

TYLOPUR[®] & METOLOSE[®]

Food Grades



Food Ingredients for your #BestBite

ShinEtsu



Soft crumb and high volume
in gluten-free bread



Best bite in
plant-based products

Benefits of TYLOPUR[®] and METOLOSE[®]



Cost optimization
for meat products



Stabilization of
reformed products

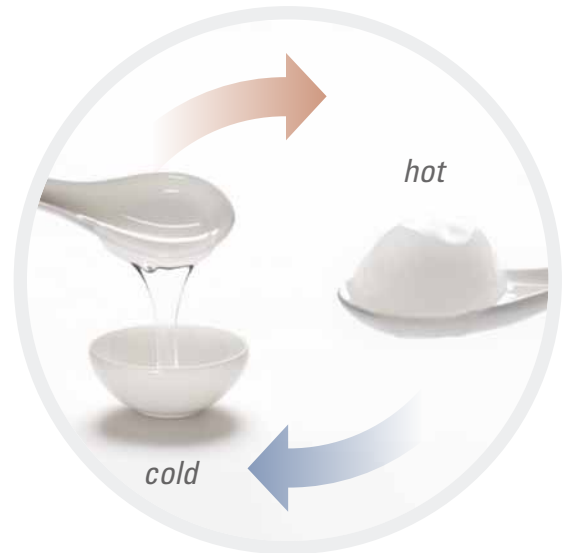
TYLOPUR® and METOLOSE® are Beneficial for Many Applications

| Applications | Benefits of TYLOPUR® | Recommended grades | Dosage level [%] |
|--|--|--|------------------|
| Plant-based products  | <ul style="list-style-type: none"> Creates strong bite Creates juicy texture Mimics meat-like texture | MCE-100TS MCE-4000 MCE-250T | 0.5 – 2.0 |
| Gluten-free products  | <ul style="list-style-type: none"> Increases volume Creates soft texture Mimics properties of gluten | NE-15000 NE-4000 SFE-4000 | 0.6 – 1.5 |
| Cost-effective meat  | <ul style="list-style-type: none"> Creates strong bite Imitates meat structure during warm consumption Lowers overall costs | MCE-100TS | 0.7 – 2.0 |
| Fillings – savory and sweet  | <ul style="list-style-type: none"> Retains product integrity at high temperatures Prevents blowouts and leakage | MCE-4000 NE-15000 MCE-250T | 0.3 – 0.6 |
| Reformed products <i>(potato, meat, cheese, fish)</i>  | <ul style="list-style-type: none"> Stabilizes reformed products Prevents blowouts and leakage Reduces oil uptake | MCE-4000 MCE-100TS | 0.2 – 0.5 |
| Non-dairy whipped cream  | <ul style="list-style-type: none"> Improves overrun Stabilizes non-dairy whipped cream | SFE-50 SFE-400 NE-4000 | 0.1 – 0.6 |






For further applications please contact us – we look forward to assisting you.

Unique Stabilizer






TYLOPUR® and METOLOSE® food grades stabilize your food system even where other typical hydrocolloids fail. Our products ensure that structured products have a good shape and texture throughout the steps of processing, frying, cooking, freezing, and making the final preparations for serving. TYLOPUR® and METOLOSE® have the unique property of increasing viscosity during heating that will solve your problems.



Benefits

-  Maintain product shape during heating
-  Provide reversible thermal gelation
-  Prevent hard and gummy textures
-  Provide fat-like mouthfeel
-  Control viscosity at low and high temperature

General Properties

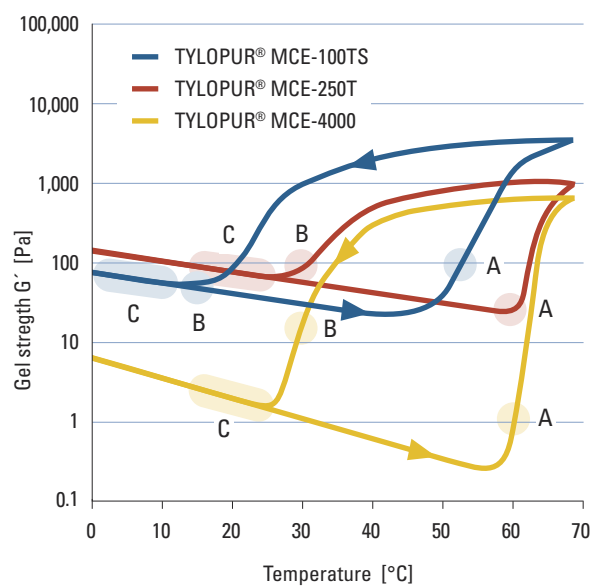
-  Plant-based
-  Thickening
-  Film-forming
-  Stable in various pHs
-  Derived from non-GMO wood pulp

Thermal Gelation

TYLOPUR® and METOLOSE® have the unique property of increasing viscosity during heating. When food containing TYLOPUR® and METOLOSE® is heated, a gel starts to form above a given temperature.

