

ADI vs DI

WHAT IS THE DIFFERENCE?

ADI = Austempered Ductile Iron

DI = Ductile Iron

ADI is derived from a quenching process using DI with strictly controlled temperatures and durations. This process changes the micro-structure of the material to form an ausferrite micro-structure. The ausferrite is shown in FIGURE 2 as the micro-grain pattern between the large, dark nodes of graphite. The change in micro-structure makes the ADI material, **harder, tougher, stronger but less ductile than DI**. In general, the ADI is considered an upgrade to DI.

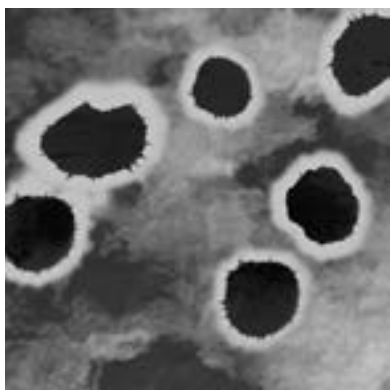


FIGURE 1: DI

The rounded graphite nodes are "clouded" which allows crack creation giving the material a more ductile nature.

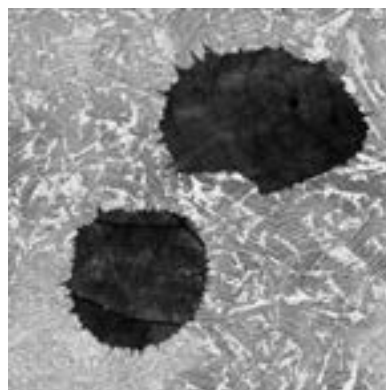


FIGURE 2: ADI

ADI also has the rounded graphite nodes but with a flake type matrix between the nodes instead of the "clouds". This strengthens the material but reduces ductility.

The quenching process changes the micro-structure which does not affect chemical resistance. The benefit of using an ADI material versus cast steel (WCB) or steel is the lower cost for obtaining similar mechanical properties.

ADI is preferred typically in slurry or abrasive applications. Parts that are available in ADI are impellers, casings, bearing housing, flanges (spools), seal and wear plates for Summit Pump's SN product line.

Mechanical properties comparison, DI (ASTM A48 Class 30) to ADI (ASTM 897M-90 Grade 3):

	Yield Strength	Hardness	Strength to Weight (Yield/Density)	Elongation at Break
DI	30,000PSI	174-210 Brinell	116	12%
ADI	125,000 PSI	341-444 Brinell	484	4%

(Just for fun - Aluminum: 410)