

ISO/TC 108/SC 2 표준 현황

Current Status for the International Standards of ISO/TC 108/SC 2

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1. 서 론

국제표준에 대한 계획, 개발 및 채택에 대한 책임을 맡고 있는 국제기구는 ISO(International Organization for Standardization), IEC(International Electrotechnical Committee) 및 ITU(International Telecommunication Union)가 있는데, ISO는 IEC가 담당하고 있는 Electrotechnical 분야와, ITU가 담당하는 Telecommunication 분야를 제외한 모든 분야의 국제 표준을 담당하고 있다.

ISO 산하에는 많은 TC(Technical Committee)를 두고 있다. 그 중에서 ISO/TC 108은 기계적 진동, 충격 및 상태 감시(Mecanical vibration, shock and condition monitoring) 분야의 국제표준을 담당하는데, ISO/TC 108 산하에는 6개의 WG(Working Group)과 5개의 SC(Sub Committee)를 두고 있다. ISO/TC 108의 5개의 SC 중 하나인 ISO/TC 108/SC 2는 “기계, 수송수단 및 구조물에 적용하는 기계적 진동 및 충격의 측정과 평가” 분야를 담당한다.

여기서는 ISO/TC 108/SC 2에서 발행하여 현재 유지되고 있는 국제표준과 현재 작업 중인 제개정 현황을 소개하였다.

2. ISO/TC 108/SC 2 조직

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ISO/TC 108/SC 2는 현재 우리나라를 비롯하여 23 개국이 P-member이며, 14개국이 O-member이다. ISO/TC 108/SC 2에서 발행되어 관리하고 있는 국제 표준은 현재 49종이다. ISO/TC 108/SC 2에는 현재 8 개의 WG을 두어 표준의 제개정 작업을 하고 있다 (Fig. 1 참조).

ISO 국제표준의 제정이나 개정은 PWI(Preliminary work item), NP(New proposal for a work item), CD(Committee draft), DIS(Draft international standard), FDIS(Final draft international standard), IS(International standard)의 단계로 이루어진다. 각 과제 별로 과제 책임자(Project leader)를 지정하여 초안안 작성과 회원국들의 간사기관으로부터 받은 의견을 반영한 수정안을 만들고, 해당 WG 회의에서 검토하여 각 단계별 표준안을 완성하며, 이 결과는 SC 총회 또는 TC 총회에 보고하고 의결한다. 회의에서 의결된 각 단계별 표준안은 회원국들에게 회람하여 수정, 보완 의견의 취합과 찬반 투표를 거치게 된다.

3. ISO/TC 108/SC 2 국제표준 현황

ISO/TC 108/SC 2에서 발행하여 관리하고 있는 표준은 현재 총 49종(Amd. 포함)이다. ISO/TC 108/SC 2는 TC 108의 타 SC 보다 상대적으로 여러 분야의 표준을 다루고 있는데, 편의 상 8개의 분야로 분류하여 현황을 살펴보면 다음과 같다.

(1)동역학 및 기계진동 관련 표준 : Table 1-1 에 보인 바와 같이 현재 16종의 표준이 있으며, 주로 WG 1에서 제개정 작업을 담당한다.

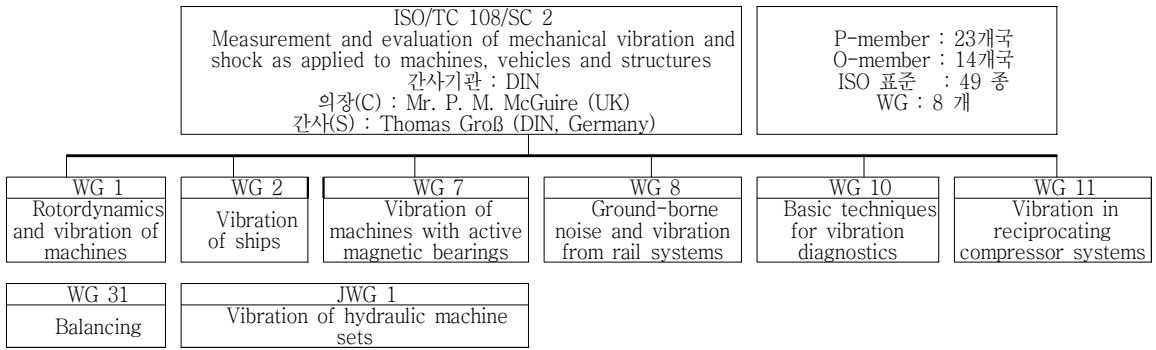


Fig. 1 Structure of ISO/TC 108/SC 2

(2)선박 진동 관련 표준 : Table 1-2에 보인 바와 같이 현재 5종의 표준이 있으며, WG 2에서 제개정 작업을 담당한다.