The figure shows the thermal gelation of 1,5 % TYLOPUR® MCE-100TS, TYLOPUR® MCE-250T, and TYLOPUR® MCE-4000 solutions.






If the solution is heated, the viscous solution starts to gel (A) and the viscosity increases. During cooling, the viscosity drops to the original value (B). It is necessary to cool below the hydration temperature (C) of the wet food containing TYLOPUR® and METOLOSE®, to guarantee optimal functionality.



Grades of TYLOPUR® and METOLOSE®



| Viscosity 2 % aqueous solution [mPa·s] | MCE-100TS | MCE | SFE | SE | NE |
|--|--------------------------|-------------------------|--|---------------------|-------------------------|
| 6 | | | | SE-6 T | |
| 15 | | MCE-15 M | | | |
| 50 | | | SFE-50 T | | |
| 400 | | MCE-400 M | SFE-400 T | | |
| 1500 | | MCE-1500 M | | | |
| 4000 | | MCE-4000 T | SFE-4000 T M | | NE-4000 T |
| 15000 | | | | | NE-15000 T |
| 110000 | MCE-100TS T | | | | |
| 250000 | MCE-250T T | | | | |

T available as TYLOPUR® M available as METOLOSE®

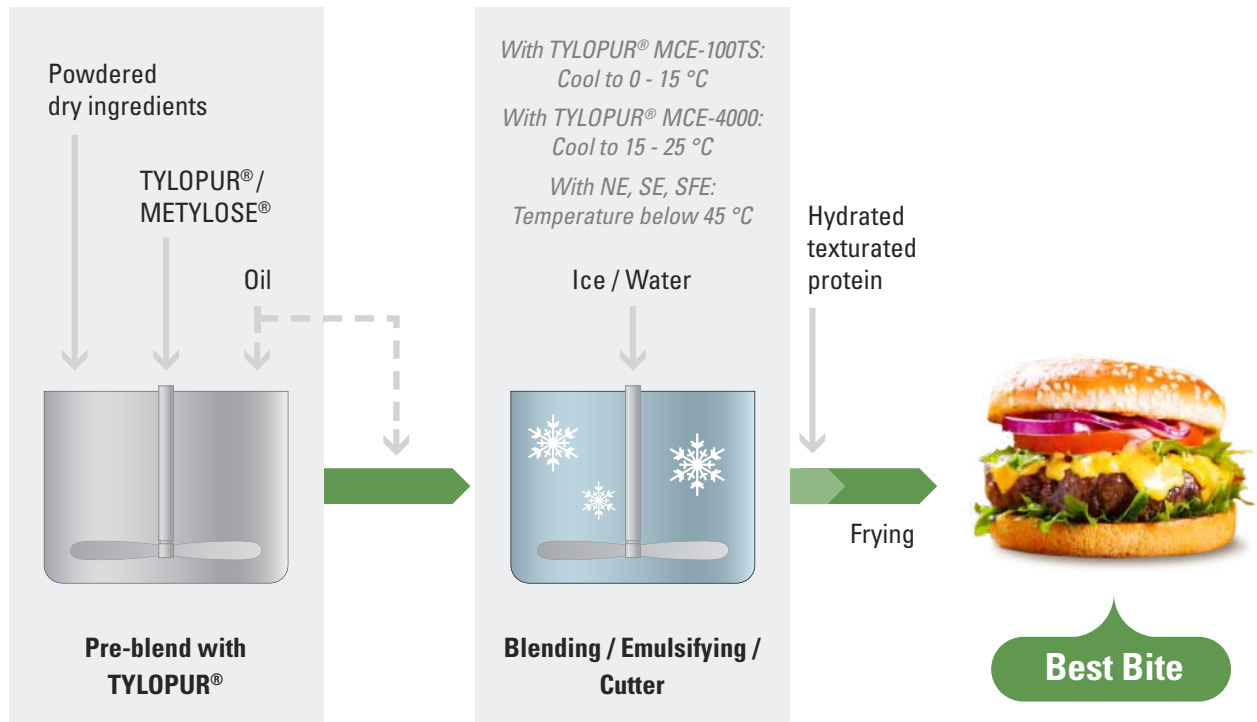
| | MCE-100TS | MCE | SFE | SE | NE |
|---|---|---|---|--|---|
| Pictures of hot gel of a 2 % aqueous solution |  |  |  |  |  |
| Labeling | Methylcellulose, E461 USA: Modified Cellulose | | Hydroxypropyl Methylcellulose, E464 USA: Modified Cellulose | | |
| Methoxyl content [%] | 27.5 – 31.5 | 27.5 – 31.5 | 27 – 30 | 28 – 30 | 19 – 24 |
| Hydroxypropoxyl content [%] | 0 | 0 | 4 – 7.5 | 7 – 12 | 4 – 12 |
| Gelation temperature* (A) | 55 °C | 60 °C | 70 °C | 65 °C | 75 °C |
| Disappearance of gel after heating* (B) | 15 °C | 30 °C | 50 °C | 55 °C | 65 °C |
| Hydration temperature* (C) | 0 – 15 °C | 15 – 25 °C | 45 °C | | |
| Properties | Very firm gel, cooling required | Firm gel, good shape and water retention | Semi-firm gel, foam stabilization | Semi-firm gel, very good film forming property | Soft gel, high sugar tolerance |

