



# Technical Bulletin

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## Advantages of Dual Shaft Dispersers (550 and 850 Series)



**Myers 800 series single-shaft high-speed disperser**

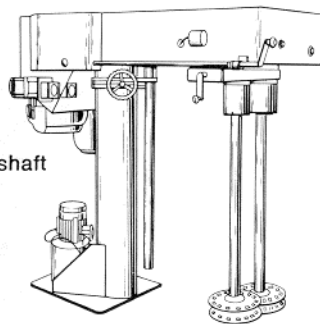
### MYERS 800 Disperser

The single shaft high-speed disperser is widely used in the paint, ink and allied industries as a pigment-dispersing mill. Its low initial and operating costs, plus fast production time and versatility, has

made it a necessary part of production equipment. In fact, with the advent of easier-to-disperse pigments, it has replaced other milling equipment in the manufacture of latex paints, oil-based house paints, primers, and some enamels and inks.

The shear and impact forces it exerts are sufficient to break down hard agglomerates, but it will wet and disperse soft agglomerates in low to medium viscosity systems faster than any other methods.

### MYERS 850 Disperser



Myers series 850 dual shaft high speed disperser.

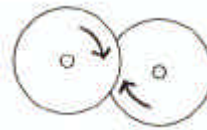
To further increase the dispersion of high gloss coatings, and in many cases eliminate the need for sand milling of fine grind finishes, Myers developed the dual shaft high-speed disperser.

This machine has two high-speed shafts, each with variable speed shafts, and four impellers -- two on each shaft positioned to alternately overlap. For special case production cases one shaft can have a fixed speed.

The shafts can be moved sideways so that the impellers are a few inches apart or moved together so that the blades overlap (without touching). In the open position the impellers create the greatest batch circulation.

In the closed position impellers produce greatly increased dispersion action. While both high-speed shafts operate in the same direction, when opposite sides of the blades overlap they are moving in opposite directions. The effect on material being

dispersed is that the rim or the tip speed is doubled. In other words, horsepower is highly concentrated in a relatively small area of intense dispersion by two impellers moving in one direction while two others overlap with opposing action. Compare this with one impeller moving in one direction and the results are obvious!



In the closed or overlapping position, the relative tip or rim speed is doubled as pigment is subjected to the opposing action of overlapping blades.

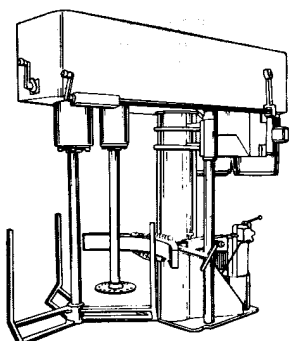
The advantages of the high-speed dual shaft disperser over the single shaft model are many:

1. **Faster pigment loading.** At the start the shafts are placed in the open position (impellers not overlapping). This gives extraordinary batch circulation and minimizes the possibility of loading the pigment too rapidly. If pigment is allowed to float on the surface, lumps can form which later produce specky dispersions.
2. **Less heat build-up.** With the impellers in the open position the batch can be loaded faster and at relatively slow speeds thereby keeping the temperature down. The high-speed blades are at a dispersion speed (the critical build up time) for a shorter period.
3. **Better dispersion.** After wetting of the pigment is completed, the shafts are moved to the closed position (blades overlapping) and the speed is adjusted to the high range. This eliminates the deep vortex and two or more shallow ones will form. The impact action of each impeller and the extra shear action caused by the overlapping will give 1/4 to 1/2 higher grind gage readings than a single shaft. A cleaner grind will be achieved because there are fewer tendencies to float pigment during the wetting process.
4. **Lower viscosity operation.** Because of the type of circulation, there are fewer tendencies to splash at low viscosities. The overlapping impellers tend to promote laminar flow, not easy to achieve with low viscosity products. Laminar flow is necessary for good dispersion.
5. **Less air entrapment.** Because of the elimination of a deep vortex, less air is sucked in. This is extremely important in latex paints and the thixotropic alkyd paints.
6. **Less sensitivity to impeller-to-batch dimensions.** Because it can operate efficiently over a wider range of viscosities than a single shaft disperser, it is not as sensitive to impeller diameter to tank diameter ratios.

