

Brass material Pb-free Checking data

1. Purpose
Investigation for Adhesion and Stress Corrosion Breaking Performance

2. Target part
Tire valve



3. Checking method
【Adhesion】

Tear the rubber from the metal part, and check the adhesive area ratio between rubber and metal. (non-treatment, heat resistance, moisture resistance, and acid resistance.)

【Ammonia Test】

Put the valve stem under the atmosphere of the ammonium solution of 11.8wt%. Wash it with 10wt% H₂SO₄, and check the cracks (stress corrosion breaking).

4. Checking result

Material		n	BZ-5U	Judgment	Eco-Brass	Judgment	Pb0.2% brass	Judgment	C3601 (Current)
Adhesion	Non-treatment → Test	5	94 (80~100)	×	62 (40~80) %	×	All 100 %	○	All 100 %
	Heat Resistance (100°C × 72h → Test)	5	91 (70~100)	×	70 (50~80) %	×	All 100 %	○	All 100 %
	Moisture Resistance (70°C × Moisture 90% × 72h → Test)	5	96 (90~100)	○	61 (40~80) %	×	All 100 %	○	All 100 %
	Acid Resistance (0.2% H ₂ SO ₄ × 168h → Test)	5	65 (60~70)	×	34 (30~40) %	×	62 (60~65) %	×	83 (80~90) %
Ammonia Test	11.8% Ammonia × 72h → Test	5	n=5 All Cracks	×	n=5 All No Cracks	○	n=5 All No Cracks	○	n=5 All No Cracks

Average. (Min.~Max.)

{ ○ : Equal to C3601
× : Inferior to C3601

5. Finding

- All Pb free materials is unstable in an adhesion state of the rubber - brass.
- As for BZ-5U, stress corrosion breaking is easy to happen.