Summary of Product Characteristics (SmPC)

1. Name of the medicinal product

FRUZ 20mg/2mL Solution for Injection (FUROSEMIDE INJECTION)

2. Qualitative and quantitative composition

Each mL solution for injection contains Furosemide BP 10 mg

For the full list of excipients, see section 6.1

3. Pharmaceutical form

Dosage form: Solution for injection

Description: A colorless or almost colorless solution.

4 Clinical particulars

4.1 Therapeutic indications

When a prompt diuresis is required. Use in emergencies or when oral therapy is precluded.

Indications include:

- Oedema caused by cardiac or hepatic diseases
- Oedema caused by renal diseases (in case of nephrotic syndrome, treatment of the underlying disease is essential
- Pulmonary oedema (e.g., in case of acute heart failure)

4.2 Posology and method of administration

The parenteral administration of furosemide is indicated in cases where oral administration is not feasible or not efficient (for example, in cases of reduced intestinal absorption) or when a quick effect is required. To achieve optimum efficacy and suppress counter-regulation, a continuous furosemide infusion is generally preferred to repeated bolus injections. Where continuous furosemide infusion is not feasible for follow-up treatment after one or several acute bolus doses, a followup regimen with low doses given at short intervals (approx. 4 hours) is to be preferred to a regimen with higher bolus doses at longer intervals. Intravenous furosemide must be injected or infused slowly; a rate of 4 mg per minute must not be exceeded and should never be given in

association with other medicinal products in the same syringe. Generally, Furosemide should be administered intravenously.

Intramuscular administration must be restricted to exceptional cases where neither oral nor intravenous administration is feasible. It must be noted that intramuscular injection is not suitable for the treatment of acute conditions such as pulmonary oedema. In the absence of conditions requiring a reduced dose (see

below) the initial dose recommended for adults and adolescents over 15 years, is of 20 mg to 40 mg furosemide (1 or 2 ampoules) by intravenous (or in exceptional cases intramuscular) administration; the maximum dose varying according to individual response. If larger doses are required, they should be given increasing by 20 mg increments and not given more often than every two hours. In adults, the recommended maximum daily dose of furosemide administration is 1500 mg.

Children and adolescents (up to 18 years of age):

The intravenous administration of furosemide to children and adolescents below 15 years is only recommended in exceptional cases. The dosage will be adapted to the body weight, and the recommended dose ranges from 0.5 to 1 mg/kg body weight daily up to a maximum total daily dose of 20 mg.

Method of administration: Intravenous or intramuscular

4.3 Contraindications

Hypersensitivity to furosemide or any of the excipients of Furosemide Injection BP 10mg/ml

- Patients with anuria or renal failure with anuria not responding to furosemide.
- Renal failure as a result of poisoning by nephrotoxic or hepatotoxic agents.
- Renal failure associated with hepatic coma.
- Patients with severe hypokalaemia or severe hyponatraemia.
- Patients with hypovolaemia (with or without hypotension) or dehydration.

- Patients in pre-comatose and comatose state associated with hepatic encephalopathy
- Patients with hypersensitivity to sulphonamides (e.g. Sulfonylureas or antibiotics of sulphonamides group) may show cross-sensitivity to furosemide.

4.4 Special warnings and precautions for use Careful monitoring is required in case of:

- Patients with partial obstruction of urinary outflow (e.g. prostatic hypertrophy, hydronephrosis, ureter stenosis). Urinary output must be secured.
- Patients with hypotension or at increased risk from pronounced fall in blood pressure patients with coronary artery stenosis or cerebral artery stenosis)
- Patients with manifest or latent diabetes mellitus or variation of glycaemia (regular monitoring of blood glucose levels necessary)
- Patients with gout and hyperuricemia (regular monitoring of uric acid levels in serum necessary)
- Patients with hepatic disease or hepatorenal syndrome (renal impairment associated to severe hepatic disease)
- Hyperproteinemia (associated to nephrotic syndrome, furosemide´s effect may be reduced and its ototoxicity increased).
- Acute porphyria (the use of diuretics is considered to be unsafe in acute porphyria and caution should be exercised)
- Too vigorous diuresis may cause orthostatic hypotension or acute hypotensive episodes.
- Where indicated, steps should be taken to correct hypotension or hypovolaemia before commencing therapy.

