

Modified Asphalt Contactor Reactor

The STRATCO® Modified Asphalt Contactor™ (MAC) reactor is designed to blend modifiers with asphalt cement / bitumen to produce modified asphalt for the paving, bitumastic roofing or building industrial applications. It also functions as a booster heater to raise the temperature of the binder.

The high dispersion mixing in the MAC is achieved using the hydraulic head assembly, in conjunction with the unique internal vessel configuration, forcing the entire contents through multiple turnover cycles every minute.

Intense mixing capability enhances quality of products, through homogenous mixture and tight temperature control.

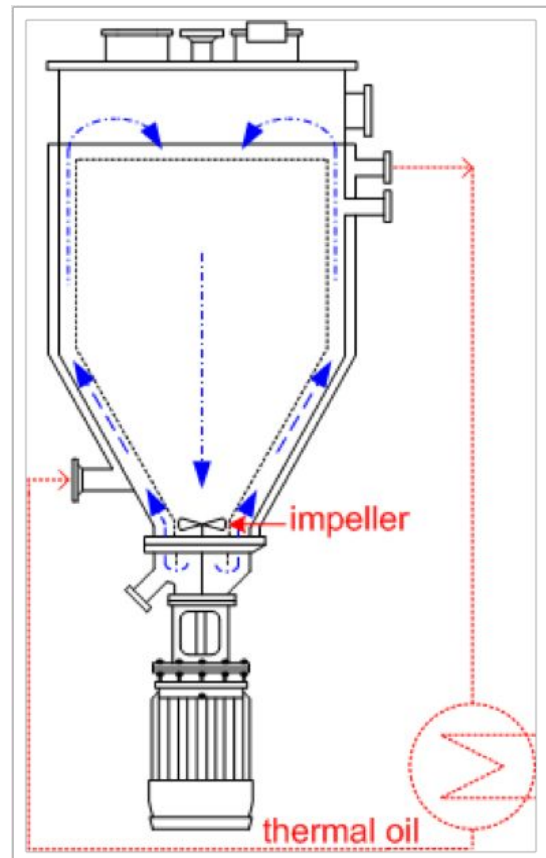
Turbulence is established between the stationary shear vanes and the blades of the impeller, resulting in a zone of high shear and intense mixing.

As the material passes through the impeller, its velocity is greatly increased. At the discharge side of the impeller, the stream is impinged against the diffuser vanes. The direction of the flow is reversed at the bottom of the hydraulic head where the vanes force an axial turbulent flow as the dispersion/emulsion passes through the annular space formed by the circulation tube and vessel wall. The liquid then flows over the top of the circulation tube and back into the impeller.

Heat transfer oil is circulated in the external heating jacket. High heat transfer coefficients are achieved by the high fluid velocities across the heating surface.

The MAC provides increased efficiency for manufacturers by offering:

- reduced curing time in polymer modification
- intense mixing capability, enhancing quality through homogenous composition
- more precise temperature control
- reduced energy cost through its heat transfer effectiveness
- less clogs and line shut downs than other mixers
- operating temperature range of 375-400 degrees Fahrenheit (can be higher, based on request)





The MAC was specially designed for high viscosity fluids, due to the high polymer and/or filler concentration of roofing asphalts.

In the original design the inner circulation tube was not heat jacketed, due to economical considerations. The heat transfer is still great, but with this solution the inner tube is removable. This provides easy cleaning during shutdown or maintenance.

If required, the inner tube could be heat jacketed for greater heating capabilities.

Polymer modification in all forms could be achieved by incorporating a colloid mill into the MAC production process.

The MAC can be designed for pressure operation as well in order to produce light hydrocarbon content adhesive (solvent based adhesive) that minimizes hydrocarbon vapor loss.

In summary, the MAC is capable of producing the following:

- all types of elastomers (e.g. SBS) modified asphalt/bitumen,
- all types of plastomers (e.g. APP) modified asphalt/bitumen,
- anionic or cationic asphalt/bitumen emulsions,
- light hydrocarbon (e.g. white spirit) containing asphalt for adhesives.

