Roquette Pyrogen-Free Range of Products for Parenteral Preparations (Injection, Infusion and Dialysis Solutions)

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INTRODUCTION

Parenteral preparations (injection, infusion, dialysis…) must be, among other requirements, sterile and “pyrogen-free”. Ingredients used (Active Pharmaceutical Ingredients, excipients) must be of high quality standards in terms of physicochemical and microbial purity.

Pyrogenic substances that cause fever, can be either an endotoxin or an exotoxin, although most pyrogens are endogenous. Endotoxins are lipopolysaccharide (LPS) molecules in part of the cell wall of gram-bacteria and released primarily upon cell lysis. Pyrogenic substances testings are LAL test (Limulus Amoebocyte Lysate) and rabbits test.

MATERIALS AND KEY TECHNICAL POINTS

LYCADEX® PF: LIFESAVING MOLECULE

Dextrose monohydrate pyrogen-free for injectable solutions (injection and infusion solutions), dialysis solutions and parenteral nutrition.
New manufacturing workshop in France operational from 01/2012. Double sourcing (France + US plant).

Quality Assurance

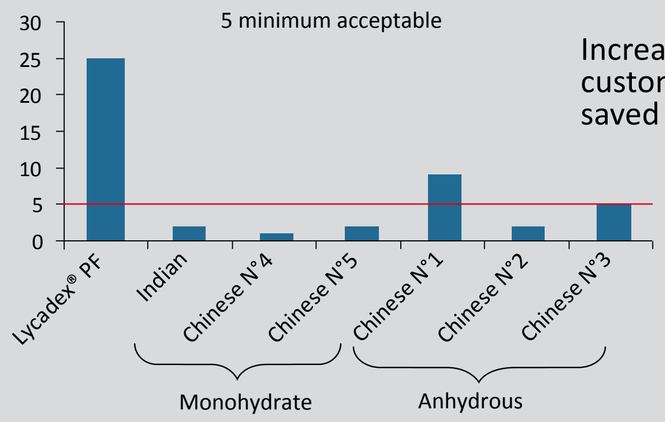
- Dedicated manufacturing line with controlled environment (no cross contamination)
- Purification steps (high quality)
- Improved filterability; customer’s benefit
- In-process controls (for example LAL) and end-product controls double control for pyrogenic substances: LAL and rabbits
- Compliance: US cGMP + EU GMP(ICH Q7)

Regulatory aspects

- Compliance to EP, USP, JP and ChP
  - CEP (Keokuk and Lestrem)
  - US-DMF type II (Keokuk and Lestrem)
  - Chinese DMF : Y20190000012
- Approved by Competent Authorities
  - U.S. FDA: last inspection, February 2017 (Lestrem), and August 2016 (Keokuk)
  - French: Inspection (ANSM), November 2017
- GMP (ICHQ7) Certificate

Key technical points: filterability

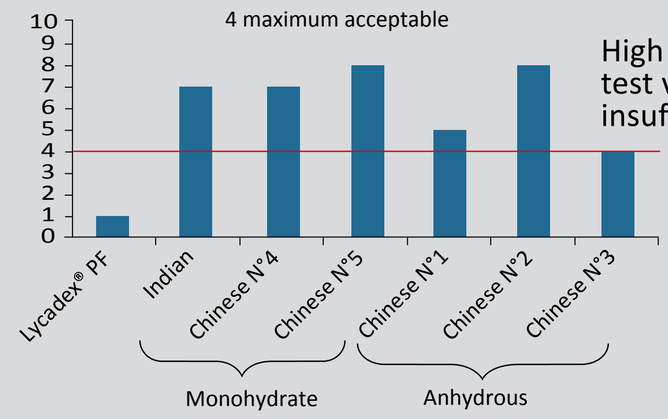
Filterability



Increased shelf life of customers’ filters and saved production costs

Key technical points: cleanliness

Cleanliness



High cleanliness test value reflects insufficient purification

OTHER PYROGEN-FREE SOLUTIONS

Quality Assurance PEARLITOL® PF Mannitol NEOSORB® PF Sorbitol KLEPTOSE® HPB / HP parenteral grade Sodium Gluconate Pharma KLEPTOSE® HPB-LB parenteral grade	• Campaign basis production; controlled environment (no cross contamination) • Purification steps (high quality) • In-process controls and end-product testing. • LAL test (pyrogenic substances) • Compliance to GMP (ICH Q7)
Regulatory aspects PEARLITOL® PF Mannitol NEOSORB® PF Sorbitol	• Compliance to EP, USP and JP PEARLITOL® PF and NEOSORB® PF: CEP PEARLITOL® PF: US-DMF type II and Canada-DMF type I (API) • Approved by Competent Authorities PEARLITOL® PF: U.S. FDA inspection, February 2017 PEARLITOL® PF and NEOSORB® PF: French inspection (ANSM), November 2017 • GMP (ICHQ7) Certificate
Regulatory aspects KLEPTOSE® HPB / HP parenteral grade	• Compliance to EP and USP US-DMF type II & type IV and Canada-DMF type III • Approved by Competent Authorities French ANSM: Inspection, November 2017 • GMP (ICH Q7) Certificate (Only Roquette)
Regulatory aspects Sodium Gluconate Pharma	• Compliance to USP (only existing monograph) • Inspected by Competent Authorities French ANSM: Inspection, November 2017
Regulatory aspects KLEPTOSE® HPB-LB parenteral grade	• Compliance to EP, USP and ChP • Chinese DMF approved

CONCLUSION

Our pyrogen-free range of products, and our vertically-integrated portfolio, support our customers’ needs for supply chain transparency and traceability. We understand our customers’ concerns and need for compliance to ensure patient safety. Additionally, we offer expertise in developing a variety of custom solutions - partnering with you from the earliest development stages of a project.