(3)능동자기베어링 장착 기계진동 관련 표준 : Table 1-3에 보인 바와 같이 현재 5종의 표준이 있으며, WG 7에서 제개정 작업을 담당한다.

(4)철도선로로부터 발생하는 지반 소음과 진동 관련 표준 : Table 1-4에 보인 바와 같이 현재 2종의 표준이 있으며, WG 8에서 제개정 작업을 담당한다.

(5)상태감시 및 진단 관련 표준 : Table 1-5에 보인 바와 같이 현재 2종의 표준이 있으며, WG 10에서 제개정 작업을 담당한다.

(6)밸런싱 관련 표준 : 밸런싱 분야는 TC 108의 WG31에서 담당했었으나 2010년에 WG31을 SC 2로 이관되었다. Table 1-6에 보인 바와 같이 현재 12종의 표준이 있으며, WG 31에서 제개정 작업을 담당한다.

(7)육상차량 진동 관련 표준 : Table 1-7에 보인 바와 같이 현재 2종의 표준이 있다. 최근 이 분야에 대한 제개정 작업이 이루어지고 있지 않으며, 현재 ISO/TC 108/SC 2에는 담당 WG이 없는 상태이다.

(8)건물, 교량 진동 관련 표준 : Table 1-8에 보인 바와 같이 현재 5종의 표준이 있다. 최근 이 분야에 대한 제개정 작업이 이루어지고 있지 않으며, 현재 ISO/TC 108/SC 2에는 담당 WG이 없는 상태이다.

4. ISO/TC 108/SC 2 국제표준 제개정 작업 현황

Table 2는 ISO/TC 108/SC 2에서 제개정 작업이 진행되고 있는 프로그램이며, Table 3은 2013년 10월 서울 총회에서 새로 작업 항목으로 채택된 프로그램이다. 현재 총 28종의 표준에 대한 제개정 작업이 진행 중이다. 그 중에서 7종은 기존 표준을 개정하는 것이며, 21종은 신규 제정하는 것이다. 담당 WG 별로는 WG 1 : 3종, WG 2 : 2종, WG 7 : 1종, WG 8 : 7종, WG 10 : 9종, WG 11 : 1종, WG 31 : 4종, JWG 1 : 1종이다.

5. 결 언

ISO/TC 108/SC 2에서 발행하여 관리하고 있는 국제표준과 ISO/TC 108/SC 2에서 현재 제개정 작업 국제표준의 현황을 정리하였다.

국제표준은 관련 산업에 큰 영향을 미칠 수 있다. 그러므로 국내 관련 산업을 위해서는 국제표준의 현황 및 제개정 동향의 파악하고 필요한 경우는 국제표준 제개정 작업에 적극적으로 참여하여 의견을 반영토록 함이 중요하다. 제개정의 주요 내용은 WG회의에서 전문가들 간의 토의를 통해 이루어지게 되므로 WG에 참여하여 의견을 제시하고 반영하는 것이 가장 바람직하다. 또한, 모든 결정사항은 회원국들에게 회람하여 검토의견 수렴과 찬반투표하게 되므로 이를 통해 의견제시도 가능하다.

우리나라는 ISO/TC 108 및 모든 산하 SC의 P-member국이며, ISO의 우리나라 간사기관은 기술표준원(KATS)이다. 한국소음진동공학회는 기술표준

원으로부터 ISO/TC 108의 국내 간사기관 위촉 받아 TC 108 전문위원회를 두고 있다. 전문위원회는 ISO에서 회람하는 표준문서 안에 대한 검토와 찬반투표 의견을 제시하여 기술표준원을 통해 ISO로 전달하고 있다. 그러므로 전문위원회에 연락하면 ISO 표준 제 개정 관련하여 정보파악이나 의견반영에 참여할 수 있다. 또한 우리학회 학술발표회 때에 전문위원회의를 개최하여 활동사항 발표 및 계획을 논의하고 있으므로 누구나 여기에 참석할 수 있다.

ISO/TC 108 및 산하 SC 국제회의 총회는 1년 6개월 정도에 한번 씩 1주일 간 열리는데, 이때 많은 WG회의도 같이 열리게 된다. 이번 국제회의는 우리나라가 초청하여 2013년 10월에 서울에서 개최된 바 있다.

