



NAKAYAMA
Co.,Ltd.

Apparatus for green sand quality control

Compactability Tester

Molds made by today's molding machines have high compression strength exceeding 2kg/cm^2 ($50\phi \times 50\text{H TP}$), and hence certain countermeasures are necessary to prevent casting defects caused by gas formed by combustion of organic materials in shell mold cores and other mold parts. Compactability test is a useful tool for quality control of mulled sand with appropriate density and fluidity for the above purpose.



This is for measuring compactability of molding sand, consisting of an air pressure type tester and a sample holder. Compactability test is a quantitative replacement of a qualitative evaluation of molding sand by the feel of a palm when squeezing sand. Amount of moisture and clay in sand as well as oolitic content and degree of mulling can be evaluated by this test.

The test is simple to perform and useful for quick determination of sand quality in laboratory and on production floor.

■ Compactability Tester

Type	NC-CBT-1
Height	680mm
Floor area	330 x 230 mm ²
Weight	40kg
Compression type	air compression
Nominal compression force	10kg
Read method	memory

■ Sample processor

Height	380mm
Floor area	210 x 210 mm
Sieve diameter	150 mm ϕ
Mesh size	6 mesh

[Attachment] Sample holder: 1 piece
Tester base: 1 piece
Push rod: 1 piece



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Casting Quality Improvement Guide in Relation to Mold Properties

↑ increasing the property value.

↓ decreasing the property value.

○ read through it

defect type																					
mold property		gas/blow	mis-run /coldshot	pin hole	dross /inclusion	displaced sand /scabbing	buckling	veining	hot-tear	sand burning	penetration	rough surface	sand sticking	dropped sand /broken mold	shrinkage	burn fusion	penetration	sand inclusion	insert metal	Fin	Carburizing Sulphurizing
permeability		↑	↑			↑					↓	↓									
green strength (strength)		↓	↓		↑	↑	↓	↓	↓		↑	↑	↓	↑	↑	↑	↑				
hardness		↓	↓		↑	↑	↓	↓	↓		↑	↑	↓	↑	↑						
compactability		↑	↑	↑	↓	↓					↓	↓		↓	↓						
surface stability index		↓		↑		↑	↑					↑					↑	↑			
moisture		↓	↓	↓	↑	↑	↓		↓		↓	↓	↓		↓						
gas production		↓	↓								↑	↑									
grain size index		↓	↓	↑			↓		↓		↑	↓									
combustible		↓	↓	↓					↑		↑	↑									
all clay fraction		↓	↓	↓	↑	↑		↑	↓			↑	↑			↓	↓				
grain size		↓		↓		↑	↑			↑	↑	↑					↑				
loss on ignition		↓	↓	↓					↑		↑	↑									
mulling time					↑	↑							↑	↑	↑						
	Shell core or Organic self hardening core				↑ core		↑ hot deformability	↑ hot deformability													
	gate design		○	○								○									
	minimize melt oxidation								○												
	core collapsibility				○ ↓	○ ↓			○		○ ↓										
	gate area				○	○			↓												
	pour temperature	↑						↓			↓	↓			↓						
	Should test the sand's antiquation			○				○	○							○	○	○			
	other	improving method mulling	higher pour temperature /faster pour rate	coarse sand (more new sand check the material)	careful pouring	faster pouring						sieve face sand /remove block sand /coating	use wetting agent /increase separator /change separator	rigid flask /gas vent /machine adjust /wetting agent		○ Lack of refractoriness coat does not match. /pouring temperature is too high.	○ Lack of refractoriness coat does not match. /pouring temperature is too high.	○ Molding Sand is weak inferior gating design /around down gate rammer's inferior make the mollen enters equally.			