USES OF STRATCO® MODIFIED ASPHALT CONTACTOR™ REACTOR IN THE ASPHALT ROOFING INDUSTRY

1. asphalt modification and/or mineral filler dispersion for continuous or batch operation
2. booster heater for fillcoat stream for both batch or continuous operation
3. surge tank and booster heater for fillcoat stream for both batch and continuous operation

The next sections contain general flow charts of the different scenarios described above and the advantages that could be beneficial for a manufacturer of roofing materials.

I. ASPHALT/BITUMEN MODIFICATION, MINERAL FILLER DISPERSION IN CONTINUOUS OR BATCH OPERATION

The following is a typical general configuration for a roof shingle asphalt manufacturing process. If an easily dissolved polymer is utilized (e.g. APP) in the binder, followed by a better mineral filler dispersion. The circle, including the colloid mill is required only if asphalt modification is part of the process otherwise no need for that (Figure 1)

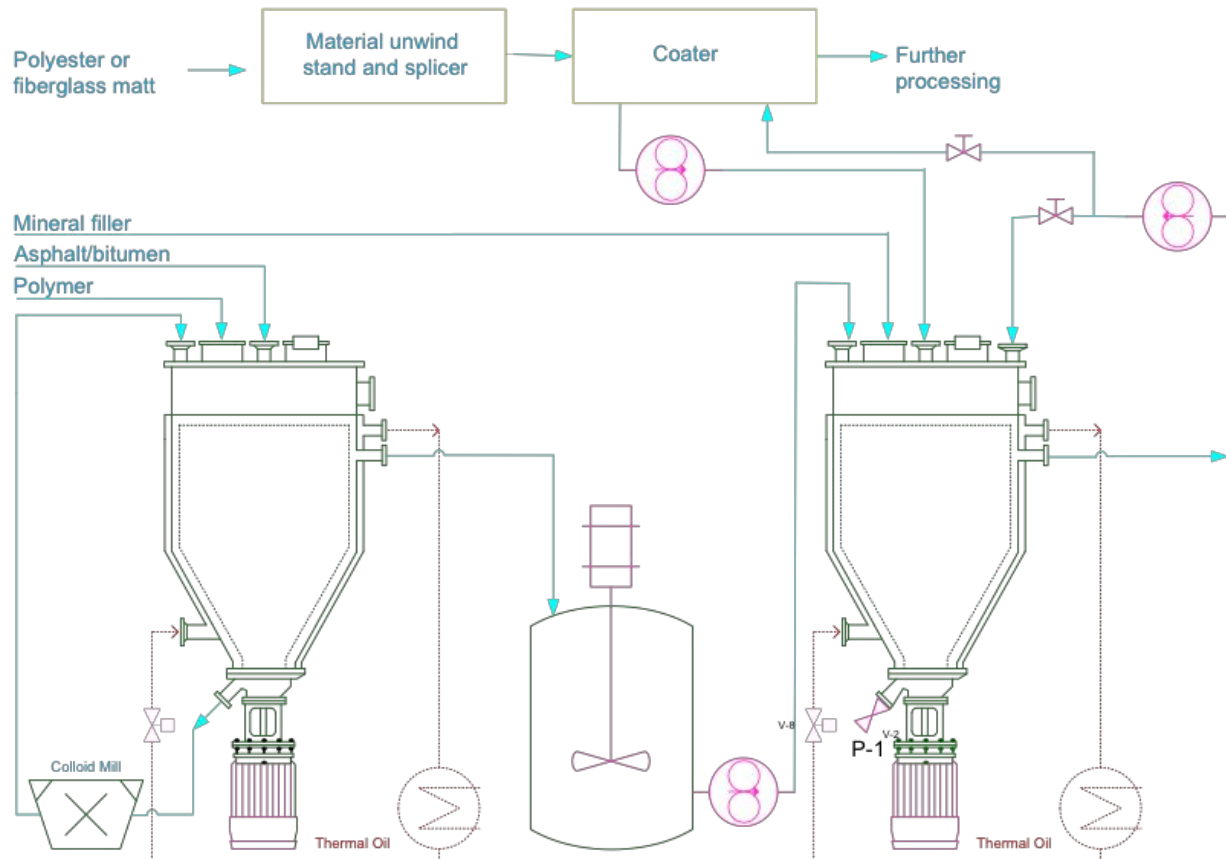


Figure 1. General flow chart of continuous or batch asphalt/bitumen modification and filler dispersion.