참고문헌

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- (2) ISO/TC 108/SC 2 N 744, Report of the Secretariat of ISO/TC 108/SC 2 to the 28th meeting to be held on 2013-10-14 and 2013-10-18 in Seoul/Republic of Korea, 2013-08.
- (3) ISO/TC 108/SC 2 N 751, Resolutions adopted at the 28th meeting of ISO/TC 108/SC 2 “Measurement and evaluation of mechanical vibration and shock as applied to machines, vehicles and structures” on 2013-10-18 in Seoul, Republic of Korea, 2013-10-18.

Table 1-1 International standards of ISO/TC 108/SC 2 (related to rotordynamics and vibration of machines)

Standard Number	Title	Remarks
ISO 4863:1984	Resilient shaft couplings - Information to be supplied by users and manufacturers	
ISO7919-1:1996	Mechanical vibration of non-reciprocating machines - Measurements on rotating shafts and evaluation criteria - Part 1: General guidelines	
ISO 7919-2:2009	Mechanical vibration - Evaluation of machine vibration by measurements on rotating shafts - Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min	
ISO 7919-3:2009	Mechanical vibration - Evaluation of machine vibration by measurements on rotating shafts - Part 3: Coupled industrial machines	
ISO 7919-4:2009	Mechanical vibration - Evaluation of machine vibration by measurements on rotating shafts - Part 4: Gas turbine sets with fluid-film bearings	
ISO 7919-5:2005	Mechanical vibration - Evaluation of machine vibration by measurements on rotating shafts - Part 5: Machine sets in hydraulic power generating and pumping plants	Under revision: amalgamation of 7919-5 and 10816-5
ISO10816-1:1995	Mechanical vibration - Evaluation of machine vibration by measurements on non-rotating parts - Part 1: General guidelines	
ISO10816-1:1995/Amd1:2009		
ISO 10816-2:2009	Mechanical vibration - Evaluation of machine vibration by measurements on non-rotating parts - Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min	
ISO 10816-3:2009	Mechanical vibration - Evaluation of machine vibration by measurements on non-rotating parts - Part 3: Industrial machines with nominal power above 15 kW and nominal speeds between 120 r/min and 15 000 r/min when measured in situ	
ISO10816-4:2009	Mechanical vibration - Evaluation of machine vibration by measurements on non-rotating parts - Part 4: Gas turbine sets with fluid-film bearings	
ISO10816-5:2000	Mechanical vibration - Evaluation of machine vibration by measurements on non-rotating parts - Part 5: Machine sets in hydraulic power generating and pumping plants	Under revision including 7919-5
ISO10816-6:1995	Mechanical vibration - Evaluation of machine vibration by measurements on non-rotating parts - Part 6: Reciprocating machines with power ratings above 100 kW	
ISO 10816-7:2009	Mechanical vibration - Evaluation of machine vibration by measurements on non-rotating parts - Part 7: Rotodynamic pumps for industrial applications, including measurements on rotating shafts	

ISO/TR 19201:2013	Mechanical vibration - Methodology for selecting appropriate machinery vibration standards	
ISO 22266-1:2009	Mechanical vibration - Torsional vibration of rotating machinery - Part 1: Land-based steam and gas turbine generator sets in excess of 50 MW	

Table 1-2 International standards of ISO/TC 108/SC 2 (related to vibration of ships)

Standard Number	Title	Remarks
ISO 6954:2000	Mechanical vibration - Guidelines for the measurement, reporting and evaluation of vibration with regard to habitability on passenger and merchant ships	Under revision with the new number 20283-5
ISO10055:1996	Mechanical vibration - Vibration testing requirements for shipboard equipment and machinery components	
ISO 20283-2:2008	Mechanical vibration - Measurement of vibration on ships - Part 2: Measurement of structural vibration	
ISO 20283-3:2006	Mechanical vibration - Measurement of vibration on ships - Part 3: Pre-installation vibration measurement of shipboard equipment	
ISO 20283-4:2012	Mechanical vibration - Measurement of vibration on ships - Part 4: Measurement and evaluation of vibration of the ship propulsion machinery	

Table 1-3 International standards of ISO/TC 108/SC 2 (related to vibration of machines with active magnetic bearings)

Standard Number	Title	Remarks
ISO 14839-1:2002	Mechanical vibration - Vibration of rotating machinery equipped with active magnetic bearings - Part 1: Vocabulary	
ISO 14839-1:2002/Amd 1:2010		
ISO 14839-2:2004	Mechanical vibration - Vibration of rotating machinery equipped with active magnetic bearings - Part 2: Evaluation of vibration	
ISO 14839-3:2006	Mechanical vibration - Vibration of rotating machinery equipped with active magnetic bearings - Part 3: Evaluation of stability margin	
ISO 14839-4:2012	Mechanical vibration - Vibration of rotating machinery equipped with active magnetic bearings - Part 4: Technical guidelines	