In patients who are at high risk for radiocontrast nephropathy, furosemide is not recommended to be used for diuresis as part of the preventative measures against radiocontrast-induced nephropathy.

Photosensitivity: Cases of photosensitivity reactions have been reported. If a photosensitivity reaction occurs during treatment, it is recommended to stop the treatment. If a re-administration is deemed necessary, it is recommended to protect exposed areas to the sun or to artificial UVA.

4.5 Interaction with other medicinal products and other forms of interaction

Lithium:

Lithium excretion levels may be reduced by furosemide, resulting in increased cardiotoxic effects and lithium toxicity. Therefore, this combination is not recommended. If this combination is deemed necessary, lithium levels should be carefully monitored, and lithium dosage should be adjusted.

Ototoxic drugs (e.g., aminoglycosides, cisplatin):

Furosemide may intensify the ototoxicity of certain drugs, for example, cisplatin or aminoglycoside antibiotics such as kanamycin, gentamicin, and tobramycin, particularly in patients with renal impairment. Since this may lead to irreversible damage, these drugs must only be used with furosemide if there are compelling medical reasons.

Chloral Hydrate:

In isolated cases, the intravenous administration of furosemide in a 24hour period prior to chloral hydrate administration may lead to flush, hyperhidrosis, anxiety, nausea, an increase in blood pressure, and tachycardia. Therefore, the simultaneous administration of furosemide and chloral hydrate is not recommended.

Inhibitors of the angiotensin converting enzyme (ACE) and Angiotensin II receptor antagonists:

The effects of other antihypertensive can be potentiated by concomitant administration of furosemide. Severe fall in blood pressure with shock in extreme cases and deterioration of renal function (acute renal failure in isolated cases) have been observed in combination with ACE

inhibitors, when the ACE inhibitor was administered for the first time, or for the first time at high dosage (first dose hypotension). If possible, furosemide therapy should be temporarily discontinued (or at least the dose reduced) for three days before therapy with an ACE inhibitor or an Angiotensin II receptor antagonists is initiated or the dose of an ACE inhibitor or Angiotensin II receptor antagonists is increased.

Thiazides:

A synergetic effect of diuresis occurs as result of interaction of furosemide and thiazides.

Anti-diabetic agents:

A decrease in glucose tolerance may occur, since furosemide may reduce these drugs action**.**

Metformin:

The blood levels of metformin may be increased by furosemide. Inversely, metformin may reduce furosemide concentration. The risk is linked to an increased occurrence of lactic acidosis in case of functional renal insufficiency.

Fibrates:

Blood levels of furosemide and of fibric acid derivate (for example clofibrate and fenofibrate) may be increased during concurrent administration (particularly in case of hypalbuminaemia). The increase of its effect/toxicity should be monitored.

4.6 Pregnancy and lactation

Pregnancy:

Furosemide should not be given during pregnancy unless there are compelling medical reasons. Furosemide crosses the placental barrier, and can therefore cause a diuresis of the fetus. Treatment during pregnancy requires monitoring of fetal growth. Treatment of pregnancy hypertension and oedema is in general not recommended, as physiological hypovolemia can be induced which causes reduction of placental perfusion. Furosemide reaches 100% of the maternal serum concentration in cord blood. No malformations in humans which might

be associated with exposure to furosemide have been reported to date. However, there is limited experience to allow a conclusive evaluation of a potential damaging effect in the embryo/fetus.

Lactation:

Furosemide passes into breast milk and may inhibit lactation.

Women must not breastfeed if they are treated with furosemide

4.7 Effects on the ability to drive and use machines

Clinical experience with furosemide indicates that it is unlikely to impair a patient's ability to drive or use machinery.

4.8 Undesirable effects

The following adverse reactions have been observed and reported during treatment with furosemide with the following frequencies: Very common (≥ 1/10); common (≥ 1/100 to < 1/10); uncommon (≥ 1/1 000 to < 1/100); rare (≥ 1/10 000 to < 1/1 000); very rare (<1/10 000).

