	2.2
M8	ISM10	2	4.0	1.5	4.0	2.5	6.3	3	6.3
M10	ISM12	2	6.3	1.5	6.3	2.5	6.3	3	6.3
M12	ISM12	2	9.2	1.5	9.2	2.5	9.2	3	9.2
M8	ISM08	1.5	4.0	1.5	4.0	2.5	4.0	3	4.0
M10	ISS10	1.5	6.3	1.5	6.3	2.5	6.3	3	6.3
M12	ISS12	1.5	9.2	1.5	9.2	2.5	9.2	3	9.2

The strength in tension of Chemset™ fixings for hollow block exceeds the strength of hollow brick and concrete block. Therefore the brick or block it is installed into limits the load capacity of the fixing. Over loading the fixing will risk destruction of the brick or block. Shear properties based on grade 4.6 carbon steel threaded rod.



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CHART 9 - CHEMICAL RESISTANCE TABLE

Chemical/ Liquid	Conc. %	Resistant	Not Resistant	Chemical/ Liquid	Conc. %	Resistant	Not Resistant
Acetic Acid	10	•		Lactic acid	any	•	
Acetic Acid	98		•	Machine oil	100	•	
Acetone	100		•	Methanol	100		•
Battery Acid	•		•	Nitric acid	conc.		•
Beer	•	•	•	Nitric acid	30		•
Butanol	100	•		Nitric acid	10	•	
Calcium chloride, aq	any	•		Petrol	100	•	
Calcium hydroxide, aq	•	•		Petroleum	100	•	
Carbon tetrachloride	10	•		Phosphoric acid	20	•	
Citric Acid	any	•		Phosphoric acid	10	•	
Common salt solution	any	•		Riverwater	•	•	
Communal waste water	•	•		Sea water	•	•	
Diesel fuel	100	•		Sodium carbonate, ag	any	•	
Distilled water	•	•		Sodium chloride, aq	any	•	
Engine oil	100	•	•	Sodium hydroxide	20		•
Ethanol	10		•	Sodium hydroxide	10		•
Formaldehyde, aq	30	•		Sodium silicate	any	•	
Formic acid	100			Sulphuric acid	conc.		•
Formic acid	10	•		Sulphuric acid	20	•	
Gasoline	100	•		Sulphuric acid	10	•	
Glycol	100	•		Tap water	•	•	
Hydrochloric acid	conc.		•	Toluene	100		•
Hydrochloric acid	20	•		Turpentine	•	•	
Hydrochloric acid	10	•		Water	•	•	
Hydrochloric acid	30		•	Water glass	any	•	

aq = aqueous solution (diluted)    sat = saturated    % = % by weight

#### HEALTH AND SAFETY

- \* Avoid contact with skin. (R38).
- \* Avoid contact with eyes (R36).
- \* Avoid breathing vapour (S23) (R20)
- \* Wear protective gloves when mixing or using.
- \* If poisoning occurs, contact a doctor or Poisons Information Centre.
- \* If swallowed do not induce vomiting. Give glass of water.
- \* If skin contact occurs, remove contaminated clothing and wash skin thoroughly.
- \* If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor.
- \* Do not use in poorly ventilated or confined space. (S38).

For more detailed information refer to the Material Safety Data Sheet.

Note: Numbers in brackets, example (R38), refer to the internationally recognized risk phrases from the "National Code of Practice for the Labelling of Workplace Substances.

#### FIRE

- \* Chemset injection contains styrene and is flammable.
- \* Do not smoke in the vicinity and do not allow naked flames or ignition sources to come into contact with this material.
- \* In case of fire use foam or CO2 fire extinguisher. (S43).

#### STORAGE

Store in a cool, dry place between 5°C and 25°C away from direct sunlight.

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