

Overview

This standard is about the skills and knowledge needed for you to control wort boiling, clarification and cooling in brewing.

This standard details the skills and understanding needed when applying heat to bring about a change in the condition of a product, when removing heat to achieve the required change in the condition of the product or to preserve the product state and/or quality. It also details the skills and knowledge to competently prepare for, start up and complete hopped wort transfer to the fermentation vessel in brewing.

It details the skills required to start up, run and shut down equipment, as well as being able to take the appropriate action should operating problems occur. It is also about working to product specifications and production schedules. Complying with and understanding health and safety, food safety and organisational requirements are essential features of this standard.

This standard also covers understanding the principles of the wort boiling process in brewing including sterilisation, stabilisation of enzyme action, evaporation, coagulation and precipitation of protein (trub formation) and beer haze precursors, flavour development other than hop bitterness and colour formation, and how the control of different factors can affect the wort. It covers what happens during the boiling process, the characteristics of hops, hop bitterness formation and values, the use of other raw materials, process aid additions and the operating principles of wort kettles (coppers). It details the understanding of the principles of wort clarification and cooling in brewing. It covers the impact of trub and spent hops on beer quality and their removal, wort clarification devices, the methods and effects of wort cooling and how wort coolers work.

This standard is for you if you require a broad knowledge and understanding of the wort boiling, clarification and cooling process and related activity in brewing.

Performance criteria

You must be able to:

Prepare for wort boiling, clarification and cooling

1. prepare for wort boiling, clarification and cooling in accordance with the legal or regulatory requirements, the organisational health and safety, hygiene and environmental standards and instructions
2. check product specifications at the right time
3. set up equipment according to specification
4. check that material for wort boiling, clarification and cooling is available and fit for use
5. check that services meet requirements
6. start up the plant and check that it is running to specification
7. take action in response to operating problems
8. maintain communication in accordance with organisational procedures

Carry out wort boiling, clarification and cooling

9. carry out wort boiling, clarification and cooling in accordance with the legal or regulatory requirements, the organisational health and safety, hygiene and environmental standards and instructions
10. use equipment and check that it is supplied with materials and services
11. achieve the required output to the correct specification
12. check the product is transferred to the next stage in the manufacturing operation
13. take action in response to operating problems within the limits of your responsibility
14. maintain communication in accordance with organisational procedures

Finish wort boiling, clarification and cooling

15. finish wort boiling, clarification and cooling in accordance with the legal or regulatory requirements, the organisational health and safety, hygiene and environmental standards and instructions
16. time shut down in accordance with relevant specifications
17. set up wort transfer equipment according to specification, including ensuring that the fermentation vessel to be used is empty and clean

18. make sure that hopped wort is ready to be transferred to the fermentation vessel
19. transfer hopped wort in accordance with the legal or regulatory requirements, the organisational health and safety, the hygiene and environmental standards and the standard operating procedures
20. use transfer equipment in accordance with organisational policies and procedures and make sure that it is supplied with specified materials and services
21. achieve the required output to the correct specification
22. follow procedures to shut down equipment
23. deal with items that can be re-cycled or reworked
24. dispose of waste in accordance with organisational requirements
25. make equipment ready for future use after completion of the process
26. maintain communication in accordance with organisational procedures
27. complete all necessary documentation

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Knowledge and understanding

You need to know and understand:

1. the organisational health and safety, hygiene, environmental and quality standards and instructions
2. the personal protective equipment required
3. the work area tools and equipment needed
4. why it is important to check the cleanliness of work area, tools and equipment
5. the purpose and importance of the process
6. what materials to use and in what quantity
7. how to obtain and interpret the relevant process or ingredient specification
8. what action to take when the process specification is not met
9. how to carry out the necessary pre start checks and why it is important to do so
10. how to follow the start up procedures for the process and why it is important to do so
11. common sources of contamination during processing, how to avoid these and what might happen if this is not done
12. how to operate, regulate and shut down the relevant equipment
13. how to follow the relevant process control procedures and why it is important to do so
14. different ways to carry out the process
15. how to carry out the process in an efficient manner and why it is important to do so
16. how to make equipment ready for future use
17. the purposes of boiling
18. what factors affect the effectiveness of wort boiling
19. hot side aeration and the downstream effects
20. what the purposes of adding liquid adjunct to the wort kettle are
21. the purpose and function of copper fining
22. what the nature and origins of hops and hop preparations are
23. the principles of isomerisation and how hops or hop preparations yield bitterness during wort boiling
24. how alternative or supplementary additions of hop bitterness are made at later stages in the process
25. how bitterness value of beer is expressed and what typical values are
26. what the bitterness potential of hops are

27. how required hop rate/hop throw/hop addition is calculated to achieve a given bitterness
28. what the principles of hop utilisation are
29. what other raw materials are used in wort boiling and their function
30. the operating principles of wort kettles (coppers)
31. the potential of trub constituents, spent hops and other materials in boiled wort to impact adversely on beer quality
32. how beer quality is affected by trub constituents, spent hops and other materials
33. the methods available for the removal of trub and/or spent hops
34. how wort clarification devices operate and carry out their function
35. the purpose of wort cooling
36. the effect of cooling on wort constituents
37. methods available for cooling wort
38. how wort coolers operate and carry out their function
39. how to deal with waste materials in accordance with organisational requirements
40. the need for records to be completed within agreed timescales and to an agreed standard
41. what should be communicated, to whom and why it should be done
42. the limits of your authority and the consequences of exceeding them

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