Investigations

Rare: serum cholesterol and triglyceride levels may rise during furosemide treatment.

Cardiac disorders

In particular, at the initial state of treatment and in elderly, a very intense diuresis may cause a reduction in blood pressure which, if pronounced may cause signs and symptoms such as orthostatic hypotension, acute hypotension, sensations of pressure in the head, dizziness, circulatory collapse, thrombophlebitis or sudden death (with i.m. or i.v. administration).

Blood and lymphatic system disorders

Uncommon: thrombocytopenia; thrombocytopenia may become manifest, especially with an increase of haemorrhage tendency. Rare: eosinophilia, leukopenia, bone marrow depression; occurrence of this symptom necessitates withdrawal of treatment.

Very rare: haemolytic anaemia, aplastic anaemia, agranulocytosis.

Nervous system disorders:

Rare: paraesthesia, vertigo, dizziness, sleepiness, confusion, sensations of pressure in the head.

Eye disorders:

Rare: blurred vision; disturbances of vision with hypovolaemia symptoms.

Ear and labyrinth disorders:

Rare: dysacusis and/or syrigmus (tinnitus aurium) due to furosemide are rare and usually transitory; incidence is higher in rapid intravenous administration, particularly in patients with renal failure or hypoproteinaemia (e.g. in nephrotic syndrome).

Gastrointestinal disorders

Rare: nausea, vomiting, diarrhoea, anorexia, gastric distress, constipation, dry mouth. Hepato-biliary disorders Very rare: acute pancreatitis, intrahepatic cholestasis, cholestasis jaundice, hepatic ischaemia, increases in hepatic transaminases.

Renal and urinary disorders

Diuretics may exacerbate or reveal acute retention of urine symptoms (bladder- emptying disorders, prostatic hyperplasia or narrowing of the urethra), vasculitis, glycosuria, transitorily increase of blood creatinine and urea levels.

Rare: interstitial nephritis

Immune system disorders

Rare: severe anaphylactic and anaphylactoid reactions such as anaphylactic shock

Skin and subcutaneous tissue disorders

Uncommon: pruritus, dermal and mucosal reactions (e.g. bullous exanthema, rash, urticaria, purpura, erythema multiforme, exfoliative dermatitis, photosensitivity)

Rare: vasculitis, lupus erythematosus exacerbation or activation.

Musculoskeletal and connective tissue disorders Rare: leg muscle cramps, asthenia. chronic arthritis. **General disorders and administration site conditions**

Rare: febrile conditions; following i.m. injection local reactions such as pain may appear.

Reporting of Adverse Reactions

Healthcare professionals are asked to report any suspected adverse reactions to the National Regulatory Authority via the Pharmacy and Poisons Board PvERS portal: https://pv.pharmacyboardkenya.org

4.9 Overdose Symptoms:

Symptoms of these disturbances include severe hypotension (progressing to shock), acute renal failure, thrombosis, delirious states, flaccid paralysis, apathy and confusion **Treatment:**

At the first signs of shock (hypotension, sudoresis, nausea, cyanosis) the injection should be immediately interrupted, place the patient head down and allow free breathing. Fluid replacement and correction of the electrolyte imbalance; monitoring of metabolic functions, and maintenance of urinary flux. Medicinal treatment in case of anaphylactic shock: dilute 1 ml of 1:1000 adrenaline solution in 10 ml and inject slowly 1 ml of the solution (corresponding to 0.1 mg of adrenaline), control pulse and tension and monitor eventual arrhythmias. Adrenaline administration may be repeated, if necessary. Subsequently, inject intravenously a glucocorticoid (for example 250 mg of methylprednisolone), repeating if necessary. Correct hypovolemia with available means and complement with artificial ventilation, oxygen and in case of anaphylactic shock with anti-histamines. No specific antidote to furosemide is known. If overdose during parenteral treatment has taken place, in principle the treatment consists on follow up and supportive therapy. Hemodialysis does not accelerate furosemide elimination.