* Dosage and type of food affect gelation temperature, disappearance of gel, and hydration temperature

Right Preparation for the Best Bite

| Right Mixing | Right Cooling |
|--|---|
|  <p>Blend TYLOPUR® and METYLOSE® with other dry ingredients or oil before adding water. Bite is improved by emulsifying and by applying vacuum thereby.</p> |  <p>TYLOPUR® MCE-100TS: Decent bite if cooled below 15 °C, best bite if cooled below 5 °C during preparation. Other MCE grades: Cool once below 15 - 25 °C If NE, SE or SFE are used, no cooling is required</p> |

TYLOPUR® and METYLOSE® require the right preparation and cooling temperature to achieve their full potential. For example, an optimal bite in plant-based burgers is achieved when a pre-blended TYLOPUR® MCE-100TS is emulsified at high shear at temperatures below 5 °C.








Example Recipes





Plant-Based Fried Sausages



-  Hydrate textured wheat with twice the amount of water for 30 min.
-  Blend all dry ingredients with oil.
-  Add onions and the remaining water (< 5 °C) and emulsify all ingredients at high shear (if possible with vacuum) below 5 °C.
-  Mix the emulsion and the hydrated texturates.
-  Fill sausages and fry them at medium temperature.




| Ingredients | Dosage [%] |
|---------------------------|------------|
| Water | 58.7 |
| Canola oil | 13 |
| Textured wheat | 10 |
| Onions | 6 |
| Pea protein isolate | 5 |
| Potato starch | 3 |
| Spices style „Nürnberger“ | 2.5 |
| TYLOPUR® MCE-250T | 1.8 |
| <i>Total</i> | <i>100</i> |

Benefits

-  Strong meatlike bite
-  Perfect texture



Plant-Based Burger



-  Emulsify TYLOPUR® with all of the oil and 40 % of the water in a vacuum cutter.
-  Hydrate the textured wheat with the rest of water.
-  Mix all ingredients together, form and fry.






| Ingredients | Dosage [%] |
|--------------------------|------------|
| Water | 66 |
| Textured wheat | 19 |
| Oil | 10 |
| TYLOPUR® MCE-250T | 2 |
| Flavor & color | 1.7 |
| Salt | 0.6 |
| Potato starch | 0.7 |
| <i>Total</i> | <i>100</i> |

Benefits

-  Best bite
-  Meatlike texture



Vegetarian Sausage



-  Blend all dry ingredients except for the egg white powder.
-  Add oil and blend well.
-  Add onions and water (if possible < 5 °C) and emulsify all ingredients. Cool mix below 20 °C.
-  Add egg white powder and emulsify well.
-  Fill sausages and heat them for about 10 min to an inner temperature above 70 °C in hot but not boiling water.





| Ingredients | Dosage [%] |
|----------------------------|------------|
| Water | 56 |
| Canola oil | 18 |
| Soy protein | 8 |
| Egg white powder | 5 |
| Aroma vegetarian sausage | 4.5 |
| Onions | 4 |
| Processed eucheama seaweed | 2 |
| TYLOPUR® MCE-4000 | 1.5 |
| Salt | 1 |
| <i>Total</i> | <i>100</i> |

Benefits

-  Strong meatlike bite
-  Perfect texture in cold and hot



Gluten-Free Bread



-  Weigh all dry ingredients and blend well.
-  Add liquid ingredients (29 °C) and knead for 6 min.
-  Prove 350 g in baking tins for 75 min (37 °C, > 80 % humidity).
-  Place bread in preheated oven with steam at 180 °C for 35 min. Leave the bread in the baking tin for 2 min after baking.






| Ingredients | Dosage [%] |
|--------------------------|------------|
| Water | 44 |
| Sourdough | 25.5 |
| Rice flour | 14 |
| Canola oil | 5 |
| Sugar | 3 |
| Psyllium | 2 |
| Yeast (fresh) | 2 |
| Rice sourdough | 1.5 |
| Salt | 1.5 |
| TYLOPUR® NE-15000 | 1.3 |
| Guar gum | 0.2 |
| <i>Total</i> | <i>100</i> |

