

Product group: Co-Processed MCC
 Brand name: Pharmacel® sMCC 90
 Article code: SAP: 1177333, Navision: 13127-5355
 Product descriptions: Silicified Microcrystalline Cellulose
 Document No.: PD- 0841 Page 1 of 6

Dear Customer,

1. Stability Statement

DFE Pharma has defined a shelf life for all of its products based on a stability testing program conforming to IPEC Excipient Stability Program Guide 2022.

DFE Pharma guarantees that its products comply with all specifications up until the end of their shelf life period (the retest date), when stored in the original unopened packaging. For Pharmacel® sMCC 90 the established shelf life is 48 months, based on ongoing stability studies.

There is no special controlled storage condition required. Our recommendation is to store the product in its original unopened pack at normal warehouse conditions. This recommendation is supported by our stability studies covering both physical/chemical and microbiological attributes.

Our experience of many years as supplier of microcrystalline cellulose to customers all over the world including humid and hot regions confirms that our products are stable during storage and transport.

2. Materials and Methods

DFE-Pharma conducts a stability program conforming IPEC Excipients Stability Program Guide 2022 for supporting the stability of its products. Pharmacel® sMCC 90 batches were produced at Chemfield Cellulosics Pvt. Ltd.(CCPL) and produced exclusively for DFE Pharma in Nagpur, India. The batches have been stability tested under ICH long term and accelerated conditions (Table 1) and are representative of Pharmacel® sMCC 90 batches made in this factory.

Table 1: Overview of batches Pharmacel® sMCC 90

| Batch | Prod. date | Pack on stability | Stability start | Duration of data (months) at | |
|-----------|------------|-------------------|-----------------|------------------------------|------------|
| | | | | 25°C/60%RH | 40°C/75%RH |
| CB20L1149 | Dec-20 | small | Dec-20 | 36 | 6 |
| CB20L1150 | Dec-20 | small | Dec-20 | 36 | 6 |
| CB20L1151 | Dec-20 | small | Dec-20 | 36 | 6 |

3. Packaging and storage

The batches were stored in downscaled commercial bags, consisting of 400g sample in single PE inner liner (80 micron) and outer bag (200µm). The packaged material was stored at 25°C/60%RH or 40°C/75%RH.

At each scheduled time point the batches were analyzed for selected tests from the product specification using the specified analytical methods. The selected tests are those deemed relevant to potential chemical, functional and microbiological product acceptability.

4. Results and Discussion

The data show that all tested parameters are within specification. The moisture content is the stability indicating parameter and remains well within specification for all tested batches.

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Extrapolation of the moisture content show no risk for out of specifications up to at least 48 months. This approach is in compliance with IPEC stability guide and in line with the product knowledge and experience we have regarding the stability of other grades of Microcrystalline. This supports an extension of the retest data for Pharmacel® sMCC 90 to 48 months.

To exemplify the results the data of the batches Pharmacel® sMCC 90 are shown in the tables in the appendix.

5. Conclusion

For Pharmacel® sMCC 90, based on 36 months stability data and our knowledge of other grades of Microcrystalline Cellulose, the product shelf life is extended to 48 months.

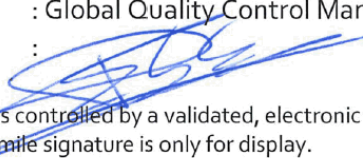
The retest date as documented on the product and the corresponding Certificate of Analysis is generated as follows:

Retest date = (Production date) + (retest date in months) – (one month)
Pharmacel® sMCC 90 = (Production date) + 47 months

The retest date in the ERP system and CoA has been adapted with the extended shelf life and will be printed on newly produced batches. It is not possible to adapt the retest/ expiry date printed on the CoA and packaging label of batches produced before this shelf life extension. Batches produced before the shelf life extension fulfill the product specification parameters till the revised shelf life and DFE Pharma confirms with this document that the customer can use batches produced prior to the shelf life extension until the extended shelf life of 48 months.

This document substitutes all previous versions issued for the brand names mentioned above. We trust this information, which is made up to the best of our knowledge, will be helpful to you.

With kindest regards,

Name : Peter Ebben
Job title : Global Quality Control Manager
Signature : 

This document is controlled by a validated, electronic system and is valid without signature.
The above facsimile signature is only for display.

