

## ISO 15665: 2003 Acoustics - Acoustic insulation for pipes valves and flanges

### » Understanding ISO 15665

ISO 15665, 'Acoustics - Acoustic Insulation for Pipes, Valves and Flanges' [1] is the newly agreed standard for measuring the performance of acoustic insulation on pipe-work and for recommending the correct application of insulation required to meet various performance classifications. Although relevant to general industrial and petrochemical process systems, this document is also aimed at replacing existing standards relating to noise control for pipe work in the marine and offshore segments e.g. OCMA - NWG5 standard [2].

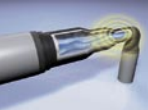
ISO 15665 is designed to enable noise control en-

gineers to specify the correct type and thickness of insulation in order to achieve a specific noise level reduction. The standard uses A, B and C performance classification, with class A denoting the lowest performance classification and C denoting the highest.

The standard also provides calculation procedures for determining the performance of each class of insulation system when applied to typical noise sources allowing the designer/specifier to calculate the expected noise reduction of the insulation applied. These noise sources include centrifugal pumps and compressors, reciprocating compressors and control valves.

**Table: Minimum insertion loss required for each class acc. ISO 15665:2003**

Class	Nominal pipe diameter D mm		Octave band centre frequency, Hz						
	lower limit	upper limit	125	250	500	1 000	2 000	4 000	8 000
			Minimum insertion loss, dB						
A1		< 300	- 4	- 4	2	9	16	22	29
A2	≥ 300	< 650	- 4	- 4	2	9	16	22	29
A3	≥ 650	< 1 000	- 4	2	7	13	19	24	30
B1		< 300	- 9	- 3	3	11	19	27	35
B2	≥ 300	< 650	- 9	- 3	6	15	24	33	42
B3	≥ 650	< 1 000	- 7	2	11	20	29	36	42
C1		< 300	- 5	- 1	11	23	34	38	42
C2	≥ 300	< 650	- 7	4	14	24	34	38	42
C3	≥ 650	< 1 000	1	9	17	26	34	38	42



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### » Why consider ArmaSound Industrial Systems?

ArmaSound Industrial Systems offer solutions for the classification requirements A2, B2 and C2 as given in ISO15665. ArmaSound Industrial Systems D also comply with Class D2 given in Shell DEP specification No. 31.

The classification values represent the expected reduction achievable from use of particular configurations of mineral wool and steel cladding. In most cases the performance of ArmaSound Industrial Systems exceed the reduction levels required to meet each insulation class. In addition ArmaSound Industrial systems generally achieve the required noise level reductions with much reduced insulation thickness and weight compared to traditional systems.

### » ArmaSound Industrial Systems offer enhanced performance

In addition to the acoustic benefits of ArmaSound Industrial Systems, these solutions offer improved environmental stability when compared to traditional methods:

1. Firstly, the use of a closed cell layer applied to the surface of the pipe enables water ingress and under insulation corrosion (UIC) of the pipe to be minimised.
2. The systems do not contain metallic coverings which may be susceptible to rust and/or galvanic

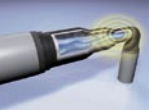
corrosion. Instead, our systems use Arma-Chek R which is a tough, flexible elastomeric protective covering. The covering also provides a higher degree of compliance during installation to ensure better flexibility and improved sealing properties. The use of flexible elastomeric coverings also reduces low-frequency re-radiation effects that may be observed in practical application.

3. The combination of closed and open cell structure allows for a high degree of thermal insulation performance to be achieved. All components within ArmaSound Industrial Systems fulfill both acoustic and thermal roles, eliminating the redundancy associated with traditional approaches.

Using an elastomeric covering could reduce re-radiation effects resulting from residual transference of acoustic vibration into the outer surface and also provide better compliance and sealing properties. Additional acoustic benefits would be realised around pipe supports and hangers through further reduction of structurally transmitted vibration. The combination of closed and open-cell technology, with an additional barrier covering, offers significant benefits to noise control engineers, specifiers and contractors. In particular, these include high thermal and acoustic performance with the reduced risk of under insulation and galvanic corrosion.

[1] ISO 15665: Acoustics – Acoustic insulation for pipes valves and flanges. International Organisation for Standardisation. 2003.

[2] EEMUA publication No 42 (Formerly OCMA Specification No. NWG 5): Acoustic Insulation of pipes valves and flanges. The Engineering Equipment and Materials Users Association 1984.



**Determine the right ArmaSound Industrial System acc. to ISO 15665** (UK 06/2009 EL)