Advantages:

- Improved polymer and mineral filler dispersion and temperature control (no settlement, no clogging shutdowns)
- Booster Heater maintains elevated temperature for higher throughput production of shingles
- Reduced asphalt/bitumen modification time compared to conventional technology
- Reduced operation costs realized by significant heating energy savings and faster filler dispersion.

II. MINERAL FILLER DISPERSION IN CONTINUOUS OPERATION

When only the mineral fillers are needed to be dispersed into asphalt/bitumen a simplified configuration should be used (Figure 2)

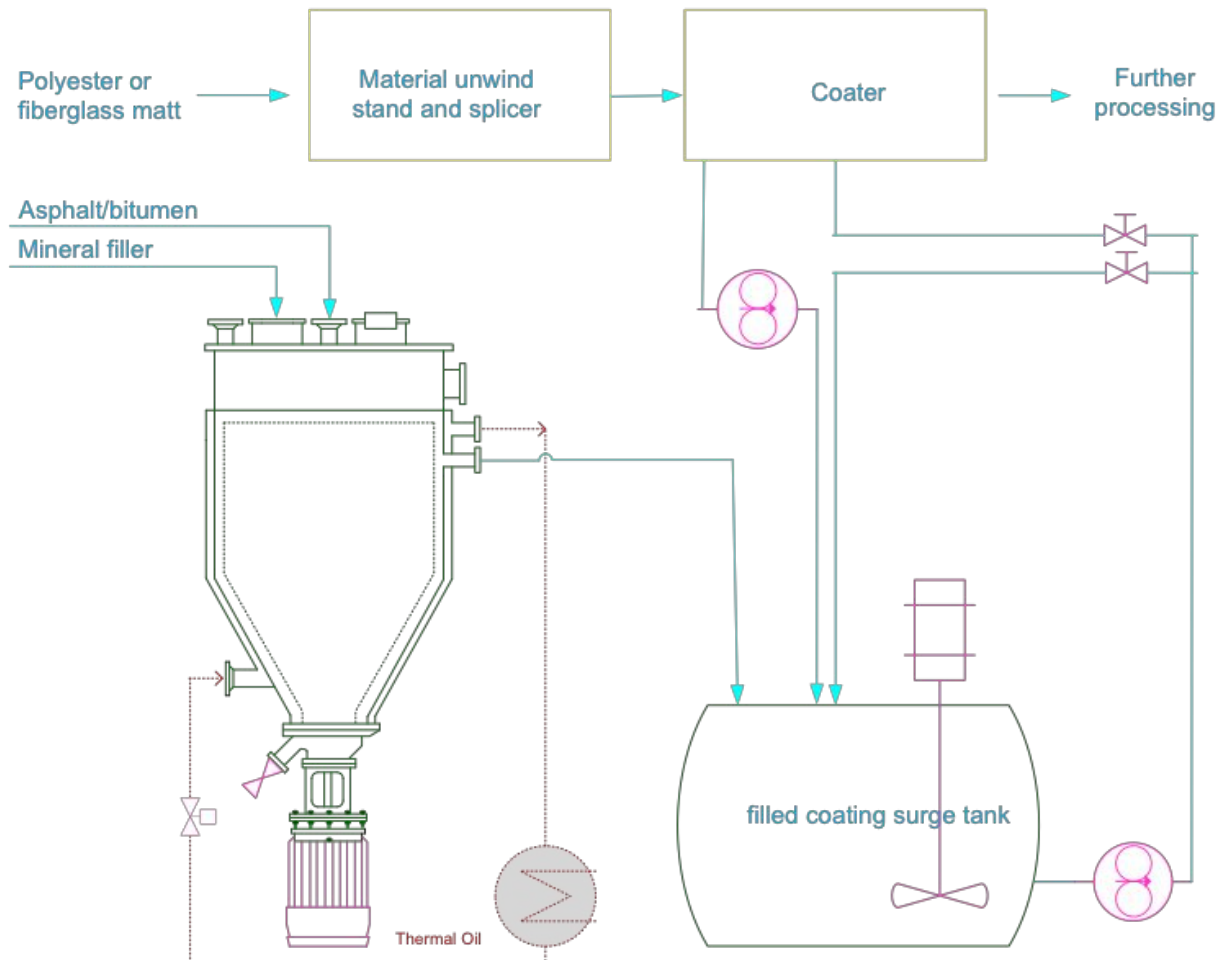


Figure 2. General flow chart of continuous mineral filler dispersion (into neat or modified binder).

Advantages:

- Multiple internal passes every minute to ensure maximum dispersion
- Reduced asphalt modification time compared to conventional technology.
- Higher concentration of mineral fillers could be dispersed into the binder compared to a conventional blender. This results material cost savings.
- High heat transfer efficiency to ensure energy efficiency and maintain elevated temperatures

