

**INDEX** 

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Target Audience  
 FOD inspectors inspecting food premises  
 Specialist Group Inspectors (Engineering)

**EUROPEAN STANDARD ON DOUGH MIXERS, EN 453: 2000**

This SIM outlines UK concerns relating to EN 453: 2000 which has been published by BSI as BS EN 453: 2000. It outlines what action inspectors should take if they come across dough mixers supplied after the publication date of 15 July 2000 which meet the requirements of EN 453: 2000 but which do not meet 'state of the art' in the UK. No special visits are required.

**EN 453: 2000 - DOUGH MIXERS**

1 At the Formal Vote stage the UK voted against the proposed standard because of guarding concerns, in particular the excessive opening in the interlocking guard to allow the operator to take dough samples during the kneading process. A copy of the UK Formal Vote technical comments is reproduced at [Appendix 1](#). These should be read in conjunction with EN 453: 2000.

2 The standard also fails to highlight that double arm mixers are more hazardous due to the relatively easy access to the scissor action of the arms.

3 Although the UK voted against the standard, it was passed at Formal Vote and published as EN 453: 2000. In the UK the standard was published as BS EN 453: 2000 by BSI with a National foreword warning of the reservations stated above. An extract from the National foreword is reproduced at [Appendix 2](#).

4 Dough mixers have traditionally been safeguarded such that access to hazardous moving parts has been **prevented**. This has been achieved by the provision of a movable interlocking guard, the dimensions of which comply with BS EN 294: 1992 *Safety of machinery: safety distances to prevent danger zones being reached by the upper limbs*, and which when opened, causes the hazardous moving parts to come to rest before they can be touched. Discussions with the UK bakery industry have not highlighted any practical problems with the use of such guards. There is a very low accident history on dough mixers in the UK but this may be due to the consistently high level of safeguarding.

5 [GAP 4 HSE and standards development, section 6](#) gives detailed information on dealing with defective standards. At this stage, (now that the standard is published) the only formal course of action open to the UK is to invoke the 'safeguard' procedure under the Machinery Directive Article 7, where action is taken against a product once it actually appears on the market. This is a resource- intensive procedure which HSE would only implement as a last resort.

## ACTION

6 No special visits are required however inspectors should be aware of the information in this SIM at visits to bakery and related establishments.

7 The following standard of guarding is considered reasonably practicable for dough mixers:

1) Interlocked guard over top of mixing bowl (can be power operated or manual). The interlock should operate such that the kneading tools stop before it is possible for the operator to gain access to the trapping point between the mixing unit and the bowl.

2) Where the guard is not solid (eg a bar guard) the openings in the guard should meet the distances specified in BS EN 294: 1992.

8 If inspectors come across dough mixers supplied since 15 July 2000 where the manufacturer/supplier is claiming conformity with BS EN 453: 2000 but is not meeting the standard outlined in para 7, the Food Section should be contacted. A SAPID form should also be raised in accordance with [OM 2001/111](#) and copied to the Food Section and FOD Safety Unit (SU). The Food Section will give consideration to what course of action should be taken in liaison with FOD SU.

Date first issued: 18 February 2002

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## APPENDIX 1 (para 1)

### PREN 453 - DOUGH MIXERS - SAFETY AND HYGIENE REQUIREMENTS

#### Formal Vote Position

HSE votes **not** to accept the document as a European Standard.

#### TECHNICAL COMMENTS

1 The standard does not differentiate between double and single arm mixers. Double arm mixers are more hazardous due to the relatively easy access to the scissor action of the arms which presents a trapping and shearing risk.

2 Although it is accepted that to have a gap in the guard for taking samples or scraping dough away may be 'state of the art' and that for this reason it may not be possible to comply with the safety distances in EN 294: 1992, it is considered that the distances specified in Table 1 permit access to the hazard which is far easier than it need necessarily be.

3 Figure 2(a) is somewhat misleading in that it graphically depicts "a" as being small and "b" as being quite large.

4 In reality, if we look at another example of figure 2(a) which shows for example the conditions in line 2 of table 1 (120 less than b less than or equal to 230) and represent them accurately to scale it would appear as follows:

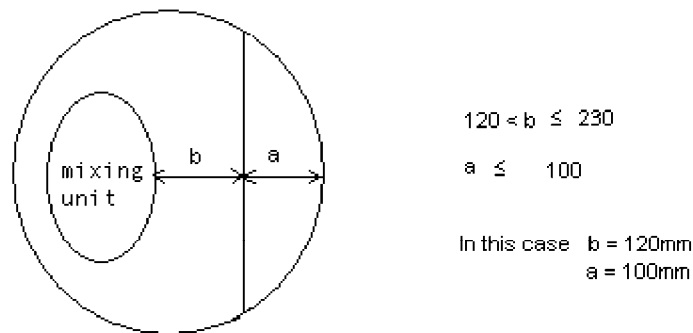


figure 2a

5 From the revised figure 2a we can see that it would be fairly easy to reach into, for example, in the case of a double arm mixer the trapping point between the arms.

6 I am also attaching to this report a life-size sketch (sketch 1) showing what is permitted by this particular example.

7 If there is to be a gap for taking samples/scraping dough, then the gap "a" should be a set size and correspondingly b should be prescribed as a minimum. There is no justification for increasing dimension 'a' simply because 'b' is increased.

8 The distance 'd' before the interlocking device is actuated is excessive. In addition a further 4 seconds once the 75mm is reached is permitted for stopping the mixer arm(s). In our view this would permit ready access on run down as well as ready **continuous** access if the guard was to be deliberately raised to just below 75mm. There is certainly no justification for increasing "d" just because "b" is increased and instead we suggest that this clause should specify that operation of the lid interlock switch should be such that the requirements of EN 294 and EN 1088 are met.

9 To summarise our position:

- (a) The dimensions specified in Table 1 permit easy access to the hazards listed in 4.1 of the standard;
  - (b) If an operator was to become entangled via this route (through the gap) the mixer would continue to operate;
  - (c) We accept that it may not be possible to meet the dimensions of EN 294 but suggest that a package which could incorporate, the following measures would address some of the deficiencies noted above:
    - (i) "a" a fixed dimension
    - (ii) hatched area only half width of bowl ie quadrant
    - (iii) "b" a fixed minimum dimension
    - (iv) "d" a fixed dimension to meet EN 294 and EN 1088
    - (v) Stopping time reduced.
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## APPENDIX 2 (para 3)

### EXTRACT FROM NATIONAL FOREWORD OF BS EN 453: 2000

"The United Kingdom as a member of CEN is obliged to publish EN 453: 2000 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard the United Kingdom has consistently voted against its approval as an EN. The UK believes that the standard is deficient in certain safety requirements compared with the state of the art for these machines in the UK and that in consequence the standard fails to meet some of the essential requirements of the EC Machinery Directive, 89/392 and amendments, which it claims to meet.

As part of BSI's duty of care we draw attention to users of BS EN 453: 2000 of our concern that the standard does not differentiate between single arm mixers and double arm mixers which are more hazardous due to the relatively easy access to the scissor action of the arms. Furthermore the standard contains inadequate safety distance requirements for protection of personnel against unintentional contact with the hazards presented by dough mixing machines. BSI will assume no liability whatsoever for any failure on the part of any user of this standard to consider these aspects"