Table 1-4 International standards of ISO/TC 108/SC 2 (related to ground-borne noise and vibration from rail systems)

Standard Number	Title	Remarks
ISO 10815:1996	Mechanical vibration - Measurement of vibration generated internally in railway tunnels by the passage of trains	Under withdrawal
ISO 14837-1:2005	Mechanical vibration - Ground-borne noise and vibration arising from rail systems - Part 1: General guidance	

Table 1-5 International standards of ISO/TC 108/SC 2 (related to basic techniques for vibration diagnostics)

Standard Number	Title	Remarks
ISO 13373-1:2002	Condition monitoring and diagnostics of machines - Vibration condition monitoring - Part 1: General procedures	
ISO 13373-2:2005	Condition monitoring and diagnostics of machines - Vibration condition monitoring - Part 2: Processing, analysis and presentation of vibration data	

Table 1-6 International standards of ISO/TC 108/SC 2 and the corresponding KS standards (related to balancing)

Standard Number	Title	Remarks
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ISO 1925:2001	Mechanical vibration – Balancing – Vocabulary	Under revision with the new number 21940-2
ISO 1940-1:2003	Mechanical vibration – Balance quality requirements for rotors in a constant (rigid) state – Part 1: Specification and verification of balance tolerances	Under revision with the new number 21940-11
ISO 1940-1:2003/ Cor 1:2005	Technical Corrigendum 1	
ISO 11342:1998 ISO 11342:1998/ Cor 1:2000	Mechanical vibration – Methods and criteria for the mechanical balancing of flexible rotors	Under revision with the new number 21940-12
ISO 19499:2007	Mechanical vibration – Balancing – Guidance on the use and application of balancing standards	Under revision with the new number 21940-1
ISO 21940-13:2012	Mechanical vibration – Rotor balancing – Part 13: Criteria and safeguards for the in-situ balancing of medium and large rotors	Replaces ISO 20806:2009
ISO 21940-14:2012	Mechanical vibration – Rotor balancing – Part 14: Procedures for assessing balance errors	Replaces ISO 1940-2:1997
ISO 21940-21:2012	Mechanical vibration – Rotor balancing – Part 21: Description and evaluation of balancing machines	Replaces ISO 2953:1999
ISO 21940-23:2012	Mechanical vibration – Rotor balancing – Part 23: Enclosures and other protective measures for the measuring station of balancing machines	Replaces ISO 7475:2002
ISO 21940-31:2013	Mechanical vibration – Rotor balancing – Part 31: Susceptibility and sensitivity of machines to unbalance	Replaces ISO 10814:1996
ISO 21940-32:2012	Mechanical vibration – Rotor balancing – Part 32: Shaft and fitment key convention	Replaces ISO 8821:1989

Table 1-7 International standards of ISO/TC 108/SC 2 (related to land vehicle vibration)

Standard Number	Title	Remarks
ISO 8002:1986	Mechanical vibrations – Land vehicles – Method for reporting measured data	
ISO 8608:1995	Mechanical vibration – Road surface profiles – Reporting of measured data	

Table 1-8 International standards of ISO/TC 108/SC 2 (related to building & bridge vibration)

Standard Number	Title	Remarks
ISO 4866:2010	Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures	
ISO/TS 10811-1:2000	Mechanical vibration and shock – Vibration and shock in buildings with sensitive equipment – Part 1: Measurement and evaluation	
ISO/TS 10811-2:2000	Mechanical vibration and shock – Vibration and shock in buildings with sensitive equipment – Part 2: Classification	
ISO 14963:2003	Mechanical vibration and shock – Guidelines for dynamic tests and investigations on bridges and viaducts	
ISO 18649:2004	Mechanical vibration – Evaluation of measurement results from dynamic tests and investigations on bridges	

Table 2 Work program of ISO/TC 108/SC 2

Project Number	Title	WG	Remarks
ISO/PWI 10816-5	Mechanical vibration – Evaluation of machine vibration by measurements on non-rotating parts – Part 5: Machine sets in hydraulic power generating and pumping plants	JWG 1	Revision and amalgamation of 10816-5 and 7919-5
ISO/DIS 10816-8	Mechanical vibration – Evaluation of machine vibration by measurements on non-rotating parts – Part 8: Guidelines for vibrations in reciprocating compressor systems	WG 11	
ISO/CD 10816-21	Mechanical vibration – Evaluation of machine vibration by measurements on non-rotating parts – Part 21: Horizontal axis wind turbines with gearbox	WG 1	
ISO/CD 13373-3	Condition monitoring and diagnostics of machines – Vibration condition monitoring – Part 3: Guidelines for vibration diagnosis	WG 10	
ISO/PWI 13373-4	Condition monitoring and diagnostics of machines – Vibration condition monitoring – Part 4: Diagnostic techniques of steam turbines	WG 10	