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In summary, the dual shaft high speed disperser has replaced sand milling in the manufacture of maintenance enamels and primers with a savings in production costs and time. Its fast loading, efficient dispersing, and low air entrapment features make it ideal for latex paints and high viscosity oil-based house paints. However, it does not handle higher viscosity products than does a single shaft model.

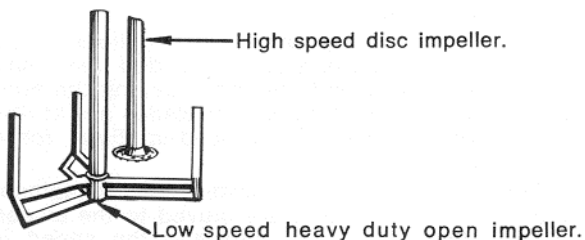
The Myers 550 series dual range shaft disperser, will however, will disperse products with viscosities up to and over 500,000 cps. Since other dispersers can handle these, the higher end 550 is primarily used for high viscosity products.



Myers dual-range, dual-shaft series 550 disperser. Note one high-speed impeller and one large slow speed sweep impeller.

### MYERS 550 Disperser

Because of the high viscosity of the paste and the unusually high concentration of pigment, the slow speed mixing impeller functions not only as a pump moving the mass into the high-speed dispersing blade, but also as a dispersing blade itself. With high viscosity products the high viscous shear of the liquid layers and the high internal friction of the pigment particles shearing against each other are ample to cause considerable dispersion as the slow speed impeller circulates the batch.



For paint products the dispersed paste is usually so highly concentrated that it lets down two to three times its volume. Often a separate letdown tank is used.

In one application the manufacturer is dispersing 1,000 gallons of paste for a baking enamel and letting it down to 3,500 gallons of finished product.

Of course the dual shaft 550 with one slow speed sweep and one high-speed impeller has some of the same advantages as the dual shaft 850.

**1. Faster pigment loading.** Pigment can be added with only the slow speed impeller. This means less splashing.

**2. Less heat build-up.** Mixing can be done by the slow sweep impeller. Then the high-speed dispersion blade can be engaged for a shorter period than with a single shaft machine.

**3. Better dispersion.** The slow speed impeller thoroughly mixes the batch before the high-speed blade is turned on for dispersion. With a single shaft machine, pigment is added a little at a time. Thus, the pigment put in first is dispersed better than that added later. This is not the case with a dual shaft disperser.

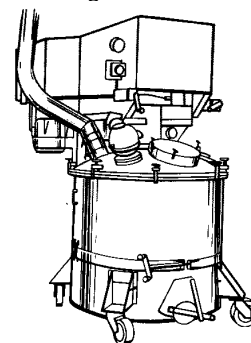
**4. Less air entrapment.** The large slow speed sweep impeller, with its pumping action, tends to reduce the deep vortex of the high-speed dispersion blade. Less air is sucked in.

By adding to the 550 series tank features such as vacuum, pressure, or a heat exchanger a greater variety of high viscosity products can be made efficiently.

At present some of the products routinely made on the dual range two-shaft dispersers are epoxy mastics, polyester gel coats, silicone caulking compounds, body putty, texture paints, printing inks, latex paints and high viscosity wood fillers.

To summarize the whole disperser picture: the single-shaft high-speed disperser has performed well as a fast, low cost mill in the low to medium viscosity range for many years.

The dual shaft high speed disperser (850 series) with its movable impellers produces a finer and cleaner grind with less air entrapment, easier loading and better temperature control.



The dual range two shaft disperser (550 series) permits fast, low cost milling at high and very high viscosities. With its unique combinations of high and low speed impellers, dispersions of high pigment content pastes can be achieved quite easily at viscosities in excess of 500,000 cps and often up to 1 million plus cps.

Finally, by incorporating optional features such as vacuum, pressure and heat exchange, a wide variety of products can be made by the dual range two-shaft disperser that heretofore could only be accomplished by very expensive and highly complex equipment. No wonder dual shaft dispersers are so popular with more and more manufacturers!