

## **CANDIDATE'S ANSWER**

A, EQE 2017

### A dishwasher product

The present invention relates to a dishwasher product.

Known dishwasher products include dishwasher tablets. Such tablets may contain detergent only, or they may additionally contain further dishwashing components, like salt and rinse aid.

There are several problems with such tablets. First of all, such tablets may be pressed together to form the tablet and these tablets are liable to fall apart before they are used and therefore become unusable. Other tablets, such as those disclosed in D1, comprise different components which are glued together to form the tablet. Although such tablets have the advantage of being more convenient than pressed tablets, which can only comprise a single component, as they do not require that all the components are provided separately by the user during the washing cycle, they suffer from the disadvantage that the glue does not always hold the different components together properly.

Tablets generally also suffer from the problem of not being stable for very long periods of time and therefore, they do not have a very long shelf-life. This instability is caused by components in the tablets that react with moisture from the air. A further problem is that users do not like to touch the tablets. Furthermore, it is difficult to control the solubility of the tablets, such that some components get released too early while others too late and this is difficult to attain with tablets.

Document D2 aims to alleviate some of the problems associated with tablets, (specifically those related to contact with the tablet causing breakage and to moisture in the air causing the tablet to lose some of its activity during storage) by providing a dishwasher product according to the preamble of Claim 1. D2 solves these problems by packaging the tablets in a pouch made of polymer film that protects them from breakage and provides a protective environment. When a user wants to use a tablet, he or she only needs to open the pouch and put the tablet in a

compartment of the dishwasher. D2 also disclosed a strip of such pouches, wherein the pouches are connected together and easily separated by the provision of perforations between the pouches. D2 also discloses that the polymer may be made of PVA (polyvinyl alcohol) and that the pouches may be closed by heat sealing, and further discloses water soluble pouches comprising a PVA film of a thickness of 40µm. A problem with the pouches of D2 which are not water-soluble is that they need to be removed before use, which is not very practical, whereas a problem with the water-soluble pouches is that they release their entire contents simultaneously and so it is not possible to control the release of the different components.

It is therefore an object of the present invention to provide a dishwasher product according to the preamble of Claim 1 which releases dishwasher components at different stages of the dishwasher cycle. This object is attained by a device according to the combination of features of independent Claim 1.

According to a first aspect of the present invention, there is provided a dishwasher product as claimed in Claim 1. In the invention of Claim 1, the dishwasher components are contained in discrete pockets which serve to protect the tablets from breakage due to contact and to protect them from the moisture in the external environment. Furthermore, each pouch is made of a water-soluble PVA film wherein at least two of the pouches are of a different thickness. The thickness of the PVA film affects its solubility, thus the pouches with thicker PVA film walls will take longer to dissolve and so will release their contents at different stages of the wash cycle. In this regard, the pouches may contain different dishwasher components suited for the different stages of the cycle.

This has the advantage that it is possible to control which dishwasher components get released during the cycle, and when. Controlled exposure of the dishes to the components leads to greater cleaning efficacy and efficiency, thereby resulting in less detergent being needed, and results in a reduced risk of damage to the dishes.

Further advantageous embodiments to the product according to the invention have been specified in dependent Claims 2 to 12.

Optionally, the product comprises at least three pouches. Thus, the product is capable of releasing components according to the main wash, the intermediate rinse cycles and the final rinse of the cycle.

Optionally, the thickness of the film of all of the pouches is different from each other. Thus, the pouches will release their contents at different stages. Embodiments wherein at least two pouches have the same thickness for where two components must be released at the same time but cannot be stored together in contact with each other.

Optionally, the thickness of the film of each pouch is between 20µm and 40µm. Such a range provides a good balance between being released at the right time and being strong enough not to break during storage.

Optionally, the pouches are connected to each other. Such a configuration provides a more compact and convenient product.

Optionally, the pouches are arranged next to each other. This configuration minimises the sealing between pouches and therefore improves product quality.

Optionally, the pouches are arranged on top of each other. Such a configuration provides for an even more compact and convenient product.

Optionally, the pouches enclose different combinations of liquid and solid components. This results in a very versatile product.

Optionally, the pouches contain a detergent and/or salt and/or a rinse aid. Thus the pouches release dishwashing components.

