

Improved wear resistance and heat efficiency
for under water pelletizing

UC (Ultra Chip) Die Plate

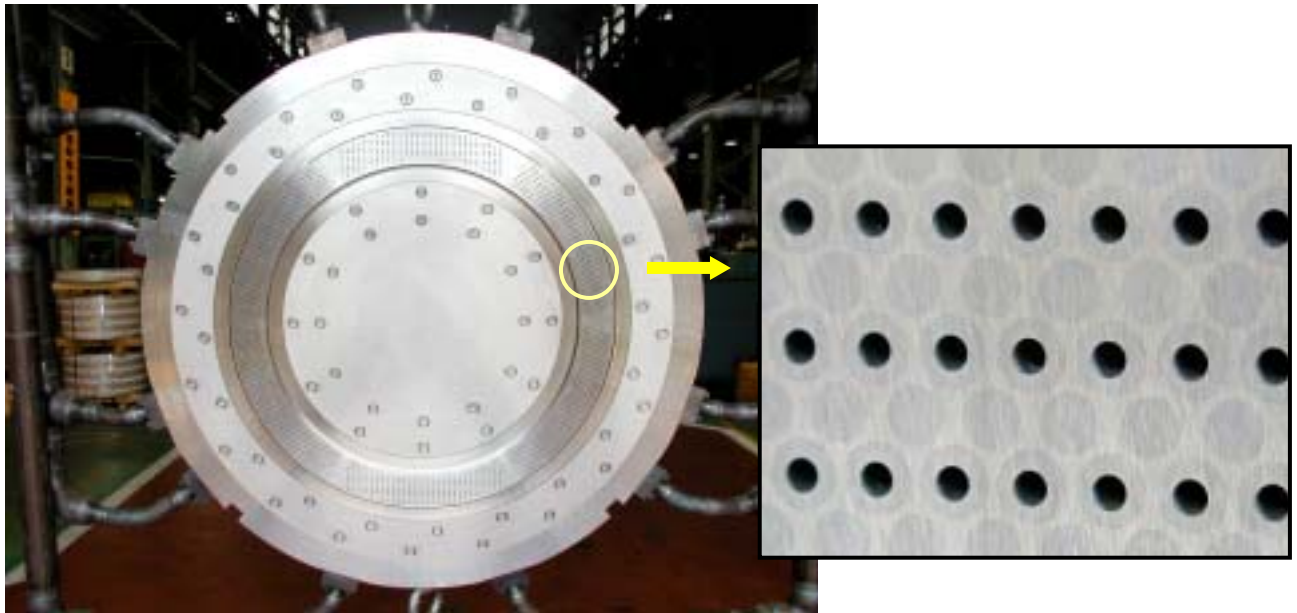


Photo 1. Appearance of UC die plate and the hard-facing

1. Outline

JSW has delivered a great number of under water pelletizing equipments all over the world. At present, TiC (Titanium Carbide) is a major material of hard-facing for die plates because of its high resistance to cavitation/erosion as well as wear and corrosion. However, as the polymer materials are getting diversified these days, more advanced technique of under water pelletizing is demanded for some polymers that were quite hard-to-cut in conventional under water pelletizing. Consequently, there is a pressing need in the market to develop a new advanced hard-facing material for die plates to have higher wear resistance.

To meet such demand, we developed the ultra-hard special wear-resistant material chip (named "Ultra Chip (UC)") and completed the die plate with the cutting face of the new Ultra Chip (UC) for large-capacity under water pelletizing.

2. Features

2-1. Longer service life of the cutting face

Fig. 1 shows a comparison of wear resistance between UC material and conventional TiC. Service life of UC die face is approx. twice longer than that of TiC. Longer service life allows long-term stable operation, which consequently contributes to extending total operating hours and improves productivity of the plant. And less exchange frequency of die plate is effective to reduce the duration of shutdown.

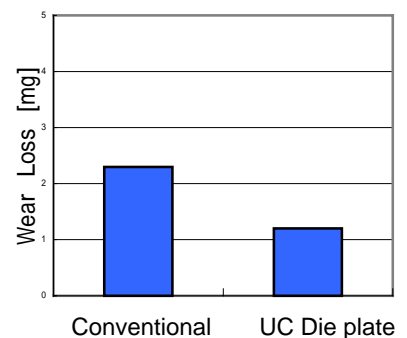


Fig.1 Wear resistance test

2-2. Pellet quality

Fig. 2 shows the temperature distribution on cross section of die plate during normal operation, which is simulated based on thermal analysis calculation. UC die plate can keep higher internal temperature than TiC under the same conditions. Higher internal temperature prevents polymer clogging in die nozzles and leads to producing uniform pellets (Refer to Fig. 3). In consequence, UC die plate improves your pellet quality.