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Appendix: Stability data Pharmacel® sMCC 90

| Product | Batch | Prod date | Start stab | | Packaging | | | | | | |
|-----------------------------|------------------|--------------------|------------|------|-----------|------|------|------|------|------------|------|
| sMCC 90 | CB20L1149 | Dec-20 | Dec-20 | | small | | | | | | |
| Article code: 1177333 | 1081HDB | months at 25°C/60% | | | | | | | | 40°C/75%rH | |
| Test | Specification | 0 | 3 | 6 | 9 | 12 | 18 | 24 | 36 | 3 | 6 |
| Identification (A,B,C,C) | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass |
| Degree of polymerization | max 350 | 201 | 202 | 203 | 203 | 204 | 204 | 205 | 206 | 201 | 201 |
| Solubility | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass |
| pH | 5,0 - 7,0 | 6,2 | 6,2 | 6,2 | 6,3 | 6,3 | 6,3 | 6,3 | 6,2 | 6,2 | 6,2 |
| Conductivity | max 75 µS/cm | 28 | 28 | 29 | 29 | 29 | 30 | 31 | 31 | 29 | 29 |
| Ether soluble substances | max 0,05% | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |
| Water soluble substance | max 0,24% | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 |
| Heavy metals | max 10 ppm | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass |
| Loss on drying | max 6,0% | 3,4 | 3,6 | 3,7 | 3,8 | 3,9 | 4,0 | 4,1 | 4,1 | 3,5 | 3,6 |
| Residue on ignition | max 1,8 - 2,2% | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 |
| Particle size >75 µm | 45,0 - 80,0 % | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 53 | 54 | 54 |
| Particle size >250 µm | max 8% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Particle size d10 (Malvern) | 20-50 µm | 33 | 38 | 33 | 34 | 35 | 32 | 33 | 33 | 37 | 33 |
| Particle size d50 (Malvern) | 90-150 µm | 110 | 121 | 111 | 110 | 111 | 106 | 110 | 108 | 119 | 111 |
| Particle size d90 (Malvern) | 190-300 µm | 269 | 247 | 239 | 224 | 225 | 233 | 234 | 229 | 245 | 228 |
| Bulk density | 0,25 - 0,37 g/ml | 0,32 | 0,32 | 0,32 | 0,32 | 0,32 | 0,32 | 0,32 | 0,32 | 0,32 | 0,32 |
| Tapped density | 0,37 - 0,50 g/ml | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 |
| TAMC | max 100 cfu/g | <100 | -- | -- | -- | -- | -- | -- | <100 | -- | -- |
| TYMC | max 20 cfu/g | <20 | -- | -- | -- | -- | -- | -- | <20 | -- | -- |
| Escherichia coli | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |
| Staphylococcus aureus | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |
| Pseudomonas aeruginosa | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |
| Salmonella | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |

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| Product | Batch | Prod date | Start stab | | Packaging | | | | | | |
|-----------------------------|------------------|--------------------|------------|--------|-----------|------|------|------|------|------------|------|
| sMCC 90 | CB20L1150 | Dec-20 | Dec-20 | Dec-20 | small | | | | | | |
| Article code: 1177333 | 1081HB9 | months at 25°C/60% | | | | | | | | 40°C/75%rH | |
| Test | Specification | 0 | 3 | 6 | 9 | 12 | 18 | 24 | 36 | 3 | 6 |
| Identification (A,B,C,C) | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass |
| Degree of polymerization | max 350 | 200 | 200 | 201 | 201 | 202 | 203 | 204 | 205 | 201 | 201 |
| Solubility | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass |
| pH | 5,0 - 7,0 | 6,2 | 6,2 | 6,2 | 6,3 | 6,2 | 6,3 | 6,2 | 6,3 | 6,2 | 6,2 |
| Conductivity | max 75 µS/cm | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 32 | 30 | 30 |
| Ether soluble substances | max 0,05% | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| Water soluble substance | max 0,24% | 0,16 | 0,16 | 0,16 | 0,16 | 0,16 | 0,16 | 0,16 | 0,15 | 0,16 | 0,16 |
| Heavy metals | max 10 ppm | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass |
| Loss on drying | max 6,0% | 3,0 | 3,2 | 3,3 | 3,4 | 3,5 | 3,6 | 3,6 | 3,7 | 3,3 | 3,3 |
| Residue on ignition | max 1,8 - 2,2% | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 |
| Particle size >75 µm | 45,0 - 80,0 % | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 54 | 55 | 55 |
| Particle size >250 µm | max 8% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Particle size d10 (Malvern) | 20-50 µm | 32 | 36 | 30 | 33 | 33 | 32 | 34 | 31 | 34 | 31 |
| Particle size d50 (Malvern) | 90-150 µm | 110 | 119 | 108 | 112 | 111 | 109 | 110 | 115 | 118 | 108 |
| Particle size d90 (Malvern) | 190-300 µm | 271 | 246 | 226 | 229 | 228 | 236 | 235 | 232 | 245 | 231 |
| Bulk density | 0,25 - 0,37 g/ml | 0,31 | 0,31 | 0,31 | 0,31 | 0,30 | 0,30 | 0,30 | 0,30 | 0,31 | 0,31 |
| Tapped density | 0,37 - 0,50 g/ml | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 |
| TAMC | max 100 cfu/g | <100 | -- | -- | -- | -- | -- | -- | <100 | -- | -- |
| TYMC | max 20 cfu/g | <20 | -- | -- | -- | -- | -- | -- | <20 | -- | -- |
| Escherichia coli | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |
| Staphylococcus aureus | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |
| Pseudomonas aeruginosa | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |
| Salmonella | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |



