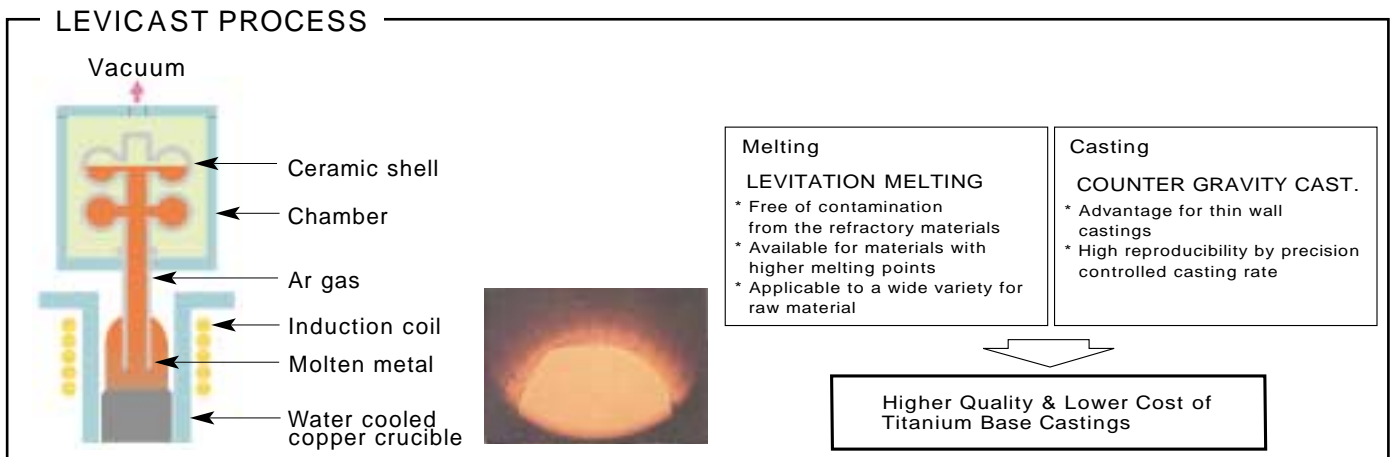


Turbine Wheel by CLV, CLI



CLV process
(Counter Gravity Low-
Pressure Vacuum Casting)



Blade tip- *min.0.3mm thickness (thin-wall)

Low occurrence of miss-run realized by Counter Gravity Casting (up to 200mm diameter)
(* for TiAl, minimum thickness is 0.5mm for 120mm diameter)

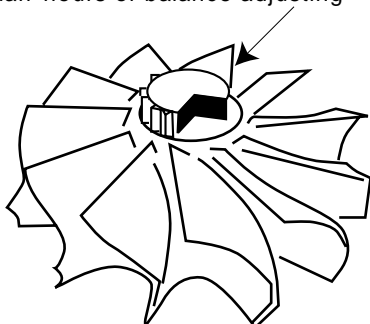
Excellent rotation balance (precision)

Highly accurate dimensions by patented mold structure

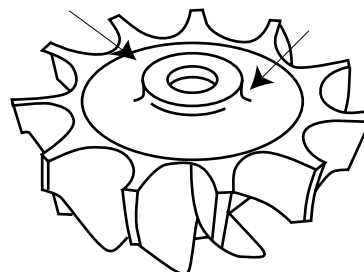
Low cost, High quality

High casting yield and reliable inspection equipment

Less man-hours of balance adjusting



Eliminates machining of a hole for shaft connection
Eliminates machining for disk flatness

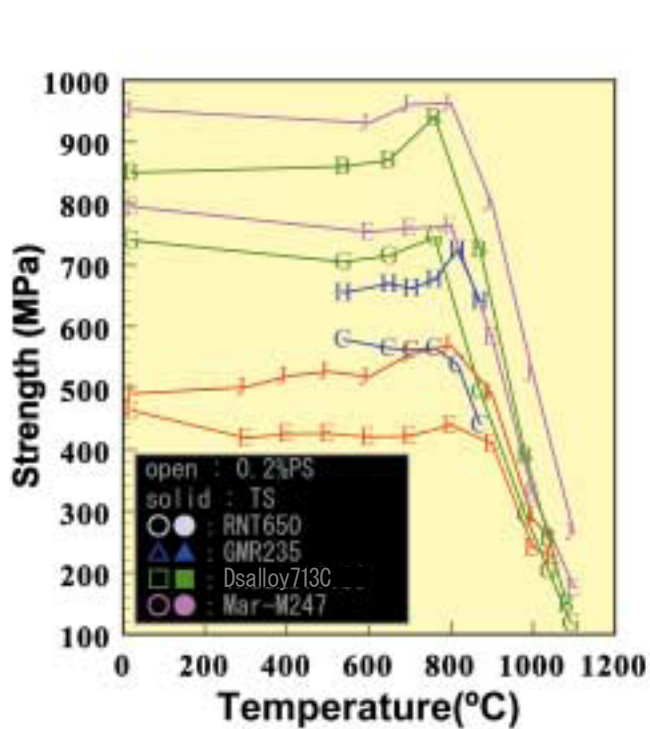


Typical Chemical Compositions (Ni base/TiAl) (wt %)

Grade	Ni	Cr	Mo	Al	Ti	B	Zr	V	Co	Nb	Ta	W	Hf	Fe
GMR235	BAL	14 17.0	4.5 6.0	3.25 4.0	1.5 2.5	0.025 0.07								8 12.0
Dsalloy 713C	BAL	12 14.0	3.8 5.2	5.5 6.5	0.5 1	0.005 0.015	0.05 0.15		1.0	1.8 2.8				2.5
IN-100	BAL	8.0 11.0	2.0 4.0	5.0 6.0	4.5 5.0	0.01 0.02	0.03 0.09	0.7 1.2	13.0 17.0					1.0
MAR-M 247	BAL	8.0 8.8	0.5 0.8	5.3 5.7	0.9 1.2	0.01 0.03	0.03 0.10		9.0 11.0		2.8 3.3	9.5 11	1.2 1.6	
TiAl		0.8 1.2		33.0 34.0	BAL					4.6 5				

(Recyclable)

Tensile Property



Mar-M247: as-cast(daido's original data)