- Open design of axial impeller prevents clogging compare to auger type mixers

III. BOOSTER HEATER FOR BOTH BATCH AND CONTINUOUS OPERATION

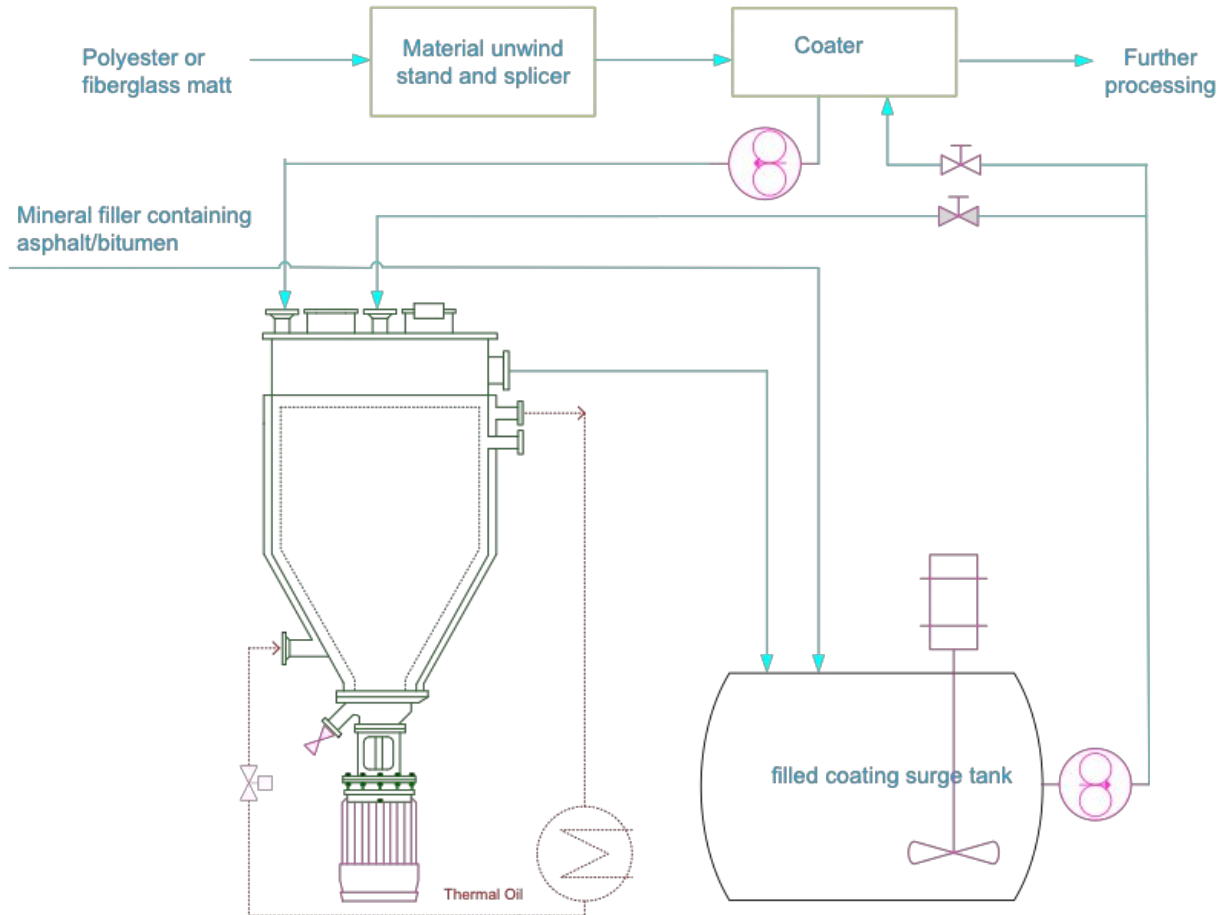


Figure 3. General flow chart of utilization the MAC as booster heater.

Advantages:

- Maximum efficiency as heat exchanger. Reduced operation costs realized by significant heating energy savings.
- Highly effective mixer to ensure uniform and maximum quality of the product (no settlement of solids)
- Better control of fillcoat stream at higher temperatures allowing higher production.