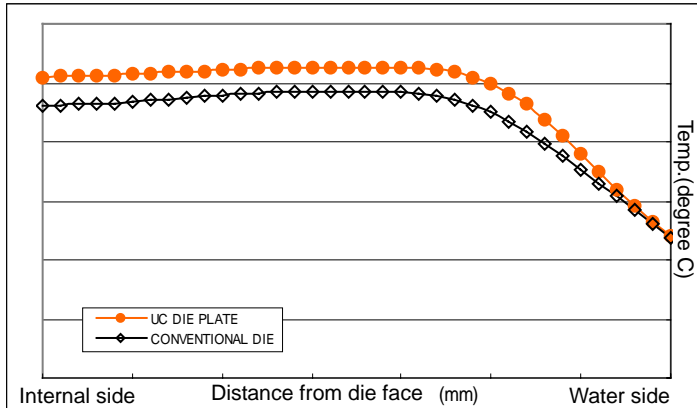


Fig. 2 Internal temperature distribution

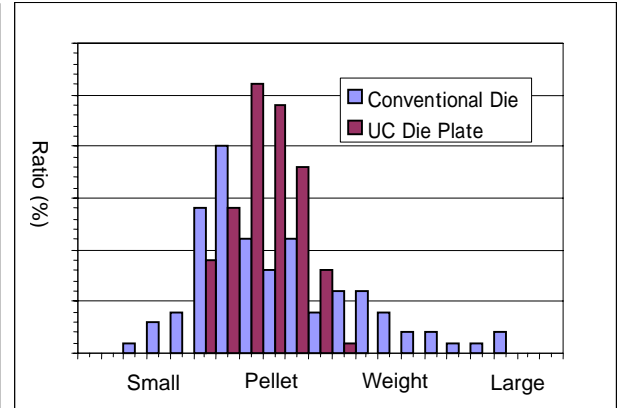


Fig. 3 Pellet weight distribution (under difficult conditions)

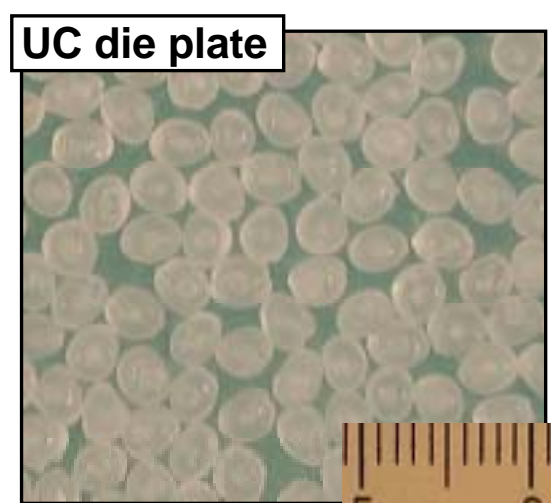
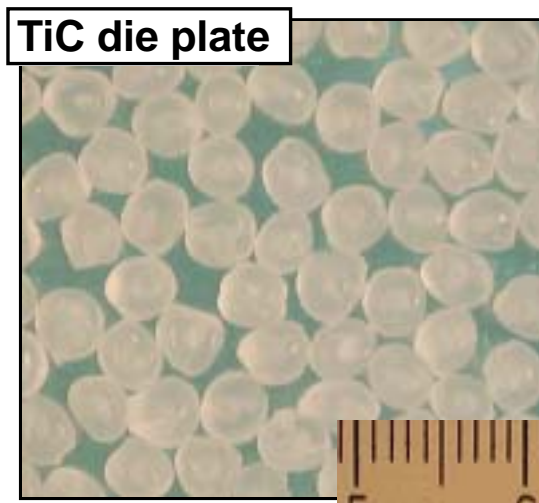


Photo 2. Pellet shape (PP pellets cut under difficult conditions)

3. Afterword

We can expect a great market needs for round pellets in the future because they offer less variation in volume even in different grain sizes. We appreciate your consideration to our UC die plate for your new project and an improvement plan of cutting performance in your existing line with not only JSW's die plate but other company's one.

Our Plastics Machinery Developing Center in Hiroshima, Japan, is available for under water pelletizing test (at customer's expense) as well as trials for various plastics compounding, reaction and devolatilization extrusion using our extruders. We believe that we can contribute to further strengthening your competitiveness.

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