ISO/PWI 13373-5	Condition monitoring and diagnostics of machines - Vibration condition monitoring - Part 5: Diagnostic techniques of fans and blowers	WG 10	
ISO/PWI 13373-6	Condition monitoring and diagnostics of machines - Vibration condition monitoring - Part 6: Diagnostic techniques of gas turbines	WG 10	
ISO/PWI 13373-7	Condition monitoring and diagnostics of machines - Vibration condition monitoring - Part 7: Diagnostic techniques of hydraulic power generation and pumping plants	WG 10	
ISO/PWI 13373-8	Condition monitoring and diagnostics of machines - Vibration condition monitoring - Part 8: Diagnostic techniques of industrial pumps	WG 10	
ISO/CD 13373-9	Condition monitoring and diagnostics of machines - Vibration condition monitoring - Part 9: Diagnostic techniques for electronic motors	WG 10	
ISO/PWI 13373-10	Condition monitoring and diagnostics of machines - Vibration condition monitoring - Part 10: Diagnostic techniques of generators	WG 10	
ISO/PWI 13373-11	Condition monitoring and diagnostics of machines - Vibration condition monitoring - Part 11: Diagnostic techniques of gearboxes	WG 10	
ISO/PWI 14837-2	Mechanical vibration - Ground-borne noise and vibration arising from rail systems - Part 2: Prediction models	WG 8	
ISO/PWI 14837-4	Mechanical vibration - Ground-borne noise and vibration arising from rail systems - Part 4: Evaluation criteria	WG 8	
ISO/PWI 14837-5	Mechanical vibration - Ground-borne noise and vibration arising from rail systems - Part 5: Mitigation	WG 8	
ISO/CD TS 14837-31	Mechanical vibration - Groundborne noise and vibration arising from rail systems - Part 31: Measurement for the evaluation of complaints at residential buildings	WG 8	
ISO/CD TS 14837-32	Mechanical vibration - Groundborne noise and vibration arising from rail systems - Part 32: Measurement of dynamic properties of the ground	WG 8	
ISO/PWI TS 14837-33	Mechanical vibration - Groundborne noise and vibration arising from rail systems - Part 33: Measurement to evaluate performance of mitigation measures	WG 8	
ISO/PWI TR 14837-34	Mechanical vibration - Groundborne noise and vibration arising from rail systems - Part 34: Measurement of rail roughness	WG 8	
ISO 20283-4/DAM 1	Mechanical vibration - Measurement of vibration on ships - Part 4: Measurement and evaluation of vibration of the ship propulsion machinery - Amendment 1	WG 2	
ISO/PWI 20283-5	Mechanical vibration - Measurement of vibration on ships - Part 5: Guidelines for the measurement, reporting and evaluation of vibration on passenger and merchant ships	WG 2	Revision of ISO 6954:2000
ISO/PWI 21940-1	Mechanical vibration - Rotor balancing - Part 1: Introduction	WG 31	Revision of ISO 19499:2007
ISO/PWI 21940-2	Mechanical vibration - Rotor balancing - Part 2: Vocabulary	WG 31	Revision of ISO 1925:2001
ISO/CD 21940-11	Mechanical vibration - Rotor balancing - Part 11: Procedures and tolerances for rotors with rigid behaviour	WG 31	Revision of ISO 1940-1
ISO/PWI 21940-12	Mechanical vibration - Rotor balancing - Part 12: Procedures and tolerances for rotors with flexible behaviour	WG 31	Revision of ISO 11342:1998

Table 3 New work items of ISO/TC 108/SC 2

Project Number	Title	WG	Remarks
ISO 10816-6:1995/NWIP Amd 1	Mechanical vibration - Evaluation of machine vibration by measurements on non-rotating parts - Part 6: Reciprocating machines with power ratings above 100 kW - Amendment 1	WG 1	
ISO/PWI 20816-1	Mechanical vibration - Measurement and evaluation of machine vibration - Part 1: General guidelines	WG 1	Revision and amalgamation of ISO 10816-1:1995 + Amd 1:2009 and ISO 7919-1:1996
ISO/PWI 14839-5	Mechanical vibration - Vibration of rotating machinery equipped with active magnetic bearings - Part 5: Vendor/customer data exchange for design and commissioning acceptance and operating management of AMB	WG 7	