IV. COMBINATION OF SURGE TANK AND BOOSTER HEATER FOR BOTH BATCH AND CONTINUOUS OPERATION

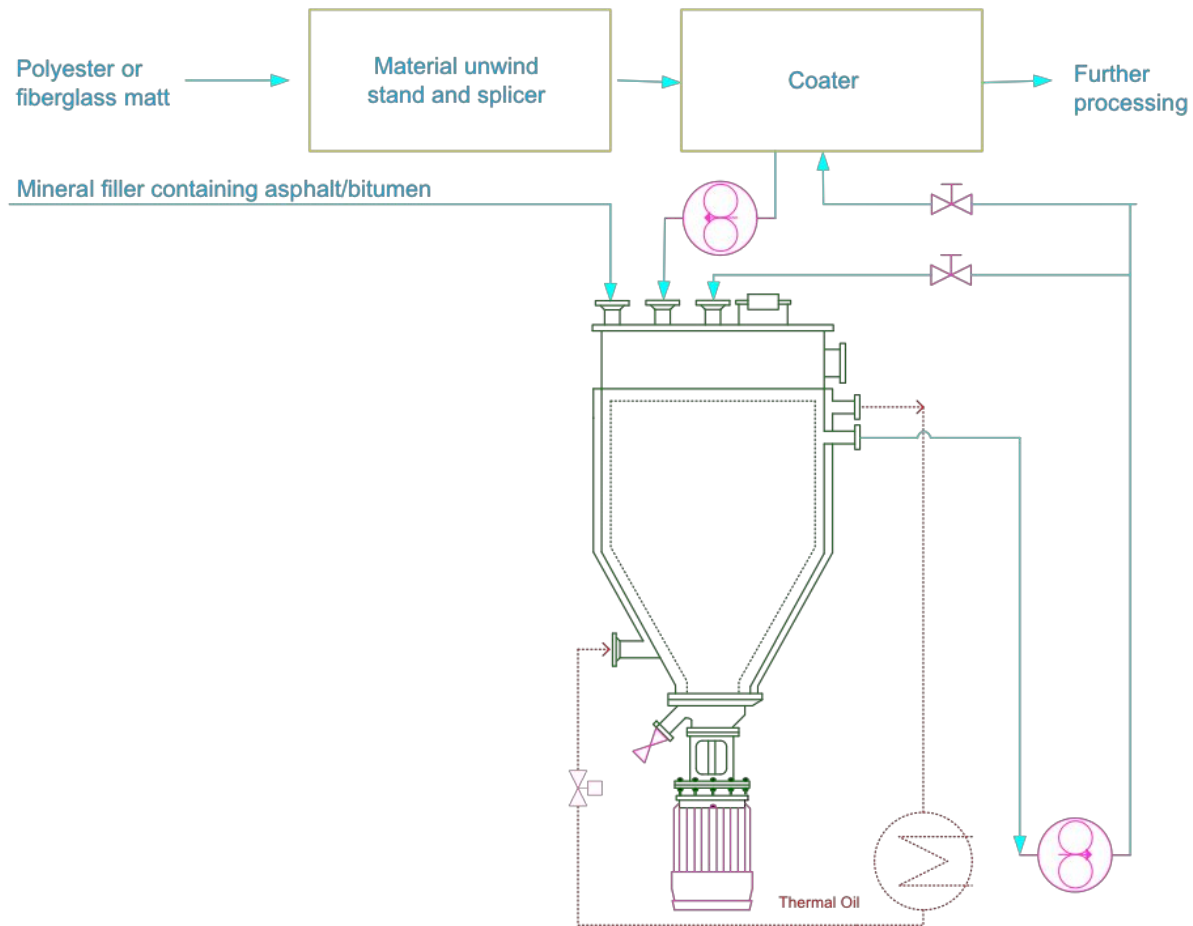


Figure 4. General flow chart of utilization the Contactor reactor (MAC)™ as booster heater and a surge tank together.

Advantages:

- Lower thermal energy consumption compared to conventional configurations. This results in significant heating energy savings.
- Compact overall system size.
- No settling issues even at very high filler concentrations.

The Advantage

The STRATCO® Modified Asphalt Contactor™ reactor (MAC) Patent No. 8,388,215 provides improved and faster manufacturing process.



The MAC reduces energy costs because of its heat transfer effectiveness.

The unit's superior design allows manufacturers to increase throughput maximizing production by controlling & maintaining the binder temperature.

The MAC provides better dispersion of higher concentration of mineral fillers than conventional equipment (even up to 80-85%). This is the key in reducing raw material costs.

Equipment performance also controls and minimizes air entrainment, which could be detrimental to finished product quality, including uniformity and aging.

Any kind of polymer modification can be achieved by incorporating a colloid mill to the MAC production process of:

- Elastomer (e.g. SBS) modified asphalts,
- Plastomer (e.g. APP) modified asphalts.

The MAC could be pressurized as well in order to produce solvent based adhesives. It minimizes hydrocarbon vapor loss.

The MAC is also capable of producing either anionic or cationic asphalt/bitumen emulsions.

For further, and more technical information please [contact us](#).

Roofing Services

One of STRATCO's latest development is the Modified Asphalt Contactor reactor ([MAC](#))™ [Patent No. 8,388,215], which was designed for asphalt, especially for the roofing industry. Beside the equipment design, STRATCO is intensively dealing with roofing material formulations to obtain the best performance at the lowest prices, in every climate (we know that every asphalt is different, so each formulation should be a little different too).

For the roofing industry we offer our customers the following:

- asphalt/bitumen formulations
- design basis and product slate studies,
- preliminary and detailed process design,
- provide process and mechanical design for the complete facility and would partner with an architectural/engineering firm for design in other disciplines, such as civil, structural, architectural and electrical,



new since 1928

- supply the proprietary Contactor reactor (MAC)[™] [Patent No. 8,388,215] directly and all other process equipment from third party manufacturers,
- construction management,
- operator training,
- provide training for plant operating personnel,
- start-up assistance,
- supervise and coordinate the start-up and commissioning of the plant,
- process audits and efficiency studies.

After the plant becomes operational, STRATCO® will provide technical troubleshooting, refurbishments, supply of spare parts, and will work with the manufacturer to satisfy any needs that arise.