

Visual Inspection SCRATA

Comparators for the Definition of Surface Quality of Castings

Visual inspection is based on the use of the human eye to identify surface defects, improper filling and molding errors. Casting defects that can be detected via visual inspection include sand holes, excessively rough surface, surface shrinkage, blowholes, misruns, cold shuts, and surface dross or slag.

Purchasers of castings can specify and assess surface quality and surface texture more accurately and definitively using tactile comparators. These provide a practical and functional alternative to photographic representation of casting surfaces in standards such as **MSS SP-55-2001**.

More than 2000 of these sets of comparators are used around the world by multi-national companies and by small enterprises. The durable plastic comparator plates, actual replicas of relevant characteristics of surface finish, have proved to be a more attractive way of reaching agreement with casting suppliers on the required surface quality during contract negotiations. They also provide a basis for acceptance of the castings after order placement.

The comparators form the basis of **ASTM A802/A802M – 95 (2006) Standard Practice for Steel Castings, Surface Acceptance Standards, Visual Examination**.

This standard comprises 31 comparators that define features such as:

- Surface Roughness (A)
- Surface Inclusions (B)
- Gas Porosity (C)
- Laps and Cold Shuts (D)
- Scabs (E)
- Chaplets (F)
- Surface Finish – Thermal Dressing (G)
- Surface Finish – Mechanical Dressing (H)
- Welds (J)
- Hot Tears
- Mechanical Dressing - Chipping

	Number of Comparators	Comparator Categories										
		A	B	C	D	E	F	G	H	J	Hot Tears	Chipping
ASTM A802	31	1-4	1,2,4,5	1-4	1,2,5	3,5	1,3	1,2,3,5	1,3,4,5	1,2,3,5	-	-

A larger, 48 comparator set applies to

ISO 11971: 2008 Steel and Iron Castings – Visual examination of surface quality

BS EN 1370: 1997 Founding – Surface roughness inspection by visual tactile comparators

BS EN 12454: 1998 Founding– Visual examination of surface discontinuities–Steel sand castings

(Companies that already have the 'short' **ASTM A802** set can upgrade to the larger set by purchasing the 17 additional comparator plates).

	Number of Comparators	Comparator Categories										
		A	B	C	D	E	F	G	H	J	Hot Tears	Chipping
Full Set	48	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-2	1
Upgrade to Full Set	17	5	3	5	3,4	1,2,4	2,4,5	4	2	4	1-2	1

A third set of 14 comparators, the basis of BS 7900:1998 Specification for examination of the surface texture of precision steel castings, is applicable to the procurement of steel castings manufactured by precision casting techniques:

- Resin Shell Process (V)
- Lost Polystyrene Process (W)
- Shaw Process (X)
- Lost Wax Process (Y)
- Fettled Surfaces (Z)

	Number of Comparators	Comparator Categories				
		V	W	X	Y	Z
Precision Set	14	1-3	1-3	1-3	1-2	1-3