5 Pharmacological properties

5.1 Pharmacodynamics properties Pharmacotherapeutic group:

Antidiuretic agent. **ATC code:** CO3CA01 **Mechanism of action:**

Furosemide is a strong diuretic agent of fast action. Furosemide inhibits the co- transport system (reabsorption) of the following electrolytes: Na, K, and 2CL, located on the luminal cell membrane on the ascending limb of the loop of Henle. Consequently, furosemide´s efficiency depends on the drug reaching the tubular lumen through an anionic transport mechanism. The diuretic effect results on the inhibition of sodium chloride reabsorption in this segment of the loop of Henle. As a result, the fraction of excreted sodium may ascend to 35% of sodium glomerular filtration. The secondary effects of increased elimination of sodium are: increase of urinary excretion and increase of potassium distal secretion at the distal tube. Excretion of calcium and magnesium salts is also increased. Furosemide inhibits the feedback mechanism in the dense macula and induces dose dependent stimulation of the reninangiotensin-aldosterone system. The diuretic effect of furosemide is established within 15 minutes of an intravenous administration.

5.2 Pharmacokinetic properties

Distribution

Furosemide distribution volume is 0.1 to 1.2 litres per kg of body weight. The distribution volume may be increased depending on the concomitant illness. Protein binding (mostly to albumin) is higher than 98%.

Renal impairment

In case of renal impairment, furosemide´s elimination is slower and its half-life is increased. In patients with end-stage renal disease the average half-life is 9.7 hours. In several multi-organs failure the halflife may range from 20-24 hours. In case of nephrotic syndrome, the lower concentration of plasma proteins leads to higher concentrations of unbound furosemide. On the other hand, the efficiency of furosemide is reduced in these patients, due to intratubular albumin binding and to reduced tubular secretion.

Elimination:

Furosemide is mostly eliminated as the non-conjugated form, mainly through secretion at the proximal tube. After intravenous administration, 60% to 70% of furosemide is eliminated by this manner. The glucuronic metabolite of furosemide represents 10% to 20% of the recovered substances in the urine. The remaining dose is eliminated in the faeces, probably after biliary secretion. After intravenous administration, the plasma half-life of furosemide ranges from 1 to 1.5 hours. Furosemide is excreted in breast milk. It crosses the placental barrier, transferring itself slowly to the foetus. Furosemide achieves similar concentrations in the mother, foetus and new-born.

Hepatic impairment

In case of hepatic impairment, furosemide´s half-life increases 30% to 90%, mainly due to the higher distribution volume. Biliary elimination might be reduced (up to 50%). In this group of patients, there is a wider variability of the pharmacokinetic parameters. Congestive heart failure, severe hypertension, elderly Furosemide elimination is slower due to reduced renal function in patients with congestive heart failure, severe hypertension or in elderly.

Premature infants and new-born

Depending on the maturity of the kidney, elimination of furosemide may be slow. In case of children with insufficient capacity of glucuronidation, the metabolism of the drug is also reduced. In term neonates the half-life is generally less than12 hours.

6 Pharmaceutical particulars

6.1 List of excipients

Sodium Chloride BP

Sodium hydroxide BP

Disodium EDTA BP

Water for Injection BP

6.2 Incompatibilities

Furosemide should not be mixed with strong acid solutions (pH lower than 5.5), such as solutions containing ascorbic acid, noradrenaline, and adrenaline, due to the risk of precipitation.

6.3 Shelf life

36 months

6.4 Special precautions for storage

Store at a temperature not exceeding 30°C. Protect from light.

6.5 Nature and contents of container

Pack 10 x 2 ml amber glass ampoule USP Type-I in tray with mono carton and insert

6.6. Special precautions for disposal and other handling

Any unused medicinal product or waste material should be disposed of in accordance with local requirements. Medicines should not be disposed of via wastewater or household waste.

Ask your pharmacist how to dispose of medicines no longer required. These measures will help to protect the environment.

7. Marketing authorization holder

Marketing Authorization Holder:

Makcur Laboratories Limited.

Manufacturer:

Makcur Laboratories Limited,

46/4-7, Village: Zak, Taluka: Dehgam, District: Gandhinagar – 382330, Gujarat, India

8. Marketing authorization number(s)

H2009/22701/349

9. Date of first authorization/renewal of the authorization

24th February 2026

10. Date of revision of the text

24th February 2026