Benefits

-  Good volume
-  Soft crumb



Gluten-free Bun



-  Blend all dry ingredients.
-  Add the liquid ingredients (29 °C) and knead the dough for 6 min.
-  Roll into the desired shape of about 60 – 70 g per piece.
-  Let prove for 50 min (37 °C, > 80 % humidity).
-  Bake at 170 – 180 °C rotating air for 20 min.









| Ingredients | Dosage [%] |
|-----------------------------|------------|
| Water | 43.47 |
| Corn starch | 23 |
| Rice flour | 15 |
| Sugar | 4 |
| Syrup | 3 |
| Psyllium | 2.3 |
| Yeast (fresh) | 2 |
| Pea protein (Cosucra, B9) | 1.7 |
| Salt | 1.4 |
| Rice sourdough (Böcker, 25) | 1.4 |
| Canola oil | 1.25 |
| TYLOPUR® NE-15000 | 1.2 |
| Guar gum | 0.28 |
| <i>Total</i> | <i>100</i> |

Benefits

-  Improved texture
-  Excellent volume



Cost-Effective Meat



-  **Matrix:** Mix dry ingredients of matrix with oil.
-  Blend and emulsify together with ice cold water at temperatures below 5 °C.
-  **Cost-effective meat:** Place ground meat in a cutter and blend for a few rounds.
-  Add seasoning ingredients.
-  Add ice and blend well until a temperature of 3 – 4 °C is reached.
-  Add oil and blend well until a temperature of 10 – 11 °C is reached.
-  Add matrix and blend briefly.
-  Fill the casings with the sausage mix and proceed with smoking, drying, and blanching.









| Ingredients matrix | [%] | Ingredients sausage | [%] |
|--------------------|------------|-----------------------|------------|
| Water | 72.7 | Matrix | 30 |
| Oil | 18.2 | Pork meat | 49 |
| MCE-100TS | 4.6 | Oil | 10.5 |
| Potato starch | 2.2 | Ice | 10.5 |
| Salt | 0.8 | <i>Total</i> | <i>100</i> |
| Sodium gluconate | 0.7 | | |
| MCC | 0.5 | | |
| Sodium carbonate | 0.4 | Seasoning | 33.2 |
| <i>Total</i> | <i>100</i> | <i>[g] per kg mix</i> | |

Benefits

-  Excellent bite
-  Lower costs



Potato Croquettes



-  Cook potatoes in salted water for about 15 min.
-  Mix dry ingredients.
-  Cool potatoes down to room temperature.
-  Add dry blend and mash potatoes.
-  Add water and mix well.
-  Form croquettes by extruding and breading.
-  Pre-fry 40 s at 180 °C, afterwards freeze croquettes.
-  Fry at 180 °C for 4 min before consumption.








| Ingredients | Dosage [%] |
|--------------------------|------------|
| Cooked floury potatoes | 80 |
| Water | 16 |
| Potato starch | 3 |
| Salt | 0.65 |
| TYLOPUR® MCE-4000 | 0.3 |
| Nutmeg | 0.05 |
| <i>Total</i> | <i>100</i> |

Benefits

-  Improved stability
-  Lower production costs



Non-Dairy Whipped Cream



-  Melt the palm kernel oil at 70 °C. Stir at 200 rpm. Add emulsifiers, **TYLOPUR® SFE-50**, and sodium alginate to the oil phase at 70 °C, while stirring at 300 rpm for 15 min.
-  Heat the water separately to 80 °C. Add the granulated sugar. Stir the mixture at 300 rpm for 10 min.
-  Slowly add the aqueous phase to the oil phase while stirring. Stir the mixture at 350 rpm for 30 min at 70 °C.
-  Homogenize the mixture at 50 °C and 500 bar.
-  Store the mixture at 4 – 8 °C for at least 24 h.
-  Before whipping, mix 2 parts of the whipped cream with 1 part cold water.
-  Whip the non-dairy whipped cream for 1 min at medium speed and for 3 more min at high speed.

| Ingredients | Dosage [%] |
|------------------------|------------|
| Water | 44.56 |
| Palm kernel oil | 32 |
| Sugar | 22 |
| TYLOPUR® SFE-50 | 0.6 |
| Polysorbate 60 | 0.3 |
| Salt | 0.19 |
| Sorbitan monostearate | 0.18 |
| Sodium alginate | 0.15 |
| Polysorbate 80 | 0.02 |
| <i>Total</i> | <i>100</i> |

Benefits

-  Stable creamy foam with increased overrun
-  Texture with fat-like mouthfeel

General Information

Description

White to slightly off-white powder

Certificates

GMO-free, Allergen free, Kosher, Halal
FSSC 22000, ISO 9001, ISO 14001

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