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| Product | Batch | | Prod date | Start stab | Packaging | | | | | | |
|-----------------------------|------------------|------|--------------------|------------|-----------|------|------|------|------|------------|------|
| sMCC 90 | CB20L1151 | | Dec-20 | Dec-20 | small | | | | | | |
| Article code: 1177333 | 1081HCR | | months at 25°C/60% | | | | | | | 40°C/75%rH | |
| Test | Specification | 0 | 3 | 6 | 9 | 12 | 18 | 24 | 36 | 3 | 6 |
| Identification (A,B,C,C) | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass |
| Degree of polymerization | max 350 | 199 | 199 | 200 | 200 | 201 | 202 | 202 | 204 | 199 | 200 |
| Solubility | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass |
| pH | 5,0 - 7,0 | 6,2 | 6,3 | 6,3 | 6,3 | 6,2 | 6,2 | 6,2 | 6,2 | 6,3 | 6,3 |
| Conductivity | max 75 µS/cm | 28 | 29 | 29 | 29 | 30 | 31 | 31 | 31 | 29 | 30 |
| Ether soluble substances | max 0,05% | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| Water soluble substance | max 0,24% | 0,16 | 0,16 | 0,16 | 0,16 | 0,16 | 0,16 | 0,16 | 0,16 | 0,16 | 0,16 |
| Heavy metals | max 10 ppm | pass | pass | pass | pass | pass | pass | pass | pass | pass | pass |
| Loss on drying | max 6,0% | 2,9 | 3,0 | 3,0 | 3,0 | 3,1 | 3,3 | 3,4 | 3,4 | 3,0 | 3,1 |
| Residue on ignition | max 1,8 - 2,2% | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 |
| Particle size >75 µm | 45,0 - 80,0 % | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 53 | 54 | 54 |
| Particle size >250 µm | max 8% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Particle size d10 (Malvern) | 20-50 µm | 32 | 38 | 34 | 37 | 36 | 32 | 33 | 37 | 38 | 35 |
| Particle size d50 (Malvern) | 90-150 µm | 109 | 121 | 112 | 117 | 118 | 108 | 109 | 112 | 122 | 117 |
| Particle size d90 (Malvern) | 190-300 µm | 266 | 246 | 234 | 237 | 238 | 237 | 236 | 237 | 248 | 244 |
| Bulk density | 0,25 - 0,37 g/ml | 0,30 | 0,30 | 0,30 | 0,30 | 0,30 | 0,30 | 0,30 | 0,30 | 0,30 | 0,30 |
| Tapped density | 0,37 - 0,50 g/ml | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 | 0,45 |
| TAMC | max 100 cfu/g | <100 | -- | -- | -- | -- | -- | -- | <100 | -- | -- |
| TYMC | max 20 cfu/g | <20 | -- | -- | -- | -- | -- | -- | <20 | -- | -- |
| Escherichia coli | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |
| Staphylococcus aureus | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |
| Pseudomonas aeruginosa | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |
| Salmonella | Negative in 10 g | neg | -- | -- | -- | -- | -- | -- | neg | -- | -- |