Optionally, the dishwasher component contained in at least two of the pouches is different from each other. Thus, the product may release one type of component at one stage in the cycle and another at another stage. The dishwasher components do not need to be different from one another however, as the same composition may need to be released at a different (i.e. later) stage of the cycle, for example during or between the intermediate rinse cycles, depending partly on their number, or during or between any other part of the cycle.

Optionally, the average molecular weight of the film is between 10,000 and 300,000g/mol, and more preferably between 20,000 and 150,000g/mol.

According to a second aspect of the present invention, there is provided a method of manufacturing the product of any one of Claims 1 to 12 as claimed in Claim 13. In the invention as claimed in Claim 13, dishwasher components are placed onto a PVA film having parts of different thicknesses and the parts are closed by heat sealing to form a plurality of enclosed pouches of different thickness which enclose the dishwasher components. Such a method provides the product of Claim 1 and its advantages. Heat sealing provides a simple and effective means of closing the pouches.

Optionally, the pouches are joined together by heat sealing. Heat sealing provides a simple and effective means of joining the pouches together.

Optionally, the different parts of the PVA film having different thicknesses is provided by rolling the film into different parts of different thicknesses. Preferably, the film is rolled into 3 parts of different thicknesses as this corresponds with the 3 main stages of wash cycle during which dishwasher composition is released.

### Claims

1. A dishwasher product (1) comprising a plurality of pouches (2, 3, 4) containing a dishwasher component, wherein each pouch is enclosed by a water-soluble PVA film having a thickness of between 10µm and 50µm, characterised in that the thickness of the film of at least two pouches is different from each other.
2. The dishwasher product (1) of Claim 1, wherein the product comprises at least three pouches (2, 3, 4).
3. The dishwasher product of Claim 1 or Claim 2, wherein the thickness of the film of all of the pouches (2, 3, 4) is different from each other.
4. The dishwasher product (1) of any preceding claim, wherein the thickness of the film of each pouch (2, 3, 4) is between 20µm and 40µm.

5. The dishwasher product (1) of any preceding claim, wherein the pouches (2, 3, 4) are connected to each other.
6. The dishwasher product (1) of Claim 5, wherein the pouches (2, 3, 4) are arranged next to each other.
7. The dishwasher product (1) of Claim 5, wherein the pouches (2, 3, 4) are arranged on top of each other.
8. The dishwasher product (1) of any preceding claim, comprising a combination of liquid and solid dishwasher components enclosed in different pouches (2, 3, 4).
9. The dishwasher product (1) of any preceding claim wherein the dishwasher component contained in the pouches (2, 3, 4) comprises a detergent and/or salt and/or a rinse aid.
10. The dishwasher product (1) of any preceding claim, wherein the dishwasher component contained in at least two of the pouches (2, 3, 4) is different from each other.
11. The dishwasher product (1) of any preceding claim, wherein the average molecular weight of the film is between 10,000 and 300,000g/mol.
12. The dishwasher product (1) of Claim 11, wherein the average molecular weight of the film is between 20,000 and 150,000g/mol.
13. A method of manufacturing the dishwasher product (1) according to any one of Claims 1 to 12, comprising the steps of:

providing a water-soluble PVA film having a plurality of parts of different thickness of between 10µm and 50µm;

placing dishwasher components onto each part of the film with different thicknesses; and

closing the parts of the film by heat sealing to form a plurality of enclosed pouches (2, 3, 4) of different thicknesses enclosing the dishwasher components.

14. The method of Claim 13 comprising the further step of joining the pouches (2, 3, 4) together by heat sealing.
15. The method of Claim 13 or 14, comprising the further step of, before the step of providing the PVA film having a plurality of parts of different thicknesses, rolling the film into said plurality of parts of different thicknesses, optionally into 3 parts.

**Examination Committee I: Paper A - Marking Details - Candidate No**

Category		Max. possible	Marks Marker 1	Marker 2
Claims	Independent claims - Product claim	36	36	36
Claims	Independent claims - Method claims	32	32	32
Claims	Independent claims - Use claim	2	0	0
Claims	Dependent claims	15	12	14
Description	Description	15	9	9
<b>Total</b>			<b>89</b>	<b>91</b>

Examination Committee I agrees on 90 points and recommends the grade PASS